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The Overwhelmed Consumer: How Information Overload
Affects Customer Participation

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The Overwhelmed Consumer:
How Information Overload Affects
Customer Participation

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Abstract

Advancements of information technology in recent years provides the consumers with endless information on every imaginable subject. As a consequence, information overload experienced by consumers has been acknowledged in research. However, a gap from information overload to the service marketing literature has been identified. Hence, we formulated the research question: *How does information overload affect customer participation?*

Our study has defined information overload in two ways; (1) Life Infostress, which is information overload in the customer's own sphere, caused by living in an information-rich society. (2) Firm Information Overload, which represents the firms' sphere, caused by over-communication. Our results are discussed in the light of other terms such as Infobesity and customers' expectations.

Results from 202 American respondents indicate that Firm Information Overload affects the customer's motivation and self-efficacy, depending on the complexity of the participation required. Moreover, Life Infostress is found to increase the customer's likelihood of participation, which contradicts our original hypothesis. The overall findings of all three hypotheses support a contribution presented in theoretical implications: *The Information Noise Reduction Effect*. This effect is found to be highly beneficial for customers with high levels of Life Infostress. Managerial implications recommends encouraging of customer participation and modification of information based on complexity. Finally, the study provides evidence for information overload's influence on self-efficacy, motivation and customer participation. Life Infostress also affects customer participation, however noise reduction copes with this.

KEYWORDS: Service marketing, information overload, customer participation, motivation, self-efficacy, infostress, Infobesity, Information Noise Reduction Effect.

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1.0 Introduction

Every 5 minutes 2855 websites are created, 360 hours of new videos are uploaded to YouTube, and 1 390 000 tweets are posted. This characterizes the information age we live in and it keeps on growing.

In 1945, human knowledge doubled every 25 years, and in 2014 it doubled every 13 months. In 2020, human knowledge is estimated to double every 12 hours. This is how fast information is generated through today's accessibility and connectivity. It makes it possible to find information about whatever you want, when you want, from unlimited sources. A quick search of "diet" on google provided about 1 100 000 000 results in 0.59 seconds. The world is becoming increasingly connected each year due to technological developments, and by the click of a button, endless amounts of information sources from firms all over the world is revealed. As this unlimited amount of information grows, the notion of information overload has appeared, creating headlines like "Overloaded and Overwhelmed" and "No more bananas: A nine-step journey towards a less stressful life." Stating that in this age of social media and information overload, we easily go bananas (Forbes, 2019).

From this overload, an association to stress has been formed and recent research has identified information overload as a new type of stress in today's information age. Stress is only one of the many consequences of information overload. It is a paradox how increasing possibilities leads to less happiness. This can be found in popular-media, on areas such as career paths, places to live, holiday destinations, and an almost infinite number of consumer products. While individual consumers may find this variety to be appealing, it has been suggested that an overwhelming amount of options to choose from has led to be opposite effect (Scheibehenne et al, 2010).

The marketing discipline has researched the impact of information overload in a typical purchase situation. However, previous research offers little guidance on how information overload influences customer participation outside the decision-

making process. Hence, we find information overload to be a relevant construct to explore relating customer participation. Moreover, as more information becomes accessible in society, stress and other factors can impact a customer's will to participate. Therefore, our research question is:

(1) *How does information overload affect customer participation?*

This thesis is structured as follows: First, is a literature review, followed by methodology, results, and general discussion including overall findings, theoretical and managerial implications, and finally limitations and future research.

The literature review is structured as follows. First, a section of what research has been conducted using information overload in the marketing discipline. Second, an overview of information overload as a construct, in terms of; definitions, effects, environment, and a sub-conclusion of how information overload is defined in this study. Third, an overview of customer participation as a construct, in terms of; definition, importance, customer participation and co-creation of value. *Finally*, the hypotheses and research model will be presented.

2.0 Literature Review

Several studies with different approaches to information overload in the marketing literature has been conducted. Regardless of context, it has proven to be influential in ways such as (1) choice overload, (2) in interface design of technological products, and (3) passive loyalty. The results of these studies show that choice overload affects motivation, interface design affect efficiency and cognitive workload, whilst the third effect shows that information overload can cause customers to stay with brands by chance. The literature review will first give account for these effects. Followed by sections of information overload and customer participation as constructs. Finally, the three tested hypotheses are presented. Where information overload and customer participation is tested regarding (1) motivation, (2) self-efficacy and (3) likelihood of participation.

2.1 Information Overload in Marketing

In daily language, information overload is typically referred to as simply receiving too much information. However, information overload is a broad subject that has been conducted research on for decades in an array of fields. As presented by Eppler & Mengis (2004), these include organizational science, accounting, marketing and Management

Information Systems.

Moreover, information overload has been defined in several ways and no single definition is agreed upon.

The first definition has been schematically presented by Eppler and Mengis (2004) as the inverted u-curve. The curve

states that information load only affect decision-making positively up to a certain point. After this point, the quality of decision-making starts declining.

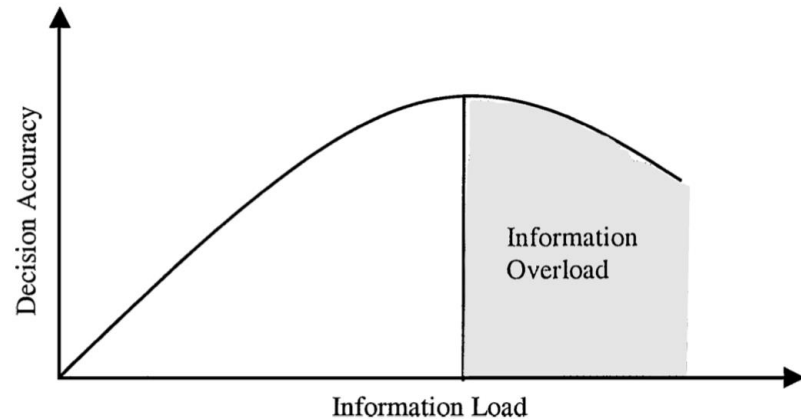


Figure 1: Information Overload as the inverted u-curve (Eppler and Mengis, 2004, 326)

The marketing discipline has defined information overload as “comparing the volume of information supply (e.g., the number of available brands) with the information-processing capacity of an individual” (Eppler & Mengis, 2004, 326). Hence, information overload occurs when information supply exceeds the capacity. The decision quality is reduced and the individual experience effects such as stress and confusion. Hence, information overload can lead to *choice* overload. Choice overload will be elaborated in the next section.

Choice Overload

Choice overload states that an increase in the number of options to choose from may lead to unfavorable consequences, such as a decrease in the motivation to choose or satisfaction with the finally chosen option. The idea of choice overload

can be traced all the way back to the French philosopher Jean Buridan (1300–1358). In the twentieth century, Miller (1944) reported early experimental evidence that leaving an attractive option to obtain another may lead to procrastination and conflict. The idea was further developed by Lewin (1951) and Festinger (1957), who proposed that choices among attractive, but mutually exclusive alternatives lead to more conflict as the options become more similar. Lipowski (1970) extended this idea by proposing that choice conflict further increases with the number of options and information overload. This in turn leads to confusion, anxiety, and the inability to make a choice (Scheibehenne et al., 2010). Moreover, Reutskaja & Hogarth (2009) hypothesized that choice overload occurs due to the increased cognitive effort needed to make a choice.

More recently, Iyengar and Lepper (2000) performed a series of experiments in order to view the consequences of having too many choices. In their first study, a tasting table with exotic jams at a grocery store was set up. The table displayed either a small assortment containing six jams or a large assortment of twenty-four jams. In line with the idea that people are attracted by large assortments, Iyengar and Lepper found that more consumers approached the tasting table when it displayed twenty-four jams. However, when it came to actual purchase, 30% of all consumers who viewed the small assortment bought one of the jams, whereas in the large assortment case, the purchase rate was only 3%. The authors interpreted this finding as a result of choice overload, thus the motivation to make a choice decreased by the many options. They found the same result in other, similar experiments they conducted and confirmed the choice overload hypothesis.

Several studies have proven evidential for information and choice overload, there are arguments both in favor and against this proposed theory. Having more options to choose from within a category is likely to make the choice more difficult. Meaning the differences between attractive options become smaller and the amount of available information about them increases (Fasolo et al., 2009; Timmermans, 1993). Large assortments also make a comparison of all options

seem undesirable from a time-and-effort perspective, which in turn could cause fear of not being able to choose optimally (Iyengar, Wells, and Schwartz, 2006).

Large assortments can have advantages however, as a large variety of choices increases the likelihood of satisfying diverse consumers (Anderson, 2006). In a series of experiments, Berger, Draganska, and Simonson (2007) showed that introducing finer distinctions within a product line increased perception of quality, and that a brand offering high variation within a category has a competitive advantage. There are other advantages of having many options to choose from as well; a large assortment made available all in one place reduces the search costs and allows for more direct comparisons between options (Scheibehenne et al., 2010). In other words, more freedom of choice.

