FUNDAÇÃO GETULIO VARGAS
ESCOLA DE ADMINISTRAÇÃO DE EMPRESAS DE SÃO PAULO

CRISTIANO DO AMARAL BRITTO DE CASTRO

THE RELATIONSHIP BETWEEN AFFECT AND CONSUMERS' RESISTANCE TO INNOVATION

SÃO PAULO
2018

CRISTIANO DO AMARAL BRITTO DE CASTRO

THE RELATIONSHIP BETWEEN AFFECT AND CONSUMERS' RESISTANCE TO INNOVATION

Thesis presented to Escola de Administração de Empresas de São Paulo, Fundação Getúlio Vargas, for granting the title of PhD in Business Administration.

Research Area: Marketing Strategy

Thesis Advisor: Prof. Dr. Felipe Zambaldi

SÃO PAULO

2018

Castro, Cristiano do Amaral Britto de.
The relationship between affect and consumers' resistance to innovation / Cristiano do Amaral Britto de Castro. - 2018.
101 f.

Orientador: Felipe Zambaldi.
Tese (doutorado) - Escola de Administração de Empresas de São Paulo.

1. Inovações tecnológicas - Aspectos sociais. 2. Inovações tecnológicas - Aspectos psicológicos. 3. Comportamento do consumidor. 4. Consumidores - Atitudes. I. Zambaldi, Felipe. II. Tese (doutorado) - Escola de Administração de Empresas de São Paulo. III. Título.

CDU 658.89

Ficha catalográfica elaborada por: Cristiane de Oliveira CRB SP-008061/O
Biblioteca Karl A. Boedecker da Fundação Getulio Vargas - SP

CRISTIANO DO AMARAL BRITTO DE CASTRO

THE RELATIONSHIP BETWEEN AFFECT AND CONSUMERS' RESISTANCE TO INNOVATION

Thesis presented to Escola de Administração de Empresas de São Paulo, Fundação Getúlio Vargas, for granting the title of PhD in Business Administration.

Research Area: Marketing Strategy

Approval date:

_____ / _____ / _____

Thesis committee:

_____

Prof. Dr. Felipe Zambaldi (thesis advisor)
FGV – EAESP

_____

Prof. Dr. Delane Botelho
FGV – EAESP

_____

Prof. Dr. Emílio José Montero Arruda Filho
Universidade da Amazônia

_____

Prof. Dr. Diógenes de Souza Bido
Universidade Presbiteriana Mackenzie

To my parents, daughter and friends, who have shown great understanding throughout the process.

ACKNOWLEDGEMENT

It was quite a journey! Four years, that at times seemed very long, but at times also seemed very short. A lot happened in my personal and professional life during these past four years, but nothing really compares to what happened in my "inner self" life. The experiences, learnings and feelings from the past four years outplay any other I've had in my life, and I have a few people to thank for that.

My daughter was very close to me during the process, and even though she is still very young and might not be aware of this, she showed great understanding and great support at all times. My parents not only were of great incentive, but also were of great help. And so was my sister, her husband and her children. My friends were always there for me, but I'd like to name a few who were important during this journey, each one for different reasons: Luiz, Belezinha, Roberto, Ciro, Pimpom, Mineiro, Dani Pintão, Mari, Carmelita, Ana Duque, Miriam, Jimmy, Alan, Bruno.

Also, Felipe Zambaldi, my advisor, who were patient enough about my whining about the difficulties I faced, supportive enough to lead me through such difficulties, present enough to let me know he was there for me whenever I needed and, above all, friend enough to talk to me about life when that was what I needed. Thank you, professors who were part of the journey, as well: Delane, Tania, Parente, Elaine, Alcadipani, Laredo, Mazzon and Russel Belk. My dear PhD colleagues, Matheus, Felipe, Ramona, Karin, Farah, Ronan and Varotto, who all went through the same journey and know what I'm talking about, thank you. Delane, Bido and Emilio, thank you for the patience of reading this research and caring enough to give me great feedback.

