

# The Effect of Task Design on Performance and Motivation for New Product Development through Crowdsourcing



Master Thesis Marketing  
Erasmus School of Economics  
Kaan Kayar  
357279  
Supervisor: Drs. Muhammad Asim  
Co-reader: Dr. Vijay Hariharan

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## **Abstract**

Technology related to communication, such as the Internet, has enabled company and customer to interact with each other on a whole new level. Collaboration can be from value for both company and customers. For the company, crowdsourcing has been found to be a great source for new idea generation. The tasks provided to participants in such crowdsourcing contests may differ based on different informational cues. This thesis was an attempt to better understand the perceptions of participants regarding different informational cues in crowdsourcing contest tasks and what the effects may be on performance and intrinsic motivation. An experiment based on a T-shirt design contest was conducted to research the effects of different informational cues. The communication of peers evaluation compared to a jury evaluation has been found to have a positive effect on performance when the contest task includes a relative simple task as coming up with ideas for a new T-shirt design, and intrinsic motivation is found to be accounted for these differences. At the same time, no effect was found in the overall model for sharing the selection (evaluation) criteria throughout the task. But separating the model for males and females to predict performance has shown that selection criteria may have different effects on performance between genders. With that, this thesis complements existing research related to performance, motivations and task characteristics in crowdsourcing contexts and leaves plenty of room to be considered for further research on the perceptions of participants regarding the task in crowdsourcing practices.

# 1. Introduction

More and more companies shift their core business characteristics from being product focused to a customer focus approach. Never before had companies the technology to interact with customers this directly (Rust, Moorman, & Bhalla, 2010). The importance of engaging customers into the company's activities is getting acknowledged by companies. The added value to and from customers comes from the active co-creation experience between customer and company (Prahalad & Ramaswamy, 2003). With that, collaboration with customers reaches to a wide range of marketing processes. The purpose may for instance be brand building, managing customer relationships or product development. A fundamental way companies interact with customers is by actually involving them into their innovation process and/or new product development process. That is, collaborate with the crowd for new idea generation. This can be done by the so called crowdsourcing platforms for open innovations, where companies work together with customers to come up with ideas for the future. When companies open their innovation process in the form of a crowdsourcing contest, they provide participants with a certain task. These tasks may include different contextual cues, so called task-attributes (Zheng, Li, & Hou, 2011). Therefore studies have been trying to understand how different informational cues in the task may influence the perceptions of participants and with that the motives and the outcome of the tasks (Kaufmann, Schulze, & Veit, 2011; Rogstadius et al., 2011; Füller, 2010; Leimeister, Huber, Bretschneider, & Krcmar, 2009).

When companies decide to involve customers only to create or come up with new ideas and/or products, this automatically means that the company itself will evaluate the ideas. Another practice includes that companies may decide to empower customers for both creation and selection of new products or ideas, where ideas will be evaluated by the crowd also. For instance Threadless – a clothing company that fully depends on their community – enables the crowd to come up with new design ideas for T-shirts and at the same time enables the crowd to vote on others' ideas as well. Similarly, toy manufacturing company Lego provides the crowd to create and also select from the crowd generated ideas throughout their innovation platform 'LEGO Ideas'. Coffee company Starbucks allows customers to submit ideas on their web based platform 'My Starbucks Ideas'. In the past users were also able to vote and comment on those ideas. But currently the platform only provides the submission of new ideas, whereas key decision makers (experts) from Starbucks decide on which ideas will work out for the company. The global snack food company Frito-Lay launched the campaign 'Do Us a Flavor'. This campaign, in the form of a crowdsourcing contest, provided consumers a web based platform to come up with original flavor ideas for potato chips. A panel of judges, including chef cooks, was appointed to select and narrow the submissions for new flavors to

a top three that were realized and supplied in stores for customers to buy. Eventually the final winning flavor was decided by public vote. Based on these distinctions, the contest task may include that idea evaluations will be done by a jury of experts of the company, or that submitted ideas will be evaluated by the crowd, i.e. peers. The aim of this study is to understand how participants regard these different levels of involvement, and what effect the different type of evaluators communicated throughout the task may have on performance in such contests.

Another potential task characteristic that has been explored is how participants of crowdsourcing contests may regard the inclusion of the criteria that will be used to evaluate or select submitted ideas upon on. For example Osram – a global player in the lighting industry and subsidiary of Siemens – organized the ‘LED-Emotionalize Your Light Contest’. The objective was to rely on the creative and innovative community to provide new ideas (or solutions) with the use of LED lightning technology. The contest included an open evaluation where participants also could evaluate others’ submissions. The company provided evaluators an assessment with several criteria the evaluation (or selection) of ideas should be based upon on. Some of these criteria included: general liking, customer benefit and market potential. With that, providers of crowdsourcing contests may consider to include such criteria in the contest task for participants to be aware of while working on the task.

Consequently, the task design of crowdsourcing contests may differ based on different informational cues. Related to the objective of this study, the evaluators may be a jury of experts or may be the crowd itself. On top of that, the criteria where evaluations will be based upon on may be shared throughout the task. The experiment in this study was designed by having the dimensions of involvement (to create only versus to create and select) and whether selection criteria was shared or not combined, separating subjects into four groups. With that, the interaction between the two proposed informational cues are investigated.

The other main objective of this study was to better understand the role of intrinsic motivation in crowdsourcing contests. Studies have been separating motivations for involvement in a company’s activities based on intrinsic and extrinsic motivation (e.g. Kaufmann, Schulze, & Veit, 2011; Zhao & Zhu, 2014a; Füller 2006; Lakhani & Panetta 2007; Boudreau & Lakhani, 2013; Lundkvist & Yakhlef, 2004; Zheng et al., 2011). Most of such studies have been focusing on the motivations to participate and contribute through crowdsourcing practices. This study is aimed to understand what role intrinsic motivation has on performance in a crowdsourcing setting. With that, the role of intrinsic motivation on the relationship between performance and the two different informational cues proposed, are investigated.

The perceptions of people towards the evaluations by peers are being discussed following findings from educational settings and in the context of workplaces. Combining the findings from studies related to customer involvement, the expectations regarding the perceptions of participants to peers evaluation in relation to performance are set. Goal-setting theory is explored to develop the hypothesis regarding the relation between selection criteria in the task of crowdsourcing contests and performance. General theory on motivation and job/task design theory are discussed to set the hypotheses regarding the role of intrinsic motivation on task characteristics and performance. A moderation analysis is performed to understand the relationship between the proposed task-attributes and performance, capturing the possible interaction between the different levels of the task-attributes. A mediation analysis is conducted to understand the role of intrinsic motivation on the relationship between task-attributes and performance.

## **1.1 Problem Statement and research question**

The purpose of this study is to contribute to existing literature on the phenomena of involving customers in a firm's activities. Co-creation with customers has been getting increased attention of companies. Involving customers by crowdsourcing contests through idea generation tasks has been one of the practices used to attract new ideas from the community. The contribution of this study is aimed at providing more insights on how participants of crowdsourcing contests perceive being involved in such contests. To get more insights, two separate aspects have been investigated.

The first aspect is related to the structure of the tasks purposed by companies in crowdsourcing contests. There has been investigated how different attributes in the task are perceived by participants of crowdsourcing contests. In particular, the effects of communicating different type of evaluators in the task, and the inclusion of selection criteria in the task, have been examined. The second aspect considers the role of motivations of participants in a crowdsourcing contest, in particular intrinsic motivation. With that, there has been investigated to what extent intrinsic motivation accounts for differences in performance caused by different attributes in the task design. In addition, to complement earlier research, the effect of intrinsic motivation on performance is explored. The main research question of this study is as follow:

*What contextual cues in the task design of crowdsourcing contests may lead to differences in performance and can these differences be accounted to differences in intrinsic motivation?*

An important issue related to customer involvement and co-creation has been the attraction of the right participants (Füller, 2006). One aspect on how to attract the right people has to do with the

design of the crowdsourcing contest. Therefore it is important to understand how a crowdsourcing contest may be perceived by participants based on different attributes in the design of the task (Zheng et al., 2011; Leimeister, Huber, Bretschneider, & Krcmar, 2009). To contribute to earlier studies related to the task design in crowdsourcing contests, two different kind of possible contextual cues (task-attributes) in contest tasks are investigated.

The first is related to how participants perceive communication of different type of evaluators in the contest design. With that, submissions of participants may be evaluated by a jury of the company (empowerment to create) or by other participants in the crowdsourcing contest (full empowerment). The informing of different type of evaluators may be perceived differently and consequently have an influence on the outcome (e.g. performance, creativity) of the contest. Therefore the following sub-question is formulated:

*Sub-question 1:* What is the effect on performance (creativity) of informing participants in crowdsourcing contests that ideas will be evaluated by a jury compared to informing participants ideas will be evaluated by peers?

Another attribute that has been investigated, has to do with including the selection criteria on which the evaluators will judge the submissions of participants. The inclusion of selection (evaluation) criteria is expected to be perceived differently among the groups and may cause therefore differences in performance. The following sub-question is formulated to examine the provision of selection criteria:

*Sub-question 2:* What is the effect on performance of providing participants the selection criteria for evaluation of ideas in crowdsourcing contests?

Besides the chance of earning monetary rewards, participation in a company's business activities, such as in a crowdsourcing contest, is being perceived as a positive experience for participants. For this reason the academic literature has been focusing on the reasons why customers would want to be actively involved in the business activities of firms, such as a crowdsourcing contest. Different studies have been investigating the motives for customers to co-create with firms. Most of these studies have been highlighting the role of intrinsic motivation and the importance of intrinsic motives to attract the right participants. In order to understand the role of intrinsic motivation on the outcome of the contest and whether different contextual cues in the task design play a role through differences in intrinsic motivation, the following sub-question is attempted to be answered:

*Sub-question 3:* Can intrinsic motivation be accounted for the relationship between different task-attributes and performance?



## 1.2 Academic and practical relevance

With this study there has been made an attempt to understand how participants of crowdsourcing contests may perceive being involved in such activities. The main objective of this research is to contribute to existing literature on customer involvement. Studies on co-creation in the form of crowdsourcing are getting increased academic attention. Crowdsourcing is a relative new practice enabled by the upcoming of the Internet and Web 2.0<sup>1</sup> sites (Howe, 2008). Several studies have been focusing on how crowdsourcing can contribute positively to the NPD process of companies and outperform ideas of experts inside the company (Nishikawa, Schreier, & Ogawa, 2013). This study will complement studies on customer involvement related to the psychology behind participating from the participant's view. One aspect will have to do with the design of the contest task and what effect different contextual cues, referred to as task-attributes, may have on the participants. The study of Zheng et al. (2011) has shown how different attributes in the task of crowdsourcing contests, in combination with motivation theory, may affect the motives for participation. The aim of this research is to complement earlier studies regarding the task design and the influence it may have on the results of participants in a crowdsourcing setting. Studies have been concerned on how to attract the right participants through the design of the contest task. These studies have been arguing on the importance of the task design to live up to the expectations of participants (e.g. Kaufmann et al., 2011; Luo and Toubia, 2015). This study will contribute to such studies by investigating how certain attributes in the task may affect perceptions of participants and with that, the effect on the performance or creativity of the ideas submitted in crowdsourcing contests.

Another aspect has to do with the two different motives distinguished by earlier studies. That is, extrinsic motives in the form of monetary rewards for participants, and intrinsic motives, where participation is considered to be a rewarding experience itself. The literature has been arguing the necessity of understanding the crowd's motivation to participate in crowdsourcing contests (e.g. Zhao & Zhu, 2014b; Brabham, 2010). This is because the results of such studies have been conflicting in relation to intrinsic and extrinsic motives to participate for contests including different contexts. For example, motivation to be part of a contest with social interests may substantially differ from business-oriented crowdsourcing contests. Among other studies, Füller (2006) has shown the importance of intrinsic motives to participate in the new product development process of companies and makes the consideration for further research to investigate the effect of different consumer motives on the quality and creativity of their contribution. Hence, this study is an attempt to

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<sup>1</sup> Web 2.0 refers to the usage of the internet as an interactive source exchanging medium between people, companies, etc.

contribute to existing literature by investigating the role of intrinsic motivation on the performance in crowdsourcing contests. Zheng et al. (2011) have shown with their study that different attributes in the task of crowdsourcing enhances intrinsic motivation and how intrinsic motivation on its turn positively affects the intention to participate. First, the effect of intrinsic motivation on performance in crowdsourcing contests will be investigated as suggested by Füller (2006). Second, this study contributes to the existing literature (e.g. Zheng et al., 2011; Kaufmann et al., 2011), by examining whether intrinsic motivation mediates the relationship between task-attributes and performance.

This study contributes to managers and designers of crowdsourcing platforms to gain insights on how participants perceive participation in crowdsourcing contests. The aim is to provide a better understanding of the factors that may influence the outcome of crowdsourcing practices. Marketers, designers, and managers are provided insights to better overcome issues related to the task and performance in crowdsourcing practice. By having a better understanding of the motives and the contest task, related to the performance in crowdsourcing, firms may want to enhance the task design to get desired contributions from participants.

### **1.3 Structure**

Chapter one starts with an introduction on co-creation and how companies have been actively starting to involve customers in their new product development activities. After this introduction the research question that is aimed to be answered has been formulated. Whereas after the academic and practical relevance of this study is described. Chapter two is dedicated to existing literature on customer involvement in the new product development process of companies, with an emphasis on crowdsourcing contests. This theoretical framework has led to the development of the expectations for this study, whereas several hypotheses are formulated. Chapter two ends with the conceptual framework of this research.

Chapter three discusses the research methodology that has been used to perform the empirical study and test the hypotheses. This chapter will contain the data collection technique and clarify the measurement of the variables. In chapter four, the results of the analyses are represented. The study ends with the conclusion in chapter five, consisting out of a general discussion of the findings, implications, limitations of the study, and considerations regarding future research.

## 2. Literature review

### 2.1 From product focus to customer (market) focus

Technological growth has led to more and more focus from companies on customers, rather than on their products. Newly available technology has enabled companies to better understand and interact with customers. Never before were companies able to interact this directly with customers to collect and gather information about them in such a powerful way. The other way around, never before were customers able to interact with companies this much either.

This shaped the landscape of product focus and mass marketing programs to shift more to customer driven products and the so called below-the-line marketing. Below the line is the opposite of above-the-line marketing. Above the line is marketing through the traditional marketing channels by television, radio-stations, and so on. This is a form of mass marketing where a message is delivered to a big crowd at once. Conversely, below-the-line marketing has to do with specific marketing to individuals. The purpose of below the line communications is to create a targeted relationship (Shukla, 2010). Focus to individual customers is meant to realize higher profits by targeting the right customers. With technological developments related to communication, firms are able to target and segment their customers in such a way that it makes it possible to send the right message to the right people at the right time. In the past companies were looking to get a message to a large population at the same time by using one way mass communications. This was without direct communication between individuals and companies. The shift to customer focus has led for companies to build relationships with customers as one of their highest priorities. While the traditional way of operating of companies was done by pushing products and pushing the brand, marketing analytic tools enables companies to directly serve customers and segment them accordingly to their needs (Rust et al., 2010). Direct marketing programs such as direct mail and telemarketing already allowed for direct and interactively communication with individuals by companies. But the new digital tools would go beyond this simple interaction. Consequently, the new technologies give power to the customers, rather than to marketers:

*Mass communication technology empowered marketers with marketer-to-consumer tools such as radio, television and database-driven direct marketing. The digital innovations of the last decade made it effortless, indeed second nature, for audiences to talk back and talk to each other. They gave us peer-to-peer tools like Napster, eBay, Tivo, MySpace, YouTube,*

*Facebook, Craigslist and blogs, and information search tools like Google and Wikipedia* (Deighton, & Kornfeld, 2009, p. 4).