What all the authors agreed on however, was that consumers can process a fairly large amount of information, though at some point they all reach their limits (Scheibehenne et al., 2010). However, Korhonen et al. (2018) found that providing decision makers with too much information may jeopardize their ability to make good choices, especially when the number of alternatives are increased. This suggests that facing too many options ultimately decreases the motivation to choose any of them (Scheibehenne et al., 2010).

We know that choice overload hampers the customers motivation to choose. Thus, we find it relevant to explore information overload's effect on customer's motivation to participate.

Interface Design

Another marketing aspect of information overload is interface design. Regarding consumption and usage of technological products, a study by Wu et al. (2016) found that interface design should be as simple as possible. This is because information overload in the interface design increases the cognitive workload of the user, and thereby decreases its efficiency. If a website is user friendly and easy to navigate, noise will be reduced, and less information overload will be

experienced. Hence, information overload has an effect in consumption of technological interfaces.

Information Overload and Passive Loyalty

Information overload can be a source for passive loyalty. Court et al. (2009) proposes two different types of customer loyalties taking shape in the post purchase stage, namely active and passive loyalists. The active loyalist is the customer who not only sticks to the brand, but also recommends it. The passive loyalist is the customers who stays with the brand without being committed to it. The reason might be due to laziness or confusion caused by choice overload.

This passivity strengthens our overall hypothesis that information overload affects customer participation. All the studies above show that information overload exists and has various effects on consumers. In addition, customer participating has shown to be beneficial for both customers and firm, as it can increase satisfaction and service quality (Ngo & O’Cass, 2013). Thus, knowledge about the interaction of these two constructs is identified as a gap. Next, definitions on information overload will be discussed and defined for the purpose of this study.

2.2. Information Overload

Information overload has been defined in various ways in addition to daily language, the inverted u curve and as by the marketing discipline. These are reviewed in the following section.

Information Overload Definitions

The classic definition is connected to the one typically used by marketers when discussing choice overload. It can be expressed by the following formula:

$$\textit{Information processing requirements} > \textit{information processing capacities}$$

The processing requirements represent information needed to complete a given task, while processing capabilities represent the actual quantity of information

possible to integrate into the decision-making process. Moreover, *requirements/capabilities* can be strained by time. Meaning the individual need to process the information within a given time frame. Thus, if the time does not allow the amount of information to be processed, information overload is the result. (Eppler & Mengis, 2004)

The final definition of information overload suggests that “information overload occurs when information becomes a hindrance rather than help when information is potentially useful” (Holtham & Courtney, 1999, 249). Additionally, information overload may also come from characteristics (quality) of information. *Quality* is defined as information usefulness. In a setting where a consumer is assessing the utility of an alternative brand, increase in quality of information increases the consumers confident in its decision (Keller & Staelin, 1987).

Symptoms affecting the individual when experiencing information overload include; demotivation, confusion, pressure, stress, anxiety and decreasing satisfaction (Eppler & Mengis, 2004). Additionally, effects such as feelings of “drowning in a sea of information”, feelings of being unable to cope, and inadequacy of knowledge has been reported (Sparrow, 1999). Moreover, when an individual experience information overload it becomes more difficult to identify the relevant information. Thus, the individual becomes more selective of the information, and ends up ignoring larger amounts of it. Hence, the individual fails to see the details and overall perspective of the focal subject (Eppler & Mengis, 2004). Furthermore, information overload has also been found to have a negative relationship with life satisfaction (Williamson & Eaker, 2012). This perspective of information overload is seen in a larger perspective, linking it to everyday life and living in an information-rich society. This leads us over to a new concept introduced by Ledzińska and Postek (2017); *Infostress*. The next section explains the concept in more detail.

Infostress

Infostress is a consequence of global technological changes and is as a new type of stress (Ledzińska & Postek, 2017). The conceptualization is based on the premise that everyday existence in an information-rich environment, leads to psychological discomfort. Infostress is caused by information overload, due to a state of perpetual overload. The stressor is the information itself. Moreover, Infostress meets the criteria of stress presented by Lazarus and Folkman (1987, 1984), meaning (1) it is evoked by a stressor. (2) The initial assessment of the situation is important, and the perception of one's own resources is seen as inadequate. (3) Physiological, cognitive, and emotional reactions take place, and (4) coping attempts take place (Ledzińska & Postek, 2017).

Infostress Coping Reactions

In the coping attempts, the person tries to allocate their resources or to obtain new resources. If this fails, secondary coping attempts will take place. This may be to rationalize the situation as less important than initially. Other psychological characteristics that makes people reactions and copings attempts vary, can be divided into *structural* and *functional* resources.

In terms of *Structural* resources, Ledzińska and Postek (2017) presented knowledge, individual experience, and wisdom. These resources provide criteria when selecting new information, and intuitive assessments of whether the information is important at all. Among *functional* resources, attention and working memory is presented as responsible for coping with the stressful situation. But when faced with more complicated tasks, metacognitive skills, such as the ability to plan, self-control, and adjust becomes increasingly important coping mechanisms.

Temperament is an important resource when an individual is coping with infostress. Temperament can be defined as the mechanism responsible for storing and distributing energy and is tied to all forms of stress. Another consequence of

Infostress, is that it can lead to deprivation of need for orientation (Ledzińska & Postek, 2017). Need for orientation is a form of need for cognition. This is closely connected to needs and motivation, which are mechanisms regulating human behavior (Ledzińska & Postek, 2017). Need for cognition is a personality trait, a driving force to learning and a powerful determinant of behavior. Individuals with this trait enjoy intellectual problem solving, they yearn for information and enjoy analyzing it. The challenges give them motivation. Individuals low on this trait on the other hand, need to be motivated externally to be engaged. Ledzińska and Postek (2017) further states that information-rich environments lead to deprivation of need for orientation for both those who carry the trait, and those who do not. This is because those who are low on the trait, will try to avoid information due to overstimulation, whilst those who carry the trait do not achieve satisfaction. The result is that both are overstimulated and will experience negative emotions like stress. This means that in theory, all customers are to some extent exposed to information overload and in risk of experiencing infostress. Hence, this is an important aspect in marketing research.

Information Environment

The last decades, information accessibility has been growing exponentially, and the number of sources of information has grown at an ever-changing pace. After the technological advancements the information environment keeps changing. Due to this change, other terms as a result of information overload has been created. First, Infobesity, is a term used to denote situations of personal information overload. Bawden and Robinson (2008) compares consumption of information to consumption of food. An individual's diet can consist of feasting on fast food, resulting in obesity. Infobesity, in comparison, can be seen as feasting, or binging information from an unlimited source. Simultaneously, a tactic used to deal with Infobesity, is information avoidance (Bawden & Robinson, 2008). Information avoidance is when the individual ignores relevant and useful information sources because there is too much to deal with. Second, Information Anxiety, is another term describing a stress condition caused by information (Bawden & Robinson, 2008), relating to the inability to access, understand or to make use of information.

An example of this is news overload. As the boundary between news production and consumption become blurred and more platforms and devices are accessible for news consumption, individuals are faced with an astonishing amount of information (Song et al., 2017). Large amounts of news act like noise when they produce overload and tends to cause anxiety.

The cause of information overload may also be due to poor organization and presentation of information, or lack of understanding the information environment in which the individual is trying to orient themselves. Building upon this, Edmunds and Morris (2000) states that large amounts and high rate of information will act like noise when it reaches overload. Returning to what Ledzińska and Postek (2017) pointed out; if information-rich environments leads to deprivation of need for orientation, all customers is at risk of infostress. We argue the importance of continuing the research on information overload in the marketing discipline. In the following section, how information overload is defined in this study is presented.

Redefining Information Overload

For the purpose of the study, information overload has been divided into two sub-constructs based on the source of the information. The reasoning behind splitting information overload based on these two sources, is found by taking the Value Creations Spheres by Grönroos and Voima (2013) into consideration. The Value Creation Spheres divides the service delivery into three spheres where value is created and co-created between customer and firm. The two sub-constructs are defined as following.

Firm Information Overload: Represent information overload caused by the firm by over-communicating to the customer. Firm Information Overload builds on the definition of information overload using the inverted u curve. Hence, the entire amount of information presented to the individual is not actually integrated into the decision. Firm Information Overload is created in the provider sphere and

communicated to the customer. It is included in the study as part of the conditions. This will be elaborated in section 3.2. Main study.

Life Infostress: Represent information overload in the customers own sphere. Therefore, this is something that happens around the customer and in the customer's life independently of the focal firm. Life Infostress builds on the definition of information overload using the concept of infostress. Infostress is a result of living in an environment of perpetual overload. It also takes on the classic definition of information overload as presented by the equation:

$$\textit{information processing requirements} > \textit{information processing capacities}$$

In conclusion, Life Infostress is a subjective and continuous experience, when the individual see its own information processing capabilities as less than what is required. How Life Infostress is measures will be elaborated in section 3.4 Measures. Next, customer participation as a construct will be discussed.

