

How does a mindset favorable for schema (in)consistency influence innovation adoption and attitude toward innovation?

The importance of resolving uncertainties



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Abstract

The objective of this study was to examine the effect of schema consistency and schema inconsistency on innovation adoption, with the influence of the personality trait: openness to experiences. Research in the field of innovation adoption is essential, as many innovations are not yet successful due to consumer resistance. An online experiment resulted in 202 valid responses. The results demonstrated that the use of schema consistent and schema inconsistent stimuli has no significant positive influence on innovation adoption. Also, people who scored high on personality trait openness had a higher intention to adopt the innovation when they first saw schema consistent stimuli. However, when people first saw schema inconsistent stimuli, their intention to adopt the innovation was lower when they scored high on openness. Moreover, there was still too much resistance to innovation. The most frequently cited reasons were usage and value & tradition. Based on the findings, it is recommended that managers focus more on the reasons against innovation adoption rather than the positive reasons to adopt an innovation. Furthermore, it is recommended that marketers should not focus on schema inconsistencies, as it harms innovation adoption. Instead, managers could focus on solving the uncertainties that innovation can create.

Keywords: Innovation Adoption, Innovation Resistance, Schema Theory, Schema Inconsistencies, Uncertainty, Schema Consistencies, Openness to Experiences.

Preface

In front of you lies the thesis ‘How does a mindset favorable for schema (in)consistency influence innovation adoption and attitude toward innovation? – the importance of resolving uncertainties.’ With this thesis, I conclude two instructive years at Radboud University. I would like to thank my supervisor, Simone Ritter, for the guidance and detailed feedback during this process. Also, I would like to thank my second examiner, Herm Joosten, for useful feedback. And last but not least, I would like to thank all the respondents of the survey, my friends and family for their support.

I hope you enjoy your reading.

Loïs van der Wielen
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1. Introduction

Imagine being at work, the canteen is closed, and one is looking forward to a hot meal. It is impossible to have a hot meal now because one only has a half-hour break. That is why one ends up eating the crackers one brought from home and then goes back to work, still desiring a hot meal. Fortunately, there are new product innovations, such as the Heatbox. This is a lunchbox that can heat food, so one can have a hot meal whenever and wherever one wants. The ideal product, but do consumers think so too?

Product innovations, such as the Heatbox, are an important element in business circles. It is the key to a company's growth (Brown, 2010). Besides, it leads to better market orientation and product advantage (Evanschitzky, Eisend, Calantone & Jiang, 2012). However, today many innovative products fail, with 41% as the average failure rate for different business sectors (Castellion & Markham, 2013). Other products, such as the dishwasher, took a long time to be accepted by the majority. This 'neglected' time can be expensive for companies due to, for example, the delayed return on investment (Garcia, Bardhi & Friedrich, 2007). Resistance is a major reason for the non-adoption of these innovations (Abbas, Nawaz, Ahmad & Ashraf, 2017; Ram & Seth, 1989; Cornescu & Adam, 2013). A significant concern in innovation resistance is that consumers are not willing to try the innovation (Kleijnen et al., 2009; Ram & Sheth, 1989; Szmigin & Foxall, 1998). Consumers have several reasons for this resistance (Kleijnen, Lee & Wetzels, 2009). One of these reasons is that innovations have both new features and new attributes that involve many inconsistencies for the consumer (Meyers-Levy & Tybout, 1989). In other words, innovations have many inconsistencies (i.e., new attributes) but also cause inconsistencies in the mind of the consumer.

Every form of information, consistent or inconsistent that enters an individual's mind, is coded into a schema. The definition which this study uses to describe a schema is: a cognitive knowledge structure of past experiences and associations of a specific interest, which is used by individuals to structure and represent incoming information (Bartlett & Bartlett, 1995; Harris, 1994). For example, an individual has a schema about a specific product category, such as lunchboxes. This schema consists of information, including 'it is a box', 'food', and 'take-away'. These are schema consistencies, as the information is already known. However, the above example about the Heatbox has specific new properties, such as 'the lunchbox can heat food by itself'. This information is schema inconsistent because it is different from expectations (Ritter & Gocłowska, 2019). Individuals have different ways to deal with schema consistencies and schema inconsistencies (Sujan & Bettman, 1989). Therefore, this study

discusses how schema consistency and schema inconsistency¹ can influence the adoption process of (radical) innovations.

Moreover, it is possible that not all individuals are equally influenced by schema (in)consistencies. In particular, an individual's personality predicts their behavior (Paunonen, 2003). Examples of behavior are resisting or adopting an innovation. This implies that innovation adoption can depend on the specific personality traits of the individual. This study focuses on the personality trait: openness to experiences, which can be defined as the extent to which people are broad-minded, such as novelty-seeking (Costa & McCrae, 2008; Homan et al., 2008). This personality trait is always present, but the extent to which it is present varies among individuals. Someone who scores high on openness to experiences has a great imagination and loves to have variation in daily life (Costa & McCrae, 2008). Whereas someone who scores low on openness to experiences, generally enjoys routines and has few (artistic) interests (John & Srivastava, 1999). Therefore, the extent to which people are open-minded can influence their innovation adoption behavior.

1.1 Research objective and research question

The objective of this study is to examine the effect of schema consistency and schema inconsistency on innovation adoption. Additionally, the question is whether schema (in)consistencies lead to innovation adoption in everyone, or just in specific individuals. This leads to the research question: *What is the effect of a schema (in)consistent mindset on innovation adoption controlled for openness to experiences?*

1.2 Research relevance

The relevance of this study is twofold. The results could be of managerial and scientific importance. Since innovation increases a company's productivity, GDP, and satisfaction among consumers (Dibrov, 2015), it is a central driver for a company's survival in the long term (Abbas et al., 2017). Especially in a dynamic market and with uncertain economic scenarios (Abbas et al., 2017). Moreover, innovation leads to better market orientation and product advantage (Evanschitzky et al., 2012). Hence, understanding whether and why consumers adopt an innovation is of major importance for companies that develop new products (Claudy, Garcia & O'Driscoll, 2015). Resistance to innovations is an essential factor in the success of an innovative product as resistance can slow down the adoption process (Ram & Sheth, 1989; Cornescu & Adam, 2013).

¹ Hereafter referred to as schema (in)consistency.

Furthermore, innovation resistance can lead to blockage of the creation of business events because it leads to contradictions within the organization (Dibrov, 2015). Consequently, innovation resistance is considered as one of the critical causes of the failure of innovations in the market (Ram & Sheth, 1989; Cornescu & Adam, 2013; Heidenreich & Kraemer, 2016). Therefore, a study into the adoption of innovations is valuable for organizations and managers as it helps to gather information to create and develop new products to achieve market success and to reduce the failure rate of new products (Cornescu & Adam, 2013).

Besides, consumer behavior to innovation has been recognized as a significant research priority in marketing science (Claudy et al., 2015). More knowledge is needed since many innovations still fail (Castellion & Markham, 2013), or these products are only accepted after a long period (Garcia et al., 2007). To the best of my knowledge, there is still limited research that examines the effect of schema consistency and schema inconsistency on innovation adoption. Therefore, this study contributes to the literature by examining the causality between these constructs.

1.3 Research outline

The remainder of this paper proceeds as follows. In the second chapter, the theoretical background of innovation adoption and schema (in)consistency is described. It gives an overview of the literature that led to the expected causality between these constructs. Also, the personality trait, openness to experiences, is defined along with an explanation of the relationships with schema (in)consistency and innovation adoption. The third chapter describes the between-subjects design of this study, including the pretest, the participants, the procedure, and research ethics. In the fourth chapter, the results of the experiment are presented, including multiple analyses. The last chapter concludes with answering the central question of this study, debates on the results, and gives suggestions for further research.

2. Theoretical background

2.1 Introduction to innovation and innovation resistance

“An innovation is an idea, practice, or product that is perceived as new by an individual” (Rogers, 2010, p. 11). Five factors characterize innovation (Roger, 2010): First, the relative advantage is about the extent to which the innovation is perceived as better than the previous product. Secondly, compatibility, which is the extent to which the innovation is perceived as being equal with the current norms, values, and needs in the daily life of the consumer. Thirdly, trial-ability, the extent to which the innovation can be tried beforehand. Fourthly is observability, which is related to the visibility of the (achievements of the) innovation. Furthermore, consumers often perceive innovation as hard to understand or apply. This complexity is the fifth characteristic of innovation, which, unlike the rest, creates more resistance towards innovation. (Rogers, 2010; Plouffe, Van den bosch & Hullan, 2001) According to Claudy, Garcia, and O’Driscoll, these five factors are the innovation adoption and innovation resistance factors (Claudy et al., 2015). In other words, an innovation can result in both ways, a success or a failure. For an innovation to be successful, it must be adopted by all relevant stakeholders, including consumers and merchants (Plouffe et al., 2001). However, at the moment, this happens insufficiently. Many innovations still fail (Castellion & Markham, 2013), or these innovations are only accepted after a long period (Garcia et al., 2007).

Innovation resistance is a major reason for the non-adoption of these innovations (Abbas et al., 2017; Ram & Seth, 1989; Cornescu & Adam, 2013). Innovation resistance is a decision based on consumer choice (Roger, 2010). Since resistance has a subjective nature, it is difficult to determine the actual level of resistance as this differs for everyone (Cornescu & Adam, 2013). However, a central concern of innovation resistance is that consumers are not willing to try the innovation (Kleijnen et al., 2009; Ram & Sheth, 1989; Szmigin & Foxall, 1998), which is harmful as trial-ability allows consumers to experience how the innovation works. It helps to evaluate the extent of the behavioral change needed when adopting the innovation (Arts, Frambach & Bijmolt, 2011; Rogers, 2010).

Innovation resistance can be further explained in three types of consumer behavior, including rejection, postponement, and opposition (Cornescu & Adam, 2013; Kleijnen et al., 2009; Ram & Sheth, 1989; Szmigin & Foxall, 1998). Rejection and postponement are types of passive innovation resistance, that is non-purchase behavior due to not seeing the relative advantage of the innovation, or due to situational factors (e.g., money, risks). Opposition is a type of active innovation resistance, and it is a negative attitude formation. Consumers think the innovation is unsuitable, which results in negative Word Of Mouth (WOM) or innovation sabotage. (Heidenreich & Handrich, 2015; Kleijnen et al., 2009; Szmigin & Foxall, 1998) Nevertheless, why do these types of resistance arise?

Consumers may have different reasons to resist an innovation (Kleijnen et al., 2009). The main drivers of resistance are usage (it does not fit in the consumers' day-to-day existence or status quo), perceived image ("a set of associations related to the innovation" (Kleijnen et al., 2009, p. 354)), economic, functional, physical and social risks (Kleijnen et al., 2009; Laukkanen, Sinkkonen, Kivijärvi & Laukkanen, 2007; Ram & Sheth, 1989), and value & tradition (Laukkanen et al., 2007; Ram & Sheth, 1989). It is relevant to know what reasons are for consumers to accept or not accept an innovation, since overcoming obstacles that create resistance to innovation requires marketing strategies other than promoting reasons for using the innovation (Claudy et al., 2015; Kleijnen et al., 2009).

A possible explanation for resisting the innovation is psychological newness (Alexander, Lynch & Wang, 2008). Consumers are less inclined to buy radical innovations (i.e., really new products) compared to incrementally innovations (i.e., modified products) because radical innovations are considered as unknown (Alexander et al., 2008). This stems from the fact that radical innovation often has both new features and new attributes that involve many inconsistencies (Chandy & Tellis, 1998; Meyers-Levy & Tybout, 1989; Sorescu, Chandy & Prabhu, 2003). The inconsistencies of the innovation force consumers to discover new activities, they cause uncertainties, and trigger changes with associated risk-considerations in order to use the innovation (Alexander et al., 2008). The question remains, what can a company do to reduce the resistance towards radical innovations?

2.2 Schema (in)consistency

Companies could apply communication or marketing instruments, such as Mental Simulation and Benefit Comparison, to decrease consumer resistance. Mental Simulation gives an imitative representation of the usage situation of the innovation. In doing so, it supports consumers to adapt to the new product (i.e., innovation) to existing usage patterns. Besides, Benefits Comparison compares the new and existing benefits of the products. These instruments need to be developed to either minimize perceived changes of the innovation or to decline satisfaction with the current status quo (Heidenreich & Kraemer, 2016). In other words, the instruments should increase the perceived relative advantage and perceived compatibility (Guiltingan, 1999; Plouffe et al., 2001). In this way, the uncertainties related to the usage and risks of the innovation are reduced (Castaño, Suján, Kacker & Suján, 2008; Heidenreich & Kraemer, 2016). When consumers perceive the innovation as more radical, these marketing instruments become even more critical because radical innovations involve a high degree of inconsistencies, which lead to uncertainties in a consumers' schema (Heidenreich & Kraemer, 2016).

A schema is a cognitive knowledge structure of past experiences, reactions, and associations related to a specific interest, which is used by individuals to code and represent incoming information (Harris, 1994). All entering information connected by a joint interest moves together to (re)build up a

schema category (Bartlett & Bartlett, 1995, p. 201). An individual has dozens of schemas, for example, a schema about sports, science, or a particular product category such as lunchboxes (Meyers-Levy & Tybout, 1989). Information in the existing schemas (i.e., schema consistencies) is evoked, and individuals are more capable of recalling it later. In other words, interpretations of information are formed by the existing schemas (Harris, 1994). However, Markus and Zajonc (1985, as cited in Harris, 1994) found that missing information can be included in the schema by default. This is a form of schema-based sense-making: one fills-in information oneself when there is too little known (Markus & Zajonc, 1985, as cited in Harris, 1994).

Besides, there are different ways in which individuals deal with newly available information (i.e., schema inconsistencies). When the incoming information is moderately inconsistent than existing schemas in mind, the information can be added in current schemas; this is called assimilation (Sujan & Bettman, 1989). For example, first, a child learned that football is a sport. Subsequently, the child discovers that hockey is also a sport. Therefore, hockey can be added to the schema 'sports'. However, if the new information has giant inconsistencies with the current schema, the accommodation process is applied; a new schema category is built in the mind of the individual (Sujan & Bettman, 1989). This happens, for example, when a student takes a course on a topic, one has never heard of before.

The ways in which individuals deal with new information arise because individuals generally prefer to give meaning to (new) things. Founder Piaget (1960, as cited in Taylor & Noseworthy, 2019) observed that things that are not logical (i.e., schema inconsistencies) produce tension. This gives people an impulse to give meaning to these inconsistencies (Piaget, 1960, as cited in Taylor & Noseworthy, 2019; Miron-Spektor, Gino & Argote, 2011). "For example, Heinz's purple ketchup violated consumers' expectations for this product category given that people have only ever known ketchup to be red, and the color red relates to schematic expectations for the primary ingredient in ketchup" (Taylor & Noseworthy, 2019, p. 77). These inconsistent and new things can be seen as a challenge. The current schemas in the mind of the individual are no longer applicable, making it essential to look for alternatives (Ritter & Gocłowska, 2019). On the other hand, these inconsistencies can also induce a more flexible mindset (Ritter & Gocłowska, 2019; Ritter et al., 2012), which is beneficial for the level of creativity (Miron-Spektor et al., 2011).