Managing customer equity implies optimal use of the available resources to interact with customers. Customer equity is defined as the lifetime value of all customers of a company (Rust, Lemon, & Zeithaml, 2004). Customer equity defines the strength of the relationship between companies and their customers. The shift from product profitability to customer profitability translates into the focus on customer loyalty and on increasing customer commitment. Focus lays on retaining and segmenting profitable customers rather than the acquisition of new ones. The traditional way of communicating with customers by mass advertising isn't efficient enough anymore. Customers now have enough means to access big amounts of information on products, brands and companies. These developments show the importance of sending the right message to the right people at the right time. The functions of marketing communications therefore are to show people how, why, when and where products may be used. But it goes behind just learning about the product, its function is also to teach customers who make the products and what the company and brand stands for (Keller, 2009). Hence, the need to listen and interact with customers for actual product development becomes increasingly important. To compete in this aggressively interactive environment, companies shift their focus from product profitability to customer profitability (Rust et al., 2010). Listening to the customers' demands simply cannot be ignored. While differentiating itself from the competition is becoming even more important due to the already available high variety of products.

In the traditional sense a market is defined as a place where goods and services are being exchanged with consumers, a one way interaction. Here, companies' value creation happens outside the markets itself. The company decides independently on what products to design, how to segment their customers and on how to communicate their products to the market of aggregate consumers. Companies try to sell their developed products to what they believe are the right customers. With that, the traditional approach of creating value by companies involves trying to sell what has been produced beforehand. The exchange of values between customers and firms take explicitly place at the marketplace itself. Here, the end-user is restricted to only an acceptance or rejection of the offered products. This traditional approach implies that the company's autonomously value creation leaves no place for the end-user to be a part of the pre-production stage.

But as emphasized, the role of customers in today's world goes far behind consuming alone. The digital innovation and the upcoming of *new media*, or to say the Internet in general, enabled not only better communication between customers but also interaction back and forth between the company and its customers. Hennig-Thurau et al. (2010) define new media as: "New media are websites and

other digital communication and information channels in which active consumers engage in behaviors that can be consumed by others both in real time and long afterwards regardless of their spatial location.” (p. 312). The authors further discuss the six defining characteristics of new media as follow:

1. Digital - individuals can distribute their ideas, thoughts or creations without any marginal costs or without any barriers like publishers, anyone with an internet connection has the access to do so;
2. Visible - all activities on new media can be seen by other people as well as companies;
3. Real-time and Memory - allows individuals to share in real-time (at the time of production) and these may be available years into the future.
4. Ubiquitous - mobile devices allow people to interact through new media at any time and any place
5. Networks - new media enables people to create their social network, and with that communicate, share and build relationships with one another.
6. Pro-active - new media allows people to engage in all parts of the value chain of companies, from writing reviews on websites to actually getting involved in the new product development by co-creation or crowdsourcing communities.

The marketplace has been changed from one way communication from business to consumer, to a modern interactive environment. One important source of information when looking at the pro-active characteristics of new media has to do with reviews of peers, e.g. previous customers of the specific products. This type of word-of-mouth, in the form of online user reviews, has been found to have a positive effect on sales for e-commerce stores selling books, e.g. Amazon (Chevalier, & Mayzlin, 2006). This increasing role of consumers in the marketplace as value creators has been referred to as co-creation. This translates into pro-active behavior from customers, and also involves active engagement from the side of firms. The concept of co-creation is discussed in the next section.

### **2.1.1 Co-creation**

It can't be denied that the role of consumers has been changed drastically when it comes to creating value in the marketplace. The customer today is more involved than ever because the digital innovations made interaction between consumers and companies easy and attractive. Customers inform themselves as much as they believe is sufficient to make the right choice. Therefore the customer has been gone from being passive to being active and being involved. Individuals are able to share ideas independently of their social status or geographical location. The role of the company of being autonomous in designing products is no longer there. Consumers are no longer only

involved at the moment of exchange, but seek to exercise their influence or value throughout the entire value chain. With that, customers are aware of their empowerment in the new marketplace. “Armed with knowledge drawn from today’s increasingly transparent business environment, customers are much more willing than in the past to negotiate prices and other transaction terms with companies” (Prahalad & Ramaswamy, 2004, p. 7). This leads to prices and products that are the result of negotiations between customer and company. Therefore companies cannot neglect this increasing empowerment of consumers. The consequences of neglecting value sources outside the company can lead to competitive disadvantage due to the increasing commoditization. The high variety of offerings due to increased globalization, outsourcing, deregulation and the convergence of industries and technologies, has led to high variety of products and services (Prahalad & Ramaswamy, 2004).

In order to create and keep their competitive advantage, companies have to rely on co-creating value with customers (Prahalad & Ramaswamy, 2004). Building a long-term relationship with customers is therefore essential. Instead of one way communication, a two way communication in narrow segments is required in order to provide value in the area of the increasing interactive environment, caused by the digital innovations. The value of co-creation comes from any interaction between customer and company, at any level of the value chain. Therefore co-creation is a relative broad term and is defined as:

*The added value to the producers are the insights from customer interaction and participation, continuous feedback, co-creation and co-ownership of products, customer satisfaction, retention, customer delight, the loyalty that comes from such interaction and the positive referrals that result from happy and delighted customers (Mascarenhas, Kesavan, & Bernacchi, 2004, p. 487).*

This implies that customers interact and are exposed to a firm’s persons, processes, products, brands and to their networking relationship (Mascarenhas et al., 2004). This results in consumers desiring to co-create value outside the marketplace itself. Co-creation from the company’s point of view has to do with the active role of consumers in and outside the marketplace, by integrating them as a source of value. As mentioned, co-creation in the sense of value creation by customers is a relative broad term. Co-creation value therefore spans to different contexts within the marketing process. These include: *customer relationship management, brand building, customer support, sales, marketing communications, and new product development (Sawhney, Verona, & Prandelli, 2005)*. An overview is provided in figure 1.

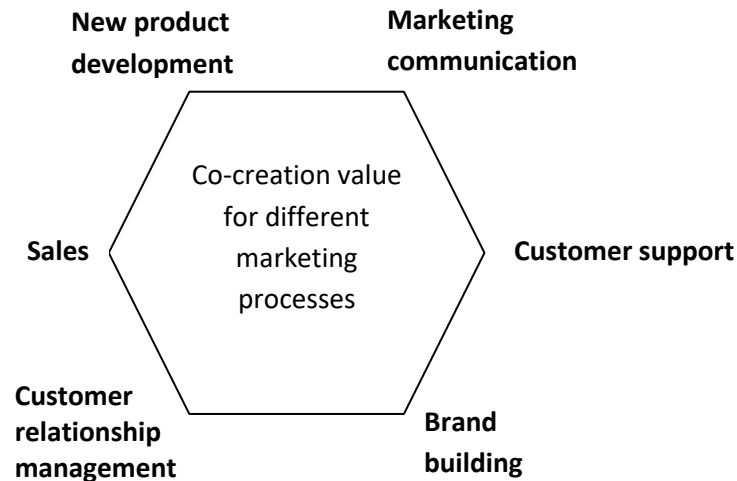


Figure 1: Different practices of marketing related to co-creating value with customers

New media enables customers to be pro-actively involved. As mentioned, this pro-active involvement may occur in the form of writing reviews on e-commerce websites, e.g. Amazon, resulting in co-creation of value. Another very simple example of co-creation in value comes from the self-service on gas stations, or in supermarkets. From relevance for this study is another key context in value co-creation, which involves a pro-active interaction. That is, customer involvement in the new product development (NPD) process.

Customer involvement in the NPD process comes in different forms, referred to as: co-creation, co-produce, co-design, open innovation and crowdsourcing. For the purpose of this study, is the definition of crowdsourcing, proposed by Jeff Howe (2008). Howe (2008) defined crowdsourcing as the act of taking a function once performed by an employee of the company, and outsourcing it to an undefined (and generally large) network of people, in the form of an open call. This 'crowd' may consist of current customers, potential customers, or other people interested in cooperation with the company.

This part has been focusing on how the landscape of new product development and marketing in general is changing from being firm centric, where value is added by the company, to the practice of value extraction from co-creation with customers. All this is enabled by the increasing communication technologies and access from consumers to unlimited amounts of information. This empowerment has been led from consumers being involved passively in the value chain of companies, to customers being actively participating to create value with companies. The value from co-creation has been shown to have value for several marketing processes including new product

development. The next part will discuss in detail what the arguments are from the firm's perspective to open their innovation process to the crowd.

## **2.2 Purposes of customer involvement, the company's view**

The internet, i.e. new media, has contributed to the pro-active role of customers in the entire value chain of products and services. With that, it has also allowed companies to regulate and build online communities to listen and connect with their customers on a whole new level. Companies are facing tough challenges related to coming up with offerings that match the needs and wants from customers. This is caused by the wide variety of choices customers have, resulting in micro-segmentation of product categories. Additionally, customers' preferences are changing rapidly as well. The argument of missing the needs and wants of customers for the failure of innovation and product introductions, has been an important issue of marketing research today (e.g., Hauser, Tellis, & Griffin, 2006; Kristensson, Matthing, & Johansson, 2008; Ogawa & Piller, 2006). The issues related to innovative products show the importance of collaboration and listening to the wants and needs of customers. Involving (potential) customers or other stakeholders outside the company in the innovation process, has been evolved to be crucial for potential growth and retaining competitive advantage.

Studies have proposed different arguments of the value for companies to be more customer orientated. The basic behind interacting intensively with customers is to better understand and react to the changes in the needs of customers. Several studies have shown the importance of customer orientation on the performance of companies (Kirca, Jayachandran, & Bearden, 2005). From the customer's perspective, Fuchs and Schreier (2011) suggest that companies who are perceived to be more customer orientated, receive more favorable corporate attitudes and have stronger behavioral intentions, that is, higher purchases, loyalty, positive word of mouth, and corporate commitment. Besides the acquisition of new ideas and solutions, customer involvement has been found to reduce development costs and shorten time to market (Fang, 2008; Laage-Hellman, Lind, & Perna, 2014). Alam (2002) suggests that the process of user involvement is useful for companies seeking for the development of a superior and differentiated product or service. Gruner and Homburg (2000) concluded that customer involvement enhances new product success. The wide range of studies have shown the positive impact of customer integration into the innovation process, for both products and services (e.g. Bhalla, 2010; Kristensson, Gustafsson, & Archer, 2004; Sawhney et al., 2005). A reason behind the success of customer involvement is that today's customers are more heterogeneous as ever before, that is, their needs are highly heterogeneous in many sectors (Von



Hippel, 2005). Because of this heterogeneity in need, many customers may not find what they are looking for in the market, while at the same time they have a high willingness to pay to get exactly what they demand (Franke & Von Hippel, 2003).

The value of co-creation has been proposed to lead to two significant sources of competitive advantage (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010). These are: 1) gains in productivity through the increase of efficiency and 2) improved effectiveness. Gains in productivity are the result of minimizing the costs. The acquisitions of consumer ideas are relatively cheap, while at the same time it cuts the costs of traditional market research (Evans & Wolf, 2005). Another source of cost savings occurs because products derived from involving customers are found to reduce the risk of being a failure (Ogawa & Piller, 2006). Costs are saved because of faster speed-to-market. This improved effectiveness arises from a better fit with the needs of consumers (Lilien, Morrison, Searls, Sonnack, & Hippel, 2002). Additionally, products and services resulted from involving consumers have been found to have an increased commercial attractiveness and an increased positive attitude towards it, this due to the increased preference resulted from a better fit with the needs (Franke, Keinz, & Steger, 2009; Franke, Von Hippel, & Schreier, 2006).

### **2.2.1 Opening the innovation process**

The internet has allowed companies to connect with consumers all over the world. The use of the so called open innovation process has the purpose to reduce uncertainties associated with customer and market needs as well as how to apply a technology to transform customer needs into products and services (Piller, Ihl, & Vossen, 2010). Consumers have been suggested to be involved by two means. This is *idea screening*, i.e. the selection of ideas proposed by the company itself and/or *idea contests*, where companies request the crowd for a solution for a particular problem in the form of a task, where the best submitted ideas/solutions are provided with a reward (Piller & Walcher, 2006; Toubia & Florès, 2007; Terwiesch & Xu, 2008). Hence, there are two dimensions in which way companies empower customers when involving them into their new product development process, namely the empowerment to vote (i.e. selecting ideas) and the empowerment to create (i.e. submitting ideas). This means in practice that there are four different types of companies when it comes to involving customers (Fuchs & Schreier, 2011). 'Zero empowerment' implies that the company both creates and decides what will be marketed and does not involve customers into the NPD process. 'Select empowerment' implies that customers may decide on which new products will be marketed. 'Create empowerment' means companies open the innovation process for customers to create a new design. At last, 'full empowerment' implies that the company enables customers to create and select new ideas. Full empowerment means that companies fully depend on the ideas and

selections of customers, whether this is part of the entire business model or just for a product group or line. Figure 2 provides examples of companies and the level of involvement they have been using to open their innovation process to the crowd.

*Who decides which designs will be produced?*

		<u>Company</u>	<u>User</u>
<i>Who creates new designs?</i>	<u>Company</u>	Zero empowerment: <i>Apple</i> <i>Amazon</i> <i>Facebook</i>	Select empowerment: <i>Google</i> <i>Audi</i> <i>Volvo</i>
	<u>User</u>	Create empowerment:  <i>Boeing</i> <i>Frito-Lay</i> <i>Ben &amp; Jerry's</i> <i>Starbucks</i>	Full empowerment:  <i>Threadless</i> <i>Muji</i> <i>LEGO</i> <i>Quirky</i>

Figure 2: Companies in relation to customer involvement

Next, the practice examples of companies involving customers for both selection and creation are discussed (full empowerment).

**2.2.2 Full Empowerment in practice**

Muji, Quirky, Lego and Threadless are all examples of companies that involve customers by empowering them with both creation and selection. This may be the core of their business model or is just one of the practices to be more customer orientated. These company examples will be discussed in detail in this section.

**Muji**

Muji, a Japanese retail chain, is an example of a company that asks the crowd to submit ideas for new products. The company sells goods ranging from apparel to household goods and foods. One part of their business model is that they ask customers to both create and select new ideas (Ogawa & Piller, 2006). Muji offers these products without any brand attached to it, this way selling these products for a much lower price. The move towards customer involvement has been the result of the

large community developed by the company throughout the years. Enthusiastic users submit ideas for new products, at the same time these submitted ideas get evaluated by the community. Afterwards, the company decides whether the highest ranked ideas are profitable to be put on the market place. The ideas get refined and reworked to be a marketable product. The company asks customers to place preorders and if the minimum amount of preorders is accomplished the product will be realized to be put on the marketplace.

### **Quirky**

Quirky is an example of a company where community based innovations are the core of its business model. This is because the company, founded in 2009, has the purpose to bring regular people's ideas to life. The company pairs these ideas to investors and manufacturers. Users can submit their ideas for different product groups via Quirky.com. Here, the community also votes on ideas and when there are enough votes for a particular idea the community is asked to preorder. If there are enough users willing to preorder, the idea will be realized into a marketable product. Quirky is an example of a company that involves customers throughout the entire span of the innovation process and with that fully depends on the involvement of customers as it is the core of its business model (Piller et al., 2010).

### **Lego**

Lego is a Danish toy manufacturing company. The purpose of the company is to make children play and learn, by building all kinds of constructions with the wide range of playable LEGO bricks. Throughout the years the company faced different strategic challenges. One of these had to do with that increasing technology led to a decrease in children wanting to play with 'traditional toys', such as the category the Lego bricks belong to. The company knew it had to make radical changes. In order to fulfill the (changing) needs of customers and keep the Lego experience alive, one of the solutions was to have a greater customer focus (Kalcher, 2012). The outcome was that Lego came up with different platforms to better interact with customers. One of these settings is an open innovation platform, called 'LEGO Ideas'. This way of crowdsourcing enabled customers to involve on a whole new level. The platform allows customers to co-design Lego sets as well as involvement in the product selection procedure. The best rated ideas eventually are evaluated by the staff of Lego to be put on the market.