2. 3 Customer Participation

Customer participation refers to “the degree to which the customer is involved in producing and delivering the service” (Dabholkar, 1990: 484). This has become a greater focus in the business industry over the last few years as they experience benefits with involving the customer. Therefore, a lot of literature is concentrated on the merits of increasing the degree of active customer participation in service production and delivery (Auh et al., 2007; Yi et al., 2011). For instance, customers who actively participate with companies are more likely to create customized offers for themselves (Firat, Dholakia, & Venkatesh, 1995). Moreover, customer participation enables companies to pursue long-term and profitable relationships to a larger extent (Bendapudi & Leone, 2003; Payne et al., 2009). Based on this, a study by Ngo and O’Cass (2013) theorizes that customer participation may account for the effect on service quality, which in turn enhances firm performance. From the customer's perspective, service quality is determined by the difference

between the customer's expectations and perceptions (Zeithaml, Berry, & Parasuraman, 1990).

Companies increase their focus on encouraging customers to participate in the production of services (Auh et al., 2007, DeSarbo et al., 2001; Yi et al., 2011). If service providers can manage customer participation appropriately, it can benefit both the firm and customers. Encouraging customers to participate is recognized as the next frontier in competitive effectiveness (Bendapudi & Leone, 2003).

Moreover, knowledge about customer participation are important for competitive strategy (Prahalad & Ramaswamy, 2000). This is a different perspective, where companies see customers as active participants, rather than a passive audience. Hence, a shift in business philosophy has occurred. Thus, moving the focus from “What can we do for you?” to “What can we do with you?” (Wind & Rangaswamy, 2000).

Customer Participation and Co-creation

The customer is always a co-creator of value according to Vargo and Lusch (2004) and “the goal is not to create value for customers but to mobilize customers to create their own value from the company's various offerings” (Normann & Ramirez, 1993: 69). The growing interaction between company and customer shows that many firms actively involve their customers in many service activities such as using customers' capacity to help design and deliver a service (Ngo & O’Cass, 2013). Participation indicates that their role is not to consume value but to help create it (Normann & Ramirez, 1993). Thus, customers are persuaded to actively collaborate with companies to co-create customized consumption experiences (Bendapudi and Leone, 2003; Payne et al., 2008; Prahalad and Ramaswamy, 2004). In order to achieve superior service quality for the customer, companies should motivate customers to participate (Ngo & O’Cass, 2013). Considering this, customer participation should be a positive experience. Naturally, customers with confidence in their capabilities, are more comfortable with participating. Thus, they are willing to put more effort into overcoming difficulties and obstacles than customers with low self-efficacy. Hence, Self-

efficacy mediates the enjoyment derived from customer participation (Yim et al., 2012). Self-efficacy has been defined as the “*belief in one’s capabilities to organize and execute the courses of action required to produce given attainments*” (Bandura, 1997: 3). Thereof, self-efficacy is a mediator of action (Yim et al., 2012), and will be used in the study.

In this study, we want to identify how knowledge about information overload can encourage customers to participate. What we know from the literature, is that (1) Information overload has been proven to decrease motivation in customers decision-making, (2) decrease efficiency in user interface design, and (3) is a source of passive loyal customers. Moreover, customer participation increase business performance, and information overload can lead to a variety of negative consequences for the individual. We want to research how these components interact. The next section presents our three hypotheses and conceptual models.

2.4. Hypotheses and Conceptual Models

The gap we are looking to fill, is what role information overload have in affecting customer participation. Three hypotheses will be presented, using three different outcome variables; Motivation, Self-efficacy and Likelihood of Participation. First, the theoretical arguments behind the relationships will be presented, followed by the hypotheses and conceptual model.

Motivation

The links from motivation to customer participation can be found in the literature. Motivation is a key mechanism regulating human behavior (Ledzińska & Postek, 2017), and a predictor of task performance (Barczak et al., 1997). Thus, motivation is a predictor of customer participation.

The links from information overload to motivation can also be found in the literature. Choice overload is found to decrease the customers motivation to make a choice (Iyengar & Lepper, 2000). Eppler and Mengis (2004) also states that

demotivation are symptoms when information overload is experienced. Hence, we find it relevant to test Firm Information Overload's effect on motivation to participate.

H1: When Customer Participation is low, a higher (lower) degree of Firm Information Overload, will lead to a decrease (increase) in motivation.

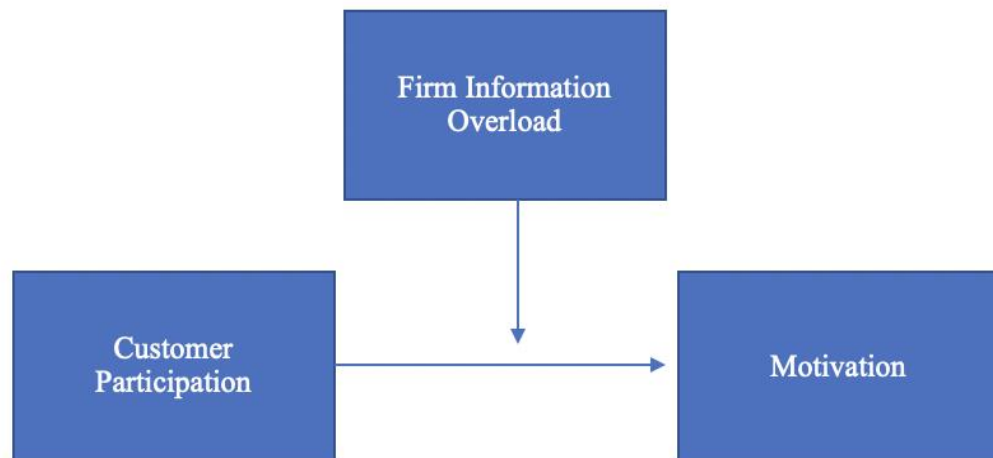


Figure 2: Conceptual model of H1

Self-Efficacy

The link from self-efficacy to customer participation can be found in the literature, as it mediates the enjoyment the customer experiences when participating.

The link from information overload to self-efficacy can be hypothesized from the literature. When experiencing infostress and met with complicated tasks, coping mechanisms such as *ability to plan* and *self-control* are important. Whilst the perception of one's own resources are experienced as inadequate. (Ledzińska & Postek, 2017). Ability to plan and self-control when conducting a task can be seen as self-efficacy. The reason for this, is because self-efficacy is defined as believing in one's capabilities to *organize and execute the courses of action*, which practically is the same concept. Moreover, Sparrow (1999) report effects like

feelings of being unable to cope as a consequence of information overload.

Because of these arguments, we hypothesize that information overload affects self-efficacy. Thus, we want to investigate if the level of Firm Information Overload and the level of customer participation have effects on self-efficacy regarding the specific participation task.

H2: When customer participation is low, a higher (lower) degree of Firm Information Overload, will lead to a decrease (increase) in self-efficacy.

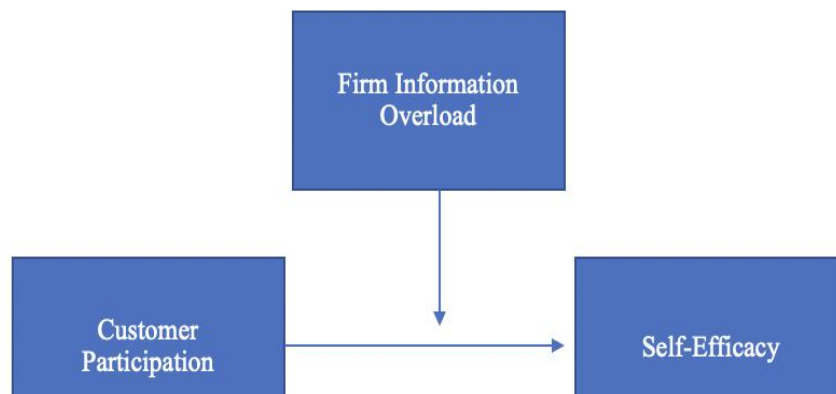


Figure 3: Conceptual model of H2

Likelihood of Participation

The link from Life Infostress to customer participation can be hypothesized from the literature. First, one of the coping mechanisms of infostress is to “*rationalize the situation as less important than initially*”. Hence, if the “situation” is participation, or interaction of any sort with a company, this could translate to rationalization regarding the customers need to participate. Thus, the likelihood of participation is affected negatively. Second, Life Infostress is a result of information overload. Hence, more information for the customer to process would increase infostress. Thus, the likelihood of participation is affected negatively as a consequence. Third, is that infostress can lead to deprivation of need for cognition. If this trait has been hampered, the customer needs external motivation to participate (Ledzińska & Postek, 2017).