2.3 Innovation adoption

This study aims to discover the effect of these schema (in)consistencies on innovation adoption. An essential factor in the relationship between adoption and non-adoption of innovations is the consumer, given the reason that a consumer can accept or resist innovations (Cornescu & Adam, 2013). The innovation reflects a change faced by the consumer. If this change is considered as satisfactory, the

consumer will accept the change. However, if the change does not meet the requirements or if the current status quo needs to change, the consumer will resist the change. The cause of this resistance arises when consumers perceive that the risks (i.e., negative evaluations) outweigh the benefits (i.e., positive evaluations) of the change. (Carbon, Faerber, Gerger, Forster & Leder, 2013; Cornescu & Adam, 2013) Ram (1987, as cited in Laukkanen et al., 2007) argued that resistance to change is a regular consumer reaction that must be overcome before the adoption process can begin (Ram, 1987, as cited in Laukkanen et al., 2007).

“Innovation adoption is the decision to make full use of an innovation” (Roger, 2010, p. 171). It is a form of consumer behavior that can be determined by someone’s attitude and behavioral intentions. Academic models (e.g., the theory of reasoned action, and technology acceptance model) are convinced that the evaluation of innovations leads to forming a positive or negative attitude toward the product, which influences the intention to adopt or reject the product. (Claudy et al., 2015; Montano & Kasprzyk, 2015) Attitude represents the overall positive or negative evaluation of a person towards doing the behavior (i.e., innovation adoption) (Claudy et al., 2014; Westaby, 2005). For example, a positive attitude is when one gets a kick out of buying an innovative product (Bruner & Kumar, 2007). The attitude toward the innovation determines the intention to (not) adopt the innovation, which in turn is the best predictor of actual behavior (Montano & Kasprzyk, 2015). “Adoption intention refers to a consumer’s expressed desire to purchase a new product in the near future. It relates to the consumer’s state of mind before actual purchase behavior has occurred and is based on the information and attitudes the consumer has at that time” (Arts et al., 2011, p. 135). The desirability to adopt the innovation is higher when consumers perceive innovation as advantageous and compatible with current needs (Arts et al., 2011; Plouffe et al., 2001). On the other hand, a strong intention is not enough to adopt the innovation; other situational factors and uncertainties (i.e., economic, social, and physical risks) also play a determining role (Montano & Kasprzyk, 2015). These uncertainties have a negative effect on the intention to adopt an innovation (Arts et al., 2011).

Besides attitudes toward innovation, reasons for and against adoption have an essential impact on the intention to adopt (Westaby, 2005). Reasons refer to the subjective drivers that consumers use to explain their expected behavior (i.e., innovation adoption or innovation resistance). They can provide a consumer in the mindset of the future and making changes for the future by evaluating the present. (Westaby, 2005) For example, a consumer has confidence in their current product and thinks it is an excellent asset (i.e., value and tradition). However, when asked to explain the probable reason for adopting or resisting a new product within the same product category, the consumer states that one will not buy the new product because one is worried the product will not be accepted by one's friends (i.e.,

social risk). Therefore, the reason directly describes the most potent cause in an individual's explanation of innovation resistance or innovation adoption (Westaby, 2005).

2.4 Schema (in)consistency in relation to innovation

The level of (in)consistency of innovations influence the information processing of an individual as innovations can lead to a fit or a misfit with the current product schemas (Alexander et al., 2008; Meyers-Levy & Tybout, 1989; Taylor & Noseworthy, 2019). In general, people prefer consistency within their lives above giant inconsistencies (Festinger, 1962; Van Harreveld, Rutjens, Rotteveel, Nordgren & Van der Pligt, 2009). Mandler (1982, as cited in Noseworthy, Muro & Murray, 2014) stated that people like things that are in line with their expectations. However, consistencies are not unique, and therefore the response to this is often positive but moderate (Mandler, 1982, as cited in Noseworthy et al., 2014).

When there are giant inconsistencies, people have to make a choice. In this case, should I buy a new innovative product or stay with my current product? This choice is disagreeable since there are many uncertainties about the outcome (Van Harreveld et al., 2009), such as to whether the product will function as well as the current product or whether it will fit existing needs. These uncertainties about the choice will lead to higher levels of arousal (Van Harreveld et al., 2009). Higher levels of arousal increase the emotional intensity, such as anxiety about the inconsistencies, because people are unable to resolve the inconsistencies. Therefore, this decreases the preference for inconsistencies, which results in a negative evaluation of the innovation. This indicates that causing arousal for new radical innovations with many inconsistencies is not a proper plan (Noseworthy et al., 2014).

However, when an innovative product is moderately inconsistent with the existing schema, the evaluations are more favorable than either the innovation is consistent or giant inconsistent (Meyer-Levy & Tybout, 1989). This is because moderate inconsistencies can be resolved by assimilation (Meyers-Levy & Tybout, 1989). After all, it forces people to look for alternatives (Ritter & Gocłowska, 2019). Therefore, these inconsistencies can induce a more flexible mindset (Ritter & Gocłowska, 2019; Ritter et al., 2012), which is beneficial for the level of creativity (Miron-Spektor et al., 2011). For example, suppose a consumer discovers a new product that has the general characteristics of a lunchbox. However, the product is also described as "heats the food itself", a characteristic that is inconsistent with other lunchboxes. This inconsistency with the lunchboxes schema can be resolved to induce a flexible mindset, and challenge themselves to create alternatives (i.e., be creative).

The finding of moderately inconsistencies (Meyer-Levy & Tybout, 1989) has been extended by demonstrating that an individual schema-based knowledge about a particular product category plays a role in the product evaluation (Peracchio & Tybout, 1996). Individuals who have almost no prior knowledge of the product category often tend to look for the meaning of the inconsistencies (Peracchio &

Tybout, 1996). Nevertheless, when the individuals have some knowledge about the innovation, their product evaluations are not influenced by the level of (in)consistencies, but rather by the associations that are linked to the specific schema (Peracchio & Tybout, 1996). For example, there is a new kind of candy on the market. This candy is moderately inconsistent with the current schemas because it has some unique attributes (e.g., it has a different taste, smell, and shape). Someone already has specific knowledge about this product category, such as “candy is unhealthy” or thinks negatively about particular attributes, “I do not like the sugar taste.” This prior knowledge of the new product category takes over the product evaluation. Instead of paying attention to the unique attributes (i.e., inconsistencies), one already has an opinion by prior knowledge of the product category (Peracchio & Tybout, 1996).

In this paragraph, it has been explained that there are multiple ways in which consumers perceive the different types of schema (in)consistency. A mindset that focuses on consistencies is recognized as not unique (Noseworthy et al., 2014), and a mindset that focuses on gigantic inconsistencies produces tension and arousal (Van Harreveld et al., 2009; Noseworthy et al., 2014). Therefore, the expectation is that by inducing a mindset that is favorable for (moderate) schema inconsistencies, one has the most positive effect on innovation adoption (Meyer-Levy & Tybout, 1989) since this induces flexibility (Ritter & Gocłowska, 2019; Ritter et al., 2012) and creativity (Miron-Spektor et al., 2011). This lead to the first hypothesis:

H1: A schema inconsistent (vs. schema consistent & no use of schema theory) mindset has a positive effect on innovation adoption.

2.5 The moderating role of openness to experiences

Innovation resistance has a negative effect on new product evaluation, and therefore on innovation adoption (Dibrov, 2015; Heidenreich & Kraemer, 2015). However, consumers who experience more variety and new things and changes in their life will perceive less resistance and accept the innovation quicker than other consumers with a steady and unvarying life (Heidenreich & Kraemer, 2015). The rising question here is whether inducing a mindset that favorable for schema inconsistency can help all people to adopt innovations, or whether it is specifically beneficial for people who score high on the personality trait openness to experiences?

Someone’s personality can be distinguished by five factors (Costa & McCrae, 2008; John & Srivastana, 1999): Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness. This study focuses on the personality trait: Openness: the extent to which people are broad-minded, such as novelty-seeking (Costa & McCrae, 2008; Homan et al., 2008). A person who scores high on openness to experiences is, according to Costa and McCrae (2008), someone with great imagination and much

fantasy. It is someone who is open to art, nature, and music. One is sensitive and loves variation in daily life, such as discovering new activities (Costa & McCrae, 2008). Other common characteristics associate with openness are: aesthetic, achievement via independence, change, creative, curious, flexible, humorous, intelligent, original, sophisticated, and broad interest (Feist, 1998, p. 293).

As described in paragraph 2.2, inconsistencies increase the level of creativity in mind. This is due to the fact that the current schema is no longer applicable and therefore making it essential to look for alternatives (Ritter & Gocłowska, 2019). Generally, individuals who score high on openness to experiences and have been exposed to more inconsistencies in their life are more inclined to engage in creativity (Feist, 1998; Leung & Chiu, 2008; Ritter & Gocłowska, 2019). Because someone who scores high on the personality trait openness is more creative than someone who scores low on this trait, this stems from an individual intrinsic motivation (Tan, Lau, Kung & Kailsan, 2019). By opening themselves up to various perspectives, people, products and situations, individuals scoring high on openness can evaluate a wide range of thoughts, feelings, and problem-solving solutions, whose combination can lead to new and functional ideas (Feist, 1998).

Moreover, someone who scores high on openness prefers schema inconsistencies over schema consistencies (Gocłowska, Baas, Elliot & De Dreu, 2017). The higher someone scores on openness, the greater the preference for schema inconsistencies. As a result, these open-minded people consider inconsistencies as more suitable in daily life (Gocłowska et al., 2017). This is in line with McCrae (1987, as cited in Feist, 1998) association that open-minded people are more fascinated with creative and open-ended thinking (McCrae, 1987, as cited in Feist, 1998).

However, inconsistencies evoke a sense of surprise. As long as these surprises have no meaning for the individual, this can have a negative effect on consumer behavior (i.e., innovation adoption). For example, when individuals are confronted with a surprise party. In the early stages of the surprise, they do not realize what is going on. This lack of knowledge can cause negative thoughts and calls them to avoid schema inconsistencies. However, at the same time, if people are scoring high on openness to experience, these schema inconsistencies create interest. This counter process encourages people to address the meaning of these inconsistencies and embrace these inconsistencies. Therefore, interest has a positive effect on schema inconsistencies among people who score high on openness (Gocłowska et al., 2017).

Therefore, the expectation is that people who score high on openness will have a more open attitude toward innovation. After all, innovations have many inconsistencies (Chandy & Tellis, 1998; Sorescu et al., 2003). However, people who score high on personality trait openness have a greater problem-solving ability, are more open-minded, and have higher interest to give meaning (Feist, 1998; Gocłowska et al., 2017; Meyers-Levy & Tybout, 1989). It is expected that having these skills and

interests, which are associated with a high score on openness, stimulate innovation adoption. This leads to the second hypothesis. Besides, Figure 1 provides a visual representation of the hypotheses of this study.

H2: The effect of a schema inconsistent (vs. schema consistent & no use of schema theory) mindset on innovation adoption is controlled by consumers' personality trait openness to experiences. Consumers scoring high on openness benefit more from a schema inconsistent mindset than consumers low in openness.

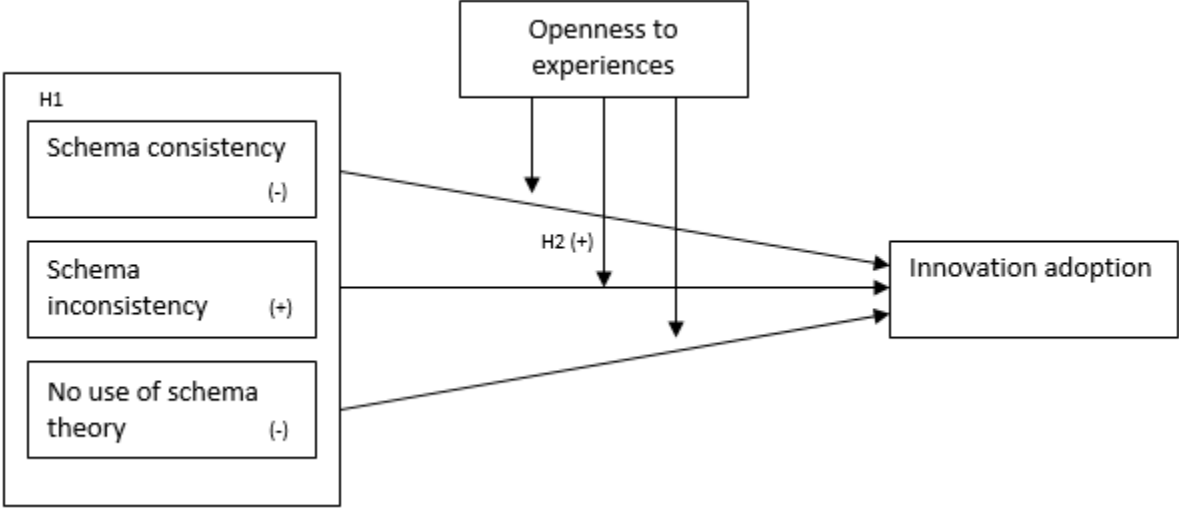


Figure 1 Conceptual framework

3. Methodology

3.1 Pretest

Procedure

Before the main study (i.e., experiment) could start, it was essential to examine which innovative products consumers perceive as radical innovation. For this purpose, five innovative products were selected that are currently not on the market. These products are listed in Appendix B. Finally, the product which was best-rated by the participants was included in the main study.

The pretest was an online survey distributed through online communication channels, such as WhatsApp and e-mail. The pretest consisted of five parts, for each part a product description and a photo were displayed. First, all participants were asked about their familiarity with the product: “To what extent are you familiar with this product?”. This was measured using a 4-point Likert scale from totally known (1) to totally unknown (4).

After the question about familiarity, the existing novelty scale of Heimonen and Kohtamäki (2019) was used to evaluate the products. This was a five-item 7-point Likert scale, which ranges from (1) totally agree, to (7) totally disagree. An example of an item is: “Product X is very unusual in comparison to the current products” (Heimonen & Kohtamäki, 2019). Table 5 in Appendix A contains the complete version of this scale.

The final questions of the pretest were about innovation adoption. Therefore these items were used to measure this construct: “I get a kick out of buying product X before most other people know it exists.” “How likely is it that in the future, you will use product X on a daily basis?” And, “I would be willing to spend time to know product X better.” Besides, the reversed item about innovation resistance was included in the pretest: “I feel resistance to product X.” These are four items of the innovation adoption scale. These are the items that are colored grey in Table 7 in Appendix A.

Results

A total of 23 consumers completed the pretest. The average age was 32,9 years (ranging from 19 to 68 years, $SD = 15,39$), and 10 were male. In order to choose the best product for the experiment, there were a few rules created: Firstly, all participants of the pretest had to be unfamiliar with the product. As can be seen in Table 1, only the Heatbox and the Portable Blender were unknown to everyone in the pretest, which is why these two products had an advantage over the other three products.

Table 1 Familiarity with the innovative products

	The Heatbox	Portable Blender	Drink Chiller	Bluesmart suitcase	Smarty Pan
Familiarity with the product:	All unknown	All unknown	One participant knew the chiller	Four participants knew the suitcase	One participant knew the pan

Secondly, the reliability of both scales (novelty and innovation adoption) had to be at least ,70, and the higher the score, the better (Field, 2018). This gave the Heatbox, the Portable Blender, and the Drink Chiller an advantage over the other two products.