Well, I hope I didn't forget anyone. If I did, I'm sorry, and I thank you too.

RESUMO

A literatura de Difusão da Inovação baseia-se em inovações bem-sucedidas e apresenta um viés pró-mudança, uma premissa de que inovações são positivas e serão adotadas por todos os consumidores. No entanto, uma grande parcela de novos produtos falha ao ser lançada no mercado e aqueles que não falham não são prontamente adotados por todos os consumidores, o que indica que a resposta natural do consumidor às inovações é a resistência. Apesar de sua importância tanto para pesquisadores quanto para gerentes, poucas pesquisas foram realizadas objetivando um melhor entendimento da resistência do consumidor à inovação. A literatura existente apresenta dois tipos de resistência: a Resistência Passiva à Inovação que é antecedente à Resistência Ativa à Inovação. Desconsiderando as indicações de que afeto possui um papel importante no processo decisório do consumidor, os fatores apresentados como antecedentes dos dois tipos de resistência são predominantemente cognitivos. Assim, a pesquisa aqui apresentada possui o objetivo de avaliar o impacto do afeto na resistência do consumidor à inovação. Em uma série de estudos baseados em equações estruturais, são apresentadas indicações de que afeto possui um papel moderador na relação entre Resistência Passiva e Resistência Ativa à Inovação, assim como acerca da existência de Resistência Ativa Cognitiva e Resistência Ativa Afetiva à Inovação. Considerando-se ambas formas de resistência ativa, obtêm-se maior poder explicativo e preditivo quanto à intenção de adotar a inovação por parte do consumidor do que se obtém utilizando-se apenas a forma cognitiva de resistência ativa, que é a dominante na literatura. Além disso, é demonstrado que a Resistência Ativa Afetiva por si só apresenta melhores resultados que a Resistência Ativa Cognitiva.

Palavras-chave: resistência à inovação, resistência ativa à inovação, resistência ativa afetiva, resistência ativa cognitiva, resistência passiva à inovação.

ABSTRACT

The Diffusion of Innovation literature is based on well succeeded products and present a pro-change bias, an assumption that innovations are positive and will be adopted by all consumers. However, a large portion of new products fail and those that do not fail are not promptly adopted, indicating that consumers' natural response to innovations is resistance. Despite its relevance to both researchers and managers, little research has been conducted toward a deeper understanding of consumers' resistance to innovation. The extant literature presents two types of resistance, Passive Innovation Resistance (PIR) which is the antecedent of Active Innovation Resistance (AIR). Notwithstanding the indications that affect plays a major role in consumers' decision-making process, mostly cognitive factors are listed as antecedents of both. Thus, the studies herein aim to evaluate the impact of affect on consumers' resistance to innovation. In a series of studies based on structural modelling, it is presented here indications of the moderating role of affective state in the relationship between PIR and AIR, as well as of the existence of both cognitive and affective active resistance to innovation. Considering both forms of AIR yields higher explanatory and predictive power as to intention to adopt that considering only the cognitive form of AIR, which is the prevailing understanding of AIR in the literature. Also, the affective form of AIR alone is shown to provide better results that the cognitive form alone.

Keywords: consumers' resistance to innovation, active innovation resistance, affective active resistance, cognitive active resistance, passive innovation resistance