## **Threadless**

Clothing company Threadless is founded in 2000 by two clothing designers. Their products are T-shirts with colorful graphic designs, a product in a market with rapid changing trends and needs. The success of Threadless is defined by the fact it opens both idea generation and selection to the crowd and therefore the company wouldn't exist without the involvement of customers. All their new products have been created, inspected, improved, approved, and selected by a user community before getting put on the market (Piller, 2010). It is an example of a company that is totally built up on the principal of co-creation and involving customers to come up with their products. To come up with new T-shirts the community collaborates throughout their website. The company totally depends on continuous commitment from their community (Ogawa & Piller, 2006). Eventually the result of these contests through their website platform is the mass production of the winning T-shirt idea.

### **2.3 Crowdsourcing and new product development**

There are several studies dedicated on how customer involvement and crowdsourcing can contribute to the new product development process. Most of these studies are done by looking at what positive effects customer involvement has for the company (Nambisan, 2002). But this so called democratization of innovation, where users are able to innovate for themselves, has the advantage that customers develop exactly what they want and these ideas are shared freely with each other (Von Hippel, 2005). According to Von Hippel (2005), this so called user-centered innovation processes offer great advantages over the traditional way of manufacturer-centric innovation. Because with manufacturer-centric innovation the producer (the firm) first has to identify the needs of customers and eventually has to come up with a product that they believe will fulfill this need. Von Hippel (2005) identifies two trends that have been driven the democratization of innovation: 1) improve in design capabilities and the increase in accessibility as well as the ability for people to actually use it, resulting from innovations related to computer hardware and software, 2) ability for people to interact and exchange knowledge resulted from the communication technologies, such as the Internet.

One important issue in the academic literature today is whether users, e.g. (potential) customers or the crowd, really can compete with experts and professionals when it comes to new product development ideas (Poetz & Schreier, 2012). Managers wonder whether the crowd is able to come with a creative and qualitative product in order to increase the performance of the company. When opening the innovation process to the crowd, the company expects to benefit from the large amount

and diversity of ideas expecting an increased chance of innovativeness. But previous studies have also suggested that having many participants or solvers work on an idea may reduce the overall average effort that is being put in to solve or come up with an innovative idea. But also that the diversity of ideas obtained from the crowd mitigates this negative effect (Terwiesch & Xu, 2008).

Challenge managers are facing when opening the innovation process to the crowd, such as in the form of a crowdsourcing contest, is how to deal with different kind of products when considering outsourcing the new development process to outsiders, rather than to inside professionals. The question that arises is whether the professionals of the firm or the customers using its products, can come up with better ideas. At the same time, whether these products have the desired commercial attractiveness. In the traditional new product development model, where the firm is responsible for which products to be marketed to match the needs of customers, it is been believed that users can define *what* the solution or need may be, but not on *how* it should work. The traditional way of thinking assumes that the firm's professionals have the acquired skills and also the capabilities to come up with high quality designs or ideas, and that the expertise of research and development is what leads to novel ideas (R&D) (Poetz & Schreier, 2012).

But the trend towards this heavily relying on the professionals, is turning around. Academic research has argued that too much focus on internal expertise to come up with new products may lead to negating the fact that the crowd may come up with potentially better alternative ideas (Stuart, & Podolny, 1996). Moreover, empirical studies have shown that indeed products driven by customer involvement are found to have a high commercial attractiveness (Franke & Shah, 2003; Franke et al., 2006).

### **2.3.1 Performance in crowdsourcing contests**

Two important measures of new product development success are the sales generated by the new developed product and how innovative the new product is (Kleinschmidt & Cooper, 1991). Whether companies have decided to open only the idea generation or both idea generation and selection, the innovativeness of the new developed product may be decided based on the willingness to buy, ratings given by other users or by an external panel, i.e. a jury. With that, innovativeness of new ideas already can be decided upon the development stage, so before any sales are realized. Another indicator of success are the sales generated by the new product measured after the commercialization stage.

As mentioned earlier, Muji is an example of a company that has products generated by both users and designers. The study of Nishikawa et al. (2013) was aimed to find out whether these products of

different sources (crowd versus experts), perform differently based on key market performance metrics. Their founding was that in the case of Muji, user-generated products outperformed the expert-generated products both in the short and long term. In the first year after the introduction, the user-generated products had a three times higher sales revenue. Also the gross margins were four times more than those of the designer-generated products. On the longer term, after three years, the aggregate sales revenues of the user generated products were substantial higher than those of the designer-generated products (Nishikawa et al., 2013). But the authors also emphasize that the users involved in their study, all had a high degree of involvement with the product category they were creating ideas for. Namely, they had relatively high levels of technical expertise and had already been dealing with the problems for which solutions were asked for in the past (Nishikawa et al., 2013). This way categorizing them as being so called lead users. Therefore the authors have emphasized that more study on the “average user” is required in order to make more generalizable conclusions. Their study has shown that the performance in crowdsourcing contests heavily depends on the product category as well as on the “knowledge” of the customers about the product, i.e. expertise the participants own (Nishikawa et al., 2013).

### **2.3.2 Structure of tasks for idea generation**

Looking from a social psychological perspective for coming up with new ideas, such as in an idea generation task of crowdsourcing contests, the Search for Ideas in Associate Memory model has been proposed to divide idea generation into two stages (Nijstad & Stroebe, 2006). In the first stage, called the knowledge-activations stage, a *search cue* is triggered to activate a so called “image” in a later stadium. Such search cues are usually an example of previously generated ideas and/or elements of the problem definition (Nijstad, Stroebe, & Lodewijckx, 2002). In the second stage this “image” activated in the first stage will trigger new creative ideas by combining knowledge or applying knowledge to a new domain (Luo & Toubia, 2015). Hence, these intervening cues that are provided in an idea generation task are there to activate the knowledge from the long-term memory for the individual to come up with new creative ideas. These search cues consist commonly out of two types, namely ‘*stimulus ideas*’ and ‘*elements of the problem definition*’ (Luo & Toubia, 2015). Stimulus ideas may be examples or provision to others’ ideas to the problem. Being exposed to stimulus ideas has been found to have a positive effect on performance because it may activate knowledge that may not be readily activated (Nijstad & Stroebe, 2006; Brown, Tumeo, Larey, & Paulus, 1998). Studies have also shown the drawbacks of stimulus ideas, which is that the exposure to it may also limit the ability to identify original ideas (Bayus, 2013; Cardoso & Badke-Schaub, 2011). Additionally, Luo and Toubia (2015) have researched the effect of stimulus ideas for low- and high-

knowledge consumers, which are consumers categorized based on their level of specific domain knowledge about the problem proposed in the idea generation task (e.g. (in)frequent users, lead users). The authors showed stimulus cues to be more beneficial to low knowledge consumers. The experiment conducted in this study includes a crowdsourcing contest to come up with design ideas for new T-shirts. T-shirt designing is a not high knowledge requiring task and in addition, there are substantial amounts of examples people are being exposed to in their daily life, since T-shirts including graphic designs are very common in today's world. Therefore the positive effects are expected to occur and negate the negative effect of limiting the ability for original ideas. Because of those reasons there has been chosen to stimulate related knowledge for the participants of the experiment conducted in this study. Thereby every of the four conditions used for this study will include a set of examples of similar previous T-shirt designs.

The other search cue related to the structure of idea generation tasks is, as mentioned, the decomposition of the problem into elements (Osborn, 1963). "Problem decomposition consists of simply decomposing the problem into sub-problems and instructing participants to consider each sub-problem separately." (Luo & Toubia, 2015, p. 103). Osborn (1963) was the first to argue that working on the components separately improves the output and the phenomena has been confirmed by many studies since (Luo & Toubia, 2015; Coskun, Paulus, Brown, & Sherwood, 2000; Pitz, Sachs, & Heerboth, 1980). An example mentioned by Luo and Toubia (2015) from an earlier conducted experiment, was that one part of participants was asked "*What can elected officials, business leaders, and the general public do to encourage at a higher level of leadership in the community?*", while the other group was asked to answer these questions separately, like "*What can business leaders do...?*", "*What can elected officials do...?*" and "*What can the general public do...?*". The result was that participants who worked on tasks that were formulated decomposed, had more and better ideas than their counterparts did. Luo & Toubia (2015) confirmed the positive effects resulted from problem decomposition and additionally show that although problem decomposition leads to improvement in the performance of both low- and high-knowledge consumers, it is significantly more beneficial for high-knowledge consumers. In the experiment for this study, a manipulation somewhat similar to dividing the task into subtasks has been applied. That is, two of the four groups of participants have been giving the criteria the evaluators are supposed to pay attention to when judging their submitted ideas. Similar to subtasks, criteria has been summed up one by one with an explanation, which the participants have to follow for their ideas to be sufficient. The other groups are simply asked to come up with a catchy, original quote to put on T-shirts.

## **2.4 The crowdsourcing task and motivation - hypotheses development**

Involving customers in a firm's activities is getting both increased academic and cooperate attention. While the company's view and the benefits for firms have been discussed earlier, this part will be dedicated to explore the customer's perspective. Within the subject of customer involvement an issue that has received academic attention has to do with how participants perceive the task in a crowdsourcing contest. Research related to the cognitive view of idea generation is trying to understand how the format and structure of the task may influence the output (Nagasundaram & Dennis, 1993).

As discussed, a company may decide to involve customers to create new ideas, where a jury of the company decides on which ideas or solutions may be from high value to the company. Another way of involving customers in the company's innovation process is by empowering customers to not only create, but also select from submitted ideas. Here, rather than the company deciding which ideas are purposeful, the crowd is also involved in the evaluation or selection of the new ideas purposed by participants. The objective of this study is to investigate how participants of crowdsourcing contest regard the communication of these two different evaluators throughout the contest task. More precisely, the purpose is to understand what effect these different evaluator types could have on performance. Another task attribute that is from interest for this study, as mentioned earlier, has to do with the communication of the selection criteria throughout the crowdsourcing contest task. That is, the criteria that will be used by evaluators in order to decide for ideas to be from significant value. Therefore the objective is to understand whether the communication of the criteria has an effect on performance. Based on different theories, expectations are made regarding the inclusion of these different contextual cues, so called task-attributes, in the task of crowdsourcing contests.

Another objective is to explore the role of intrinsic motivation on performance and whether the purposed task-attributes affect performance through differences in intrinsic motivation. With that, different theories on intrinsic motivation and customer involvement will be explored. Therefore the second major aim of this study is the investigation whether intrinsic motivation increases performance in crowdsourcing contests and to what extent intrinsic motivation may be accounted for the relationship between different task attributes and performance. Therefore the theory on intrinsic motivation, based on the self-determination theory will be discussed, from which expectations for the outcome of this study are being set.



## 2.4.1 Task-attributes in the content task

### Informing different type of evaluators, peers versus jury evaluation

In this study the focus is on the attitude (i.e. perception) of participants on two different types of evaluators, namely a jury (experts) and peers (potential customers) and what effect this may have on the output. Evaluation by peers is defined as the perspective of individuals of the same level, it is work reviewed and evaluated by people of similar status (Chen & Lou, 2004). For this study, this includes the crowd of potential customers or other participants involved in companies' innovation process. Both expert evaluation and peers evaluation has its own advantages and disadvantages. The most relevant advantage of expert evaluation over peer evaluation from the participant's point of view, is the belief in the accuracy of the expert evaluation system, or putted in another way; the disbelief on accuracy of judgment by peers (Erez, Lepine, & Elms, 2002; Dochy, Segers, & Sluijsmans, 1999).

Studies researched the effect of peer evaluations from a company's perspective, and concluded it can be a reliable measure for performance in certain situations. However there are also studies that raise the doubts regarding its acceptance, reliability, and even validity (Paswan & Gollakota, 2004). One problem, from the perception of the people getting evaluated by peers, may be user acceptance, which could lead to resistance for doing a particular assessment. Related studies suggest that peer evaluation may be a good practice as feedback or for developmental purposes rather than a decisive factor or for evaluative purposes (e.g., Cederblom & Lounsbury, 1980; Farh, Cannella, & Bedeian, 1991). In contrast to expert or single evaluations (e.g., supervisors, professors), peer evaluations are founded to increase reliability and remove biases associated with singular raters due to the pooling of peer evaluations, i.e. aggregation of evaluations (Brutus & Donia, 2010). This is something participants, perhaps unconscious, may be aware of during task performing.

In an educational setting, the perception of students to peer assessments has been found to be motivating and a recommended methodology that causes learning at different levels (Planas Lladó et al., 2014). Participants in a crowdsourcing contest are motivated by a combination of extrinsic and intrinsic motivations; an aspect of intrinsic motivation in a crowdsourcing setting comes from the ability to learn from (other) peers (Aitamurto, Landemore, & Saldivar Galli, 2017). Therefore increased motivation is expected to play a great role when providing evaluation by peers compared to jury evaluation.

When looking at it from the crowdsourcing contest principle, the advantages of the perception of peer evaluations may offset the disadvantages in the case of a relative simple task like coming up

with a new T-shirt design. This has to do with that designing T-shirts does not require any high skills per se, but rather has to do with being creative. In addition the user acceptance of peer evaluation in the case of a T-shirt design contest is expected to be high, this due to the fact that the consequences of ratings from peers in this case are not crucial, like it is in the case of for example, getting a raise or a promotion at a workplace. Additionally, the disbelief of accuracy of peers is not expected to be high due to the nature of the task, which involves creativity rather than high knowledge or skills. Therefore providing participants the information that their ideas will be evaluated by potential customers in a T-shirt design contest is expected to increase performance compared to communicating ideas will be evaluated by a jury. The following hypothesis is formulated in order to investigate the role of communicating different type of evaluators on performance:

**H1:** Communicating evaluation by peers throughout the contest task, compared to being informed evaluation by a jury of the company, increases performance.

*Including selection (evaluation) criteria in the task of crowdsourcing contests*

Based on goal-setting theory, an expectation of the attitude of customers towards the provision of criteria in a design task is attempted to be set. A theory from the psychological literature related to task performance is that of goal-setting (Locke, 1968). Goal-setting theory is considered with the relationship between conscious goals and performances in tasks. One of the key-findings of goal-setting theory is that setting specific goals, rather than just simply stating the goal, lead to higher performance (Locke, 1968). Making a goal more specific includes: setting specific performance goals (e.g. "increase sales by 10%" instead of just "increase sales") and defining sub-goals in order to accomplish the larger goal instead of only mentioning the final goal. Ability and motivation are main factors that influence goals. Therefore reasons why setting specific goals lead to better performance include motivation to use existing abilities, 'activate' task-related knowledge and/or motivation to gain new knowledge (Locke & Latham, 2006). Additionally, Locke (1968) suggests that a part of the process for setting up goals involves agreement upon the criteria to be used in evaluation. This being said, including the selection criteria in the design task may be perceived as the communication of specific goals in order to complete the T-shirt designing contest. Following the goal-setting theory, the inclusion of selection criteria, in comparison to just asking participants to freely come up with a T-shirt design, gives reasons to believe that it will increase performance. Based on the literature and the assumptions made here, the following hypothesis has been defined in relation to performance and providing the selection criteria in idea generation tasks:

**H2:** Providing participants the selection criteria throughout the contest task has a positive effect on performance in crowdsourcing contests.

Furthermore, another main purpose of this study is to investigate whether there is interplay between the two manipulations of different task-attributes in the task. This way there may be said something about the magnitude for the two treatment variables depending on the level of the other. For both hypotheses on evaluator type and selection criteria there has been assumed to have a positive relationship regarding the output in a crowdsourcing contest of idea generation. There is no reason to believe that the interplay between the two manipulations will lead to a change in direction when it comes to the affects there may be on performance. Hence, the effect of the two variables is expected to differ significantly depending on each level for the variables. With that, the combination of including peers evaluation and providing the selection criteria is expected to further increase performance. The following hypothesis is formulated in order to investigate the interaction between the communication of different type of evaluators and selection criteria included in the task:

**H3:** There is a positive interaction between communicating peers evaluation and including the selection criteria in the idea generation task of crowdsourcing contests, leading to further increase of performance.