Therefore, we want to investigate how the levels of Life Infostress and Firm Information Overload affect likelihood to participate.

H3: High (low) level of Life Infostress, will lead to lower (higher) likelihood of participation.



Figure 4: Conceptual model of H3

3.0 Methodology

This section describes the methodology of our research and is structured as follows: First, there is an overview of the study. Second, there is a description of the main study and the conditions. Third, is measures. Fourth, is ethics. Finally, validity and reliability are discussed.

3.1 Overview of Study

In this section, the methods and testing of the hypotheses are described through one main study. The study tested the suggested hypotheses about the influencing relationship between Firm Information Overload and customer participation where the amount of information was manipulated. Moreover, we wanted to investigate if variables of human behavior (motivation and self-efficacy) could affect the relationship as these are frequently mentioned as predictors of behavior in previous literature.

First, we conducted a *pretest* using a convenience sample. This was to ensure that our variables would be valid and measurable when executing statistical analysis. Moreover, it ensured a greater understanding regarding question wording and made it possible to make changes before publishing the main study.

3.2 Main Study

The study was a two (Information: high vs. low) x two (customer participation high vs. low) between subject design. All conditions were randomly assigned to the participants. The respondents were recruited through the online panel Amazon Mechanical Turk (MTurk). Overall, 202 participants from the US answered our approximately 6-minute study in exchange for a moderate financial reward. We chose to focus on the US as this is a large, diverse country and was concerned that choosing a smaller country would make the sample too narrow.

The usage of MTurk rather than a controlled lab experiment or depth interviews, was based on existing research showing that it does not significantly influence the result of the study (Feinberg, DeBruine, Jones, & Little 2008). By using MTurk, participants cover a larger demographic area, thus contributing to a high external validity. Further, the survey was evenly distributed in terms of gender and most participants were employed full time. Furthermore, the majority of the participants were between the ages of 25-54. Another characteristic was their overall high interest in exercise and dieting, which was the topic of our conditions.

Conditions

The manipulated conditions in the study design was the amount of Firm Information Overload and the degree of customer participation. The scenarios for the conditions were constructed by gathering information about dieting and exercising through several sources and writing up the findings as a text for a fictive website. A summary of the scenarios is presented in figure 5.

<p>High CP + High info</p> <p>Diet and exercise plan</p> <p>4447 words</p> <p>Number of participants 46</p>	<p>Low CP + High info</p> <p>Exercise plan</p> <p>1843 words</p> <p>Number of participants 36</p>
<p>High CP + Low info</p> <p>Diet and exercise plan</p> <p>422 words</p> <p>Number of participants 60</p>	<p>Low CP + Low info</p> <p>Exercise plan</p> <p>256 words</p> <p>Number of participants 37</p>

Figure 5: Overview of conditions

Info (high / low): Firm Information Overload was manipulated in terms of the amount of information. Hence, the texts contained the same information breadth. Meaning, topics were consistent, but information load was manipulated. Information load can be found in terms of number of words in figure 5. This was to ensure the survey's reliability.

CP (High / low): The degree of customer participation was manipulated in terms of how extensive the participation was. Hence, low degree included only an exercise program. The high degree included both exercise program and a diet plan. Following a dietary plan requires extensive involvement from the customers' side, due to how much daily habits are affected by it. Thus, we find the manipulation of customer participation degree to be satisfactory.

Respondents were randomized when assigned to the different conditions. When participants respond to surveys, several types of response errors can occur. One common error is related to the effect of the question order. Previous research has shown that the order of questions asked is important, but there are ambiguous interpretations regarding what direction the effects move toward. Several studies argued for the primacy effect, where respondents are biased to answer the first option available (McFarland, 1981). On the contrary, many studies have also

found proof of the recency effect, where participants tend to respond to the last choice presented to them. In addition, some studies have found no order effects at all (Krosnick, 1999). A method to control for this is randomization, where the order in which the questions are shown to the participant will vary (McFarland, 1981). To make sure the measurements only included effects of Firm Information Overload on customer participation, not the effect of priming from other questions, the conditions was orderly randomized. The next section provides insight in which analysis we are going to conduct.

Analysis

Three ANCOVA analysis will be conducted to test our hypotheses. ANCOVA is chosen because it is used to test for main and interaction effects, which we ought to do. We will use the conditions in figure 5, and Life Infostress as categorical variables. Motivation, self-efficacy and likelihood of participation will be utilized as the continuous dependent variables. The control variable interest/knowledge will be used as the covariate (Malhotra, 2010). The next section provides more information about the measures.

3.3 Measures

The measures are presented in the same order as it was to the respondents. The first and second are measured before the respondents were exposed to the conditions. Naturally, the three outcome variables were measured after. The full survey can be found in appendix 1.

Life Infostress

Life Infostress is measured using the Information Overload Scale created by Williamson and Eaker (2012). The respondents reported their answers on a 7-point Likert scale between “Strongly disagree” and “Strongly agree”. The Information Overload Scale is a fifteen-item scale. Six items were used in this study.

Information Overload Scale was selected because it is not context specific. Moreover, the questions are linked to everyday life and living in an information-

rich society. Furthermore, it was developed using psychometric scale development procedures and measures information overload on a subjective dimension. Therefore, it was found to be an appropriate scale to use in this study. The full scale and which items were used can be found in appendix 2.

Control Variable

When faced with infostress, resources such as knowledge, experience, and wisdom are important (Ledzińska & Postek, 2017). Hence, interest and self-perceived knowledge was controlled for. Interest/knowledge is measured with four items. The items capture the respondent's subjective perceptions of themselves regarding; the respondents self-reported knowledge about (1) dieting and (2) exercise. (3) Whether the respondent try to maintain a healthy diet, and (4) regularly engage in physical activity. The questions were reported on a 7-point Likert scale between "Strongly disagree" and "Strongly agree".

Likelihood of Participation

Likelihood of participation aims to measure the respondents' intentions to participate after being exposed to the conditions. Likelihood of participation was measured by asking the respondents two questions. The questions were reported on a 7-point Likert scale between "Strongly disagree" and "Strongly agree".

Self-Efficacy

Self-efficacy is measured using the General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995). The respondents reported their answers on a 7-point Likert scale between "Strongly disagree" and "Strongly agree". The General Self-Efficacy Scale is a ten-item scale. Schwarzer and Jerusalem (1995) points out the generalizability of the scale as a weakness and recommend users to add extra items to cover the particular content. Three items were used, and one extra item was added (Added: *I have confidence in my ability to participate effectively*). In addition, all questions were asked in the context of the scenarios.

The General Self-Efficacy Scale was selected due to its generalizability and adaptability. Moreover, it is a self-report measure of self-efficacy, which fits the study design. Furthermore, the purpose of the General Self-Efficacy Scale is to assess a general sense of perceived self-efficacy, with the aim to predict coping with daily hassles (Schwarzer & Jerusalem, 1995). Which fits the purpose of this study. Because of these aspects, the scale was found to be an appropriate scale to use in this study. The full scale and which items were used can be found in appendix 3.

Motivation

Motivation is measured using the Research Motivation Scale (RMS) created by Deemer et al. (2010). The respondents reported their answers on a 7-point Likert scale between “Strongly disagree” and “Strongly agree”. RMS is a twenty-item scale which measures motivation on three dimensions (1) Intrinsic Reward, (2) Failure Avoidance and (3) Extrinsic Reward. Two items from RMS scale was adapted and used in this study. One extra item was added.

Research Motivation Scale (RMS) was selected due to its wide scope and the fact that it is a self-report instrument. However, RMS is created to understand psychological factors and motivation of STEM students (Deemer et al., 2010). Thus, the scale is not a natural match to this study. In spite of this, it was found to be the most appropriate scale to measure motivation. This was because of its adaptability. The full scale and which items were used in this study can be found in appendix 4.

3.4 Ethics

In every research project, ethical considerations must be taken. In this project, some aspects were prominent. The first, was to show the respondents respect. This research project measures and aims at answering questions which touches upon sensitive aspects, such as self-reported Life Infostress, motivation, self-efficacy

and the topic of the conditions; diet and exercise. These are personal questions. Hence, transparency was important to communicate to the respondent beforehand. Respondents was made aware that the study was about online information and health. Given the first aspect, the second, is to protect privacy concerns. This was communicated to the respondent in advance. Every promise regarding confidentiality and privacy has been kept. Third, is regarding the construct which has been researched: Information overload. Information overload is a construct with a lot of negativity connected to it: stress, anxiety, etc. These are not reactions our study intend to evoke in the respondent. Hence, before the respondent was presented to the condition, they were not led to believe that they were supposed to read all the information provided. Instead, the respondent was told to spend a maximum of three minutes to look at the information. We considered these aspects to be quite unique to our thesis. Therefore, we chose to focus on these.