LIST OF ILLUSTRATIONS

EXHIBITS

FIGURES

TABLES

LIST OF ABBREVIATIONS

AAR	Affective Active Resistance
AB	Arousal Barrier
ADR	Affective-Dominant Resistance
AffResp	Affective Response
AIM	Affect Infusion Model
AIR	Active Innovation Resistance
AIRc+a	Active Innovation Resistance comprised of cognitive and affective dimensions
AIRs	Active Innovation Resistance simple model
AttHTP	Attitude Towards high tech Products
AVE	Average Variance Extracted
CAR	Cognitive Active Resistance
CB	Complexity Barrier
CDR	Cognitive-Dominant Resistance
CR	Composite Reliability
CRi	Cognitive Rigidity
DB	Dominance Barrier
DOI	Diffusion of Innovations
DSI	Domain-Specific Innovativeness
ER	Emotional Response to imposed changes
HIS	High Infusion Strategy
IRC	Inclination to Resist Changes
LIS	Low Infusion Strategy
OB	Observability Barrier
PAD	Pleasure - Arousal - Dominance
PANAS	Positive Affect and Negative Affect Scale
PB	Pleasure Barrier
PIR	Passive Innovation Resistance
RB	Risk Barrier
RS	Routine Seeking
SOR	Stimulus - Organism - Response
SQS	Status-Quo Satisfaction
SQSI	Status-Quo Satisfaction toward Innovations
SQSP	Status-Quo Satisfaction toward Products
STF	Shot-Term Focus
TB	Trialability Barrier
UB	Usage Barrier
VB	Value Barrier
VIF	Variance Inflation Factor

SUMMARY

1. INTRODUCTION

The launching of new products is considered an essential activity of companies (Balachandra & Friar, 1997; Cooper, 2011; Prins & Verhoef, 2007), since it contributes to firm's long-term financial success (Bayus, Erickson, & Jacobson, 2003), and fosters companies' competitive position (Gourville, 2006; Shankar, Carpenter, & Krishnamurthi, 1998). Thus, innovations are a sensitive aspect of firm's strategies and require high investments in respective areas. These high expenditures on researching and developing new products require a quick return on investment, and a key element for that to happen is the new product's successful launch and fast diffusion in the market (Montaguti, Kuester, & Robertson, 2002).

Most literature on consumers' new product adoption behavior focuses on well-succeeded innovations and considers only the positive outcomes and the motivating factors within the adoption process (Heidenreich & Spieth, 2013; Rogers, 1976). This emphasis is rooted in the belief that innovativeness is one of the main drivers in consumers' behavior (Hirschman, 1980; Rogers, 2003) and in the assumption that innovations are positive and should be adopted by everyone (Rogers, 1976; Sheth, 1981). Consumers are considered to be willing to accept all changes imposed by the innovations, indicating the existence of a pro-change bias in the new product adoption literature (Heidenreich & Kraemer, 2015a; Heidenreich & Spieth, 2013; Ram, 1989; Ram & Sheth, 1989; Rogers, 1976; Sheth, 1981).

However, the incidence of unsuccessful market introductions for new products is alarmingly high, with failure rates around 40% of those products that reach the market (Castellion & Markham, 2013). Innovations that fail cannot generate future revenues, nor strengthen the firm's competitive position, hence representing ineffective investments. This indicates the importance of understanding the reasons for consumers' non-adoption of the innovation.

Whether innovations are rejected permanently or temporarily, which slows down its adoption process, there is some degree of resistance before its adoption most of the time (Kuisma, Laukkanen, & Hiltunen, 2007), and despite its importance to both managers (Garcia, Bardhi, & Friedrich, 2007; Gourville, 2006) and researchers (Ram & Sheth, 1989; Sheth, 1981), little research has been done on consumers' resistance to innovation (Claudy, Garcia, & Driscoll, 2015; Sheth, 1981; Talke & Heidenreich, 2014).

Researchers seem to agree that such resistance may be product- (Bagozzi & Lee, 1999; Kleijnen, Lee, & Wetzels, 2009; Laukannen, Sinkonnen, & Laukannen, 2007; Ram & Sheth, 1989; Rogers, 2003; Sheth, 1981; Szmigin & Foxall, 1998), consumer- (Bagozzi & Lee, 1999; Heidenreich & Kraemer, 2015b; Heidenreich & Spieth, 2013; Oreg, 2003; Oreg & Goldenberg, 2015; Ram, 1987), and situation-related (Ellen, Bearden, & Sharma, 1991; Heidenreich & Kraemer, 2015b;

Heidenreich & Spieth, 2013; Ram & Sheth, 1989; Sheth, 1981). The combination of such factors originates two different types of resistance to innovations. Active innovation resistance (AIR) is described as a negative attitude formation driven by functional and psychological barriers that follow careful new product evaluation (Heidenreich & Handrich, 2015). On the other hand, passive innovation resistance (PIR) is described as a predisposition to resist innovations due to an individual's inclination to resist changes (IRC) and status-quo satisfaction (SQS) that forms somewhat unconsciously prior to new product evaluation (Heidenreich & Handrich, 2015).