Table 2 Reliability of the innovative products

	Novelty scale	Innovation Adoption scale
The Heatbox	Cronbach's Alpha: .728, 5 items	Cronbach's Alpha: .788, 3 items
Portable Blender	Cronbach's Alpha: .872, 5 items	Cronbach's Alpha: .782, 3 items
Drink Chiller	Cronbach's Alpha: .782, 5 items	Cronbach's Alpha: .618, 3 items
Bluesmart Suitcase	Cronbach's Alpha: .842, 5 items	Cronbach's Alpha: .579, 3 items
Smarty Pan	Cronbach's Alpha: .467, 5 items	Cronbach's Alpha: .658, 3 items

Thirdly, the scores for novelty and innovation adoption were assessed because the products needed to be experienced as both new and should not be wholly resisted. To be able to compare the scores of the two scales, mean variables were created. The scores ranged as follows: (1) totally agree, to (7) totally disagree. This implied that a lower mean score reflected a higher novelty or innovation adoption score². This indicates that the Smarty Pan scored best on novelty, followed by the Heatbox and the Bluesmart Suitcase. Besides, the Drink Chiller scored best on innovation adoption, followed by the Bluesmart Suitcase and the Heatbox.

Table 3 Mean scores of the innovative products

	Mean novelty	Mean Innovation adoption
The Heatbox	2,4870, <i>SD</i> = ,71051	3,9565, <i>SD</i> = 1,48155
Portable Blender	3,2174, <i>SD</i> = 1,11341	4,8551, <i>SD</i> = 1,49351
Drink Chiller	2,8087, <i>SD</i> = ,86230	3,5652, <i>SD</i> = 1,42643
Bluesmart Suitcase	2,5478, <i>SD</i> = ,98205	3,7101, <i>SD</i> = 1,37915
Smarty Pan	2,4087, <i>SD</i> = ,61045	4,3188, <i>SD</i> = 1,41948

² During the pretest I came to the conclusion that this is a difficult way of calculating, this is why in the experiment the anchors were reversed, namely (1) totally disagree, to (7) totally agree.

Fourth, there had to be resistance to the innovative product. As can be seen in table 4, the Portable Blender caused the most resistance, followed by the Smarty Pan and the Heatbox.

Table 4 resistance to the innovative products

	“I feel resistance to product X.”		
The Heatbox	4 agree	7 neutrally	12 disagree
Portable Blender	10 agree	5 neutrally	8 disagree
Drink Chiller	1 agree	4 neutrally	18 disagree
Bluesmart Suitcase	3 agree	3 neutrally	17 disagree
Smarty Pan	7 agree	0 neutrally	16 disagree

In the end, the Heatbox had the best score. This product scored average to high on every factor mentioned above. That is why the Heatbox was used in the experiment.

3.2 Participants

The population of this study consisted of Dutch consumers who were older than eighteen. The participants were recruited through online communication channels, such as Facebook, E-mail, and WhatsApp. They did not receive any incentive to take part in the study; their participation was voluntary.

The sample of this study consist of the participants who completed the online survey. After closing the survey, there was data collected from 209 participants. Seven participants were already familiar with the innovation used in this study, the Heatbox. In order to prevent that prior knowledge influences the product adoption process (Peracchio & Tybout, 1996), it was decided to eliminate these participants from the data analysis. Of the remaining 202 participants,³ 64 were male (31,7%), and 138 were female (68,3%). The average age (based on 201 participants, as one participant did not provide his/her age) was 32,2 years ranging from 18 to 78 years with a standard deviation of 14,15. Almost 70% of the participants were between 20 and 40 years old. The majority of the participants were highly educated (HBO 32,7% and WO bachelor and master 30,7%).

Since there were three conditions of schema (in)consistency, the participants were randomly assigned to one of these conditions (1= schema consistency, 2= schema inconsistency, and 3=no use of schemas). By randomizing the participants, everyone had an equal chance of ending up in a particular condition. In this way, each participant could be assigned to any one of the conditions (Sekaran & Bougie, 2016). In the final analysis, 75 participants were in the schema consistency condition (37,1%), 62

³ According to Faul, Erdfelder, Lang & Buchner, the minimum sample size was 158 participants. Therefore 202 participants was a sufficient sample size, with a corresponding power of ,80, an alpha of ,05 and a minimum effect size of ,0625 (Faul et al., 2007).

participants were in the schema inconsistency condition (30,7%), and the remaining 65 participants were in the third condition, no use of schema theory (32,2%).

3.3 Materials

This paragraph describes the material used to manipulate the independent variable and to measure the dependent variable and the moderator of this study. A detailed overview of the variables is presented in Appendix A.

Schema (in)consistency

A total of sixteen pictures (eight consistent and eight inconsistent) were used in this study to manipulate schema (in)consistency. The consistent pictures are standard images, such as a dromedary in the desert. Whereas, the inconsistent pictures are non-normal images, such as a dromedary in the snow. In Table 6 in Appendix A, the description of the pictures is given. The stimuli material for schema (in)consistency originally came from the study of Gocłowska, Baas, Crisp, and De Dreu (2014). These authors designed 32 pictures, sixteen of which are consistent, and the remain sixteen inconsistent with the current schemas of consumers. Due to copyright, the pictures are not published in this document.

Innovation adoption

The dependent variable, innovation adoption, consists of four different essential concepts. These are attitude toward innovation, intention to adopt innovation, willingness to try innovation, and resistance to innovation (Table 7). Attitude toward innovation was measured using a 3-item 7-point Likert scale, ranging from (1) strongly disagree, to (7) strongly agree. The original scale consisted of five items, of which three items were used during this study. An example of an item is: "I get a kick out of buying the Heatbox before most other people know it exists" (Bruner & Kumar, 2007). Second, the intention to adopt innovation was measured using a 3-item 7-point Likert scale, which ranges from (1) strongly disagree, to (7) strongly agree. An example of an item is: "How likely is it that in the future you will use the Heatbox on a daily basis?" (Escalas & Luce, 2004). The third concept, willingness to try innovation, was measured using a 3-item 7-point Likert scale, ranging from (1) strongly disagree, to (7) strongly agree. An example of an item is: "I would be willing to spend time to know the Heatbox better" (Chaudhuri, Aboulnasr & Ligas, 2010). To be able to measure the resistance aspect of this study, respondents received the item: "I feel resistance to the Heatbox." This is a reversed item in contrast to the above items. If one experienced resistance (i.e., when one answered strongly agree, agree, somewhat agree, neither agree nor disagree), one received two additional questions. First, one was asked to explain why one experiences some resistance. This was an open-ended question. Finally, there was a multiple-

choice question with seven answer options, including usage, perceived image, economic and financial risk, physical risk, social risk, and value & tradition. These answer options arose from the literature review. Appendix A contains Table 8, which provides a list of the answers and the literature used.

Since each of the innovation adoption scales was measured using a 7-point Likert scale, which ranges from (1) strongly disagree, to (7) strongly agree; all items were added up to one sum score. A high sum score indicates a high intention to adopt the innovation (and vice versa). All items and the follow-up questions of resistance are shown in Appendix A.

Openness to experiences

Openness to experiences was measured through The Big Five Inventory (BFI). This is a 44-item 5-point Likert scale, which ranges from (1) strongly disagree, to (5) strongly agree. Openness to experiences is one of the ‘big five’ factors. Out of these 44 items, ten items measure openness to experiences. These ten items were used to measure openness to experiences in this study. An example of an item is: “I see myself as someone who is original, comes up with new ideas” (Benet-Martínez & John, 1998; John & Srivastava, 1999). Denissen, Geenen, Van Aken, Gosling, and Potter (2008) developed a Dutch version of the BFI. This version was used in the survey since the population consists of Dutch consumers. Table 9 in Appendix A contains the complete text of this scale.

3.4 Research design

The goal of this study was to answer the central question: *What is the effect of a schema (in)consistent mindset on innovation adoption controlled for openness to experiences?* An experimental research design was used to answer this question.

Experimental designs allow the researcher to control the behavior of their participants by exposing them to different conditions. By manipulating the independent variable, the researcher can establish the causality of the dependent variable (Charness, Gneezy & Kuhn, 2012; Sekaran & Bougie, 2016). Manipulation means that we created various levels of the independent variable to determine the effect on the dependent variable (Sekaran & Bougie, 2016). Therefore, this study uses a “between-subject” design, which means that each participant was exposed to only one condition. In the end, the behavior of participants was compared in all conditions (Charness et al., 2012). This study, therefore, compared the effects of different conditions of schema (in)consistency (1= schema consistency, 2= schema inconsistency, and 3=no use of schemas) on innovation adoption.

3.5 Procedure

This experiment was conducted using an online survey (Appendix E), developed through Qualtrics. The spread of the survey took place mainly via online communication channels, including Facebook and WhatsApp.

The survey consists of four parts. In the first part, the material of schema (in)consistency was applied. As mentioned before, there were three conditions; each participant was exposed to only one condition. The first condition saw pictures that were consistent with their current schemas. The second condition saw pictures that were inconsistent with their current schemas. These pictures in both conditions were counter-balanced (i.e., the same object and backgrounds were used in either condition). For example, the consistent condition saw an Eskimo in the snow, while the inconsistent condition saw an Eskimo in the desert (Gocłowska et al., 2014). A one-minute timer was installed in the survey to check that participants were studying the pictures. This meant that the participants could only continue with the questions after one minute⁴. The last condition (i.e., no use of schema theory) did not get to see any pictures; this is the baseline group. These participants went directly sent to the second part of the survey.

In the second part, each participant was shown a description and a picture of an innovative product, the Heatbox (Appendix B). The Heatbox is a lunchbox that can heat up food anywhere and anytime due to its autonomous steam technology. Before the participants were allowed to start with the evaluation of the Heatbox, they were asked if they were already familiar with this product. There is no point in asking further questions if participants have prior knowledge about the Heatbox because then the product is evaluated by the prior knowledge (existing product schema) and not by the (in)consistency manipulation (Peracchio & Tybout, 1996). Therefore, respondents who were familiar with the Heatbox were not included in further analyses of the experiment. The Heatbox was evaluated using the 10-items of attitude toward innovation, intention to adopt innovation, willingness to try innovation, and one item of resistance (Table 7). Besides, two follow-up questions were asked if participants experienced resistance.

For the third part of the survey, each participant completed a Dutch version of the 10-item openness to experience scale and a 9-item Need For Closure scale⁵(both 5-point Likert scale). The survey ended with part four that consisted of demographic questions, including age, gender, and educational level.

⁴ At first, the timer was supposed to last a minute and a half. However, this timer was adjusted to one minute after a test round ($N = 6$). The participants of the test round were not included in the final analysis.

⁵ The Need For Closure scale was studied by Juliette van der Burg. It was part of this experiment to make data collection more efficient.

3.6 Research ethics

It is important to act correctly and take into account the interests of others and society as a whole. That is why several things were strictly observed during this study. First of all, participation was voluntary. Before the survey started, an explanation was given of what was expected of the participants. For example, filling in the survey seriously. Also, the duration of the survey was told. Besides, there were no risks or consequences of participating in the survey. Participants were always allowed to stop the survey if they felt uncomfortable. Moreover, in case of questions, participants could always contact me; this was also mentioned twice in the survey. (Sekaran & Bougie, 2016; Smith, 2003)

Ethics were also taken into account during data collection. All primary data was used anonymously; participants were also informed about this. Besides, communication only took place via official RU e-mail addresses. Concerning secondary data (such as academic papers from others and the used stimuli), the APA guidelines were taken into account, and copyright was respected. (Smith, 2003)

4. Data analysis and results

The variables names (such as Intention_1) used in this chapter are given in Appendix A with their corresponding description.

4.1 Missing data

There was almost no missing data. Only some data were missing due to the research design (i.e., routings in the experiment). In other words, not all participants had resistance to the Heatbox. Those who did experience resistance got two follow-up questions. Because not everyone got these follow-up questions, there emerged missing data. However, these are ignorable missing data. Furthermore, the missing data represented less than 10% of the total data. Therefore, it was assumed that these missing data were random; no Missing Value Analysis was performed. (Hair, Black, Babin & Anderson, 2014).

4.2 Factor analysis

The dependent variable and moderator of this study were two latent variables. A principal axis factor analysis was conducted to define the structure among the variables. This is exploratory and an ideal starting point for other multivariate techniques. (Field, 2018; Hair et al., 2014)

Innovation Adoption

On the ten items of innovation adoption⁶, a principal axis factor analysis was conducted with oblique rotation. The Kaiser-Meyer-Olkin (KMO) measure checked the appropriateness of the sampling adequacy, $KMO = ,820$. Besides, Bartlett's Test had a probability level ($,000$) lower than the alpha. Next point, determining how many factors that had to be extracted from the analysis. Two factors had eigenvalues of 1 (Kaiser's criterion), and in combination explained 62,06% of the variance. The scree plot showed inflections also on two factors. Table 10 gives an overview of factor-loadings with associated communality. All communalities were greater than $,20$ meaning there was no immediate reason to delete any item. Only Resistance_1 had a communality that was low ($,227$). However, for the purposes of this study, Resistance_1 was retained. Furthermore, all factor-loadings were practical significant (i.e., greater than $,50$) (Hair et al., 2014). There was one negative factor-loading; this was the Resistance_1, which is a reversed item compared to the others. Therefore, it is logical that it is negative. Also, there were two items with a cross-loading. However, the difference between the two loadings was greater than $,20$.

⁶ These are the three 3-item scales of attitude, intention & willingness, and the item on resistance. The follow-up questions of resistance were not included in the factor analysis and MANCOVA. These questions were analyzed in paragraph 4.8.

In the end, factor 1 represents innovation adoption, and factor 2 represents attitude toward innovation, these are the dependent variables. In order to include these variables in subsequent analyses, the reversed item was transformed into a normal (i.e., positive) item. After that, all items were added up to one sum score. A high score indicates a high intention to adopt the innovation, and a positive attitude toward innovation (and vice versa). As a result, innovation adoption consisted of seven items, and attitude toward innovation consisted of three items, as shown in Table 10.

Table 10 Factor analysis dependent variables

Item	Pattern Matrix		
	Factor 1	Factor 2	Communality
Intention_1	,726		,529
Intention_2	,691		,514
Intention_3	,844		,689
Willingness_1	,796		,654
Willingness_2	,704		,533
Willingness_3	,552	,102	,369
Resistance_1	-,509		,227
Attitude_1		,881	,850
Attitude_2	,112	,744	,647
Attitude_3		,638	,369

Since there were two dependent variables in this study instead of one, the following two sub hypotheses were added to the study:

H1b: A schema inconsistent (vs. schema consistent & no use of schema theory) mindset has a positive effect on attitude toward innovation.

H2b: The effect of a schema inconsistent (vs. schema consistent & no use of schema theory) mindset on attitude toward innovation is controlled by consumers' personality trait openness to experiences. Consumers scoring high on openness benefit more from a schema inconsistent mindset than consumers low in openness.

Openness to Experiences

On the ten items of openness to experiences, a principal axis factor analysis was conducted with oblique rotation. This factor analysis consisted of several iterations. The first time the communality of Openness_7 was too low (.136). Besides Openness_7 and Openness_8 had a cross-loading, which was less than .20. Because both the communality and the factor loading were not correct, Openness_7 was deleted. The second time, all communalities were correct. However, Openness_8 still had a cross-loading, which was too small (.023 difference between the factor-loadings). Therefore, this item was also deleted.