3.5 Validity & Reliability

This section discusses the validity and reliability of this study. The section includes (1) a factor analysis of variables, (2) transforming Life Infostress into a categorical variable, (3) data cleansing, (4) assumptions and (5) reliability test.

After conducting the study, we will be utilizing the analyzing software SPSS to inspect our main findings. Before conducting our main analysis in SPSS, our dependent and independent variables was reduced by conducting a factor analysis, converting several variables into one for further usage in the ANCOVAs. Factor analysis is used for the purpose of data reduction in terms of detecting the variables that are correlated and reducing them to a manageable level (Malhotra, 2010). The reduction of variables will be further explained in the next section.

Factor Analysis

The Bartlett's test was significant with $p < .05$ in all cases and proved that our variables were significantly correlated. The Eigenvalue must be above 1 in order to extract factors, and only one was extracted in each variable case. The self-

efficacy scale with 4 items explained 72% of the variance and had a factor loading of .739 to -.889. The Life Infostress variable had 6 items that explained 67% of the variance with factor loadings from .646 to .912. The two items representing motivation explained 88% of the variance with a factor loading of .940. The variable interest/knowledge explained 59% of the variance with factor loadings from .709 to .822. Lastly, likelihood of participation was comprised of 2 items and explained 92% of the variance with a factor loading of .958. This indicates a satisfactory prediction for the model.

Transforming Life Infostress

The Life Infostress variable was transformed from a scale variable into a categorical variable. This was done in order to test the effect of Life Infostress on the dependent variables. To transform the variable, number of levels and cutoff points had to be decided. To identify number of levels, the standardized scale variable was compared to a computed variable, on the same 7-point Likert scale the respondents had reported Life Infostress on. After studying histograms of both variables, a bimodal distribution was discovered. This indicates that two groups can be identified. Thus, the categorical version of Life Infostress will have two levels (High vs. Low).

It is important to ensure meaningful cutoff points for the categorical variable, to represent clear levels of Life Infostress. The cutoff point was decided to be 4.6 using the computed variable, (Low < 4.60), (High > 4.61). The reasoning behind assigning *Neither agree nor disagree* respondents (M = 3.5), (M =4.5) in the low category, is because we find it fair to say that an indifferent attitude regarding a state of being Life Infostressed, is closer to non-existing (Low).

Data Cleansing

Data cleansing was required and completed before conducting the ANCOVAs. There were no missing values according to the frequency table and all variables were checked to be in the right measurement scale and therefore valid. Outliers were assessed by exploring box plots and there were several outliers detected in

the dataset. These had extreme values, meaning respondents answered either extremely positive or extremely negative on all questions in the survey. Moreover, we controlled for duration, and it could be observed that the outliers represented respondents with the lowest duration for completing the survey (between 30-120 seconds). Furthermore, the survey was estimated to at least 6 minutes, and it can therefore be argued that respondents with duration under two minutes did not read and answer the questions carefully. These respondents were removed in order to obtain a higher reliability. In total, 202 respondents were reduced to 179. More outliers were detected in terms of the dependent variables to be used in the ANCOVA and will be explained together with the assumptions regarding these.

Assumptions

First, the assumption of outliers was explored using boxplots, and four outliers were found (respondents: 32, 169, 135, 175) for motivation. The outliers were not a result of measurement error or data entry error. Moreover, removing the outliers did not affect the results sufficiently. Therefore, the outliers were kept in the analysis. This assumption had similar outcome for Life Infostress. Outliers were also explored for self-efficacy and six outliers were detected (respondents: 32, 169, 135, 172, 175, 176). Removing the outliers changed the p-values of Shapiro-Wilk's normality test in two conditions to satisfactory levels. Hence, the outliers were removed. In addition, the outliers did not affect the actual outcome of the ANCOVA.

Second, p-values of Shapiro-Wilk's normality test for each cell was tested. The p-values are $p < .05$ in all four of the conditions. Hence, the values are not normally distributed, and the assumption of normality is not met. However, when inspecting the histograms, a right skewed bell curve tendency can be observed. This can be observed for all three variables. Moreover, ANCOVA is a robust analysis regarding this assumption. Hence, the analysis is used.

Third, Levene's test for homogeneity of variance was conducted, resulting in $p > .05$. This test is not supposed to be significant. Hence, the assumption is met. This

is the case for both motivation, self-efficacy and Life Infostress. Based on this, we believe these variables can be properly used in an ANCOVA analysis. Before presenting the ANCOVA results, a reliability test was conducted to inspect if the survey results could be trusted.

Reliability Test

Cronbach's alpha was conducted to measure the reliability of the variables Life Infostress, self-efficacy, motivation and Likelihood of participation. Reliability means that the random errors which can occur should be as few as possible for the study to be viewed as reliable. Random errors that can influence the reliability in the selection is mood, limited time and other physical needs. In addition, personal factors can affect the reliability. In order to acquire an acceptable reliability, the rule of thumb is that the alpha value should be at least .7 (Gripsrud, Olsson & Silkoset, 2010). The Cronbach's alpha for the variables is .829, which is good. This indicates that our study is satisfactory in terms of reliability as the alpha value is high. This indicates that if the survey was distributed once more, the likelihood of similar results would be big. Accordingly, internal consistency which shows stability over time is reached, and the study is reliable (Gripsrud, Olsson & Silkoset, 2010). In the next section, results from the ANCOVA analysis' will be presented. The first uses motivation as DV, followed by self-efficacy and likelihood of participation.

4.0 Results

4.1 Motivation

A two-way ANCOVA was conducted to determine the effects of Firm Information Overload and Customer Participation on Motivation controlling for interest/knowledge in dieting and exercising.

Dependent Variable: Motivation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	19.823 ^a	4	13.384	5.452	.000
Intercept	.007	1	.021	.007	.931
Interest/Knowledge	14.354	1	49.477	15.790	.000
Info	.658	1	.079	.723	.396
CP	.022	1	.453	.025	.875
Info*CP	5.989	1	5.989	6.589	.011
Error	158.177	174	.909		
Total	178.000	179			
Corrected Total	178.000	178			

a. R Squared = .111 (Adjusted R Squared = .091)

Table 1: Test of between-subjects effects (DV: Motivation; COV: Interest/Knowledge; IV: condition CP and condition Info)

The main effect for Firm Information Overload was not significant, $F(1, 174) = 0.723$, $p = .396$. Neither was there a significant main effect for customer participation, $F(1, 174) = 0.025$, $p = .875$. However, there is a significant interaction effect between Firm Information Overload and Customer participation on motivation, $F(1, 174) = 6.589$, $p = .011$. Hence, Motivation is affected by the interaction of Firm Information Overload and Customer participation. Thus, we did find support for H1 stating that when Customer participation low, a higher degree of Firm Information Overload, will lead to a decrease in motivation. The effect can be observed in the profile plot below.

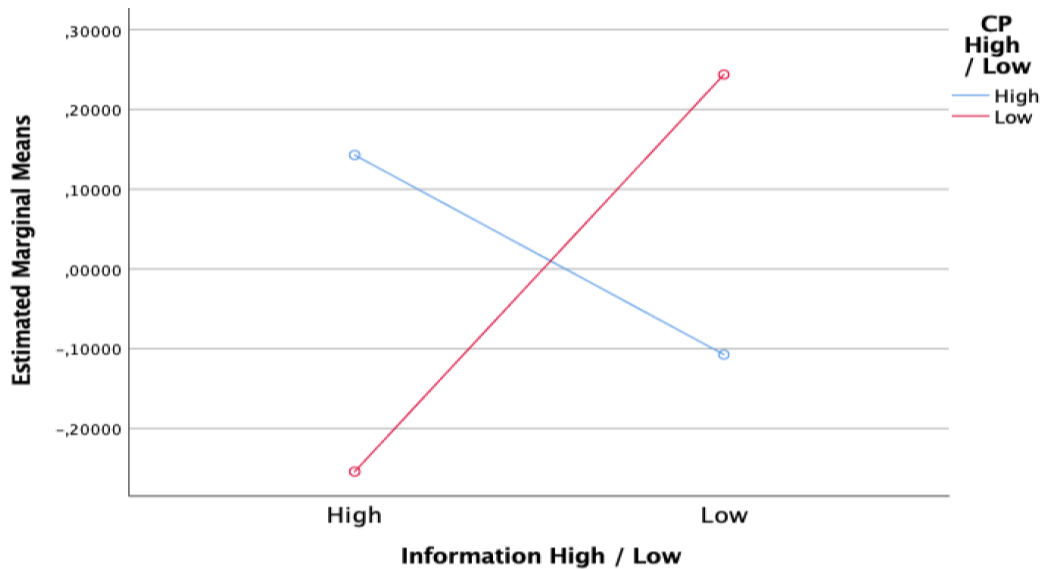


Figure 6: Profile plot from SPSS output H1

4.2 Self-Efficacy

A two-way ANCOVA was conducted to determine the effects of Customer participation and Firm Information Overload on Self-efficacy controlling for interest/knowledge in dieting and exercising.