In both AIR and PIR, its generating factors are of cognitive nature. Emotions are rarely taken into consideration when consumers' resistance to innovation is discussed (Bagozzi & Lee, 1999). However, it has been suggested and empirically proven that affect (a general term that encompasses mood and emotion [Bagozzi, Gopinath, & Nyer, 1999]) play an important role in consumers' decisions. For instance, it has been confirmed that consumers' level of happiness influences product choices (Mogilner, Aaker, & Kamvar, 2012). Also, consumers' level of hope might influence how they will perceive product's claims (de Mello & MacInnis, 2005; MacInnis, de Mello, & Patrick, 2004). Consumers' level of optimism/pessimism influences the outcome of an ad perception (Chaudhuri, Aboulnasr, & Ligas, 2010). Adding emotions to the Technology Acceptance Model (TAM) increases its explanation power (Ferreira, da Rocha, & da Silva, 2014; Kulviwat et al., 2007). All of these findings confirm the propositions of Forgas (1995) and Gardner (1985) that affect is an important piece in consumer's information processing.

Even though a lot has been discussed about affect in the literature, So et al. (2015) indicate the necessity to extend the extant research on emotions and consumer decision making. One of the calls they make is for exploring "the nature of the decision-making contexts and investigate how emotional appraisals might interact with the decision-making contexts to shape judgments" (p. 11). In that sense, it is proposed herein that affect also plays a role in consumer's resistance to innovations. More specifically, the investigations are twofold. First, considering PIR's impact on AIR and its higher prediction power than innovativeness as to consumers' adoption of innovations (Heidenreich & Spieth, 2013), this research seeks to enhance our understanding of the factors influencing PIR and contends that consumers' affective state play a moderation role between PIR and AIR.

Second, in line with Bagozzi and Lee (1999)'s study that proposes that emotions are part of the information taken into consideration by the consumer when deciding whether to adopt or reject and innovation, this research seeks to evaluate the weight of affect in consumer's decision when appraising an innovation. Thus, the role of affect is evaluated on both PIR and AIR, which is in line with Talke and Heidenreich (2014)'s call for research that "tests the influence of different adopter-specific, situation-specific or innovation specific factors on rejection behavior throughout

the decision process" (p. 905). In that sense, contributions will be made to both researchers and managers, since the understanding of the mechanisms underlying consumers' relationship with innovations will be extended, which in turn offers new perspectives on how to overcome consumers' resistance to innovative products.

The remainder of this research is organized as follows. The next section presents a literature review on resistance to innovation and affect as well as the hypothesis and expectations generated by such review. Afterwards, details on data and measures are offered, and then the results of the research are discussed. Finally, the implications of the empirical results are presented and some directions for future research are outlined.

2. CONCEPTUAL BACKGROUND

2.1. Resistance to Innovation

It's been suggested the existence of a pro-change bias in the literature of Diffusion of Innovation (DOI) (Heidenreich, Kraemer, & Handrich, 2016; Ram, 1987; Ram & Sheth, 1989; Sheth, 1981; Talke & Heidenreich, 2014). Such bias assumes that consumers are eager for novelties, and willing to adopt new solutions for their needs. However, most individuals tend "to strive for consistency and status quo rather than to continuously search for, and embrace new behaviors" (Sheth, 1981, p. 274). Indeed, a very small fraction of the market is willing to promptly adopt innovations (Moore, 2014; Rogers, 1976, 2003), which causes a high failure rate for new products in the market (Castellion & Markham, 2013; Oreg & Goldenberg, 2015) and indicates the existence of different mechanisms in the behavior of most consumers.