In iteration 3, KMO = ,712 and Bartlett’s Test had a probability level of ,000. Three factors had eigenvalues of 1, and in combination explained 67,22% of the variance. The scree plot showed inflections also on three factors. Table 11 gives an overview of factor-loadings with associated communality. All communalities had a correct level above ,20. Almost all factor-loadings were practical significant, except for Openness_3 and Openness_4. Nevertheless, these factor-scores were acceptable, as they were above ,30 (Hair et al., 2014). Furthermore, there were four items with a cross-loading; however, the difference between these loadings was greater than ,20, which is correct.

In the end, factor 1 represents the openness to art, factor 2 represents the great imagination, and factor 3 represents a broad interest. These are three dimensions of openness to experience (Costa & McCrae, 2008; Feist, 1998). Therefore, it was decided to keep openness to experiences as one variable instead of splitting it into three. The reversed items were transformed into normal (positive) items, and all items were added together. In the end, openness to experiences consisted of eight items. A high score reflects someone who scores high on personality trait openness to experiences.

Table 11 Factor analysis moderator

Item	Pattern Matrix			Communality
	Factor 1	Factor 2	Factor 3	
Openness_1		,580	-,158	,445
Openness_2			-,802	,605
Openness_3			-,462	,255
Openness_4	,144	,493		,278
Openness_5	-,102	,745		,531
Openness_6	,786	,148		,742
Openness_9	-,815			,671
Openness_10	,626			,371

4.3 Reliability analysis

In order to test the internal consistency between the items, a reliability analysis was conducted. Generally, Cronbach’s Alpha should exceed a value of ,70 and values around ,80 are good (Field, 2018). This indicates that the Cronbach’s Alpha of innovation adoption was correct (,866, 7 items). The Alpha would be slightly higher (,874) if Resistance_1 was deleted. Also, Cronbach’s Alpha of attitude toward innovation was correct (,798, 3 items). Also, this Alpha would be higher (,854) if an item (Attitude_3) was deleted. On the other hand, deleting items was not beneficial for the content validity (Field, 2018). That is the reason why it was decided not to delete any items. Moreover, the reliability of openness to experience was sufficient (,719, 8 items). This alpha would not increase by removing any item.

4.4 Assumptions

Before the Multivariate Analysis of Covariance (MANCOVA) was conducted, the following assumptions were tested. A more detailed explanation of the assumptions is described in Appendix C.

Measurement level, correlations, and independence

The variables had the right measurement level: the independent variable, schema (in)consistency, was a categorical variable. The two dependent variables, innovation adoption and attitude toward innovation, and the covariate, openness to experience, were metrically scaled variables.

There was a significant positive correlation between innovation adoption and attitude toward innovation. It was a moderate effect ($r = ,477, p = ,000$). Therefore, MANCOVA was an appropriate analysis for this study (Hair et al., 2014). For correlations between all variables, see Table 12 in Appendix C. Conversely, there was independence between the independent variable and covariate. An analysis of variance (ANOVA) was conducted to illustrate this. Due to the fact that $F(2, 199) = 1,104, p = ,334$, was non-significant. This means that the independent variable and covariate had no significant relationship with each other and were independent (Hair et al., 2014). Therefore, these assumptions were met.

Normality

Openness to experience had a normal distribution. The other two variables had a non-normal distribution, namely innovation adoption had a slightly flat distribution, and attitude toward innovation had a positively skewed distribution. Transforming these variables did not produce better results. Hence, the original data was continued. An overview of this assumption is shown in Table 13 in Appendix C

Homoscedasticity

The probability level of the Levene's Test for innovation adoption was $F(2, 199) = ,092, p = ,912$, and for attitude toward innovation it was $F(2, 199) = 2,274, p = ,106$. Besides, the probability level of the Box's M test was $F(6, 846250,08) = ,568, p = ,756$. Both tests identified non-significant effects, there was equal (co)variance across groups.

Linearity

The scatterplots (in Appendix C) showed that there was a linear relationship. All matrices showed a pattern that started at the bottom left and ended at the top right. Hence, the original data was continued.

Group Differences and outliers

The boxplots (in Appendix C) showed that there were differences in the dependent variables across the three conditions of schema (in)consistency. For both dependent variables, the schema inconsistency condition had the lowest median score. That was the opposite of what was expected. The next step was to see whether there were also significant differences between the three conditions of schema (in)consistency.

4.5 Multivariate analysis of covariance

A MANCOVA was conducted with innovation adoption and attitude toward innovation as the dependent variables and schema (in)consistency (1= schema consistency, 2= schema inconsistency, and 3= no use of schema theory) as the independent variable. Openness to experiences was included as a covariate. The analysis was conducted with and without the covariate to assess whether openness to experiences contributed to the overall effect in this analysis (Hair et al., 2014). The observed power of the multivariate test of MANCOVA (.837) was slightly lower than for MANOVA (.851), but both were correct (Field, 2018). Bartlett's test was significant, which again identified a correlation between the dependent variables. The 'Residual SSCP Matrix' showed that it was a moderate correlation of .462.

Univariate effects

There was a significant effect of schema (in)consistency on innovation adoption, $F(2, 199) = 6,556, p < ,05$ with a low Partial $\eta^2 = ,062$. However, there was a non-significant effect of schema (in)consistency on attitude toward innovation, $F(2, 199) = 2,501, p = ,085$. These effects showed that there was a significant difference in the mean of the three conditions for schema (in)consistency for innovation adoption, but not for attitude toward innovation. Even when this analysis was conducted with control by the covariate, the (non)significant values remained unchanged. Because there was still a significant effect of schema (in)consistency on innovation adoption, controlled by openness to experiences $F(2, 198) = 6,418, p < ,05$ with a low Partial $\eta^2 = ,061$. Besides, there was a non-significant effect of schema (in)consistency of attitude toward innovation, controlled by openness to experiences, $F(2, 198) = 2,164, p = ,118$.

Multivariate effect

How did each individual dependent variable correspond to the multivariate effect? (Hair et al., 2014) Using Pillai's trace⁷, there was a significant effect of schema (in)consistency on innovation adoption and attitude toward innovation under control of openness to experiences, $F(4, 396) = 3,291, p < ,05$ with a low partial $\eta^2 = ,032$. This effect and the explained variance were smaller than the univariate effect of schema (in)consistency on innovation adoption, controlled for openness ($F(2, 198) = 6,418, p < ,05$ with a low Partial $\eta^2 = ,061$).

Differences between the conditions of Schema (in)consistency

In order to identify which means were different from the schema (in)consistency conditions with regard to innovation adoption, a Post hoc test was conducted. This test was chosen because it also checks for the type I error rate (Field, 2018). Since there was equal variance across the three conditions, and the conditions had an equal size (i.e., the difference between the largest and smallest group was less than 1,5), the Tukey test with a Bonferroni correction was used. For innovation adoption, the Post hoc comparisons revealed that schema inconsistency had a significantly lower score than no use of schema theory (Mean difference = -5,34, $p = ,001$). For attitude toward innovation, the Post hoc comparisons revealed that there were no significant mean differences. This result corresponded to the non-significant F-test.

The differences between the conditions are also shown in Table 14. For both with and without the covariate, only the second condition (=schema inconsistency) and the third condition (= no use of schema theory) had significant B -values. There was a significant negative effect of schema inconsistency on innovation adoption, $B = -5,340, p < ,05$. When this effect was controlled by openness, it was still a significant negative effect, $B = -5,325, p < ,05$. In other words, when participants saw inconsistent pictures, the intention to adopt the innovation (i.e., Heatbox) became less. Therefore, hypothesis 1a was rejected: schema inconsistencies have no positive effect on innovation adoption. Moreover, the third condition (= no use of schema theory) was the only condition with a positive significant effect on innovation adoption ($B = 3,728, p < ,05$), and controlled by openness the effect was: $B = 3,706, p < ,05$. Hence, those participants who did not receive pictures had the highest intention of adopting the innovation.

In addition, there was a significant negative effect of schema inconsistency on attitude toward innovation ($B = -1,527, p < ,05$), and a significant positive effect of no use of schema theory on attitude toward innovation ($B = 1,290, p < ,05$). Therefore, hypothesis 1b was also rejected; schema inconsistency had no positive effect on attitude toward innovation. The significance and direction did not change when

⁷ Pillai's criterion was the appropriated measure to use since this study had a large sample size, no major assumption violations, and approximately equal group sizes (Field, 2018; Hair et al., 2014).

controlled by openness: effect for schema inconsistency, $B = -1,422$, $p < ,05$ and the effect for no use of schema theory, $B = 1,205$, $p < ,05$.

Table 14 Main results

	Controlled by Openness to experiences			Not controlled by Openness to experiences		
	<i>B</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>t</i>	<i>p</i>
Innovation adoption						
Schema consistency	-2,386	-1,685	,094	-2,396	-1,700	,091
Schema inconsistency	-5,325**	-3,578	,000	-5,340**	-3,617	,000
No use of schema theory	3,706**	2,914	,004	3,728**	2,952	,004
Attitude toward innovation						
Schema consistency	-1,028	-1,520	,130	-1,1094	-1,617	,107
Schema inconsistency	-1,422*	-2,000	,047	-1,527*	-2,154	,032
No use of schema theory	1,205*	2,003	,047	1,290*	2,149	,033
** $p < ,01$						
* $p < ,05$						

The influence of Openness to experience

As can be seen in Table 14, openness had a significant effect on schema inconsistency and no use of schema theory. With the control of openness, the *B*-values only changed a little. These *B*-values became, at both conditions and both dependent variables, slightly lower. This means that the control of openness made almost no difference in the end.

A second way to evaluate what the effect of the covariate was by looking at the Estimated Marginal Means. As shown in Table 15, adding the covariate had hardly any effect on the mean-scores. It can also be noted that both with and without the covariate, the condition about schema inconsistency had the lowest score on both innovation adoption and attitude. This result indicates that the respondents in the second condition (=schema inconsistency) had the lowest average score to adopt the innovation and to form a positive attitude toward the innovation.

Table 15 Estimated marginal means

Dependent variable	Schema (in)consistency	Controlled by Openness		Not controlled by Openness	
		<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Innovation adoption	Schema consistency	26,57	,96	26,57	,96
	Schema inconsistency	23,64	1,06	23,63	1,06
	No use of schema theory	28,96	1,04	28,97	1,03
Attitude toward innovation	Schema consistency	7,02	,46	7,01	,46
	Schema inconsistency	6,63	,51	6,58	,51
	No use of schema theory	8,05	,49	8,11	,50

4.6 Two-way MANOVA

The second hypothesis refers to a high and low score of openness. Therefore, a MANOVA was conducted again, but with openness as an independent variable instead of a covariate. As the independent variable had to be categorical, there was created a dummy variable of openness. A low score indicated that someone scored 1 to 28 points on the openness questions, and a high score indicated that someone scored 29 to 56 points⁸.

The interaction effect between schema (in)consistency and the dummy variable of openness (1= someone scoring low on openness, 2=someone scoring high on openness) on innovation adoption and attitude toward innovation is not significant, $F(10, 392) = 1,660, p = ,088$. Although the effect of schema (in)consistency and the dummy variable of openness on innovation adoption is significant, $F(5, 196) = 2,873, p < ,05$. The effect for attitude toward innovation is also in this analysis, not significant, $F(5, 196) = 1,194, p = ,313$, which was also confirmed in Figure 4. The lines were almost parallel to each other and did not cross. Therefore, hypothesis 2b was rejected since there is no significant effect.

The left side of Figure 4 showed the significant interaction effect of schema (in)consistency and openness on innovation adoption. People scoring high on personality trait openness had a higher intention to adopt the Heatbox when they were in condition 1 (= schema consistency) and 3 (=no use of schema theory). However, participants scoring high on personality trait openness who were exposed to schema inconsistent pictures had a lower intention to adopt the Heatbox. Therefore, hypothesis 2a was rejected, there was a significant effect, except the effect was positive for different conditions.

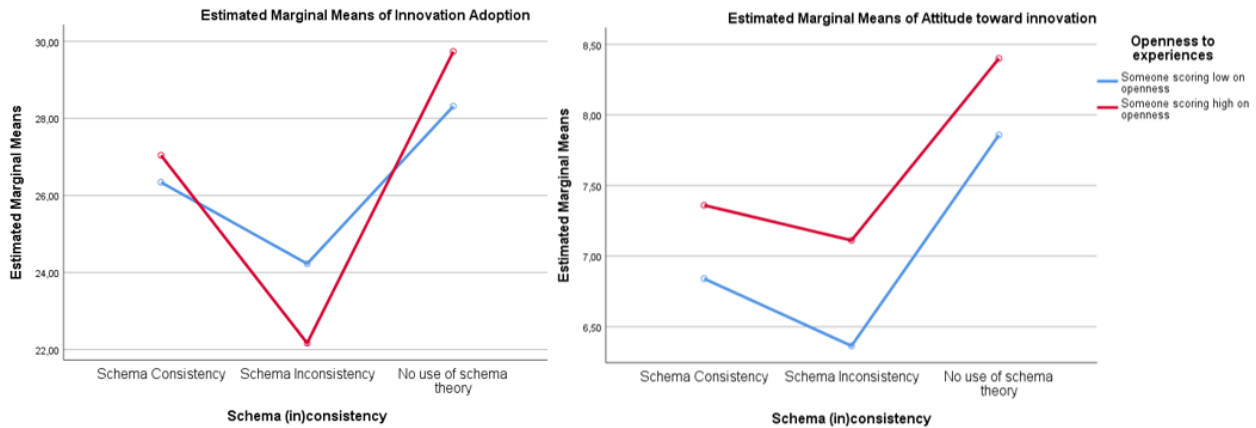


Figure 4 The significant interaction effect of schema (in)consistency and openness to experiences on innovation adoption, and the non-significant effect of schema (in)consistency and openness on attitude toward innovation

⁸ For the openness scale, the minimum number of points was 8, the maximum number of points was 56 (8 items, 7-point Likert scale). Therefore, the lower half of numbers was chosen as a low value, whereas the upper half of numbers was chosen as a high value on openness.