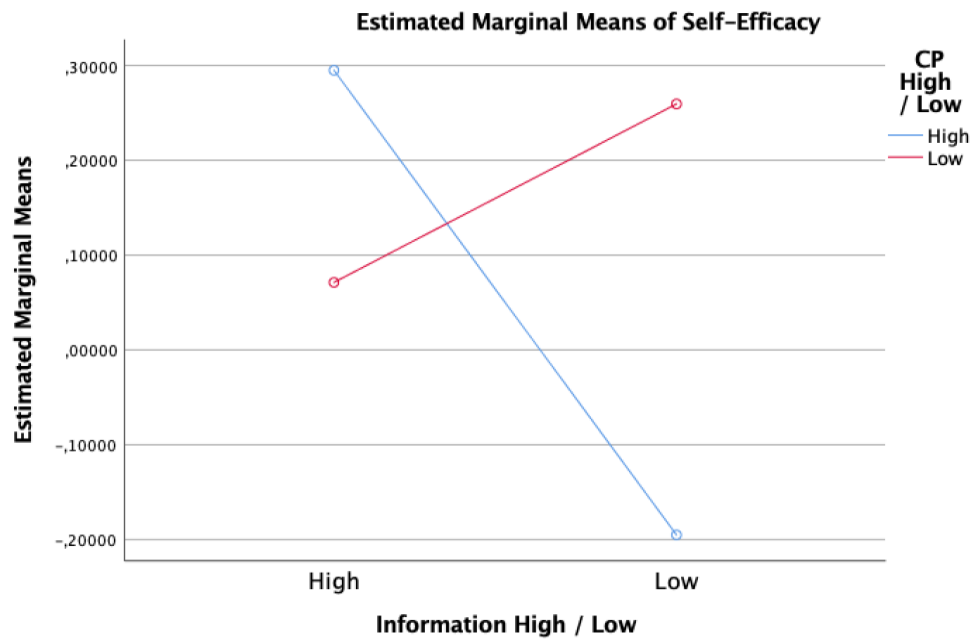
Dependent Variable: Self-Efficacy

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	34.055 ^a	4	8.514	13.357	.000
Intercept	1.064	1	1.064	1.669	.198
Interest/Knowledge	28.372	1	28.372	44.512	.000
Info	.987	1	.987	1.549	.215
CP	.461	1	.461	.724	.396
Info*CP	4.168	1	4.168	6.538	.011
Error	107.722	169	.637		
Total	178.000	174			
Corrected Total	178.000	173			

a. R Squared = .240 (Adjusted R Squared = .222)

Table 2: Test of between-subjects effects (DV: Self-Efficacy; COV: Interest/Knowledge; IV: condition CP and condition Info)

The main effect for Firm Information Overload was not significant, $F(1, 169) = 1.549, p = .215$. The main effect for Customer participation was not significant either, $F(1, 169) = 0.724, p = .396$. However, there is a significant interaction effect between Firm Information Overload and Customer participation on Self-efficacy, $F(1, 169) = 6.538, p = .011$. Hence, Self-efficacy is affected by the interaction of Firm Information Overload and Customer participation. Thus, we did find support for H2 stating that when Customer participation is low, a higher (lower) degree of Firm Information Overload, will lead to a decrease (increase) in self-efficacy, and the opposite effect when Customer participation is high. The interaction effect can be observed in the profile plot below.



4.3

Figure 7: Profile plot from SPSS output H2

Likelihood of Participation

A two-way ANCOVA was conducted to determine the effects of Firm information overload and Life infostress on Likelihood of participation controlling for interest/knowledge in dieting and exercising.

Dependent Variable: Likelihood of Participation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected model	17.449 ^a	4	4.362	4.728	.001
Intercept	.414	1	.414	.448	.504
Interest/Knowledge	9.195	1	9.195	15.790	.002
Info	1.328	1	1.328	.723	.232
Life_Infostress	5.141	1	5.141	.025	.019
Info*Life_Infostress	.130	1	.130	.141	.708
Error	160.551	174	.923		
Total	178.000	179			
Corrected Total	178.000	178			

a. R Squared = .098 (Adjusted R Squared = .077)

Table 3: Test of between-subjects effects (DV: Likelihood of Participation; COV: Interest/Knowledge; IV: condition Life Infostress and condition Info)

The main effect for Firm Information Overload was not significant, $F(1, 174) = 0.723, p = .232$. The main effect for Life Infostress however, is significant, $F(1, 174) = 0.025, p = .019$. This indicates that more Life Infostress increases likelihood of participation. The interaction effect between Firm Information Overload and Life Infostress is not significant, $F(1, 174) = 0.141, p = .708$. Hence, we did not find support for H3 stating that high level of Life Infostress, will lead to lower likelihood of participation. In fact, the effect was opposite. The effect can be observed in the profile plot below.

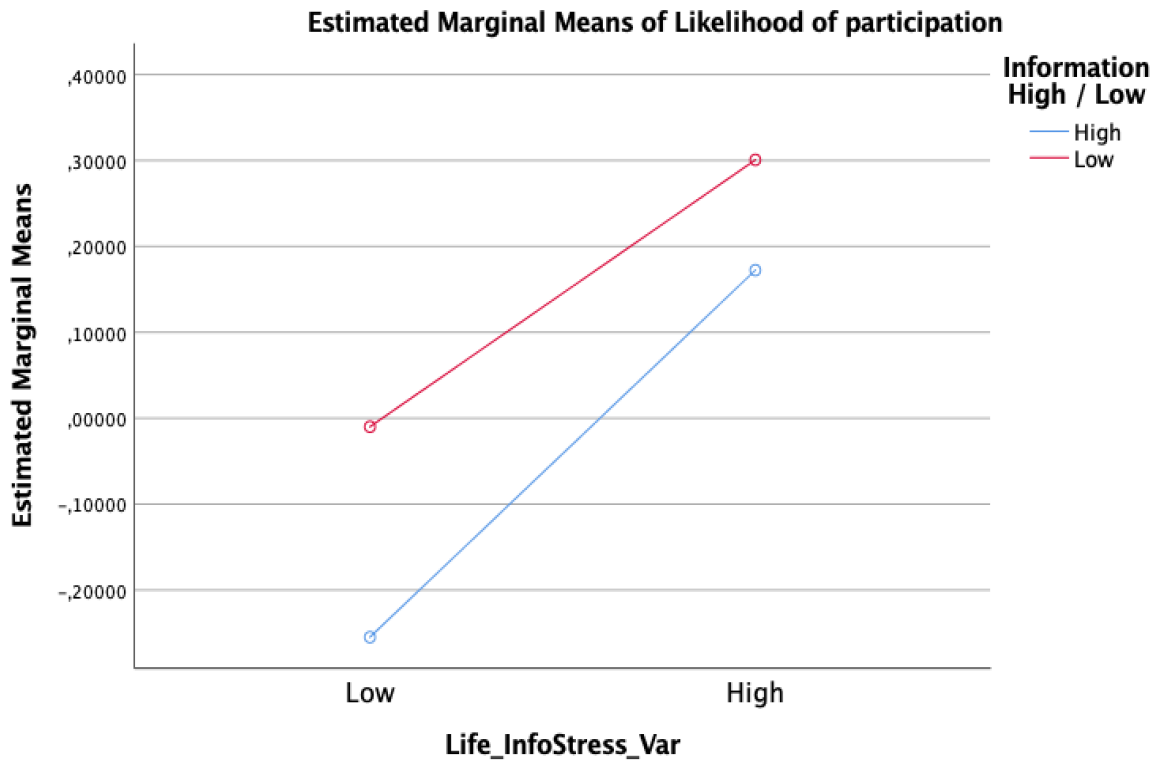


Figure 8: Profile plot from SPSS output H3

5.0 General Discussion

As outlined in the introduction, the aim of this research is to identify *How information overload affects customer participation?* This thesis has explored this question by conducting three ANCOVA analysis' from an online experiment, using three different outcome variables: (1) Motivation, (2) Self-efficacy and (3) Likelihood of Participation. Additionally, the study has defined and applied two different types of information overload: Firm Information Overload and Life Infostress. The study has found evidence to support two hypotheses. The third provided evidence for the opposing effect, which will be discussed. The general discussion includes overall findings of the three hypotheses, theoretical and managerial implications, and limitations & future research.

5.1 Overall Findings

This thesis has theoretically connected the construct of information overload to customer participation using three different outcome variables, and two defined types of information overload. First, is Motivation and Firm Information Overload. Second, is Self-efficacy and Firm Information Overload. Third, is Likelihood of Participation and Life Infostress. Finally, a short conclusion to the research question are presented.