## **2.4.2 Intrinsic motivation**

Past research considering crowdsourcing contests has focused on the question why customers would want to share their ideas, know-hows, knowledge and so on, with companies. The main question the literature has been attempting to answer is: what drives customers to be part of the innovation process of companies? Engaging customers in the activities of the firm logically should have benefit for, not only the company, but also for the participants. To understand the reasons to be part of a crowdsourcing contest, the literature on crowdsourcing has followed the general theory on motivation.

General motivation theory is simply considered with the factors that drive people to take on an activity. Motivation theory splits the reasons for people's actions, desires, needs and behavior into two types of motivations: intrinsic motivations and extrinsic motivations (Ryan & Deci, 2000). An individual is driven by *intrinsic* motives when actions are the result of seeking for fulfillment generated by the activity itself, *extrinsic* motives occur when actions are an instrument for achieving a certain desired outcome, such as a monetary reward or avoidance of sanctions (Kaufmann et al., 2011). Similarly, past research on reasons for people to participate in a crowdsourcing contest, have been distinguishing between intrinsic and extrinsic motives. Research has been focusing on discovering how to reward people for their participation. Some of these studies have been emphasizing on the importance of monetary rewards (Lerner & Tirole, 2002). But other studies have been arguing this system of monetary rewards and concluded that the willingness to contribute

rather have an intrinsic nature (Lakhani & Panetta 2007; Boudreau & Lakhani, 2013; Lundkvist & Yakhlef, 2004). Extrinsic rewards in a crowdsourcing set-up may include the chance to win prizes, a share in profits or simply money and so on. Intrinsic motivation in a crowdsourcing context comes from the enjoyment of the innovation task itself and also has to do with the status and identity that participants gain by being involved (Boudreau & Lakhani, 2009).

Deci and Ryan (1985) proposed the Self-determination theory to explain the important role of intrinsic motivation on human behavior. According to the SDT the three main factors that cause intrinsic motivation are *autonomy*, *competency* and *relatedness*. Autonomy has to do with the need to have ownership over one's behavior, behavior that flows from and expressing one's self. When performing a task, it is related to having a feeling of volition or willingness. Competency is the feeling to produce desired outcomes; it is the need for challenge and the need to experience effectiveness. Finally, relatedness is the need to feel connected to others, the feeling to belong to a social group. When the three intrinsic needs are satisfied, intrinsic motivation for doing an activity is found to increase. This will on its turn lead to increased interest, inherent satisfaction and enjoyment of an activity (Ryan & Deci, 2000).

To understand the role of intrinsic motivation, studies on participation in design tasks such as in a crowdsourcing contest, have been using the SDT framework to explore the influence of intrinsic motivation on participation (e.g. Zheng et al., 2011; Kaufmann et al., 2011; Zhao & Zhu, 2014a). Combined with theory on intrinsic motivation, the Job Characteristics Model provides insights which job/task characteristics in the workplace influence intrinsic motivation of workers (Hackman & Oldham, 1980). The job characteristics that have been argued to stimulate workers by enhancing intrinsic motivation are: skill variety, task identity, task significance, autonomy and feedback from the job itself (Hackman & Oldham, 1980). Because being part of a crowdsourcing contest can be compared to a daily job, crowdsourcing studies have been using general motivation theory and work motivation theory to explain the reasons for being part of a crowdsourcing contest based on intrinsic motives. For example, based on Self-determination theory and the Job Characteristics Model, Kaufmann et al. (2011) investigated what motivates people to participate in Amazon's crowdsourcing platform Mechanical Turk. Mechanical Turk is a platform that provides crowdsourcing organizations to post small tasks the crowd can be involved in. In return they get a fixed monetary reward, which have been found to be quite low for western standards (Horton & Chilton, 2010). Despite the payments being quite low, there is a large variety of participants, including highly skilled full time workers. The Mechanical Turk platform therefore provides a good environment to investigate what aspects motivate people to work on such a platform besides the extrinsic rewards. By conducting a survey, the importance of the factors causing intrinsic motivation adapted from the Self-

determination theory was investigated (task autonomy and task variety). Both intrinsic and extrinsic motives were found to have a significant effect on the time spent in Amazon's Mechanical Turk platform. However aspects of intrinsic motivation, such as 'task autonomy' were found to be the reasons for participants of Mechanical Turk to be significantly from more importance for participation (Kaufmann et al., 2011).

Some studies argue that being part of crowdsourcing has a mixture of intrinsic and extrinsic motivations (Zhao & Zhu, 2014a). Lundkvist and Yakhlef (2004) have been arguing that existent literature have been mostly taking an approach to customer involvement as one were information is transformed between customer and firm and were knowledge is jointly-created. This is in economical and contractual orders. But the authors conclude that this view is too simple to account for why people are willingly share their views and collaborate with companies. Füller (2006) determined different possible motives for participation in a crowdsourcing contest; curiosity, dissatisfaction with the existing products, intrinsic interest in innovation, to gain knowledge, to show ideas or to get monetary rewards. A regression analysis was performed by the author to determine which of these motives lead to consumers' interest in frequent and further participation in crowdsourcing contests. The result was that intrinsic interest in innovation; curiosity and showing ideas were the main drivers for interest in further and frequent (on a continuous basis) participation. This while 'monetary rewards' had a significant negative effect on the interest of further participation and was positively related to interest in frequent participation (Füller, 2006). Such studies have been showing that consumers consider participation in crowdsourcing contests because they consider it as a rewarding experience. With that, current literature has been largely focusing on how to encourage and induce *participation* in crowdsourcing contest while making a distinction between intrinsic and extrinsic motivation (Zheng et al., 2011). Consequently, the role of intrinsic motivation as the drive of participation in crowdsourcing practices has been shown frequently.

Less is known about the effect of motivations for participation, is having on the performance in crowdsourcing contests. In the study of Füller (2006) an unanswered question is: "What is the effect of different consumer motives on the creativity, quality and quantity of their contributions?" (p. 645). The design of this experimental study enables to capture the relation between intrinsic motives and performance, enabling to contribute to explore the relationship between intrinsic motivation and performance. Because of the substantial role of intrinsic motivation on participation, the expectation is that intrinsic motivation leads to better performance in a crowdsourcing contest. Therefore the following hypothesis is formulated:

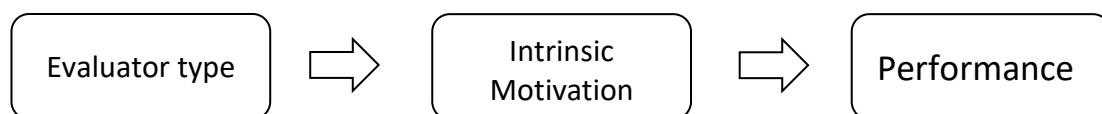
**H4:** Higher intrinsic motivation leads to better performance in crowdsourcing contests.

Another aim of this study was to examine whether the effects of the proposed task attributes on performance, could be accounted to intrinsic motivation. When participants evaluate each other's ideas instead of being evaluated by a designated jury this may be seen as given feedback to each other and at the same time creates a competitive atmosphere. That being said there are several studies dedicated to intrinsic motivation and competition with different outcomes; in a sport-based competition intrinsic motivation increases (Frederick-Recascino & Schuster-Smith, 2003). But another study where participants were to compete on solving puzzles as fast as possible, suggests that when the reward includes 'winning', intrinsic motivation decreases. This is because the reward associated with the activity is the basis for the type of motivation, which is extrinsic in case of 'winning' (Deci, Betley, Kahle, Abrams, & Porac, 1981). Intrinsic motivation belongs to internal motives which have to do with needs, cognitions and emotions (Zhang, 2008). Getting evaluated by other participants in a crowdsourcing platform may increase intrinsic motivations by fulfilling the need for feedback from other participants (peers). These group collaboration environments are also found to fulfill the participants' motivational needs (i.e. intrinsic motivations) in such a way that it enhances idea generation performance (Jung, Schneider, & Valacich, 2010).

Following the theory of self-determination, an aspect of intrinsic motivation includes relatedness, which is the need for belonging to a community. Peers evaluation may satisfy this need and with that communicating evaluation by peers may enhance intrinsic motivation and indirectly increase performance. Intrinsic motivation has also been found to enhance creativity. This is because intrinsically motivated people get more absorbed in a task and derive enjoyment from the challenge itself (Burroughs, Dahl, Moreau, Chattopadhyay, & Gorn, 2011).

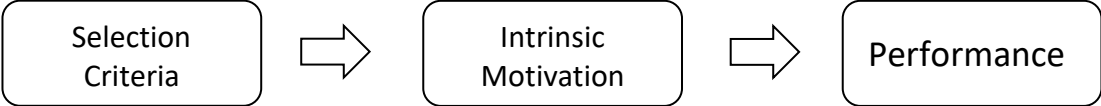
Considering these arguments, in a crowdsourcing setting where participants evaluate each other, intrinsic motivation is expected to increase. These findings therefore suggest that differences in performance of submitted ideas may be caused due to differences in intrinsic motivation. In order to investigate the effect of different type of evaluators on intrinsic motivation and indirectly on performance, the following hypothesis is formulated:

**H5:** Intrinsic motivation mediates the relationship between informing different type of evaluators in the task of a crowdsourcing contest and the performance.



In the previous section there has been argued that including the selection criteria in the task may act as a form of specific goal-setting. The second aim related to the role of intrinsic motivation on performance in contest tasks, is to investigate whether the perception of selection criteria leads to increased interest, inherent satisfaction and enjoyment (i.e. intrinsic motivation) of a crowdsourcing contest. Here, another aspect of intrinsic motivation may play a role, which is competency. When selection criteria are provided in the task, participants may perceive the task differently and intrinsic motivation may increase because the need for challenge and the need to produce effectiveness could be satisfied. Selection criteria may lead to perceiving the task to be more meaningful and more as a rewarding and learning experience. Therefore the feeling to produce desired outcomes could be satisfied. To investigate the effects of including selection criteria on intrinsic motivation and indirectly on performance, the following hypothesis is formulated:

**H6:** Intrinsic motivation mediates the relationship between including selection criteria in the task of a crowdsourcing contest and the performance.



## 2.5 Conceptual model

The main goal of this study will be to provide insights on how participants of crowdsourcing contests may perceive the task provided by companies. One aspect will be to understand how providing different evaluators in the task effects the performance of participants in the contest. The other aspect has to do with whether providing the selection criteria, which upon evaluators base their selection on, has an impact on performance. With that, there will also be investigated whether these two variables interact with each other and how this eventually may affect performance. Another purpose will be to understand what motives play a role on the outcome in crowdsourcing contests. Therefore the role of intrinsic motivation on performance is being investigated. Intrinsic motivation will be used as a presumed mediating variable to find out whether differences in performance due to the different informational cues in the task, can be accounted to differences in intrinsic motivation. A quantitative research is conducted in order to meet these objectives. The hypotheses are based on the literature review that makes up for the first part of this study. An empirical study, based on an experimental survey, will be conducted in order to test the hypotheses. To have a better understanding of the hypotheses and the framework this study is based upon on, the following conceptual model is developed as shown in figure 3. The responding arrows show the hypotheses developed in the previous sections. Using SPSS, a moderation analysis is conducted. This was in order to test the hypotheses 1, 2 and 3. Subsequently, to test hypotheses 4, 5 and 6, a mediation analysis is conducted using SPSS.

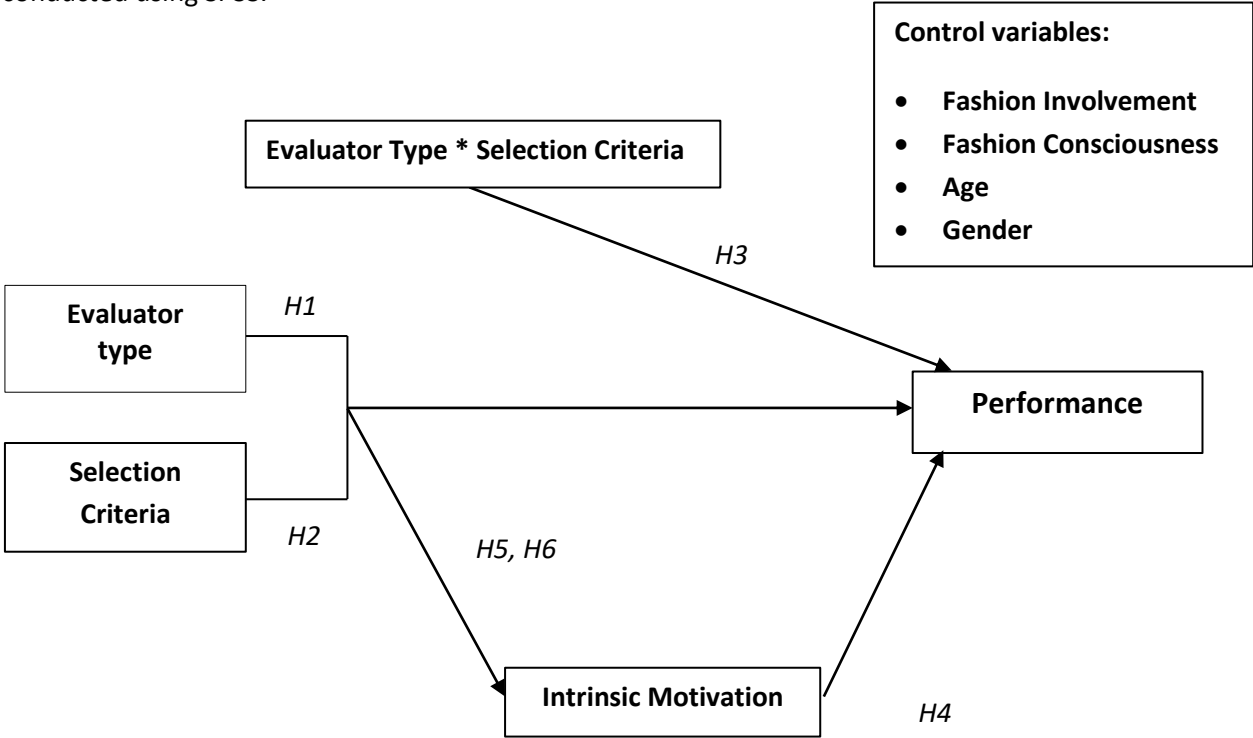


Figure 3: Conceptual model



## **3. Methodology**

This chapter explains the methodology used in this study for data collection and the analysis. The first part will contain how the experimental design is set up and how I collected the data. The second part describes how the variables are measured. The third part is dedicated to the measuring of the reliability for the underlying variables for intrinsic motivation, fashion involvement and fashion consciousness.

### **3.1 Experimental design**

The survey for this experiment was created using the online survey tool Qualtrics. The survey consisted out of four different conditions, i.e. four differently manipulated questionnaires. Using an integrated option of Qualtrics, people were assigned randomly and equally among one of the four conditions. By having four separate groups, the design of this experiment is a between-subject design. The survey was distributed directly and by using online social media channels such as WhatsApp, Facebook and Instagram.

#### **3.1.1 Conditions**

The experiment consists of four different conditions. The intention of the survey is asking participants about their ideas for a new T-shirt design, from the perspective of a company. For each of the four questionnaires participants were asked to take the role of a T-shirt designer and come up with a catchy quote or slogan to put on T-shirts, from which the winning design will be realized to be produced. The four different conditions consisted out of two levels for each of the two different variables, namely 'Evaluator Type' and 'Selection Criteria'. The selection criteria consisted of five different elements, these are: originality, catchiness, non-common words, length and meaningfulness. One survey informed participants that their ideas would be evaluated by a jury and at the same time the selection criteria evaluations will be based upon on, had been provided. A second survey informed participants ideas would be evaluated by a jury while selection criteria were not shared. A third survey informed participants that their ideas would be evaluated by potential customers (peers) and at the same time provides the selection criteria. The fourth questionnaire informed participants that their ideas would be evaluated by potential customers and does not provide the selection criteria. Four separate groups were created as a result.