4.7 Discriminant analysis

The multivariate test was significant, even when the univariate effect of attitude was non-significant. Therefore, the MANCOVA was followed up with a discriminant analysis (Field, 2018). The analysis revealed that there were two discriminant functions. The first explained 95,6% of the variance, canonical $R^2 = ,251$ whereas the second variate explained only 4,4%, canonical $R^2 = ,055$. In combination these discriminant functions were significantly different, $\lambda = ,934$, $\chi^2(4) = 13,54$, $p < ,05$. However, if the first function got deleted, the second function did not significantly differentiate the groups, $\lambda = ,997$, $\chi^2(1) = ,611$, $p = ,43$. The correlations between the outcomes and discriminant functions revealed that innovation adoption loaded positively high on function 1 ($r = ,989$), but loaded negatively small on factor 2 ($r = -,148$). Besides, attitude toward innovation loaded positively on both functions ($r = ,586$ for the first function, and $r = ,810$ for the second function). The discriminant function plot (in Figure 5) showed that the first function discriminated schema inconsistency (group centroid = $-,336$) from no use of schema theory (group centroid = $,314$), and the second function differentiated the schema consistency (group centroid = $-,072$) from the other two (group centroid schema inconsistency = $,041$ and no use of schema theory = $,043$). (Field, 2018)

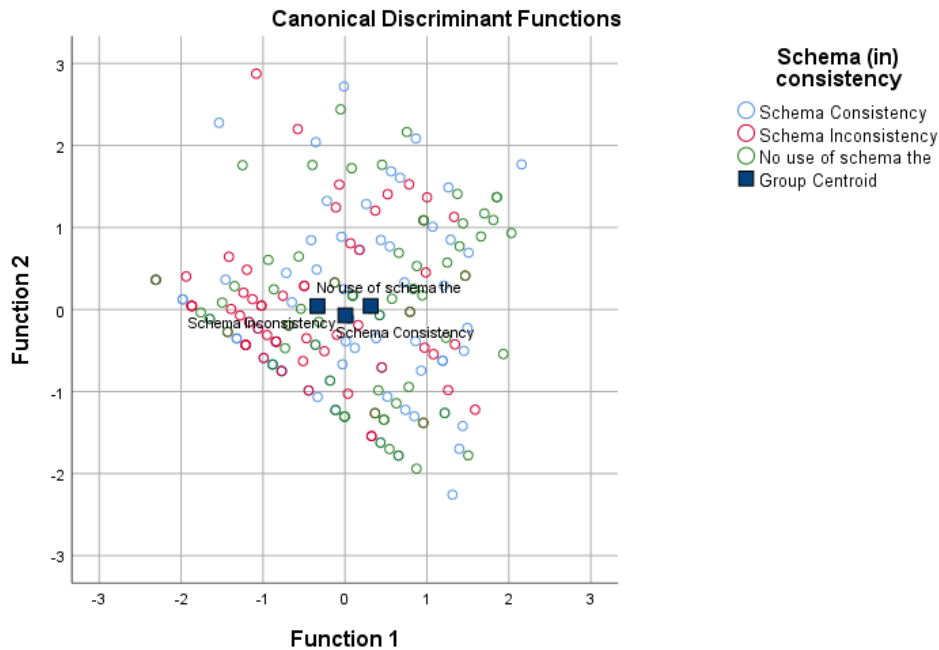


Figure 5 Discriminant function plot

4.8 The follow-up questions of resistance to innovation

In total 60 respondents (29,8%) had resistance to the Heatbox. Besides, 44 respondents (21,8%) were neutrally (nor agree nor disagree). Therefore, this part of the respondents (104 respondents, 51,6%) received two follow-up questions about resistance. In order to get a better idea of the specific reasons why these participants in the experiment experienced resistance, the answers to the open-ended question were coded. Given the deductive approach of this study, there were already specific categories expected (Sekaran & Bougie, 2016), including usage, perceived image, economic and financial risks, physical risk, social risks, and value & tradition (consult Table 8). Table 16 in Appendix D contains the coded answers. There were 69 answers⁹ given by the respondents. Sometimes there were multiple codes linked to a single answer.

In addition to the above categories, one category (i.e., code) was added, namely the lack of knowledge. These were reactions such as: “I will believe it when I see it” and “Reviews of others are important to me.” Moreover, it was noticed that category value & tradition, not only included their current product value, but other values such as environmental issues and sustainability recurred several times in the answers.

The most common category for the open-ended question was usage: “the product does not fit in my daily life.” 39,8% fell into this category. The second most relevant category was value & tradition (21,7%). On the other hand, none of the respondents was worried about social risks. The results of the open-ended question corresponded to the multiple-choice sequel question of resistance. In this question, usage was also the main reason (54,9%), followed by values & tradition (17,4%). Besides, social risk was the least important reason for feeling resistance. An overview of this comparison is given in Table 17 in Appendix D.

⁹ The open-ended question was not compulsory to fill in, hence there were fewer answers than the number of respondents who saw this question.

5. Conclusion and discussion

5.1 Summary of results

The objective of this study was to examine the effect of schema consistency, schema inconsistency, and no use of schema theory (i.e., baseline group) on innovation adoption. It was expected that introducing schema inconsistent stimuli before the exposure of an innovation (i.e., the Heatbox) was more favorable for the adoption of radical innovation. This idea was based on the notion that inconsistent stimuli cause a more flexible mindset, which is beneficial for the level of creativity. Before discussing the theoretical- and managerial implications of this study, the unexpected main results of this study are described.

Results from the factor analysis demonstrated that there were two dependent variables instead of one, namely innovation adoption and attitude toward innovation. In addition, results from the MANCOVA showed that the averages of schema consistency, schema inconsistency, and no use of schema theory differ for innovation adoption, but not for attitude toward innovation. When respondents were not exposed to any stimuli, their intention to adopt the innovation was the highest compared to the respondents who did see stimuli material. Moreover, the respondents who saw schema inconsistent stimuli had the lowest score on innovation adoption. This is contrary to all expectations.

The results from the two-way MANOVA demonstrated that there was a significant interaction effect of schema (in)consistency for innovation adoption, controlled for openness to experiences. However, the effect on attitude toward innovation was not significant. This means that someone who scored high on personality trait openness to experiences had a higher intention to adopt the Heatbox when they were first exposed to schema consistent pictures or when they were exposed to no pictures. However, someone who was scoring high on personality trait openness to experiences, and was exposed to schema inconsistent pictures, had a lower intention to adopt the Heatbox.

Besides, the results from the follow-up resistance questions demonstrated that 51,6% of the respondents still had resistance or answered neutrally (nor agree nor disagree) concerning the innovation (i.e., Heatbox). The primary reason for this resistance was usage: the respondents stated that the Heatbox did not fit into their daily lives. Other common reasons were value & tradition (i.e., the respondents stated that they appreciated their current product), and lack of knowledge (i.e., the respondents stated that they did not have enough information regarding the product). Finally, social risk was the least important reason for feeling resistance.

5.2 Limitations and future research

The broad and relevant field of innovation adoption gives a diversity of research opportunities. The conceptual framework of this study needs additional research both to refine it and to propose other implications that can contribute to marketing techniques. Moreover, there are also some limitations of this study, which are mentioned in this chapter.

First, literature (e.g., Noseworthy et al., 2014; Peracchio & Tybout, 1996) suggested that three types of (in)consistencies exist, including consistencies, moderate inconsistencies, and gigantic inconsistencies. Among these (in)consistencies, moderate inconsistencies would have the best results on radical innovation (Noseworthy et al., 2014; Peracchio & Tybout, 1996). However, this study only used consistent and inconsistent stimuli instead of three levels of (in)consistency. This is a limitation; therefore, further research could design stimuli at three levels of (in)consistencies and investigate whether it affects innovation adoption positively.

Besides, the results showed that consumers who scored high on openness to experiences benefit less from a schema inconsistent mindset than consumers low in openness. A future study may examine why people scoring high on openness had a higher intention to adopt when they had a mindset favorable for schema consistencies or had no manipulated mindset (i.e., baseline group). Possible reasoning is that people who score high on openness do not need the activation of a mindset favorable to inconsistencies (such as radical innovation). Therefore, it only has a negative effect. While those who score low on openness benefit from the activating of a mindset for inconsistencies.

Third, the findings were obtained in one specific empirical context, namely about the Heatbox. This affects the external validity (Sekaran & Bougie, 2016); the results might be less generalizable in another empirical context. For other products, there will likely be varying results of schema consistency, schema inconsistency, and no use of schema theory on innovation adoption. Therefore, a suggestion for future research is to conduct the same study with other or multiple innovations.

Next, the population of the study consists of Dutch consumers older than eighteen years old. This is a broad segmentation. However, the sample did not use the same distribution of consumers as the actual Dutch population. For example, in the sample, approximately 70% consists of people between 20 and 40 years old. While in the real Dutch population, only 25% of the population belonged to the 20 to 40 years old in 2019 (CBS, 2019). In other words, the sample may not represent a normal distribution. This non-normal distribution is probably due to the fact that snowball and convenience (i.e., nonprobability) sampling were used in the distribution of the survey, as it was distributed through personal online channels. Therefore, this study was not representative of the entire population (Sekaran & Bougie, 2016). By extending the scope of the survey, future research can prevent a survey from being unrepresentative for the entire population. For example, using multiple online channels (i.e., LinkedIn, Instagram, other

online websites) and if it is possible, distributing the survey offline in public buildings, including universities and supermarkets.

Next, the factor analysis suggested that attitude toward innovation and innovation adoption were two separate dependent variables. This result is similar to other literature (e.g., Claudy et al., 2015; Montano & Kasprzyk, 2015; Westaby, 2005) that indicate that someone's attitude and behavioral intentions can determine innovation adoption. However, all effects of attitude toward innovation were not significant. A possible explanation could be that I measured attitude toward innovation on a scale that was aimed for technological innovativeness. That is "the extent to which a consumer is motivated to be the first to adopt the new product" (Bruner & Kumar, 2007, p. 331). This definition differs from a consumer's attitude towards innovation because the latter focuses on the overall positive or negative evaluation of the innovation (Claudy et al., 2014; Westaby, 2005). Therefore, this study may have unintendedly focused on a consumer's degree of innovativeness instead of attitude toward innovation. This result would mean that schema consistency, schema inconsistency, and no use of schema theory does not represent a significant difference in a consumer's degree of technological innovativeness¹⁰. In other words, it made no (significant) difference if respondents had seen schema consistent pictures or schema inconsistent pictures. Their level of innovativeness remained the same: there was no difference in the extent to which a consumer wanted to be the first to buy the innovative product. Since all the effects were not significant, it could be that the used scale did not measure the particular concept it was intended to measure. In other words, the content validity of this variable is questionable (Sekaran & Bougie, 2016). Hence, a suggestion for future research is to conduct this study with another scale for attitude toward innovation to check if there are significant effects. In other words, all other variables of this study remain the same, except attitude toward innovation is adjusted through another scale. An example of a different attitude toward innovation scale is from the research of Lee (2012). This scale focuses more on how positive one finds the product rather than how much one wants to be the first to buy the new product (Lee, 2012).

In addition, the price of the product was deliberately not been included in this study because it is a relative and personal variable. For example, a specific price, such as 50 euros, can be expensive for a student, but a person with a full-time job can find it cheap. However, the price of the product could play a significant factor in consumer resistance (Abbas et al., 2017). Therefore control variables, such as price and employment status (i.e., student, employed, unemployed), could be interesting to include in future research. This allows the researcher to make comparisons between different employments groups. In this way, one can distinguish which group has a higher intention to adopt the innovation and whether this

¹⁰ Since all effects on attitude toward innovation were not significant.

depends on income or not. Nevertheless, one should pay attention to research ethics, since price and employment status can be sensitive issues (Smith, 2003).

Finally, this study concerns the consequences caused by the coronavirus (Covid-19). This crisis had several (indirect) effects on this study. First of all, the entire study was carried out digitally, and communication with those involved was only via online communication channels. Secondly, the corona crisis caused a historic decline in consumer confidence. Besides, consumers have a negative willingness to buy. (CBS, 2020) The corona crisis is an uncontrolled variable that may have indirectly influence the results of the study. In other words, the results may be more negative concerning the current circumstances regarding the corona crisis.

5.3 Theoretical implications

The results of this study deviate from previous literature. Therefore, this paragraph discusses what is different and the possible reasons for these differences. First, the results demonstrated that respondents who did not see any stimuli provoked a mindset that is most favorable for radical innovations. Therefore respondents in this group had the highest intention to adopt the innovation. This result is not as expected. It seems that the level of inconsistency had a negative influence, which was different from other literature (e.g., Taylor & Noseworthy, 2019). Since they expected, inconsistencies could have a positive effect on radical innovations (Taylor & Noseworthy, 2019). A reason why the schema inconsistency condition did not have a positive effect as expected may be because of the uncertainties raised by the picture (Van Harreveld et al., 2009). These uncertainties can have a positive effect when consumers can solve the uncertainties by assimilation of the schema (Meyers-Levy & Tybout, 1989). However, if consumers cannot solve these uncertainties, it could lead to innovation resistance (Noseworthy et al., 2014). It is possible that the inconsistencies in the pictures increased the emotional intensity, such as anxiety of having to remember the pictures or uncertainty because participants did not know what would be asked about the pictures. These increased emotions can cause a higher level of arousal. As participants could not solve these uncertainties, this resulted in a more negative evaluation of the innovation (Noseworthy et al., 2014).

Second, the results showed that consumers scoring high on openness to experiences benefit less from a schema inconsistent mindset than consumers low in openness (Figure 4). This result could imply that the open-minded consumer, who is known for his rich imagination, preference for variation, and problem-solving ability (Costa & McCrae, 2008; Feist, 1998), is also less inclined towards inconsistencies and therefore to radical innovations. There is an alternative theory that could be the cause of this unexpected effect: Mandler (1982, as cited in Noseworthy et al., 2014) acknowledged that inconsistencies could trigger curiosity and interest. However, he stated that this would only have a

positive effect if the inconsistencies can be resolved (Mandler, 1982, as cited in Noseworthy et al., 2014). This theory is in line with Gocłowska et al. (2017). They agreed that people who scored high of openness operate in parallel processes: surprises that have a negative effect on innovations as long as people cannot give meaning to the inconsistencies of the innovation, and interest that encourages people to give meaning to these inconsistencies and therefore has a more positive effect (Gocłowska et al., 2017). In this study, therefore, there is a chance that the process of surprises has gained the upper hand. This may have led to an inability to solve the inconsistencies. This inability to solve could have resulted in people who scored high on openness to experiences that had not developed a mentality favorable for the adoption of radical innovation.

Thirdly, the answers to the open-ended question were diverse, but all answers could be coded based on previous research (Kleijnen et al., 2009; Laukkanen et al., 2007; Ram & Seth, 1989). It was noticeable that many participants twisted the product in their own right or gave it their own interpretation. Several examples: “The Heatbox is probably very expensive,” “The Heatbox might break quickly,” “The Heatbox is unsustainable and bad for the environment,” and “The Heatbox may cause short-circuit.” These twisted interpretations are in line with the theory of Markus and Zajonc (1985, as cited in Harris, 1994), who found that missing information can be included in the schema by default. People fill-in information themselves when there is too little known (Markus & Zajonc, 1985, as cited in Harris, 1994). Hence, the respondents of this study could have made their own interpretations because they did not have a complete understanding of the product. This study showed that missing information can cause misinterpretations (Markus & Zajonc, 1985, as cited in Harris, 1994), but also that this missing (and often wrong) information can lead to innovation resistance. The respondents in this study created things that were not mentioned in the survey (such as environmental issues, price, et cetera). Therefore, they experienced resistance to the innovation.

5.4 Managerial implications

This study has relevant implications for companies that intend to bring innovations successfully to the market. First, managers should focus more on the reasons against innovation adoption rather than the positive reasons to adopt an innovation. This statement is based on the fact that 51,6% of the respondents would not adopt the innovation. Therefore, this study showed that innovation resistance plays a major role in consumer behavior for whether or not to adopt an innovative product. The common reasons to resist an innovation are usage, perceived image, risks (i.e., economic, financial, physical, and social) and value & tradition. Consequently, these outcomes of innovation resistance are in agreement with other studies (e.g., Kleijnen et al., 2009; Laukkanen et al., 2007; Ram & Seth, 1989). Besides, this study found that ‘lack of knowledge’ is an additional reason why consumers resist innovations. Managers

focus insufficiently on the resistance side of innovation, while it is a crucial issue for future revenues and existence.