The first hypothesis was:

H1: When Customer Participation is low, a higher (lower) degree of Firm Information Overload, will lead to a decrease (increase) in motivation.

The results provided evidence for an interaction effect. The interaction effect shows that when participation is *less comprehensive* and the firm provides an extended amount of information, the customer is less motivated. Simultaneously, if less information is provided, customers are motivated. These findings make sense, because when a customer is set out to do an uncomplicated task, an extended amount of information might seem unnecessary and meaningless. Hence, the customer experience information overload in this situation. Whilst when little

information is provided, the information is more on point and valuable. Thus, it is more effective and therefore motivates the customer.

On the other hand, when participation is *more comprehensive* the effect is opposite. When the firm provides an extended amount of information, customers are motivated. Simultaneously, if less information is provided, customers are less motivated. These findings appear to match our hypothesis, when a customer is set out to do a complicated task, sufficient information is necessary. Whilst when little information is provided, it is not enough for the customer to know what is expected of him or her to participate properly. Thereof, the customer's motivation is hampered. These findings resonate well with the result of the second hypothesis.

The second hypothesis was:

H2: When customer participation is low, a higher (lower) degree of Firm Information Overload, will lead to a decrease (increase) in self-efficacy.

The results provided evidence for an interaction effect. The interaction effect shows that when participation is *more comprehensive* and the firm provides an extended amount of information, the customer has more self-efficacy. Simultaneously, if less information is provided, customers have less self-efficacy. On the other hand, when participation is *less comprehensive*, the effect is opposite. These findings make sense and overlap logically with the findings of the first hypothesis.

The third hypothesis was:

H3: High (low) level of Life Infostress, will lead to lower (higher) likelihood of participation

The results provided main effect for Life Infostress. This indicates that customers who are Life Infostressed are more likely to participate regardless of the amount of information. This finding contradicts our hypothesis. Looking at the initial

arguments from the hypothesis, some possible explanations for the contradiction is presented.

The first argument was that, because Life Infostress is a result of information overload, the information presented to the customer would amplify the information overload. One of the reasons the opposite effect has been found can be explained by the concept of Infobesity. The customer who has a high level of Life Infostress is well knowing that unlimited sources of information are available. Thus, this Infobesity is amplifying information overload. Hence, the information provided from the firm alone can reduce the information noise.

The second argument was that, rationalization as a coping mechanism lead the customer to either procrastinate or rationalize its own needs. The Life Infostressed customer is likely to rationalize its need. However, this is more likely to happen because of Infobesity. Thus, the customer procrastinates and thereof, has unfulfilled needs. Hence, because of these unfulfilled needs, the Life Infostressed customer is more likely to participate when faced with “information noise reduction”.

The third argument was that, because the Life Infostressed customer is likely to lack need for cognition, external motivation is needed. However, because of the findings of H1, the customer receives external motivation due to noise reduction. Moreover, customers whom does not experience Life Infostress are less likely to rationalize and procrastinate. Their needs are more likely to be met. Thus, they are less likely to participate according to our results.

To summarize, when customer participation is expected to be somewhat difficult and complex, Firm Information Overload counteracts information overload. Instead of “acting” as information overload, it acts as a noise reduction effect. On the other hand, when customer participation is not expected to be difficult and complex, Firm Information Overload *is* information overload. Thus, when

participation is simple, information should be limited. When participation is comprehensive, information should be extensive.

Concluding the Research Question

After discussing the results in the overall findings section, answer to the research question is provided.

(1) Identify: *How information overload affects customer participation?*

Information overload was divided into two different sub-constructs: Firm Information Overload & Life Infostress.

Firm Information Overload:

1. When the customer expects the participation to be difficult and complicated, Firm Information Overload is positive. In this case, the information works as a noise reduction effect and motivation and self-efficacy to participate is improved.
2. When the customer expects the participation to be simple, Firm Information Overload is negative. In this case, the information *is* information overload, and motivation and self-efficacy to participate is hampered.

Life Infostress:

Life Infostressed customers are found to be more likely to participate. However, this effect is expected to be explained by the “*noise reduction effect*”. This will be elaborated in theoretical implications.

5.2 Theoretical Implications

The present study has identified evidence claiming that information overload does effect customer participation and is a relevant construct to theoretically link to Service Marketing. Throughout this process, we have identified several theoretical implications. First, the degree of complexity required of the participation determines whether Firm Information Overload is positive or negative. Second, based on the findings of all three hypotheses, a new theoretical term is coined. Namely the *Information Noise Reduction Effect*.

The results indicate that Firm Information Overload is positive when customer participation is more comprehensive. In these cases, extended amounts of information increase both customer's motivation and self-efficacy. Drawing from the information overload and service marketing literature, a few constructs seems relevant to discuss.

First, there is Infobesity. This is relevant because unlimited amounts of sources are available at all times, by the click of a button or quick voice search online. The information environment itself may cause information overload, and act like noise for the customer. Thus, Firm Information Overload works as *noise reduction*, when a substantial amount of information is needed.

Second, are the customer's expectations. This because the customer's perspective and satisfaction are strongly connected to its prior expectations. This because motivation and self-efficacy are both affected by the amount of information provided and complexity of the participation. We find it possible that the customer initially expected the focal task to be difficult and complicated. But because of the noise reduction, the task might have been perceived as less difficult and complicated than expected. Hence, the gap between expectations and experience after seeing the extended information was closed. This lead the customer to become more motivated and have more faith in their own abilities.

On the other hand, when little information is provided for extensive participation, the noise reduction is not present. Consequently, the gap between expectations and experience in terms of difficulty and complexity is not closed. In this case, the customer is not motivated and have less faith in their own abilities.

The results indicate that Firm Information Overload is negative when customer participation is less comprehensive. In these cases, extended amounts of information decrease both customer's motivation and self-efficacy. Drawing on

the literature of customer expectations, this is the case for more simple participation tasks. It does make sense that Firm Information Overload leads the customer to believe that the task is more difficult and complicated than initially expected. Hence, a gap is created due to Firm Information Overload. Thus, in these situations, Firm Information Overload results in information overload.

Information Noise Reduction Effect

The Information Noise Reduction Effect is: “*When a stimulus reduces information overload for an individual in an infobese environment, and an experience of increase in motivation and self-efficacy occur.*”

What we can tell from this study about the **stimuli** is that, the amount of information did not have an effect on the Life Infostressed participant. However, all stimuli presented did cover a substantial part of the focal subject, as compressing, aggregating, categorizing and structure are countermeasures against information overload (Eppler & Mengis, 2004). We conclude that the stimuli ought to provide information breadth.

What we can tell from this study about the **individual** is that the Life Infostressed individual is more likely to be affected by the noise reduction effect.

What we can tell from this study about the **infobese environment** is that the effect exist under the following premises: When the information about focal subject *otherwise* are (1) ambiguous and (2) complex, and the potential sources are (3) unlimited, (4) have an overabundance of irrelevant information, and (5) various channels distribute the same content. We argue that these premises apply to the subject of exercise and diet. Moreover, these premises can be a source of Information Overload (Eppler & Mengis, 2004). Hence, the study found that the effect exists under these premises.

Our results suggested that the *Information Noise Reduction Effect* exist under these conditions, and that it positively affect customers motivation and self-efficacy

regarding participation. Further research should look into if our results are applicable to other conditions and services.

5.3 Managerial Implications

Through the study we have shown that Firm Information Overload and Life Infostress affects customer participation. The recognition that encouraging customers to participate with firms is the next frontier in competitive effectiveness (Bendapudi & Leone, 2003) and eventually a method to gain marketplace advantages over rivals. Therefore, managers should acknowledge the importance of this, and from a strategic point of view, strive to encourage participation. This section summarizes three takeaways from this study managers can apply in practice.

First, it is important to consider the extensiveness of the participation when managers are looking to encourage customers. If participation is complex, the firm should focus on boosting the consumers self-efficacy by giving more information. If the participation is simple, the firm must be careful not to overload the customer, as this will hamper their motivation. Self-efficacy and motivation are important determinants of action. If the customer expects the participation to be difficult, provide enough information to encourage. If the customer expects the participation to be simple, keep it simple. Hence, managers should consider this when advertising and providing information about the firm and its services.

Second, there are a few questions practitioners ought to ask themselves when (1) developing new and complementary products and services, (2) investing in new technologies, and (3) creating new marketing material.

- How can infobesity be a problem for our customers?
- How can Information Noise Reduction benefit our customers?
- How can we create a stimulus which uses the Information Noise Reduction Effect to create value for our current and potential customers?

Because information is in such overabundance, it is expected to create value for both customer and firm to take these questions into consideration. In addition, it may also stimulate innovation, and identify new opportunities to satisfy customers, which again leads to higher profitability.