### 3.1.2 Experimental procedure

The survey consists out of a short introduction without informing the purpose of the study. This was in order to prevent biased outcomes. After the introduction, subjects were asked to fill in the questions related to the control variables. Participants were asked to fill in their gender and age (demographics). In addition, the control variables associated with the participants' 'fashion involvement' and 'fashion consciousness', were explored.

After the questions related to the control variables, several examples of T-shirts with catchy quotes and slogans were provided. As discussed in the literature review, stimulus ideas in the form of examples of similar ideas may have a positive impact on performance due to the activation of knowledge that may not be readily activated (Nijstad & Stroebe, 2006; Brown et al., 1998). Because T-shirts are a very common product in daily life, respondents may have differed in their recent exposure to T-shirts including quotes or slogans. The actual purpose of including these stimulus ideas was an attempt to control for the fact that all participants were on an equal level of activated knowledge, right before the idea generation phase started.

Then, subjects were randomly exposed to one of the four conditions mentioned earlier. Here, the subjects were asked to come up with a quote or slogan to put on T-shirts, the color of the T-shirt and were provided the possibility to add additional information or a description for the T-shirt idea. Also in each questionnaire, the participants were communicated that the winning idea will get a €50 gift card. This in order to make sure there is controlled for any extrinsic motives, because the purpose is to explore participants' intrinsic motives.

In the final question, the intrinsic motivation of the participants was measured based on seven different statements. Here, participants were asked to state their feelings while they were performing the task. Besides the box for the possibility of 'additional information or description of the T-shirt idea', it was not possible to skip any question in order to finish the survey.

## 3.2 Measurement of the variables

### Dependent variable: Performance

Participants of the experiment were divided into two groups that were informed two different types of evaluators their submissions will be judged by. This was a part of the manipulation effects intended to be created. In reality, three people were appointed to judge all the submitted ideas from this experiment. Those three persons may be seen as experts when it comes to apparel. One female judge is currently working as a floor manager for a major multinational clothing-retail company and has been working there for over ten years. The other female judge also has been working for a multinational clothing company for several years. The third male judge has much interest in clothing and apparel in general and scored a maximum score for both the fashion involvement and consciousness indexes. The two female judges also scored substantially high for both indexes. This made all three of them suitable to perform the actual evaluation task for the experiment. Their initial survey results were left out of the experiment.

All three designated judges were asked separately to evaluate the ideas. The appointed judges were instructed to evaluate the ideas based on effort that has been put into the idea as well as the creativity of the ideas. For each submitted T-shirt idea they were provided the following question: *How likely do you think that the following T-shirt ideas would be offered particularly in a clothing store?* The answers were provided on a seven-point Likert scale ranging from very unlikely, unlikely, somewhat unlikely, undecided, somewhat likely, likely, to very likely.

### Independent variables: Evaluator type and Selection criteria

The independent variables considering this study are: 1) the communication to participants of different type of evaluators, 2) whether the selection (evaluation) criteria, submitted ideas will be evaluated upon on, is included in the task or not. These two independent variables are accounted for the treatment effects that determined the four different conditions, dividing subjects into four different groups.

### Mediator variable: Intrinsic Motivation

At the end of each survey, intrinsic motivation is measured. The intrinsic motivation measurements were based on the 'Intrinsic Motivation Inventory'. McAuley, Duncan, and Tammen (1989) found strong evidence for the validity of this instrument for measuring intrinsic motivation. The Intrinsic Motivation Inventory questionnaire has been widely used to measure feelings of people during or

after performance tasks (Nix, Ryan, Manly, & Deci, 1999; Tamborini, Bowman, Eden, Grizzard, & Organ, 2010; Reinboth, Duda, & Ntoumanis, 2004; Walton & Cohen, 2007). Seven statements regarding intrinsic motivation were conducted from the Intrinsic Motivation Inventory, to then ask participants how true they were to them after having performed the T-shirt designing contest task. The measure was with a seven-point Likert scale ranging from 1 (not true at all) to 7 (very true).

### Control variables

Two variables related to how fashion aware the subjects are, were used to control for in the model. An attempt to control for fashion awareness was done in order to have a better examination for the effects of task attributes on performance. Controlling for these variables was an attempt to have better unbiased outcomes. Motivation and creativity may differ between frequent clothing shoppers, compared to people that are less involved in fashion and clothing. This is because being more aware of fashion and more interested in clothing may lead to a better performance for a T-shirt idea on its self. This eventually may lead to biased outcomes regarding the intention of this study, namely to examine the effects of task attributes on performance for new T-shirt ideas. The two variables related to fashion awareness, or level of interest in clothing, consist of 'fashion involvement' and 'fashion consciousness'.

Involvement in certain products or product categories from a consumer behavior perspective can be defined as to which degree consumers are involved in the consumption process related to products, advertisements and purchasing (Broderick & Mueller, 1999). The term 'fashion involvement' has been used to indicate interest for clothing and the fashion industry (Kim, 2005). Involvement related to the product category of fashion and clothing can be best defined as a person's perceived relevance of clothing and fashion, based on inherent needs, values and interests (Zaichkowsky, 1985). Fashion involvement has been found to have a positive effect on purchase intension and participants scoring high on fashion involvement tend to be heavy clothing buyers (Kim, 2005; Kinley, Josiam, & Lockett, 2010).

The measure of involvement in fashion will be based on the Personal Involvement Inventory (PII), developed by Zaichkowsky (1985), for capturing the concept of involvement for products. The PII has been successfully used to capture apparel product involvement and the validity and reliability of this measurement scale for fashion involvement has been shown by other studies (e.g. Goldsmith & Emmert, 1991; Warrington, & Shim, 2000). A shortened version of Zachkowsky's PII will be adapted from existing literature (Shephard, Pookulangara, Kinley, & Josiam, 2016; O'Cass & Choy, 2008). Subjects are provided with five statements and asked to provide answers on a seven-point Likert scale to indicate how true the statements were to them ranging from 1 to 7 (very untrue of me,

untrue of me, somewhat untrue of me, neutral, somewhat true of me, true of me and very true of me).

Fashion consciousness can be defined as a person’s interest in clothing, fashion and appearance (Nam et al., 2007). The scale to measure fashion consciousness will be extracted from the study of Stephen Parker, Hermans, & Schaefer (2004). The scale has been successfully used by several studies for measuring fashion consciousness (Shephard et al., 2016; Shim, & Gehrt, 1996; Nam et al., 2007). The fashion consciousness items were based on four statements and measured on a seven-point Likert scale ranging from 1 (very untrue of me) to 7 (very true of me). The other control variables that have been measured and included in the analysis are age and gender. An overview of the variables measured for this research is shown in table 1.

<b>Variable Name</b>	<b>Type of variable</b>	<b>Scale</b>	<b>Levels</b>	<b>Instrument/ Method</b>
EvaluatorType	Independent variable/moderator	Nominal	Peers and Jury	Between-subject treatment design
SelectionCriteria	Independent variable/moderator	Nominal	Selection criteria and no selection criteria	Between-subject treatment design
IntrinsicMotivation	Mediator	Ordinal	Seven-point likert scale	Intrinsic Motivation Inventory
Performance	Dependent variable	Ordinal	Seven-point Likert scale	Appointed evaluators
FashionInvolvement	Control variable	Ordinal	Seven-point Likert scale	Zachkowsky’s PII
FashionConsciousness	Control variable	Ordinal	Seven-point Likert scale	Stephen Parker, Hermans, & Schaefer (2004)
Age	Control variable	Continuous	Numerical	Survey response
Gender	Control variable	Nominal	Male and Female	Survey response

Table 1: measured variables

### 3.3 Reliability of scales measurement

In order to be transformed to the corresponding index variables, the means are taken for the underlying variables of 'intrinsic motivation', 'fashion involvement' and 'fashion consciousness' using SPSS. In a similar way the means of the three designated evaluators was taken to come up with the 'performance' variable. Before the means of the underlying variables were taken, a reliability analysis was conducted to check whether the underlying variables are consistent with each other. The reliability of the instrument used to define intrinsic motivation, the Intrinsic Motivation Inventory, will be tested by using Cronbach's alpha. Similarly, the reliability of the underlying variables used to assess fashion consciousness and fashion involvement have been tested by using Cronbach's alpha as well.

In a Marketing Research contest, Mazzocchi (2008) defines reliability as "the property referring to the consistency of the measurement across several questionnaire items measuring the same latent construct or over time" (p. 10). Cronbach (1951) developed a measure of internal reliability for measurement scales named Cronbach's alpha, which has been widely accepted as a measure for reliability since. The Cronbach's alpha reliability coefficient should at least have a value of 0.7 to be considered as an acceptable reliability, everything above a value of 0.9 is considered to have an excellent internal consistency (Mazzocchi, 2008). The SPSS output showed a Cronbach's alpha value of 0.803 for the intrinsic motivation measure. For the fashion consciousness and fashion involvement measures the Cronbach's alpha tests showed values of 0.835 and 0.882, respectively. The consistency of the underlying variables, i.e. questionnaire items, is therefore confirmed.

<b>Variable</b>	<b>Cronbach's Alpha Value</b>	<b>Internal Consistency</b>
Intrinsic Motivation	0.803	Good
Fashion Involvement	0.882	Good
Fashion Consciousness	0.835	Good

Table 2: Cronbach's alpha results

## 4. Results

### 4.1 Participants

A total of 167 survey responses were used for the experiment of coming up with an idea for a new T-shirt design. Nine surveys needed to be deleted to overcome biases related to respondent errors. This was because, although these surveys were completed, the answers did not make much sense to me. From the total of 167 respondents, 44 subjects belonged in the jury and no selection criteria group, 39 subjects were in the jury and selection criteria group, 40 subjects belonged in the peers and no selection group and the group of peers and selection criteria consisted of 44 subjects. From the respondents, 59% were male and 41% were female. The ages of the respondents ranged from 19 to 43 years old. From which 89% belonged to the age group of 20 to 30 years old. Table 3 shows the overview of the average characteristics of the participants per group and in addition the average performance for each group is shown.

	<i>No selection criteria shared</i>	<i>Selection criteria shared</i>
<i>Peers evaluation</i>	40 participants Performance – 4.68 Age - 27.2 65% male - 35% female	44 participants Performance – 4.38 Age - 25.6 64% male - 36% female
<i>Jury evaluation</i>	44 participants Performance – 3.95 Age - 25.9 57% male - 43% female	39 participants Performance – 3.98 Age - 27.6 49% male - 51% female

Table 3: Overview of participants per group

## 4.2 Moderation analysis – Task Attributes

A regression analysis is conducted to determine what effect different task attributes may have on performance (H1 and H2). The between subject design enables to investigate the interaction effect between the task attributes: evaluator type and inclusion of selection criteria (H3). The ‘Evaluator Type’ variable has a value of 1 when subjects were communicated evaluation by peers. And a value of 0 when subjects were communicated evaluation by a jury. The ‘Selection Criteria’ variable takes on the value of 1 when subjects were shared the selection criteria and 0 when subjects were not shared the selection criteria evaluations would be based upon on. The effects of different evaluators and the inclusion of selection criteria on performance have been analyzed controlling for fashion involvement, fashion consciousness, age and gender. Gender takes on a value of 1 when subjects were males and a value of 0 for females. The overall equation of the regression model to predict performance is given below. Table 3 shows the output from the regression analysis.

$$Performance = \beta_0 + \beta_1 \text{ EvaluatorType} + \beta_2 \text{ SelectionCriteria} + \beta_3 (\text{EvaluatorType} \times \text{SelectionCriteria}) + \beta_4 \text{ FashionInvolvement} + \beta_5 \text{ FashionConsciousness} + \beta_6 \text{ Age} + \beta_7 \text{ Gender} + \epsilon$$

Dependent variable: Performance		
	<u>B</u>	<u>Sig.</u>
<i>EvaluatorType</i>	0.819	0.021
<i>SelectionCriteria</i>	0.097	0.783
<i>EvaluatorType*SelectionCriteria</i>	- 0.405	0.420
<i>FashionInvolvement</i>	0.160	0.143
<i>FashionConsciousness</i>	0.100	0.391
<i>Age</i>	0.002	0.953
<i>Gender</i>	- 0.048	0.854

Table 4: Regression output

The output shows that the main effect of communicating peers evaluation compared to jury evaluation had a positive significant effect on performance ( $p = 0.021 < 0.05$ ). The interaction effect between the two informational cues show to have no significant effect ( $p = 0.420 > 0.05$ ). These results imply that informing participants in a crowdsourcing contest that their ideas will be evaluated by peers does have a positive significant effect on performance and that this effect does not



significantly differ on whether the selection criteria is shared throughout the task or not. Therefore hypothesis 1 is supported and in case of a crowdsourcing contest involving designing a T-shirt, there is a positive and significant effect on performance when participants are informed that their ideas will be evaluated by peers compared to a jury evaluation.

Hypothesis 2 assumed that including the selection criteria in the task would enhance performance. The main effect of including the selection criteria is been found to have no significant effect on performance ( $p = 0.783 > 0.05$ ). Since the interaction term is also found to be non-significant, the effect of sharing the selection criteria throughout the task on performance does also not differ significantly according to different type of evaluators. Therefore the results imply that including the selection criteria in the task does not have an effect on performance for a crowdsourcing contest involving a T-shirt designing contest. With that hypotheses 2 is rejected. Hypothesis 3 predicted that there would be an interaction between the different levels of the independent variables in relation to performance. Since the interaction term has shown to be non-significant, hypothesis 3 is also not supported.

In addition to the overall model, the performance of males and females are predicted separately. Using the estimated regression equation, there has been estimated whether performances differ between genders across the four groups. The values for fashion involvement, fashion consciousness and age are determined by taking the averages for the samples of males and females. This was 4.09, 3.74 and 26.37 for males, and 4.83, 4.50 and 26.74 for females, respectively. Table 5 and 6 show the regression outputs for both genders.