A second recommendation concerns usage, value & tradition, and lack of knowledge. These factors emerged in this study as the primary reasons why consumers did have resistance to the innovation. These reasons have in common that consumers do not want to change from their status quo and that consumers think they have not enough information to make a decision. Managers can respond to these types of resistance by reducing consumer uncertainties and emphasizing the benefits of the innovation. Mental Simulation and Benefit Comparison are marketing tools that can facilitate this process. As explained in paragraph 2.2, Mental Simulation gives an imitative representation of the usage situation of the innovation. Besides, Benefits Comparison compares the new and existing benefits of the innovation (Heidenreich & Kraemer, 2016). By using these kinds of tools, uncertainties of the innovation can be reduced, as the consumer can see what the product is and how it works. Moreover, it shows both known and new aspects of the product, making sure everyone knows what to expect. Research into the possible relationship between usage, value & tradition, and lack of knowledge and these marketing tools, and their effect on innovation resistance, may also be an option for future research.

Finally, marketing campaigns should not focus too much on the inconsistent properties of innovation. This statement is based on the fact that inconsistent stimuli in both cases (i.e., innovation adoption and attitude toward innovation) did not have a positive effect. Therefore, managers need to consider how they want to promote their innovative products. The respondents who saw no stimuli (i.e., baseline condition) had the highest intention to adopt. This makes it clear that schema inconsistent- and schema consistent pictures are not the best incentives to promote this type of product category (i.e., kitchen and food equipment).

5.5 Conclusion

Having identified the limitations and implications of this study, I can answer the central question: *What is the effect of a schema (in)consistent mindset on innovation adoption and attitude toward innovation controlled for openness to experiences?* There is a significant effect for schema (in)consistency on innovation adoption, controlled for openness. However, the effect on attitude toward innovations is not significant. The effect of schema consistency was not significant, and the effect of schema inconsistency was significant but negative. This means that schema (in)consistency had no positive effect on innovation adoption. The respondents who did not see any stimuli (i.e., baseline group) had the highest intention to adopt the innovation; this group had the only significant positive slope (*B*-value).

Other factors, like those mentioned in the theoretical implications, may have contributed to this study, leading to a different result than expected. In my opinion, the primary factor why the participants did not get into a favorable mindset for radical innovation is because they could not solve the uncertainties of the pictures. This may imply that the uncertainties that arise during the adoption process first need to be resolved. Otherwise, consumers will not adopt the innovation; this is in line with Arts et al. (2011), who argued that uncertainties harm the intention to adopt an innovation.

5.6 Closing words

Consumer resistance is an essential factor in the success of an innovative product because resistance can slow down consumer adoption. It is considered as one of the critical causes of the failure of innovations in the market (Ram & Sheth, 1989; Cornescu & Adam, 2013) Therefore more research is still needed to solve this problem. Although this study has no major breakthroughs, it has contributed to gathering more information about the innovation adoption (and resistance) process.

In this regard, I have one final question for those participants who perceived resistance toward the Heatbox: next time you are out of the house and looking forward to a hot meal, do you have regrets about not buying the Heatbox?

References

- Abbas, M., Nawaz, M. S., Ahmad, J., & Ashraf, M. (2017). The effect of innovation and consumer related factors on consumer resistance to innovation. *Cogent Business & Management*, 4(1), 1-23.
- Arts, J. W., Frambach, R. T., & Bijmolt, T. H. (2011). Generalizations on consumer innovation adoption: A meta-analysis on drivers of intention and behavior. *International Journal of Research in Marketing*, 28(2), 134-144.
- Alexander, D. L., Lynch Jr, J. G., & Wang, Q. (2008). As time goes by: Do cold feet follow warm intentions for really new versus incrementally new products?. *Journal of Marketing Research*, 45(3), 307-319.
- Bartlett, F. C., & Bartlett, F. C. (1995). *Remembering: A study in experimental and social psychology*. Cambridge University Press.
- Benet-Martínez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of personality and social psychology*, 75(3), 729.
- Brown, B. (2010). Why innovation matters. *Research-Technology Management*, 53(6), 18-23.
- Bruner, G. C., & Kumar, A. (2007). Gadget lovers. *Journal of the Academy of Marketing Science*, 35(3), 329-339.
- Carbon, C. C., Faerber, S. J., Gerger, G., Forster, M., & Leder, H. (2013). Innovation is appreciated when we feel safe: On the situational dependence of the appreciation of innovation. *International Journal of Design*, 7(2).
- Castaño, R., Sujan, M., Kacker, M., & Sujan, H. (2008). Managing consumer uncertainty in the adoption of new products: Temporal distance and mental simulation. *Journal of Marketing Research*, 45(3), 320-336.
- Castellion, G., & Markham, S. K. (2013). Perspective: New Product Failure Rates: Influence of Argumentum ad Populum and Self-Interest. *Journal of Product Innovation Management*, 30(5), 976-979.
- CBS. (2019). *Bevolking; kerncijfers*. Retrieved from <https://opendata.cbs.nl/statline/#/CBS/nl/dataset/37296ned/table?ts=1589124528009>
- CBS. (2020). *Consumentenvertrouwen, economisch klimaat en koopbereidheid; gecorrigeerd*. Retrieved from <https://www.cbs.nl/nl-nl/cijfers/detail/83693NED>
- Chandy, R. K., & Tellis, G. J. (1998). Organizing for radical product innovation: The overlooked role of willingness to cannibalize. *Journal of marketing research*, 35(4), 474-487.

- Charness, G., Gneezy, U., & Kuhn, M. A. (2012). Experimental methods: Between-subject and within-subject design. *Journal of Economic Behavior & Organization*, *81*(1), 1-8.
- Chaudhuri, A., Aboulnasr, K., & Ligas, M. (2010). Emotional responses on initial exposure to a hedonic or utilitarian description of a radical innovation. *Journal of Marketing Theory and Practice*, *18*(4), 339-359.
- Claudy, M. C., Garcia, R., & O'Driscoll, A. (2015). Consumer resistance to innovation—a behavioral reasoning perspective. *Journal of the Academy of Marketing Science*, *43*(4), 528-544.
- Cornescu, V., & Adam, C. R. (2013). The consumer resistance behavior towards innovation. *Procedia Economics and Finance*, *6*, 457-465.
- Costa, P. & McCrae, R. (2008). The revised NEO personality inventory (NEO-PI-R). The SAGE Handbook of Personality Theory and Assessment. 2. 179-198.
- Denissen, J. J., Geenen, R., Van Aken, M. A., Gosling, S. D., & Potter, J. (2008). Development and validation of a Dutch translation of the Big Five Inventory (BFI). *Journal of personality assessment*, *90*(2), 152-157.
- Dibrov, A. (2015). Innovation resistance: the main factors and ways to overcome them. *Procedia-Social and Behavioral Sciences*, *166*(7), 92-96.
- Escalas, J. E., & Luce, M. F. (2004). Understanding the effects of process-focused versus outcome-focused thought in response to advertising. *Journal of Consumer Research*, *31*(2), 274-285.
- Evanschitzky, H., Eisend, M., Calantone, R. J., & Jiang, Y. (2012). Success factors of product innovation: An updated meta-analysis. *Journal of product innovation management*, *29*, 21-37.
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, *39*(2), 175-191.
- Feist, G. J. (1998). A meta-analysis of personality in scientific and artistic creativity. *Personality and social psychology review*, *2*(4), 290-309.
- Festinger, L. (1962). *A theory of cognitive dissonance* (Vol. 2). Stanford university press.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics*. London, England: SAGE
- Garcia, R., Bardhi, F., & Friedrich, C. (2007). Overcoming consumer resistance to innovation. *MIT Sloan management review*, *48*(4), 82.
- Gocłowska, M. A., Baas, M., Crisp, R. J., & De Dreu, C. K. (2014). Whether social schema violations help or hurt creativity depends on need for structure. *Personality and Social Psychology Bulletin*, *40*(8), 959-971.

- Gołowska, M. A., Baas, M., Elliot, A. J., & De Dreu, C. K. (2017). Why schema-violations are sometimes preferable to schema-consistencies: The role of interest and openness to experience. *Journal of Research in Personality*, 66, 54-69.
- Guiltinan, Joseph P. (1999) Launch strategy, launch tactics, and demand outcomes, *Journal of Product Innovation Management*, 16(3), 509-529.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis – Pearson New International Edition*. Essex, England: Pearson Education Limited.
- Harris, S. G. (1994). Organizational culture and individual sensemaking: A schema-based perspective. *Organization science*, 5(3), 309-321.
- Heidenreich, S., & Handrich, M. (2015). What about passive innovation resistance? Investigating adoption-related behavior from a resistance perspective. *Journal of Product Innovation Management*, 32(6), 878-903.
- Heidenreich, S., & Kraemer, T. (2015). Passive innovation resistance: The curse of innovation? Investigating consequences for innovative consumer behavior. *Journal of Economic Psychology*, 51, 134-151.
- Heidenreich, S., & Kraemer, T. (2016). Innovations—doomed to fail? Investigating strategies to overcome passive innovation resistance. *Journal of Product Innovation Management*, 33(3), 277-297.
- Heimonen, J., & Kohtamäki, M. (2019). Measuring new product and service portfolio advantage. *International Entrepreneurship and Management Journal*, 15(1), 163-174.
- Homan, A. C., Hollenbeck, J. R., Humphrey, S. E., Knippenberg, D. V., Ilgen, D. R., & Van Kleef, G. A. (2008). Facing differences with an open mind: Openness to experience, salience of intragroup differences, and performance of diverse work groups. *Academy of Management Journal*, 51(6), 1204-1222.
- John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York: Guilford Press.
- Kleijnen, M., Lee, N., & Wetzels, M. (2009). An exploration of consumer resistance to innovation and its antecedents. *Journal of economic psychology*, 30(3), 344-357.
- Laukkanen, T., Sinkkonen, S., Kivijärvi, M., & Laukkanen, P. (2007). Innovation resistance among mature consumers. *Journal of Consumer Marketing*, 24(7), 419-427.
- Lee, B. C. (2012). The determinants of consumer attitude toward service innovation—the evidence of ETC system in Taiwan. *Journal of Services Marketing*, 26(1), 9-19.

- Leung, A. K. Y., & Chiu, C. Y. (2008). Interactive effects of multicultural experiences and openness to experience on creative potential. *Creativity Research Journal*, 20(4), 376-382.
- Meyers-Levy, J., & Tybout, A. M. (1989). Schema congruity as a basis for product evaluation. *Journal of consumer research*, 16(1), 39-54.
- Miron-Spektor, E., Gino, F., & Argote, L. (2011). Paradoxical frames and creative sparks: Enhancing individual creativity through conflict and integration. *Organizational Behavior and Human Decision Processes*, 116(2), 229-240.
- Montano, D. E., & Kasprzyk, D. (2015). Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. *Health behavior: Theory, research and practice*, 70(4), 231.
- Noseworthy, T. J., Di Muro, F., & Murray, K. B. (2014). The role of arousal in congruity-based product evaluation. *Journal of Consumer Research*, 41(4), 1108-1126.
- Paunonen, S. V. (2003). Big Five factors of personality and replicated predictions of behavior. *Journal of personality and social psychology*, 84(2), 411-424.
- Peracchio, L. A., & Tybout, A. M. (1996). The moderating role of prior knowledge in schema-based product evaluation. *Journal of consumer research*, 23(3), 177-192.
- Plouffe, Christopher R., Mark Van den Bosch, and John Hulland (2001) Intermediating technologies and multi-group adoption: a comparison of consumer and merchant adoption intentions toward a new electronic payment system, *Journal of Product Innovation Management*, 18(2), 65-81.
- Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations: the marketing problem and its solutions. *Journal of consumer marketing*, 6(2), 5-14.
- Ritter, S. M., Damian, R. I., Simonton, D. K., van Baaren, R. B., Strick, M., Derks, J., & Dijksterhuis, A. (2012). Diversifying experiences enhance cognitive flexibility. *Journal of experimental social psychology*, 48(4), 961-964.
- Ritter, S. M., Gocłowska, M. A. (2019). Diversifying Experiences. In M. Runco & S. R. Pritzker (Eds.), *Encyclopedia of Creativity*. United States: Elsevier
- Rogers, E. M. (2010). *Diffusion of innovations*. Simon and Schuster.
- Sekaran, U. & Bougie, R. (2016). *Research methods for business: A skill-building approach*. Chichester, West Sussex, United Kingdom: John Wiley & Sons.
- Smith, D. (2003). *Five principles for research ethics*. Retrieved from <https://www.apa.org/monitor/jan03/principles>
- Sorescu, A. B., Chandy, R. K., & Prabhu, J. C. (2003). Sources and financial consequences of radical innovation: Insights from pharmaceuticals. *Journal of marketing*, 67(4), 82-102.

- Sujan, M., & Bettman, J. R. (1989). The effects of brand positioning strategies on consumers' brand and category perceptions: Some insights from schema research. *Journal of marketing research*, 26(4), 454-467.
- Szmigin, I., & Foxall, G. (1998). Three forms of innovation resistance: the case of retail payment methods. *Technovation*, 18(6-7), 459-468.
- Tan, C. S., Lau, X. S., Kung, Y. T., & Kailsan, R. A. L. (2019). Openness to experience enhances creativity: The mediating role of intrinsic motivation and the creative process engagement. *The Journal of Creative Behavior*, 53(1), 109-119.
- Taylor, N., & Noseworthy, T. J. (2019). Compensating for Innovation: Extreme Product Incongruity Encourages Consumers to Affirm Unrelated Consumption Schemas. *Journal of Consumer Psychology*, 30(1), 77-95.
- Van Harreveld, F., Rutjens, B. T., Rotteveel, M., Nordgren, L. F., & Van Der Pligt, J. (2009). Ambivalence and decisional conflict as a cause of psychological discomfort: Feeling tense before jumping off the fence. *Journal of Experimental Social Psychology*, 45(1), 167-173.
- Westaby, J. D. (2005). Behavioral reasoning theory: Identifying new linkages underlying intentions and behavior. *Organizational behavior and human decision processes*, 98(2), 97-120.

Appendices

Appendix A – Operationalization

Novelty (Pretest)

Table 5 Novelty scale

English items (Heimonen & Kohtamäki, 2019)	Dutch items
Product X is very unusual in comparison to the competing products.	Product X ¹¹ is afwijkend in vergelijking met huidige producten
Product X is more revolutionary than the competing products	Product X is revolutionairder dan huidige producten
Product X is very unexpected in comparison to the competing products	Product X is zeer onverwachts in vergelijking met huidige producten
Product X offers a new kind of solution to the customer's problems versus the competing products	Product X biedt een betere oplossing dan huidige producten
Product X is unique in terms of their features versus the competitive products	Product X is uniek qua eigenschappen ten opzichte van de huidige producten

Schema (in)consistency

Table 6 Stimuli material originated from Gocłowska, Baas, Crisp, & De Dreu (2014).