Third, relates to targeting. This study has revealed that Life Infostressed customers especially benefits the Information Noise Reduction Effect. Moreover, Williamson & Eaker (2012) found that Information Overload Scale is significantly correlated with four aspects: (1) Being female, (2) age, (3) education level, and (4) life satisfaction (negatively). Thus, companies who target customers who are more likely to be Life Infostressed, ought to take these findings of this study into consideration.

5.4 Limitations & Future Research

Three possible limitations of the study will be presented in this section and recommendations for future research. The first limitation is that the main study was conducted through an online survey, Amazon Mechanical Turk (MTurk). By using this platform, it is difficult to control for environmental factors which can be interrupting. Therefore, we cannot exclude possible laboratory setting as a confound. Moreover, the recruitment of participants through MTurk contains little knowledgeable research and the validity by using this distributing channel is not fully known. However, Paolacci et al. (2011) found that researchers should consider MTurk as a sustainable alternative for collecting data using experiments. However, MTurk samples are argued to be less representative than recruitment through internet-based panels according to Belinsky et al. (2012). This is a possible limitation to our study. The second limitation is the lack of attention checks in the survey. Attention checks would make it easier to detect who actually paid attention to the questions asked and the content of the conditions. If participants responded in such a way that indicated they did not pay attention, these participants could more easily be removed. However, by examining the

respondent's duration and patterns indicating that the participant was not paying attention, many respondents had to be removed. Leading us over to the final limitation, unequal distribution in the conditions. 202 respondents were recruited in total, later reduced to 179 after data cleansing. Because the respondents were randomized to the four conditions, they were not equally distributed. The conditions varied from 36 at the least, to 60 respondents at the most. This is a limitation of this study.

Future research should investigate the Information Noise Reduction Effect, and identify more properties connected to it. We believe more knowledge revolving the perspective of reducing noise for customers can be beneficial for innovation and thereof, value creation for firms and customers. In addition, this study has provided evidence that Life Infostressed customers can reap benefits from the noise reduction effect. Thus, identifying other ways Life Infostress can affect customers in services could be relevant. An example could be to connect the concept of Life Infostress to consumer rage and service recovery. Considering that we know temperament is an important resource when an individual is coping with infostress, connecting these constructs are recommended.

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5.6 Appendices

Appendix 1:

Master thesis

Q2

Thank you for your interest in taking our master thesis survey.

This study aims to understand how information affects customer participation. You will be asked several questions and shown a hypothetical website regarding health.

Your contribution is highly appreciated.

All data from participants will be treated with utmost confidentiality and all participants will remain anonymous. The data will be stored in Qualtrics-secure database, which is only accessible to the researchers of this study. We respect your trust and protect your privacy and will therefore never share or sell this data to any third parties.

Participation in this study is voluntary and you have the right to withdraw at any time.

We encourage your honest opinion during this survey.

Do you consent in taking this survey?

I consent (1)

I do not consent (2)

Which social media do you use?

- Facebook
- Instagram
- Snapchat
- Twitter
- LinkedIn
- YouTube
- Pinterest
- Tumblr
- Reddit
- WhatsApp



Now, we are interested in your personal opinion of 6 statements

Answer the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
1. I regularly feel overwhelmed by too much information these days	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I am confronted by an overflow of email, phone and text messages each day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I am stressed out by the sheer volume of information I have to manage on a daily basis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. It seems like the volume of information available is increasing exponentially in a relatively short period of time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I sometimes feel numb and incapable of action because of all the information I have to process on a daily basis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I regularly feel pressed for time because of all the information I have to deal with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Answer the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I try to maintain a healthy diet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I regularly engage in physical activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have knowledge about exercising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have knowledge about dieting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Answer the following statement

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am interested in customizing my own exercise and diet program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

→

Start of Block: Block 7

Q17 You will now be introduced to a hypothetical company's web page. Please look at the information provided.

After using **maximum** 3 minutes to look at the web page, you will answer 9 questions about it.
The company provides customized health programs.

Start of Block: Block 8

Q16 Condition

Q18 Condition

Q19 Condition

Q20 Condition

End of Block: Block 8

Based on the information you received from the company							
	Extremely unlikely	Moderately unlikely	Slightly unlikely	Neither likely nor unlikely	Slightly likely	Moderately likely	Extremely likely
1. How likely are you to sign up to receive your customized program?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. How likely are you to complete the customized program?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

After looking at the information provided on the company's web page							
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
3. The customized program will provide me with feelings of satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I want to pursue a less difficult program because I am concerned I may fail	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I am motivated to complete the customized program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In terms of using the customized program							
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
6. I have confidence in my ability to participate effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Thanks to my resourcefulness, I can handle unforeseen situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I can remain calm when facing difficulties because I can rely on my coping abilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I can handle whatever comes my way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Age

- Under 18
- 18 - 24
- 25 - 34
- 35 - 44
- 45 - 54
- 55 - 64
- 65 - 74
- 75 - 84
- 85 or older

Gender

- Male
- Female

Education

- Less than high school
- High school graduate
- Some college
- 2 year degree
- 4 year degree
- Professional degree
- Doctorate

Employment status

- Employed full time
- Employed part time
- Unemployed looking for work
- Unemployed not looking for work
- Retired
- Student
- Disabled

Appendix 2: The Information Overload Scale (Williamson and Eaker (2012))

The Information Overload Scale:	Items used:
Q 1: I have to manage so much Fant ingen oppføringer i innholdsfortegnelsen .in my daily life that it takes me a long time to complete even simple tasks.	
Q 2: I regularly feel overwhelmed by too much information these days.	X
Q 3: It is sometimes hard for me to concentrate because of all the information I have to assimilate.	
Q 4: There is so much information available on topics of interest to me that I have trouble choosing what is important and what's not.	
Q 5: I have to process so much information that it frequently takes me too long to get things done in a timely manner.	
Q 6: I feel overwhelmed learning a new subject or topic because there is so much information.	
Q 7: I am confronted by an avalanche of Email, phone and text messages each day.	X
Q 8: When I search for information on a topic of interest to me, I usually get too much rather than too little information.	
Q 9: I have so much information to manage on a daily basis that it is hard for me to prioritize tasks.	
Q 10: I am stressed out by the sheer volume of information I have to manage on a daily basis.	X
Q 11: It seems like the volume of information available is increasing exponentially in a relatively short period of time.	X
Q 12: I feel like I can't keep up with all the new developments in my area of expertise.	
Q 13: I sometimes feel numb and incapable of action because of all the information I have to process on a daily basis.	X
Q 14: I feel like my attention span is becoming shorter and shorter because of information overload.	
Q 15: I regularly feel pressed for time because of all the information I have to deal with.	X

Appendix 3: The General Self-Efficacy Scale (Schwarzer & Jerusalem, 1995)

The General Self-Efficacy Scale	Items used:
Q 1: I can always manage to solve difficult problems if I try hard enough	
Q 2: If someone opposes me, I can find the means and ways to get what I want.	
Q 3: It is easy for me to stick to my aims and accomplish my goals.	
Q 4: I am confident that I could deal efficiently with unexpected events	
Q 5: Thanks to my resourcefulness, I know how to handle unforeseen situations.	X
Q 6: I can solve most problems if I invest the necessary efforts.	
Q 7: I can remain calm when facing difficulties because I can rely on my coping abilities.	X
Q 8: When I am confronted with a problem, I can usually find several solutions.	
Q 9: If I am in trouble, I can usually think of a solution	
Q 10: I can usually handle whatever comes my way.	X

Appendix 4: Research Motivation Scale (Deemer et al.,2010)

Research Motivation Scale:	Items used:
Q 1: Conducting research provides me with feelings of satisfaction.	X
Q 2: I want to pursue less difficult research projects that I know will guarantee a successful outcome.	
Q 3: I conduct research to earn the respect of my colleagues.	
Q 4: I conduct research for the joy of it	
Q 5: When the preliminary results of my research have not met my expectations, I want to cut my losses and	
Q 6: I want to be recognized by my colleagues as a competent researcher.	
Q 7: I have a general feeling of well-being when I'm involved in research.	
Q 8: I sometimes want to avoid difficult research projects because I'm concerned that I may fail.	X
Q 9: love to learn new things through research.	
Q 10: I want to leave my mark on my field.	
Q 11: I have a need to understand scientific phenomena.	
Q 12: I want to receive awards for my scientific accomplishments.	
Q 13: I feel great pleasure when I've learned something new in my area of research.	
Q 14: I sometimes want to give up when my research is not proceeding as I would like.	
Q 15: Research in and of itself is enjoyable to me.	
Q 16: I want to focus more of my energy on other research projects when the current project I am working on is not progressing as expected.	
Q 17: I enjoy doing research for its own sake.	
Q 18: I want to avoid pursuing difficult research projects that might result in a negative outcome (e.g., lack of significant findings, not accepted for publication, etc.).	
Q 19: Time seems to fly by when I'm conducting research.	
Q 20: I want to be recognized by my colleagues for conducting sound research.	