Dependent variable: Performance_Males		
	B	Sig.
<i>EvaluatorType</i>	1.080	0.017
<i>SelectionCriteria</i>	0.069	0.886
<i>EvaluatorType*SelectionCriteria</i>	- 0.782	0.229
<i>FashionInvolvement</i>	0.190	0.158
<i>FashionConsciousness</i>	- 0.072	0.632
<i>Age</i>	-0.009	0.847
<i>Constant</i>	3.502	0.020

Table 5: Regression output for sample of males

Dependent variable: Performance_Females		
	B	Sig.
<i>EvaluatorType</i>	0.352	0.546
<i>SelectionCriteria</i>	0.071	0.896
<i>EvaluatorType*SelectionCriteria</i>	0.177	0.834
<i>FashionInvolvement</i>	0.071	0.711
<i>FashionConsciousness</i>	0.314	0.101
<i>Age</i>	0.015	0.739
<i>Constant</i>	1.969	0.185

Table 6: Regression output for sample of females

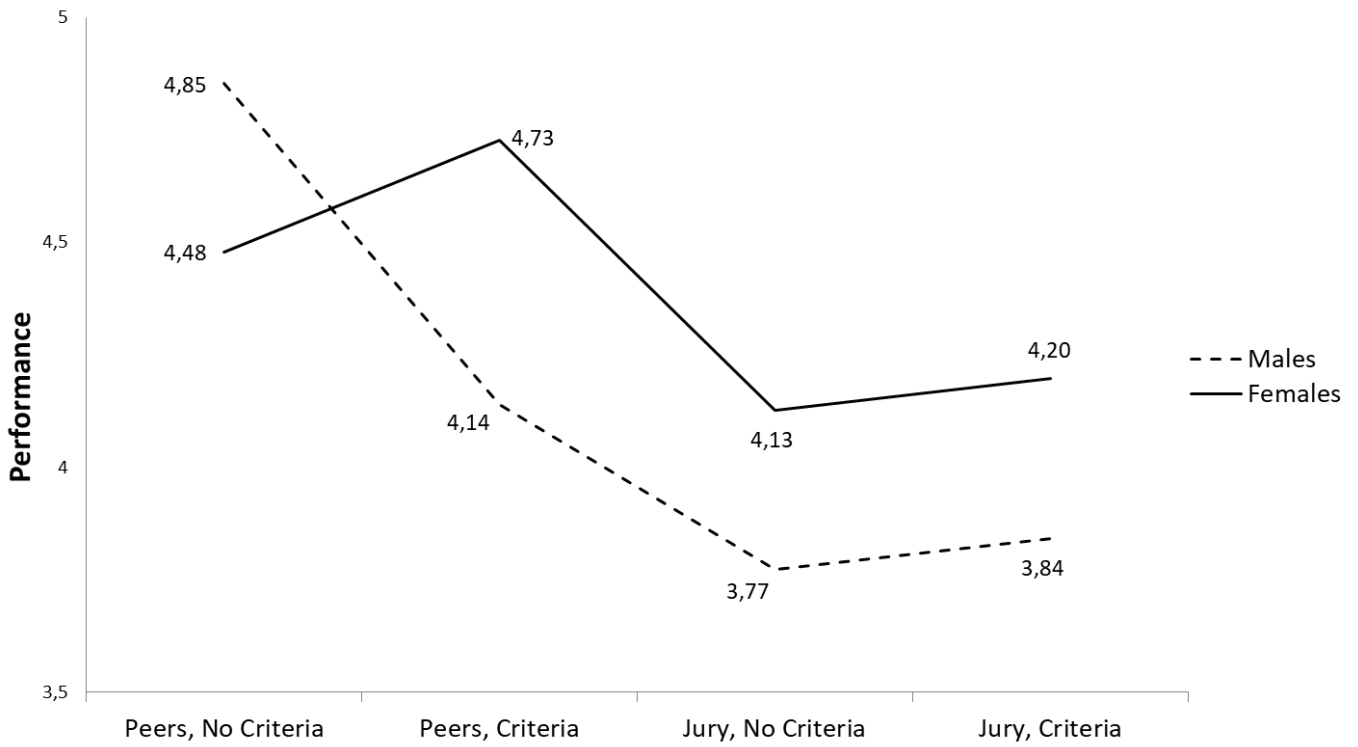


Figure 4: Predicted performances between groups for male and female participants

The predictions of the performance for males and females are shown in figure 4 for each of the four groups. When we look at the graph in figure 4, what is most striking is the difference between males and females for the sharing of selection criteria in the groups that were communicated evaluations by peers. For the female and peers group sharing the selection criteria seems to increase performance on a seven-point Likert scale (4.48 against 4.73). While in the male and peers group sharing the selection criteria is shown to decrease performance (4.85 against 4.14).

### 4.3 Mediation analysis – Intrinsic Motivation

The purpose of the mediation analysis is to look whether intrinsic motivation mediates the relationship between the different task-attributes and performance. The analysis is an attempt to understand to what extent a third variable may be accounted for the relationship between the independent and dependent variable. In other words, it is the underlying process through which the mediator variable influences the observed relationship between independent and dependent variable. Therefore the mediator variable speaks to how or why an effect occurs. In case of this study mediation analysis is conducted in an attempt to explain the effect of different informational cues on performance. The main purpose therefore was to determine to what extent intrinsic motivation may be accounted for differences in performance. The mediation analysis is conducted based up on the steps provided by the method of Baron and Kenny (1986). The procedure consists of three steps to test the mediating effect, estimating three different regressions:

- 1) Regressing the mediator on the independent variable. (a)
- 2) Regressing the dependent variable on the independent variable. (total effect c)
- 3) Regressing the dependent variable on both the independent variable and on the mediator. (direct and indirect effect =  $a \times b \times c'$ )

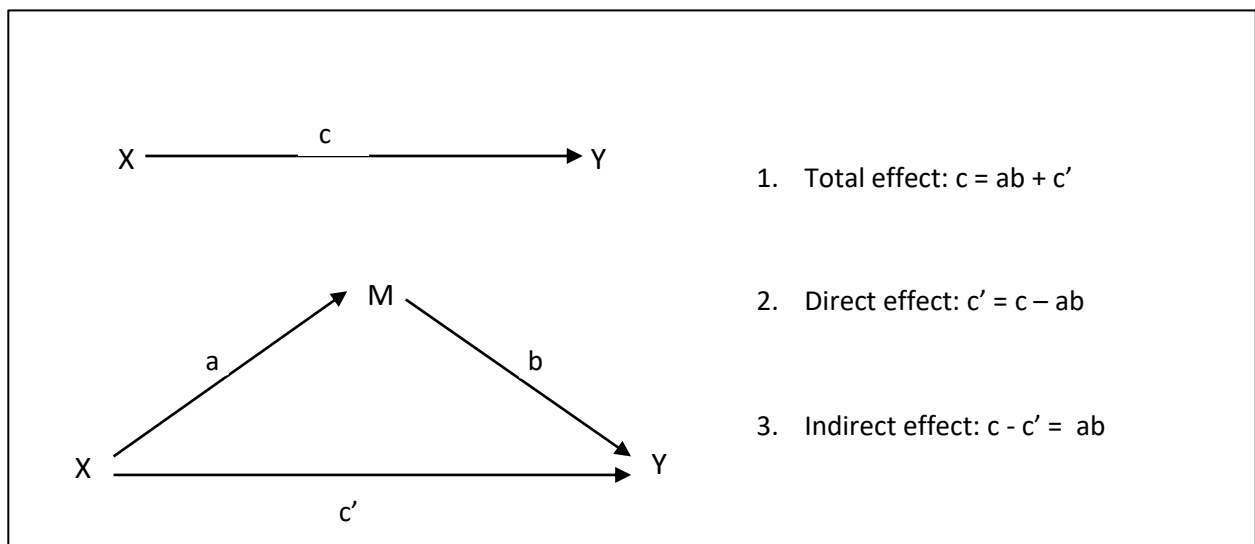


Figure 5: moderation model

Shown in figure 5, for a variable M to be considered to have a mediating effect on the relationship between variable X and Y, Baron and Kenny (1986, p. 1176) argue that the following conditions should be met:

*A variable functions as a mediator when it meets the following conditions: (a) variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., Path a), (b) variations in the mediator significantly account for variations in the dependent variable (i.e., Path b), and (c) when Paths a and b are controlled, a previously significant relation between the independent and dependent variables is no longer significant, with the strongest demonstration of mediation occurring when Path c is zero.*

The strongest mediation occurs when regressing the dependent variable on both the independent variable and the mediator variable (step 3) and when there is only an indirect effect (*path a and b*) and no direct effect (*path c'*), referred to as 'full mediation'. If there is still a both direct and indirect significant effect after including the presumed mediator variable, it's called 'partial mediation'.

But where the model of Baron and Kenny argued that a full mediation is the "golden standard", Zhao, Lynch Jr and Chen (2010) have been arguing this view because the majority of studies had been concluding that mediation usually is accompanied by a significant direct effect, i.e. partial mediation. This implies that the mediator variable accounts only for some of the effect between the independent variable and dependent variable. The reason for this is simply because the direct effect may be accounted to other, so called omitted (left out) mediators, which may remain unexplained and/or unobserved. Additionally, the authors argue that a non-significant effect of the total effect, i.e. relationship between independent and dependent variable (step 2), not necessarily have to mean that there is a reason to not investigate the initiated mediator M. The reason for this also remains in the unexplained part of the total effect, where the relationship between X-Y only explains the total effect of the independent variable on the dependent variable, without considering the direct and indirect effects separately. The direct and indirect effects may be from the opposite signs and hence there will be no total effect prior to the mediation analysis. In contrast to the Baron and Kenny method of 'full, partial and none' - classifications, Zhao et al. (2010, p. 200) provide an overarching framework considering five different patterns, three consistent with mediation and two with non-mediation:

1. *Complementary mediation*: Mediated effect ( $a \times b$ ) and direct effect ( $c$ ) both exist and point at the same direction.
2. *Competitive mediation*: Mediated effect ( $a \times b$ ) and direct effect ( $c$ ) both exist and point in opposite directions.
3. *Indirect-only mediation*: Mediated effect ( $a \times b$ ) exists, but no direct effect.
4. *Direct-only non-mediation*: Direct effect ( $c$ ) exists, but no indirect effect.
5. *No-effect non-mediation*: Neither direct effect nor in-direct effect exists.

As has been mentioned, the effect of the independent variable on the dependent variable (X on Y), is in reality the 'total effect' consisting of both the indirect (path a and b) and direct (path c') effects. This means that in case the presumed mediation effect and the direct effect are of the opposite signs, the total effect regression may lead to insignificant results, because these indirect and direct effects may have cancelled each other out. This means that a non-significant total effect (X on Y) not necessarily implies that there is not an 'effect to be mediated', as suggested by the method of Baron and Kenny (1986). In short, the partial mediation, or direct only mediation, should be considered with the likelihood of an omitted mediator in the 'direct' path. When both the direct and indirect effect show a non-significant effect in a mediation analysis, while the total effect of X on Y may be significant, there can be concluded that no mediation effect exists. But in case the indirect effect (a x b) shows a non-significant effect while the direct effect (c') is significant, there is an indication for the likelihood of a yet undiscovered mediator. Therefore Zhao et al. (2010) suggest that the only requirement to demonstrate mediation is a significant indirect effect (a x b). Rather than the two dimensions of partial and full mediation suggested by Baron and Kenny (1986), the authors provide mediation based on direct and indirect effects due to consideration of omitted variables.

The starting point of the Baron and Kenny method is to have a significant total effect and that path b should be significant to claim mediation. For this study the Baron and Kenny's three equations method have been used to determine the type of mediation, based on regression analyses. Additionally the reformed framework of direct and indirect mediation by Zhao et al. (2010) has been followed to determine whether there is a significant indirect effect (a x b), and base the conclusions regarding the mediation analysis upon on. The authors recommend the use of the bootstrapping method provided by Preacher and Hayes (2004), to determine whether there is an indirect effect (a x b). The bootstrap test is able to overcome the issue of (non-)significant (unexplained) direct effects and has a higher power in comparison to the Sobel test suggested by Baron and Kenny (1986). The macro PROCESS, provided by Preacher and Hayes (2004), is used as an extension in SPSS to perform the bootstrap test.

### *Intrinsic motivation on performance*

Hypothesis 4 will be tested by regressing performance on intrinsic motivation, which is equal to path a in the mediation analysis model. Hypothesis 4 predicted that participants would perform better if intrinsic motivates were higher. The result of the regression analysis shows that indeed performance increases significantly when intrinsic motivation is higher ( $p = 0.000 < 0.05$ ). Therefore hypothesis 4 is supported.

*Evaluator type and intrinsic motivation on performance*

To test whether intrinsic motivation accounts for the differences in performance between the groups provided peers evaluation compared to the groups provided jury evaluation, hypothesis H5 is tested.

First intrinsic motivation is regressed on the evaluator type variable. The result was that providing peers evaluation to participants, significantly increases intrinsic motivation ( $p = 0.006 < 0.05$ ). The next step is to determine whether evaluator type has a significant effect on performance. Providing participants their submissions will be evaluated by peers compared to evaluation by a jury had a significant positive effect on performance ( $p = 0.027 < 0.05$ ), as was expected from the regression results in the moderation analysis from study 1.

Next, performance is regressed on both intrinsic motivation and evaluator type. The regression results show that the effect of intrinsic motivation on performance remained positive and significant ( $p = 0.000 < 0.05$ ). The previous significant relation between evaluator type and performance disappeared when intrinsic motivation was added to the model ( $p = 0.220 > 0.05$ ). This suggests that intrinsic motivation is accounted for the differences between the groups provided with peers compared to jury evaluators. Table 4 shows the results of the regression analyses.

	<u>Evaluator Type</u>		<u>Intrinsic Motivation</u>	
	Beta	Sig.	Beta	Sig.
<u>Effect of X on M</u>				
Evaluator type on Intrinsic motivation	0.211	0.006		
<u>Effect of X on Y</u>				
Evaluator type on Performance	0.171	0.027		
<u>Effect of X and M on Y</u>				
Evaluator type and intrinsic motivation on performance	0.090	0.220	0.386	0.000

Table 7: regressions output of mediation analysis for evaluator type

Finally, to confirm whether intrinsic motivation mediates the relationship between evaluator type and performance, the bootstrap test is performed to determine whether the indirect effect is significant. The bootstrapping analysis shows that the confidence interval of 95% does not include zero (0.0731 to 0.4724), confirming the positive and significant indirect effect ( $a \times b = 0.054$ ). These results suggest an indirect-only mediation. Both the indirect effect and direct effect have a positive

sign. This means that the increase in performance due to providing peers evaluation in the task of this experimental crowdsourcing contest, is fully accounted to the increase in intrinsic motivation. Therefore hypothesis 5 is supported and intrinsic motivation is established to be the mediator for the relationship between evaluator type and performance.

*Selection criteria and intrinsic motivation on performance*

Hypothesis 6 predicted that the differences as a result of including the evaluation (selection) criteria in the task, was accounted to differences in intrinsic motivation. The causal regression steps are followed to determine whether intrinsic motivation mediates the relationship between including selection criteria in the task of a crowdsourcing contest and the output (performance).

Regressing intrinsic motivation on selection criteria shows to have a negative and partially significant effect ( $p = 0.083 < 0.1$ ). Therefore, including the selection criteria in the task has been found to decrease intrinsic motivation, although this effect was only partially significant. The effect of selection criteria on performance (total effect) is shown to be insignificant ( $p = 0.679 > 0.05$ ), indicating that providing the selection criteria did not had an effect on performance.

Then, both selection criteria and intrinsic motivation were added into the model to test the effect on performance. The effect of intrinsic motivation on performance is positive and significant ( $p = 0.000 < 0.05$ ). The direct effect of selection criteria on performance remained insignificant ( $p = 0.775 > 0.05$ ). The results of the regression analyses are shown in table 5.

	<u>SelectionCriteria</u>		<u>IntrinsicMotivation</u>	
	Beta	Sig.	Beta	Sig.
<i><u>Effect of X on M</u></i>				
Selection criteria on Intrinsic motivation	-0.135	0.083		
<i><u>Effect of X on Y</u></i>				
Selection criteria on Performance	-0.032	0.677		
<i><u>Effect of X and M on Y</u></i>				
Selection criteria and intrinsic motivation on performance	0.022	0.756	0.408	0.000

Table 8: regressions output of mediation analysis for selection criteria

These results suggest that intrinsic motivation does not account for potential differences in performance between the groups provided the selection criteria and not provided the selection

criteria. To confirm this, a bootstrapping analysis is performed to test whether the indirect effect is significant or not. The bootstrapping shows that the 95% confidence interval indeed includes zero (-0.4000 to 0.0145). Since, the direct effect in the mediation model also has an insignificant outcome, there has been established a no effect non-mediation. Hence, there is no effect on performance, irrespective of the inclusion of selection criteria in the task. Although the selection criteria groups shows to have a partially significant lower mean for intrinsic motivation, there is no evidence that this has led to significantly lower performance for this group. These results therefore indicate that hypotheses H6 needs to be rejected.