Schema consistent condition	Schema inconsistent condition
A dromedary in the desert	A dromedary in the snow
A penguin in the snow	A penguin in the desert
A swimming float by the swimming pool	A swimming float on the ice rink
Ice skates on the ice rink	Ice skates by the swimming pool
An Eskimo in the snow	An Eskimo in the desert
A soccer player on the soccer field	A soccer player on the ice rink
An astronaut in space	An astronaut at the beach
Man in swimwear at the beach	Man in swimwear in space

Attitude toward Innovation & Innovation Adoption

Table 7 Scales dependent variables

SPSS name	English items: attitude toward innovation (Bruner & Kumar, 2007)	Dutch items: houding ten opzichte van de innovatie
Attitude_1	I get a kick out of buying the Heatbox before most other people know it exists ¹²	Ik krijg een kick van het kopen van de Heatbox voordat de meeste andere mensen weten dat dit product bestaat
Attitude_2	It is cool to be the first to own the Heatbox.	Het is cool om als eerste de Heatbox te bezitten

¹¹ Product X refers to the products shown in the pretest (e.g. the Heatbox or the Portable Blender).

¹² The items colored grey were used in the pretest.

Attitude_3	Being the first to buy the Heatbox is very important to me	De eerste zijn die de Heatbox koopt is belangrijk voor mij
	English items: intention to adopt innovation (Escalas & Luce, 2004)	Dutch items: intentie om de innovatie uit te proberen
Intention_1	How likely is it that in the future you will use the Heatbox on a daily basis?	De kans is aanwezig dat ik in de toekomst de Heatbox dagelijks ga gebruiken
Intention_2	How likely is it that you will change your current habits or behaviour in order to use the Heatbox effectively?	De kans is aanwezig dat ik mijn huidige gewoonten of gedrag ga veranderen om de Heatbox effectief te (kunnen) gebruiken
Intention_3	How likely is that you will incorporate the Heatbox into your daily routine?	De kans is aanwezig dat ik de Heatbox ga opnemen in mijn dagelijkse routine
	English items: willingness to try innovation (Chaudhuri et al., 2010)	Dutch items: bereidheid om de innovatie te proberen
Willingness_1	I would be willing to spend time to know the Heatbox better	Ik ben bereid tijd te besteden om de Heatbox beter te leren kennen
Willingness_2	I would be willing to spend the effort to know the Heatbox better	Ik ben bereid om de moeite te nemen om de Heatbox beter te begrijpen
Willingness_3	If I asked, I am willing to take a demo of the Heatbox today	Indien gevraagd wordt, ben ik bereid om vandaag een demo van de Heatbox uit te proberen
	English item: resistance	Dutch item: weerstand
Resistance_1	I feel resistance to the Heatbox. (Resistance to buying, using or existence of the Heatbox)	Ik voel weerstand ten opzichte van de Heatbox. (Weerstand tegen het kopen, gebruiken of bestaan van de Heatbox)

Follow-up multiple choice question of Resistance

Table 8 Resistance multiple choice answer options

Dutch multiple choice option	English concept	Sources
Het past niet in mijn dagelijks leven	Usage	Kleijnen et al.,2009;
Het imago spreekt me niet aan	Perceived image	Laukkanen et al., 2007;
Het product heeft te veel economische en/of financiële risico's	Economic and financial risks	Ram & Sheth, 1989.
Ik ben bezorgd dat dit product schadelijk of ongeschikt is voor mijn gezondheid	Physical risk	Ram & Sheth, 1989.
Ik ben bezorgd dat dit product niet geaccepteerd wordt door mijn vriendenkring	Social risk	Kleijnen et al.,2009; Laukkanen et al., 2007;
Ik hecht waarde aan mijn huidige producten	Value and tradition	Ram & Sheth, 1989.

Openness to Experiences

Out of 44 items BFI scale, ten items are aimed for measuring Openness to Experiences; these items are listed in Table 9. Openness_7 and Openness_9 are reverse-scored items (John and Srivastava, 1999).

Table 9 Scale moderator

SPSS name	English items (John & Srivastava, 1999)	Dutch items (Denissen et al., 2008)
	I see myself as someone who...	Ik zie mezelf als iemand die...
Openness_1	Is original, comes up with new ideas	Origineel is, met nieuwe ideeën komt
Openness_2	Is curious about many different things	Benieuwd is naar veel verschillende dingen
Openness_3	Is ingenious, a deep thinker	Scherpzinnig, een denker is
Openness_4	Has an active imagination	Een levendige fantasie heeft
Openness_5	Is inventive	Vindingrijk is
Openness_6	Values artistic, aesthetic experiences	Waarde hecht aan kunstzinnige ervaringen
Openness_7	Prefers work that is routine	Een voorkeur heeft voor werk dat routine is
Openness_8	Likes to reflect, play with ideas	Graag nadenkt, met ideeën speelt
Openness_9	Has few artistic interests	Weinig interesse voor kunst heeft
Openness_10	Is sophisticated in art, music, or literature	Het fijne weet van kunst, muziek of literatuur

Appendix B – Products Pretest

1. The Heatbox

The website of the Heatbox (<https://www.myheatbox.com/>) provides information about the innovative product. The Heatbox is a self-heating lunchbox, which gives consumers freedom because they can have a hot meal anywhere and anytime. The Heatbox can heat up the food through autonomous steam technology. Besides, consumers can connect the Heatbox to their mobile phone and the Heatbox App. With this app, they can select the right steam program for each meal. In this way, the meals retain the right nutritional values.

Thanks to its lightweight and double sealing, the Heatbox is easy to carry in various bags (i.e., sports bags and backpack). The Heatbox is rechargeable and can heat the food three times per charge.

2. Portable Blender

The website of the Millo Chiller (<https://getmillo.com/>) provides information about the innovative product. The Portable Blender makes it possible to make a smoothie on the go. With the Portable Blender, consumers are no longer limited to a socket. The intuitive 360° touch allows consumers to start and control the mixing by touching the blender. With the smart stop function, the blender automatically stops mixing when the smoothie is ready.

Thanks to its compact design, the Portable Blender can be taken anywhere, even in a handbag. The blender is rechargeable and can mix ten smoothies per charge.

3. Drink Chiller

The website of Indiegogo (<https://www.indiegogo.com/projects/juno-like-a-microwave-for-cooling#/>) provides information about the innovative product. The Drink Chiller is a device that can rapidly chill drinks. In three minutes, the Drink Chiller can chill a bottle of wine, and a bottle of beer needs less than one minute to get cold. The Drink Chiller is also capable of chilling soft drinks and even hot drinks, such as coffee and hot tea, to the desired temperature. Within a few minutes, the drink is ‘ready to drink!’

The Drink Chiller uses MATRIX-powered thermoelectric technology to cool drinks quickly, using no noisy compressors or harmful chemical coolants. Also, the universal design enables practically any type of beverage bottle to be placed in the Drink Chiller for rapid cooling; it is suitable for a wide variety of bottles. Besides, the Drink Chiller tells consumers when the drink is ready, employing an LED status bar on the front of the Chiller.

4. Bluesmart Suitcase

The website of Indiegogo (<https://www.indiegogo.com/projects/bluesmart-series-2-smart-luggage-system#/>) provides information about the innovative product. The Bluesmart Suitcase is a case equipped with GPS technology. This technology allows consumers to track the location of their suitcase anywhere in the world by means of a smartphone. In addition, the suitcase has weight sensors. Therefore, consumers can easily measure the weight of the suitcase with their smartphones. The Bluesmart Suitcase also contains a possibility to charge devices, such as a laptop or mobile phone.

5. Smarty Pan

The website of SmartyPans (<https://smartyfans.io/>) provides information about the innovative product. The Smarty Pan is a pan with built-in weight and temperature sensors. This enables the Smarty Pan to calculate the nutrition of ingredients accurately. The pan guides consumers in adding ingredients and gives step by step instructions by using these sensors. It measures the exact quantity and monitors the temperature & cook times of each step. Besides, consumers can synchronize the pan with a cooking app, and always know exactly which steps to take while cooking.

Appendix C – Assumptions

Measurement level, correlation, and independence

The independent variable, schema (in)consistency, consisted of three conditions (1=schema consistency, 2=schema inconsistency, and 3=no use of schema theory). Therefore it was a categorical variable. Furthermore, the two dependent variables, innovation adoption and attitude toward innovation, and the covariate, openness to experience, were metrically scaled variables.

There was a significant positive correlation between innovation adoption and attitude toward innovation. It was a moderate effect ($r = ,477, p = ,000$). Because there was some degree of correlation between the dependent variables, MANCOVA was an appropriate analysis for this study (Hair et al., 2014). However, the dependent variables had a non-significant correlation with openness to experiences. Both were positive, but weak effects: $r = ,032, p = ,649$ for innovation adoption, and $r = ,116, p = ,100$ for attitude toward innovation. As a consequence, the assumption about the correlation between the covariate and dependent variables was not fulfilled. For correlations between all variables, see Table 12.

Conversely, there was independence between the independent variable and covariate. An analysis of variance (ANOVA) was conducted to illustrate this independence. Due to the fact that $F(2, 199) = 1,104, p = ,334$, was non-significant. This finding indicates that the independent variable and covariate had no significant relationship with each other and were independent (Hair et al., 2014).

Table 12 Correlations between the variables

	<i>M</i>	<i>SD</i>	1	2	3
1 Schema (in)consistency	1,95	,83			
2 Innovation adoption	26,44	8,54	,108		
3 Attitude toward innovation	7,23	4,02	,109	,477**	
4 Openness to experiences	26,84	4,63	,065	,032	,116
** $p < ,01$ (2-tailed)					

Normality

There were two ways applied to check the univariate normality, including using z-values and the test of normality. Both methods indicated that only openness to experience had a normal distribution. The other two variables had a non-normal distribution, namely innovation adoption had a slightly flat distribution, and attitude toward innovation had a positively skewed distribution. Transforming these variables did not produce better results for both the skewness and the kurtosis. Innovation adoption and attitude toward innovation still had a non-normal distribution. In view of the large sample size of more than 200 participants of this study, normality is not a major concern (Hair et al., 2014). Hence, the original data was continued. An overview of this assumption is shown in Table 13.

Table 13 Assumption of normality

Variable	Shape descriptors				Test of Normality	
	Skewness	Z-value	Kurtosis	Z-value	Statistic	Significance
Innovation adoption	-,174	-1,02*	-,802	-2,35**	,074	,008
Transformed Innovation Adoption ¹³	-,534	-3,12	-,306	-,90*	,088	,001
Attitude toward Innovation	,712	4,16	-,694	-2,04**	,171	,000
Transformed Attitude toward Innovation	,125	,731*	-1,311	-3,84	,135	,000
Openness to Experiences	,148	,87*	-,303	-,89*	,057	,200*

* Normal distribution at .05 significance level (< 1.96)
 ** Normal distribution at .01 significance level (< 2.58)
 Note 1: the z-values were derived by dividing by the standard error of ,171 (skewness) and ,341 (kurtosis).
 Note 2: Kolmogorov-Smirnov test of normality was used to calculate the significance.

Homoscedasticity

Although a non-normal distribution of variables was not a major concern for this study, it can cause heteroscedasticity (Hair et al., 2014). This is what you want to avoid, and that is why this assumption was checked. The probability level of the Levene's Test for innovation adoption was $F(2, 199) = ,081, p = ,923$, and for attitude toward innovation it was $F(2, 199) = 2,307, p = ,102$. Besides, the probability level of the Box's M test was $F(6, 846250,08) = ,568, p = ,756$. Both tests identified non-significant effects; there was equal (co)variance across groups.

Linearity

The scatterplots (in Figure 2) showed that there was a linear relationship. All matrices showed a pattern that started at the bottom left and ended at the top right. The scatterplot of innovation adoption and attitude toward innovation suggested a heteroscedastic pattern (Hair et al., 2014). However, Box's M test indicated the opposite: the data is homoscedastic. Hence, the original data was continued.

¹³ The transformations applied to the transformed variables are: log transformation, inverse transformation, and square root transformation. The best transformation is shown in the table, for transformed innovation adoption this is square root, and for the transformed variable of attitude toward innovation was log transformation used.

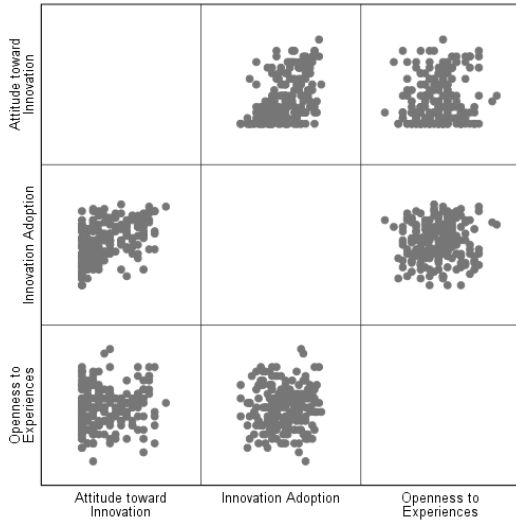


Figure 2 Assumption of Linearity

Group Differences and outliers

The boxplots (Figure 3) showed that there were differences in the dependent variables across the three conditions of schema (in)consistency. The conditions of schema (in)consistency were more equal for innovation adoption than for attitude toward innovation. Furthermore, there were some lower and upper extreme scores. Especially the upper score of attitude on the schema consistency condition was eye-catching. However, there were no outliers.

Additionally, for both dependent variables, schema inconsistency-condition had the lowest median score. That was the opposite of what was expected. The next step was to see whether there were also significant differences between the three conditions of schema (in)consistency.