# 5. Conclusion

## 5.1 General Discussion

Crowdsourcing practice is getting more and more academic attention. Companies are implementing crowdsourcing in their business model, starting to rely more and more on involving customers. The main purpose of this study was to provide insights on how participants of a crowdsourcing contest may perceive such contests based on different contexts. To complement existing research there has been investigated how different task attributes may influence the performance. On top of that the role of intrinsic motivation in this process is explored. The primary objective of this study was to better understand how customers may perceive being involved in the innovation process of companies. Companies may decide to involve customers to create new ideas. In addition to that, companies may decide to involve customers to create and also select from the submitted ideas at the same time. The latter involves the communication that ideas will be evaluated by peers throughout the contest task. A major finding of this study is that, in case of a relative simple crowdsourcing task, empowering customers to create and select ideas had a positive and significant effect on performance. At the same time the results of this study show that a higher intrinsic motivation was accounted for the differences in performance between the 'jury' and 'peers' group. An explanation for this may be found in one of the factors of intrinsic motivation, namely relatedness. That is the need to feel connected to others, the feeling to belong to a social group (Deci & Ryan, 1985). Therefore, we argue that respondents who were communicated throughout the task that customers are asked to both create and select from ideas, had an increased intrinsic motivation while performing the T-shirt designing task. This on its turn led to better performance.

The other task attribute that has been investigated, was that of including selection criteria in the task of crowdsourcing contests. The expectation was that the selection criteria may act as a form of specific goal setting, leading to enhanced performance. In contrast to our expectation that the hypothesis that selection criteria would increase performance, there was no significant relationship found between performance and the inclusion of selection criteria. Intrinsic motivation was also not found to be accounted for any of the possible effects of selection criteria on performance. But the results demonstrated that, although not strong, including selection criteria in the task of crowdsourcing contests lowered intrinsic motivation. At the same time, intrinsic motivation was found to have an overall positive effect on performance, supporting the hypothesis that intrinsic motivation increases performance. Therefore, rather than that the inclusion of selection criteria in the task had a positive effect on intrinsic motivation, it is has been found to decrease intrinsic

motivation. But this conclusion should be made with caution since the effect was only marginally significant. The study of Zheng et al. (2011) has investigated the effect of different task designs on motivations of intrinsic nature. Based on theory on extrinsic and intrinsic motivation as well as the theory of job design, the authors examined how contest task attributes affect motivation in relation to participation. One factor leading to higher intrinsic motivation, as argued by the Job Characteristics Model, is that of autonomy (Hackman & Oldham, 1980; Kaufmann et al., 2011). Task autonomy is referred to as the extent to which participants are provided freedom and control on how the contest task is to be solved (Zheng et al., 2011). The authors studied the effects of autonomy in a task on participation in crowdsourcing contests. As expected accordingly to the theory on intrinsic motivation, task autonomy was found to be positively associated with intrinsic motivation. Also the study provided evidence for the positive relationship between intrinsic motivation and actual participation in crowdsourcing contests. With that, suggesting that task autonomy is positively associated to participation. Therefore we may argue that the reasons for the findings that including selection criteria lowers intrinsic motivation in this study, has to do with the aspect of intrinsic motivation related to task autonomy. The reason for this is that perhaps including the selection criteria in the task of crowdsourcing contest rather lowers the degree participants are perceived freedom, independence and discretion in the task. Therefore the positive effects of the inclusion of selection criteria as we predicted beforehand, may have offset the effect of loss in autonomy caused by intrinsic motivation. But this may only apply in the case of a relative simple task, equal to the task we demonstrated in this study. Further research is required to find out whether providing selection criteria in the task has the same effect in case the contest task involves a more complex task or product. In addition to the overall model, estimations for the performances were made for male and female participants. In the overall model, although not significant, sharing the selection criteria showed to have a negative sign in relation to performance. But estimating the performances in the model separately for males and females has shown to have contradictory results across genders regarding the provision of selection criteria, this was specifically in the groups with peers evaluations. Here, performance is predicted to be higher for females while the performance in the males group has found to decrease. With that, these differences provide even stronger arguments for further research on the effects of criteria on performance amongst different product categories, to make stronger generalizable conclusions.

## 5.2 Implications

The findings of this study are intended to provide more insights and contribute to earlier studies on the optimization of the task design of crowdsourcing practices. The study was an attempt to complement earlier research on how the task of crowdsourcing contest may be perceived by participants based on different task features. Therefore this study complements earlier research on the perception of participants on different task characteristics in relation to performance and motivation (Leimeister et al., 2009; Luo and Toubia, 2015; Füller, 2006; Zheng et al., 2011). Most of the earlier studies have been investigating the role of different task features (based on job design theory) on participation. This study contributes by examining what effect task characteristics may have on performance. Two different task features are provided in this study. The provision of evaluation by peers throughout the contest task has been found to have a positive effect on performance. At the same time, the results showed that better performance due to the communication of evaluation by peers was accounted to an increase in intrinsic motivation. We provide managers, task designers and marketers insights on how the design of the task may enhance performance and motivation. Our findings suggest that the providers of crowdsourcing practices, in case the task does not involve complex tasks, may want to take in consideration to emphasize on the fact that others in the community will evaluate submitted ideas and solutions. In other words companies should try to keep the option open to provide customers to not only create ideas but also to select ideas provided by the crowd. Sometimes it may be not be desirable for companies to empower the crowd to select from the ideas. This could be especially the case for more complicated tasks where the accuracy of peers may not be accurate and sufficient to evaluate more complicated solutions. But even when it is not desirable to have an evaluation by the crowd, our findings suggest that companies still may want to make the consideration to communicate that submitted ideas will be presented to the crowd, before decisions on the realizations of the ideas are being made. As discussed earlier, research has shown that the higher the effort demanded and the difficulty of a task gets, the more extrinsic motivations (e.g. monetary rewards) play a part for participation. So in general, the findings of our study suggest that if the task of a crowdsourcing contest includes a simple task and the goal is to attract customers from which the motives are desired to be from intrinsic nature, providers of the crowdsourcing contest should consider the communication of evaluation by peers.

Including the selection criteria has been found to have no effect on performance in case of a relative simple task. In contrast to the performance, there is some evidence found that selection criteria lowers intrinsic motivation. In the discussion section we argued that in case of a simple task the

inclusion of selection criteria may be perceived as a loss in autonomy over the task by participants. Therefore our findings suggest that in case the crowdsourcing contests requires to attract a group of participants from which the motives are from intrinsic nature rather than extrinsic, the inclusion of selection criteria does not need to be considered in the task design. But at the same time, we want to emphasize on the contradictory results of the effects of sharing selection criteria on performance between male and female participants in the peers group. With that, crowdsourcing providers should be aware of possible differences of perceptions across genders.

### **5.3 Limitations**

This study has several considerable limitations. Perhaps the biggest shortcoming is related to the generalizability of the results in relation to crowdsourcing practices in general. This is because the experiment consisted of particularly one product category, which is that of clothing. More specifically, the task included to come up with a quote or slogan that can be put on T-shirts. Therefore the task can be categorized as quite simple, because you don't have to be a clothing designer per se to come up with a catchy quote or slogan that can be putted on T-shirts. Earlier studies have been separating motivations and performance in crowdsourcing contest based on the nature of the task, namely for simple and complex tasks. With that, contests may differ substantially in their so called 'task granularity', required from participants. Task granularity has to do with the effort demanded, complexity, structure and difficulty of a task (Chan, & Song, 2010). Zhao and Zhu (2014a) conclude that the higher this 'task granularity' is for the task, the more extrinsic motivations play a part for participation. On top of that, a T-shirt designing contest does not per se require any high skills from participants. The outcome with different product categories, involving more complex and high knowledge requiring tasks, may therefore differ drastically. For those reasons, our conclusions drawn from this research are not applicable to crowdsourcing contest practices and environments in general. With that, the conclusions regarding the non-significant interaction effects between the task features that have been purposed should be taken carefully as well, since this may differ for other crowdsourcing contexts.

Another shortcoming is related to the sample of respondents in the conducted experiment. The occurrence of a sample selection bias should be considered. That is because the random extraction of the sample subjects may not be executed optimally. On top of that, the respondents belong to quite a narrow sample as regards geographical location. Consequently this may lead to that our sample may not be representative for the target population (mainly teenagers and young adults).

With that, a lack in external validity should be considered and generalization of the results regarding a whole population should be taken carefully.

Additionally, the conducted experiment was intended to simulate a crowdsourcing contest, and therefore the data is not based on an actual crowdsourcing contest. In a real crowdsourcing contest, people participate because they are interested in the content behind the crowdsourcing task. There is a certain motive behind the participation itself, irrespective whether the underlying motives are from intrinsic or extrinsic nature. Participation happens because people believe they can contribute or have the ability to do so. In case of an actual crowdsourcing contest, it is perhaps harder to investigate what factors actually involve the outcome in relation to task attributes, something the design of our experiment is suitable for.

But at the same time, for our experiment participants were asked to fill in an experimental survey, not knowing how the experiment is manipulated and not knowing what the goal of the experiment is. Therefore the reasons behind participating are not quite as similar to when customers participate in an actual crowdsourcing contest. The sample of participants in our survey may have included people that would not be part of an actual crowdsourcing contest or would want to share their ideas with companies beforehand. For instance, someone may have performed well in the design contest, and also quite enjoyed the task itself, but this may be purely accounted to the fact the purpose was a survey. While in reality, this person perhaps would not want to share ideas with an actual company beforehand. Although this effect has been captured to some extent by intrinsic motivation and also to some extent by surveys that were not completed, the conclusions regarding performance in relation to intrinsic motivation, should be considered with caution. Therefore, some lack in internal validity in the conducted experiment is expected. However, this study still provides a framework which could be used in an actual crowdsourcing contest, where participants could be hand out tasks differing in context.

## **5.4 Recommendations for future research**

By conducting an experimental crowdsourcing survey in the form of an idea competition, this study demonstrated a construction to measure performance, in relation to different task contexts and intrinsic motivation. With that, our study has complemented earlier research regarding the role of intrinsic motivation and the task design on performance in crowdsourcing contest. But there are still unanswered questions and possibilities to consider for future research.

Among the limitations of this study was that of generalizability of the results for different crowdsourcing contexts. That is because the product group that was the subject for this experiment was very specific, categorized as being quite simple; not per se high knowledge requiring; and in addition a very common product. Therefore, in order to make more complete and generalizable conclusions regarding crowdsourcing for a wider range of product groups, further research on the effects and perceptions of the purposed different contextual cues (i.e. task attributes) in the task design could be explored. Three different product and crowdsourcing categories are suggested, that could be distinguished based on: task complexity (or task gratuity), level of knowledge requiring (high or low) and the level of commonness of the product group. On top of that, a distinction could be made for the effects on high knowledge (e.g. lead users) and low knowledge customers, or participants. First, in contrast to a simpler task, including the selection criteria in the case of a more sophisticated task could be perceived differently by participants. While discussing the theory for this study, there has been argued that providing the selection criteria could trigger the feeling to produce effective outcomes (competency). In addition to that, comparisons with goal-setting theory were made. Therefore our expectation was that providing the selection criteria would lead to higher performance and because it satisfies the need for 'competency', even to higher intrinsic motivation. Therefore, further research is suggested to examine whether selection criteria in a more complex task could lead to higher intrinsic motivation and enhance performance, as we expected initially in case of this study. Second, the other way around, providing peers evaluation in more complex tasks, could change the participants' perception as well. A reason for this could be related to the acceptance and disbelief of the accuracy of evaluation by peers from the participants' perspective, in case the task involves a more sophisticated task. Therefore and in addition, an examination on the perception of participants of providing both evaluation by peers and a jury of experts in the task, could be considered for the proposed categories as well for future research. This would enable to better understand the roles of different type of evaluators across different product categories. Finally, we argue that the effects for different product categories also should be examined separately for male and females participants.

Regarding the findings of this study, the specific causes of the differences in performance could perhaps be further explored as well. In case of providing peers evaluations, i.e. empowerment to create and select, intrinsic motivation has been found to be higher and so did performance. We argued that this could be accounted to one of the aspects of intrinsic motivation, namely relatedness. Based on questionnaire items more specific to 'relatedness', the perceptions of participants related to the need to belong to a social group could be explored for the different levels of empowerment (i.e. jury versus peers). The mediating effect of 'relatedness' could provide stronger

conclusive answers on this issue. In addition, intrinsic motivation has been found to be lower in the group provided with the selection criteria and has been argued to be due to the loss in autonomy in the task from the participants' view. Similarly, to provide conclusive answers, the perceptions of the participants towards the level of 'autonomy' in the task could be examined for groups that are provided the selection criteria and for groups with no selection criteria provided, using 'autonomy' as the presumed mediator.

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## 7. Appendix

### 7.1 Online survey and performance measuring

#### Online Survey

Thank you for being part of this survey!

You are asked to be a T-shirt designer and come up with a quote or slogan that can be put on T-shirts. You can provide your idea in both English or Dutch.

But before we start, we would like to get to know you a little better...



How old are you?

---

What is your gender?

Please indicate how strongly the following statements apply to you.

	1. Very untrue of me	2. Untrue of me	3. Somewhat untrue of me	4. Neutral	5. Somewhat true of me	6. True of me	7. Very true of me
I am interested in fashion clothing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To me, shopping for clothes is valuable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fashion clothing means a lot to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To me, shopping for clothing is beneficial.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
For me personally fashion clothing is important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

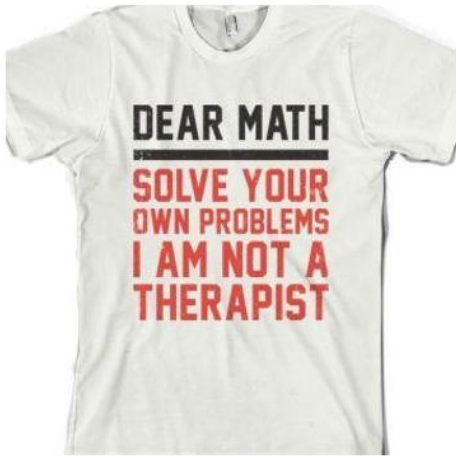
And how strongly do the following statements apply to you?

	1. Very untrue of me	2. Untrue of me	3. Somewhat untrue of me	4. Neutral	5. Somewhat true of me	6. True of me	7. Very true of me
I usually have one or more outfits that are of the very latest style.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I must choose between the two, I usually dress for style, not comfort.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An important part of my life and activities involves dressing stylishly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fashionable, attractive styling is very important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Some examples to inspire you for your own T-shirt idea!

---



A fashion company asks you to get involved in their new T-shirt design. They are asking you to come up with a catchy quote or slogan they can put on T-shirts and in addition the color(s) of the T-shirt.

After all submissions are collected, a jury designated by the company will evaluate every design idea to come up with the T-shirt which will eventually be realized to be sold. The winning design idea will be rewarded with a €50 gift card for bol.com or Amazon. The jury will be instructed to give points based on the following 5 criteria:

- 1) **Originality**, how original the quotes are, did somebody already come up with similar quotes on T-shirts;
  - 2) **Catchiness**, how catchy the quotes are;
  - 3) **Non-common words**, non-common words are more appreciated;
  - 4) **Length**, not too long, not too short;
  - 5) **Meaningfulness**, how meaningful the quotes are, whether the quote has a deeper understanding or message.
- 

A fashion company asks you to get involved in their new T-shirt design. They are asking you to come up with a catchy quote they can put on T-shirts and in addition the color(s) of the T-shirt. After all submissions are collected, potential customers will evaluate and give points to every design idea to come up with the T-shirt which will eventually be realized to be sold. The winning design idea will be rewarded with a €50 gift card for bol.com or Amazon. The evaluators, which are potential buyers of the T-shirts, will be instructed to give points based on the following 5 criteria:

- 1) **Originality**, how original the quotes are, did somebody already come up with similar quotes on T-shirts;
  - 2) **Catchiness**, how catchy the quotes are;
  - 3) **Non-common words**, non-common words are more appreciated;
  - 4) **Length**, not too long, not too short;
  - 5) **Meaningfulness**, how meaningful the quotes are, whether the quote has a deeper understanding or message.
-

A fashion company asks you to get involved in their new T-shirt design. They are asking you to come up with a catchy quote they can put on T-shirts and in addition the color(s) of the T-shirt. After all submissions are collected, a jury designated by the company will evaluate every design idea to come up with the T-shirt which will eventually be realized to be sold. The winning design idea will be rewarded with a €50 gift card for bol.com or Amazon.

---

A fashion company asks you to get involved in their new T-shirt design. They are asking you to come up with a catchy quote they can put on T-shirts and in addition the color(s) of the T-shirt. After all submissions are collected, potential buyers of the T-shirts will evaluate and give points to every design idea to come up with the T-shirt which will eventually be realized to be sold. The winning design idea will be rewarded with a €50 gift card for bol.com or Amazon.

---

Slogan or quote:

What color should the T-shirt be?

Additional information or description to your design idea:



Please indicate how true the following statements are to you after participated in this T-shirt designing contest on a scale of 1 to 7:

	1 = Not true at all	2	3	4 = Somewhat true	5	6	7 = Very true
I enjoyed doing this activity very much.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
While I was doing this activity, I was thinking about how much I enjoyed it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with my performance at this task.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tried very hard on this activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It was important to me to do well at this task.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe this activity could be of some value to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think this is an important activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



We thank you for your time spent taking this survey.  
Your response has been recorded.

## Performance evaluation survey

As you have already been told, you are asked to evaluate submissions of people that are randomly asked to come up with a T-shirt idea, including a catchy quote or slogan. You will be provided with the submitted T-shirt ideas. While evaluating the ideas, please bear in mind the effort and creativity that has been put into the T-shirt idea.

You are asked to evaluate each T-shirt based on the following question:

*How likely do you think that the following T-shirt ideas would be offered particularly in a clothing store?*

Please provide your evaluation answers from a scale of 1 to 7.



**Slogan or quote:**

FEAR WILL LEARN TO FEAR ME

**What color should the T-shirt be?**

Black

**Additional information or description to your design idea:**

The quote should be on the back three times underneath each other in white letters and the letters should be outlined in red (so outside of the letter is red and inside is white). Thereby should the font be Racing Sans One.

---

I imagine this T-shirt to be sold in a clothing store.

7. very likely

6. likely

5. somewhat likely

4. undecided

3. somewhat unlikely

2. unlikely

1. very unlikely

## 7.2 Reliability measures

### SPSS Cronbach's Alpha measures output

#### Intrinsic Motivation

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,803	,802	7

#### Fashion Involvement

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,882	,882	5

#### Fashion Consciousness

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,835	,835	4

## 7.3 SPSS output of Analyses

### 7.3.1 Moderation analysis

#### Between-Subjects Factors

		Value Label	N
SelectionCriteria	0	No Selection Criteria	84
	1	Selection Criteria	83
EvaluatorType	0	Jury	83
	1	Peers	84

#### Descriptive Statistics

Dependent Variable: Performance

SelectionCriteria	EvaluatorType	Mean	Std. Deviation	N
No Selection Criteria	Jury	3,9545	1,55284	44
	Peers	4,6750	1,63384	40
	Total	4,2976	1,62314	84
Selection Criteria	Jury	3,9829	1,74206	39
	Peers	4,3788	1,50896	44
	Total	4,1928	1,62477	83
Total	Jury	3,9679	1,63433	83
	Peers	4,5198	1,56719	84
	Total	4,2455	1,61991	167

#### Overall Regression Model

##### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,295 <sup>a</sup>	,087	,047	1,58149

a. Predictors: (Constant), Gender, SelectionCriteria, Age, EvaluatorType, FashionInvolvement, FashionConsciousness, EvaluatorTypeSelectionCriteria

b. Dependent Variable: Performance



**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37,927	7	5,418	2,166	,040 <sup>b</sup>
	Residual	397,674	159	2,501		
	Total	435,601	166			

a. Dependent Variable: Performance

b. Predictors: (Constant), Gender, SelectionCriteria, Age, EvaluatorType, FashionInvolvement, FashionConsciousness, EvaluatorTypeSelectionCriteria

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2,765	1,062		2,603	,010	,667	4,863
	EvaluatorType	,819	,350	,254	2,340	,021	,128	1,510
	SelectionCriteria	,097	,353	,030	,276	,783	-,599	,794
	EvaluatorType_SelectionCriteria	-,405	,502	-,111	-,808	,420	-1,396	,585
	FashionInvolvement	,160	,108	,156	1,474	,143	-,054	,374
	FashionConsciousness	,100	,116	,092	,860	,391	-,129	,329
	Age	,002	,031	,005	,060	,953	-,060	,064
	Gender	-,048	,261	-,015	-,185	,854	-,564	,467

a. Dependent Variable: Performance

**Regression Model Males**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,318 <sup>a</sup>	,101	,042	1,56806

a. Predictors: (Constant), Male\_Age, MaleSelectionCriteria, MaleEvaluatorType, Male\_FashionInvolvement, Male\_FashionConsciousness, Male\_EvaluatorTypeSelectionCriteria

b. Dependent Variable: Male\_Performance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25,187	6	4,198	1,707	,128 <sup>b</sup>
	Residual	223,752	91	2,459		
	Total	248,940	97			

a. Dependent Variable: Male\_Performance

b. Predictors: (Constant), Male\_Age, MaleSelectionCriteria, MaleEvaluatorType, Male\_FashionInvolvement, Male\_FashionConsciousness, Male\_EvaluatorTypeSelectionCriteria

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3,502	1,477		2,372	,020	,569	6,435
	MaleEvaluatorType	1,080	,443	,337	2,436	,017	,199	1,961
	MaleSelectionCriteria	,069	,478	,022	,144	,886	-,881	1,019
	Male_EvaluatorType_Selection Criteria	-,782	,645	-,222	-1,212	,229	-2,063	,499
	Male_FashionInvolvement	,190	,133	,187	1,423	,158	-,075	,455
	Male_FashionConsciousness	-,072	,150	-,063	-,481	,632	-,370	,226
	Male_Age	-,009	,047	-,020	-,194	,847	-,102	,084

a. Dependent Variable: Male\_Performance

**Regression Model Females**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,368 <sup>a</sup>	,135	,052	1,60817

a. Predictors: (Constant), Female\_Age, Female\_SelectionCriteria, Female\_EvaluatorType, Female\_FashionInvolvement, Female\_FashionConsciousness, Female\_EvaluatorTypeSelectionCriteria

b. Dependent Variable: Female\_Performance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25,085	6	4,181	1,617	,158 <sup>b</sup>
	Residual	160,345	62	2,586		
	Total	185,430	68			

a. Dependent Variable: Female\_Performance

b. Predictors: (Constant), Female\_Age, Female\_SelectionCriteria, Female\_EvaluatorType, Female\_FashionInvolvement, Female\_FashionConsciousness, Female\_EvaluatorTypeSelectionCriteria

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1,969	1,469		1,340	,185	-,968	4,907
	Female_EvaluatorType	,352	,580	,107	,607	,546	-,808	1,512
	Female_SelectionCriteria	,071	,536	,021	,132	,896	-1,001	1,142
	Female_EvaluatorType_SelectionCriteria	,177	,844	,046	,210	,834	-1,510	1,865
	Female_FashionInvolvement	,071	,189	,064	,373	,711	-,308	,449
	Female_FashionConsciousness	,314	,189	,288	1,663	,101	-,063	,691
	Female_Age	,015	,044	,043	,334	,739	-,073	,103

a. Dependent Variable: Female\_Performance

### 7.3.2 Mediation analysis

#### Evaluator Type and Intrinsic Motivation on Performance

##### Evaluator Type x Intrinsic Motivation

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,211 <sup>a</sup>	,044	,039	1,05838	1,905

a. Predictors: (Constant), EvaluatorType

b. Dependent Variable: IntrinsicMotivation

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8,596	1	8,596	7,674	,006 <sup>b</sup>
	Residual	184,826	165	1,120		
	Total	193,422	166			

a. Dependent Variable: IntrinsicMotivation

b. Predictors: (Constant), EvaluatorType

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3,885	,116		33,439	,000	3,655	4,114
	EvaluatorType	,454	,164	,211	2,770	,006	,130	,777

a. Dependent Variable: IntrinsicMotivation

##### Evaluator Type x Performance

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,171 <sup>a</sup>	,029	,023	1,60091	2,420

a. Predictors: (Constant), EvaluatorType

b. Dependent Variable: Performance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12,720	1	12,720	4,963	,027 <sup>b</sup>
	Residual	422,881	165	2,563		
	Total	435,601	166			

- a. Dependent Variable: Performance
- b. Predictors: (Constant), EvaluatorType

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	3,968	,176		22,580	,000	3,621	4,315
	EvaluatorType	,552	,248	,171	2,228	,027	,063	1,041

- a. Dependent Variable: Performance

**Evaluator Type x Intrinsic Motivation x Performance**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,414 <sup>a</sup>	,172	,162	1,48316	2,198

- a. Predictors: (Constant), IntrinsicMotivation, EvaluatorType
- b. Dependent Variable: Performance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74,841	2	37,420	17,011	,000 <sup>b</sup>
	Residual	360,760	164	2,200		
	Total	435,601	166			

- a. Dependent Variable: Performance
- b. Predictors: (Constant), IntrinsicMotivation, EvaluatorType

		Coefficients <sup>a</sup>						
		Unstandardized Coefficients		Standardized Coefficients		95,0% Confidence Interval for B		
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	1,716	,454		3,779	,000	,819	2,612
	EvaluatorType	,289	,235	,089	1,230	,220	-,175	,753
	IntrinsicMotivation	,580	,109	,386	5,314	,000	,364	,795

a. Dependent Variable: Performance

### Evaluator Type Bootstrap results PROCESS SPSS

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 3.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
 Documentation available in Hayes (2018). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 4  
 Y : Performa  
 X : Evaluato  
 M : Intrinsi

Sample  
 Size: 167

\*\*\*\*\*

OUTCOME VARIABLE:  
 Intrinsi

Model Summary

	R	R-sq	MSE	F	df1	df2
p	,2108	,0444	1,1202	7,6737	1,0000	165,0000
	,0062					

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,8847	,1162	33,4391	,0000	3,6553	4,1141
Evaluato	,4538	,1638	2,7701	,0062	,1303	,7772

\*\*\*\*\*

OUTCOME VARIABLE:  
 Performa

Model Summary

	R	R-sq	MSE	F	df1	df2
p	,4145	,1718	2,1998	17,0111	2,0000	164,0000
	,0000					

Model	coeff	se	t	p	LLCI	ULCI
constant	1,7157	,4540	3,7792	,0002	,8193	2,6122
Evaluato	,2889	,2348	1,2303	,2203	-,1748	,7526
Intrinsi	,5797	,1091	5,3141	,0000	,3643	,7952

\*\*\*\*\* TOTAL EFFECT MODEL \*\*\*\*\*

OUTCOME VARIABLE:

Performa

Model Summary

	R	R-sq	MSE	F	df1	df2
p	,1709	,0292	2,5629	4,9629	1,0000	165,0000
	,0272					

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,9679	,1757	22,5803	,0000	3,6209	4,3148
Evaluato	,5520	,2478	2,2278	,0272	,0628	1,0412

\*\*\*\*\* TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y \*\*\*\*\*

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
,5520	,2478	2,2278	,0272	,0628	1,0412

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
,2889	,2348	1,2303	,2203	-,1748	,7526

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Intrinsi	,2631	,1021	,0747	,4783

\*\*\*\*\* ANALYSIS NOTES AND ERRORS \*\*\*\*\*

Level of confidence for all confidence intervals in output:

95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

NOTE: Variables names longer than eight characters can produce incorrect output.

Shorter variable names are recommended.

----- END MATRIX -----

## Selection Criteria and Intrinsic Motivation on Performance

### Selection Criteria x Intrinsic Motivation

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,135 <sup>a</sup>	,018	,012	1,07287	1,894

a. Predictors: (Constant), SelectionCriteria

b. Dependent Variable: IntrinsicMotivation

#### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,499	1	3,499	3,040	,083 <sup>b</sup>
	Residual	189,923	165	1,151		
	Total	193,422	166			

a. Dependent Variable: IntrinsicMotivation

b. Predictors: (Constant), SelectionCriteria

#### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4,257	,117		36,364	,000	4,026	4,488
	SelectionCriteria	-,290	,166	-,135	-1,744	,083	-,617	,038

a. Dependent Variable: IntrinsicMotivation

### Selection Criteria x Performance

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,032 <sup>a</sup>	,001	-,005	1,62395	2,392

a. Predictors: (Constant), SelectionCriteria

b. Dependent Variable: Performance



**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,459	1	,459	,174	,677 <sup>b</sup>
	Residual	435,142	165	2,637		
	Total	435,601	166			

- a. Dependent Variable: Performance  
 b. Predictors: (Constant), SelectionCriteria

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4,298	,177		24,255	,000	3,948	4,647
	SelectionCriteria	-,105	,251	-,032	-,417	,677	-,601	,391

- a. Dependent Variable: Performance

**Selection Criteria x Intrinsic Motivation x Performance**

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,406 <sup>a</sup>	,165	,154	1,48955	2,192

- a. Predictors: (Constant), IntrinsicMotivation, SelectionCriteria  
 b. Dependent Variable: Performance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	71,726	2	35,863	16,164	,000 <sup>b</sup>
	Residual	363,874	164	2,219		
	Total	435,601	166			

- a. Dependent Variable: Performance  
 b. Predictors: (Constant), IntrinsicMotivation, SelectionCriteria

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1,690	,488		3,463	,001	,727	2,654
	SelectionCriteria	,072	,233	,022	,312	,756	-,387	,532
	IntrinsicMotivation	,613	,108	,408	5,667	,000	,399	,826

- a. Dependent Variable: Performance

**Selection Criteria Bootstrap results PROCESS SPSS**

Run MATRIX procedure:

\*\*\*\*\* PROCESS Procedure for SPSS Version 3.1 \*\*\*\*\*

Written by Andrew F. Hayes, Ph.D. [www.afhayes.com](http://www.afhayes.com)  
 Documentation available in Hayes (2018). [www.guilford.com/p/hayes3](http://www.guilford.com/p/hayes3)

\*\*\*\*\*

Model : 4  
 Y : Performa  
 X : Selectio  
 M : Intrinsi

Sample  
 Size: 167

\*\*\*\*\*

OUTCOME VARIABLE:  
 Intrinsi

Model Summary

	R	R-sq	MSE	F	df1	df2
p	,1345	,0181	1,1510	3,0399	1,0000	165,0000
	,0831					

Model

	coeff	se	t	p	LLCI	ULCI
constant	4,2568	,1171	36,3644	,0000	4,0257	4,4879
Selectio	-,2895	,1660	-1,7435	,0831	-,6174	,0383

\*\*\*\*\*

OUTCOME VARIABLE:  
 Performa

Model Summary

	R	R-sq	MSE	F	df1	df2
p	,4058	,1647	2,2187	16,1637	2,0000	164,0000
	,0000					

Model

	coeff	se	t	p	LLCI	ULCI
constant	1,6900	,4880	3,4635	,0007	,7265	2,6535
Selectio	,0725	,2326	,3116	,7557	-,3869	,5319
Intrinsi	,6126	,1081	5,6675	,0000	,3992	,8260

\*\*\*\*\* TOTAL EFFECT MODEL \*\*\*\*\*

OUTCOME VARIABLE:  
 Performa

Model Summary

	R	R-sq	MSE	F	df1	df2
p	,0325	,0011	2,6372	,1740	1,0000	165,0000
	,6771					

Model

	coeff	se	t	p	LLCI	ULCI
constant	4,2976	,1772	24,2546	,0000	3,9478	4,6475
Selectio	-,1048	,2513	-,4172	,6771	-,6011	,3914

\*\*\*\*\* TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y \*\*\*\*\*

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
-,1048	,2513	-,4172	,6771	-,6011	,3914

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
,0725	,2326	,3116	,7557	-,3869	,5319

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Intrinsi	-,1773	,1048	-,3912	,0217

\*\*\*\*\* ANALYSIS NOTES AND ERRORS \*\*\*\*\*

Level of confidence for all confidence intervals in output:

95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

NOTE: Variables names longer than eight characters can produce incorrect output.

Shorter variable names are recommended.

----- END MATRIX -----