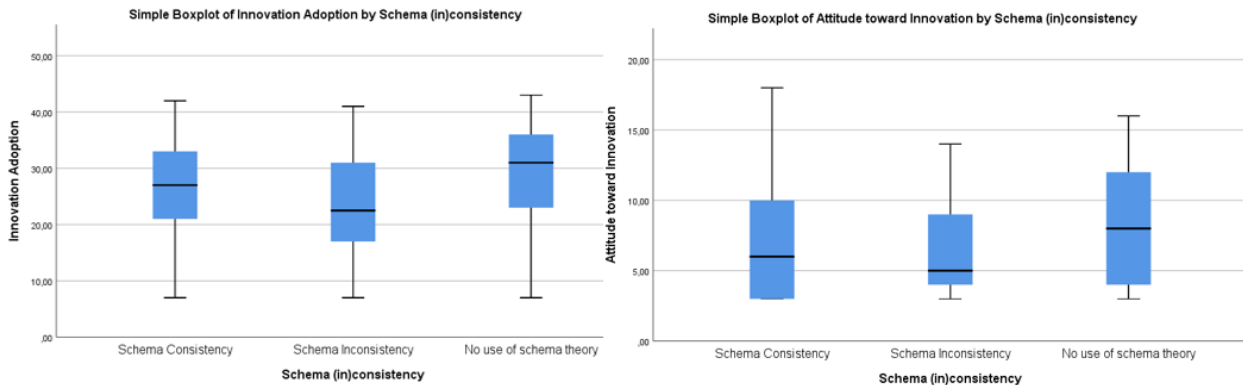


Figure 3 Simple Boxplots of Innovation adoption and Attitude toward innovation by schema (in)consistency

Appendix D – Resistance follow-up questions

Table 16 Resistance open-ended question

Respondent answer	Codes ¹⁴ Based on (Kleijnen et al., 2009; Laukkanen et al., 2007; Ram & Seth, 1989)
Kostenplaatje? Ik denk dat ik hem weinig gebruik, omdat ik niet veel onderweg ben of eten mee hoeft te nemen	Usage, Financial risks
De onwetendheid of het wel goed werkt of niet aangezien ik het niet ken.	Lack of knowledge
Early adaptors krijgen vaak te maken met de kinderziektes	Lack of knowledge
Een onnodig product	Perceived image
Eerst zien dan geloven	Lack of knowledge
Eet geen warme lunch	Usage
Enige weerstand is dat ik mijn lunch koud eet, dus dat spreekt tegen met het opwarmen	Usage
Eten opwarmen vind ik onwenselijk en ik hou niet van hypes	Physical risk, perceived image
Geen behoefte aan	Usage
Geen idee, het is weer iets nieuws en ik neem ook geen warm eten mee normaal gesproken, dus voor mij hoeft het niet verwarmd te worden.	Usage, lack of knowledge
Gevoel van weerstand, weet niet zo goed te onderbouwen waarom...	Value and tradition
Heb er niks mee	Perceived image
Heb ik niet nodig	Usage
Het "hippe" gedoe spreekt me niet aan.	Perceived image
Het is niet aan de orde om dit te gebruiken	Usage
Het is waarschijnlijk erg duur, en ik ken het merk nog niet.	Financial risks
Het komt over als een vrij onnodig product, iets wat mogelijk snel kapot gaat en niet goed is voor het milieu. Voelt als zeer niet essentieel in mijn leven.	Usage, value and tradition (environment)
Het lijkt me eigenlijk alleen maar gedoe, en ik heb er een hekel aan dat alles tegenwoordig door middel van technologie makkelijker gemaakt moet worden.	Value and tradition
Het lijkt me niet echt nodig. Wel handig maar niet echt nodig.	Usage
Het maakt mij niet uit alleen ik heb niks aan zo'n ding.	Usage
Hou er niet van om weer een apparaat mee te moeten sleuren dat ik elke dag moet opladen (heb daarom bijv. ook geen draadloze oortjes). Daarnaast vind ik het irritant dat het instellen van de juiste "stand" via een app moet en zie ik ook het nut er niet echt van in om een Heatbox te hebben. Loop nooit tegen het "probleem" aan dat ik warm eten wil hebben, maar dit niet kan zelf kan maken o.i.d.	Value and tradition
Ik denk dat het product te prijzig is voor mijn budget.	Financial risk
Ik denk dat hij misschien kortsluiting zou kunnen krijgen en daardoor zou kunnen exploderen in mijn tas	Physical risk
Ik eet meestal iets kouds, en in de avond, wanneer ik warm eet, ben ik vaak niet weg van huis	Usage
Ik eet niet dagelijks een warme maaltijd buiten de deur	Usage
Ik gebruik het niet in mijn routine	Usage
Ik heb geen behoefte aan een warme maaltijd in een lunch box	Value and tradition
Ik heb geen weerstand, zou er eerst wat meer van willen weten.	Lack of knowledge
Ik heb hier geen profijt bij.	Usage
Ik hecht steeds meer waarde aan minimalisme en vind dit dan dus ook niet iets wat je echt nodig hebt.	Value and tradition
Ik houd niet zo van warm eten, dus ik zou het niet graag elk moment van de dag een warme maaltijd willen eten.	Usage, value and tradition
Ik ken het product niet	Lack of knowledge
Ik ken het product niet en zie de toegevoegde waarde ervan niet in. het lijkt meer op een hebbing die je eenmalig gebruikt.	Lack of knowledge, value and tradition
Ik neem normaal gesproken geen warme maaltijden mee	Usage
Ik vind dat mensen niet zoveel spullen moeten kopen en alles willen hebben omdat dat slecht voor het milieu is	Value and tradition

¹⁴ These codes were checked and corrected by three other persons.

Ik vind de stoomfunctie ideaal. Dat is inderdaad veel beter voor je voedsel. We hebben thuis een eigen stoomoven, maar ik ben dan meer een voorstander om die te gaan gebruiken dan dat er nog meer dingen digitaal worden. We kunnen steeds minder zonder onze mobiel op deze manier.	Value and tradition
Ik vind gezond en vers eten en denk dat dit product niet aan mijn wensen kan voldoen	Physical risk
Ik vind het een mooi product maar het moet bij je gewoonten passen ik werk namelijk thuis dus neem ik nooit geen maaltijden mee na mijn werk	Usage
Ik vind het een overbodig product. Ik zou het zelf niet gebruiken	Usage, perceived image
Ik vind het product onzin. Ik eet mijn eten liever koud. Ik verbrand vaak mijn mond aan opgewarmd eten.	Usage, value and tradition
Ik vul zonet in dat ik neutraal ben, ik ken het product nog niet en ik vind s 'middags brood eten prima.	Lack of knowledge, usage
Ik weet niet in hoeverre dit product veilig is (een elektrische box in je tas meenemen), of de accu kan ontploffen etc.	Physical risk
Ik weet niet zeker of ik de Heatbox goed ga gebruiken	Usage, lack of knowledge
Ik zie de toegevoegde waarde van het product niet in mijn dagelijkse routines (e.g. ik neem geen warm te eten mee om buitenshuis te nuttigen).	Usage
Ik zou er geen gebruik van maken omdat makkelijk mijn eten kan opwarmen in de magnetron	Usage
Info waar ik niet om vraag	Perceived image
Interessant idee, maar voor mij niet heel nuttig.	Usage
Mensen moeten niet nog meer warm gaan eten. Zijn al dik genoeg	Physical risk
Mijn werk regelt lunch.	Usage
Niet al het eten is lekker als je het opnieuw opwarmt, zoals net een magnetron, ik vraag me af of de Heatbox hetzelfde effect heeft als een magnetron	Value and tradition, perceived image
Niet duurzaam, onbenullig, onnodig	Value and tradition (sustainability and environment)
Niet handig	Usage
Niet nodig, omdat ik gewoon thuis mijn eten maak en opeet.	Usage
Niet per se noodzakelijk	Usage
Omdat het een nieuw product is dat ik niet ken, weet ik niet of het een betrouwbaar product is (recensies van anderen is belangrijk voor mij)	Lack of knowledge, physical risk
Omdat ik het op dit moment niet nodig heb. Daarnaast heb ik nu te weinig kennis over hoe het product werkt.	Lack of knowledge, usage
Onbekendheid met het product	Lack of knowledge
Onnodig voor mij	Usage
Opdringerig	Perceived image
Past niet in mijn dagelijks leven	Usage
Slecht voor het milieu	Value and tradition (environment)
Te trendy, hip, onnodig	Perceived image
Voelt niet als iets nuttigs	Perceived image
Voor op het werk neem ik een salade en wat crackers mee, indien ik daar niets zou kunnen kopen.	Usage
Vraag me af of het gezond is, we nemen nog minder tijd om te eten. Kan dan altijd en overal tussendoor. Kan in sommige gevallen gemakkelijk zijn maar over het algemeen denk ik dat rustig eten aan tafel beter is.	Physical risk
Warmte opwekken met behulp van elektriciteit kost ontzettend veel elektriciteit. Daarnaast acht ik het hebben van een warme maaltijd in mijn pauze op school of werk niet noodzakelijk.	Value and tradition (environment), usage
Wij koken graag Proberen smaken. Maken geen probleem over koken eerder dat we zeggen nu kook ik vandaag komt weinig voor maar bij ons is dat zo	Value and tradition
Zie de meerwaarde niet t.o.v. regulier fornuis of magnetron	Value and tradition
Zie voor mezelf de meerwaarde er niet van in. Mis zo n product nu niet.	Value and tradition

Table 17 Comparison open-ended and multiple-choice question

Codes*	Open-ended question		Multiple-choice question	
	Frequency	Percentage	Frequency	Percentage
Usage	33	39,76%	85	54,84%
Perceived image	10	12,05%	20	12,90%
Economic or financial risk	3	3,61%	6	3,87%
Physical risk	7	8,43%	14	9,03%
Social risk	0	0%	3	1,94%
Value & tradition	18	21,69%	27	17,42%
Lack of knowledge	12	14,46%	Was not an option in the multiple-choice question	
Total	83 codes	100%	155	100%

*For both the open-ended question and the multiple-choice question, more codes/answers were applicable

Appendix E – Experiment

Beste respondent,

Allereerst bedankt voor uw tijd en betrokkenheid in dit onderzoek. Wij zijn Juliette van der Burg en Loïs van der Wielen, en wij zijn Master studenten aan de Radboud Universiteit in Nijmegen. Om onze Master in Bedrijfskunde (Marketing) succesvol af te sluiten, zijn wij bezig met ons afstudeeronderzoek. U kan ons helpen met afstuderen, door deze vragenlijst in te vullen.

De vragenlijst begint met enkele afbeeldingen. Wij willen u vragen om nauwkeurig naar deze afbeeldingen te kijken. Na één minuut verschijnt het pijltje, zodat u verder kunt naar de vragen¹⁵. Helaas kunnen wij u geen verdere uitleg geven over de vragenlijst, omdat dit onze resultaten kan beïnvloeden. Daarnaast willen wij benadrukken dat er geen goed of fout antwoord is, wij zijn enkel geïnteresseerd in uw mening.

Deze vragenlijst zal maximaal 10 minuten van uw tijd in beslag nemen. Uw reactie is volledig anoniem en de resultaten van de vragenlijst worden enkel gebruikt voor dit afstudeeronderzoek. Door verder te gaan met de vragenlijst geeft u aan dat u bovenstaande informatie gelezen heeft, u 18 jaar of ouder bent en de Nederlandse taal beheerst.

Als u vragen en/of opmerkingen heeft, neem dan graag contact met ons op via:

lois.vanderwielen@student.ru.nl

Part 1: schema consistency, schema inconsistency, and no use of schema theory (Timer = 1 minute)

Condition 1: Wij willen u vragen om de onderstaande afbeeldingen goed te bestuderen.

Eight schema consistent pictures

Note: refer to Table 6, left side

Condition 2: Wij willen u vragen om de onderstaande afbeeldingen goed te bestuderen.

Eight schema inconsistent pictures

Note: refer to Table 6, right side

¹⁵ This was not mentioned in the baseline condition (= no use of schema theory), because these participants did not see any pictures in the experiment.

Condition 3: these participants went directly sent to the second part of the survey.

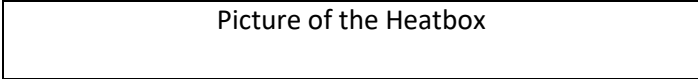
Part 2: Innovation adoption

De Heatbox

De Heatbox is de ‘zelf-verwarmende’ lunchbox. Deze lunchbox geeft u vrijheid, omdat u overal en altijd een warme maaltijd kunt nuttigen. De Heatbox kan namelijk uw eten verwarmen met één druk op de knop. Met behulp van autonome stoomtechniek wordt uw eten verwarmd. Daarnaast kunt u de Heatbox verbinden met uw mobiele telefoon en de Heatbox App. Met deze app kunt u het juiste stoomprogramma selecteren voor elke maaltijd. Op deze manier behouden uw maaltijden de juiste voedingswaarden.

Dankzij het lichte gewicht en een dubbele afsluiting is de Heatbox gemakkelijk mee te nemen in een sporttas, koffer of rugzak. De Heatbox is oplaadbaar en kan uw eten drie keer verwarmen per lading.

Picture of the Heatbox



In hoeverre bent u bekend met de Heatbox? Bekend betekent dat u het product al vaker heeft gezien of zelf gebruikt.

- Helemaal onbekend
- Enigszins onbekend
- Enigszins bekend
- Helemaal bekend

Zou u willen aangeven in hoeverre u het eens bent met de volgende stellingen:

1. Ik zou een kick krijgen van het kopen van de Heatbox voordat de meeste andere mensen weten dat dit product bestaat
2. Het is cool om als eerste de Heatbox te bezitten
3. De eerste zijn die de Heatbox koopt is belangrijk voor mij
4. Ik ben bereid tijd te besteden om de Heatbox beter te leren kennen
5. Ik ben bereid om de moeite te nemen om de Heatbox beter te begrijpen
6. Indien het gevraagd wordt, ben ik bereid om vandaag een demo van de Heatbox uit te proberen
7. De kans is aanwezig dat ik in de toekomst de Heatbox dagelijks ga gebruiken
8. De kans is aanwezig dat ik mijn huidige gewoonten en gedrag ga veranderen om de Heatbox effectief te (kunnen) gebruiken
9. De kans is aanwezig dat ik de Heatbox ga opnemen in mijn dagelijkse routine

10. Ik voel weerstand ten opzichte van de Heatbox. (Weerstand tegen het kopen, gebruiken of bestaan van de Heatbox)

Follow-up questions resistance (this is a routing, only the participant who indicated they were neutral, or had resistance, received these questions)

Zou u uw antwoord kunnen toelichten waarom u weerstand ervaart? (open-ended question)

Waarom ervaart u weerstand? Selecteer de reden(en) die het meest op u van toepassing zijn. Meerdere antwoorden zijn mogelijk.

- De heatbox past niet in mijn dagelijks leven/levensstijl
- Het imago van de Heatbox spreekt me niet aan
- De heatbox heeft te veel economische en/of financiële risico's
- Ik ben bezorgd dat de Heatbox schadelijk of ongeschikt is voor mijn gezondheid
- Ik ben bezorgd dat de Heatbox niet geaccepteerd wordt door mijn vriendenkring
- Ik hecht waarde aan mijn huidige producten

Part 3: Openness to experiences

Hieronder volgen een aantal kenmerken die wel of niet op u van toepassing zijn. Geef aan in hoeverre u het eens of oneens bent met de stelling.

Ik zie mezelf als iemand die..

1. Origineel is, met nieuwe ideeën komt
2. Benieuwd is naar veel verschillende dingen
3. Scherpzinnig, een denker is
4. Een levendige fantasie heeft
5. Vindingrijk is
6. Waarde hecht aan kunstzinnige ervaringen
7. Een voorkeur heeft voor werk dat routine is
8. Graag nadenkt, met ideeën spelt
9. Weinig interesse voor kunst heeft
10. Het fijne weet van kunst, muziek of literatuur

Part 4: demographic questions

De laatste vragen gaan over enkele persoonskenmerken

Wat is uw geslacht?

- Man
- Vrouw
- Dit zeg ik liever niet

Wat is uw leeftijd? (open-ended question)

Wat is uw hoogst behaalde opleidingsniveau?

- Basisonderwijs
- Voorbereidend beroepsonderwijs (lbo / vmbo)
- Hoger algemeen voortgezet onderwijs (havo)
- Voorbereidend wetenschappelijk onderwijs (vwo) / Gymnasium
- Middelbaar beroepsonderwijs (mbo)
- Hoger beroepsonderwijs (hbo)
- Wetenschappelijk onderwijs (wo) Bachelor
- Wetenschappelijk onderwijs (wo) Master
- PhD
- Anders

Einde van de vragenlijst.

Uw antwoorden zijn geregistreerd.

Hartelijk dank voor het invullen!

Als u nog vragen en/of opmerkingen heeft, kunt u contact opnemen met ons via het volgende e-mailadres:

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