Such mechanisms, named resistance to innovation, present three major characteristics (Ram & Sheth, 1989): (1) it impacts the time it will take consumers to adopt an innovation; (2) it exists in different degrees, ranging from inertia to very active resistance, where consumer preach against an innovation (Kleijnen et al., 2009; Szmigin & Foxall, 1998); and (3) it exists in all sorts of product categories, from complex innovations (e.g.: genetically modified food, auto-piloting cars) to simpler innovations (e.g.: twisting wine cap [Garcia et al., 2007]). Also, Ram (1989) establishes that such kind of resistance will only take place when consumers perceive the new product as an innovation, which then adds a perspective of perceived newness to the product that plays an important role in the understanding of the phenomenon.

Different types of resistance have been proposed (Szmigin & Foxall, 1998): (1) postponement, which is defined as "an active decision not to adopt an innovation at that moment in time" (p. 352), and is proposed to be a twofold construct by Bagozzi and Lee (2005), enclosing (a) active emergent resistance, when consumers delay the action of an already taken decision; and (b) passive emergent resistance, that takes place when consumers face difficulty in reaching a decision; (2) rejection, referring to "the active decision to not at all take up an innovation which had been introduced to market." (p. 352); and (3) opposition, the strongest form of resistance, described as the "active behavior directed in some way towards opposing the introduction of an innovation" (p.

353), considered by some as not pertaining to the resistance continuum, since it poses no difference from Rejection in terms of adoption of the innovation (Claudy et al., 2010a).

Thus, the term 'resistance to innovation' has been used to explain different mechanisms across different studies. Some studies view it as a negative attitude that results from the evaluation of any given new product (Kleijnen et al., 2009), whereas other studies see it as any individual's predisposition to resist an innovation (Szmigin & Foxall, 1998). Thus, such resistance may be a result of (1) product-specific barriers, which describes the consumer's perceptions as to the attributes of the new product, including its relative advantage, complexity, compatibility, trialability, and observability (Gatignon & Robertson, 1985; Ram, 1987; Rogers, 2003), as well as of (2) adopter-specific, which includes cognitive rigidity and aversion to risks and/or changes, and (3) situation-specific barriers, that reflects the circumstances of the adoption, including factors such as product already possessed by the consumer and monetary restrictions. In an attempt to solve such variation in meaning, the terms Active Innovation Resistance and Passive Innovation Resistance have been proposed (Heidenreich & Spieth, 2013; Talke & Heidenreich, 2014).

2.1.2. Active Innovation Resistance

Active Innovation Resistance (AIR) is the most commonly portrayed form of resistance (Bagozzi & Lee, 1999; Ellen et al., 1991; Kleijnen et al., 2009; Laukannen et al., 2007; Szmigin & Foxall, 1998), and is defined as an attitudinal outcome that follows an unfavorable new product evaluation (Nabih et al., 1997). It has been suggested that such attitudinal outcome is part of an appraisal process in which Reasons For and Against Adoption precede Attitudes Towards Adoption and Adoption Intentions, which in turn influence the Adoption Behavior (Claudy et al., 2015).

Thus, it is a deliberate form of resistance that evolves from innovation-specific factors, indicating it is an outcome of the Persuasion Stage of the Innovation-Decision Process (Talke & Heidenreich, 2014), which is the stage when consumers form their favorable or unfavorable attitude toward the innovation depending on how they evaluated it (Rogers, 2003). If consumers' perceptions of product attributes do not meet their expectations, innovation-specific barriers arise. If such barriers surpass consumers' self-specified threshold, a negative attitude towards the innovation is formed, characterizing an active

resistance to innovation. Higher levels of AIR will likely lead to congruent behavior (Kuisma et al., 2007).

AIR is driven by functional and psychological barriers (Ram & Sheth, 1989; Talke & Heidenreich, 2014), both of which are of a cognitive nature. Functional barriers are related to the changes that the innovation may cause in the individual's routine, and arise when consumers perceive any product attribute as not fitting their specific needs and/or usage patterns or as being dysfunctional (Bagozzi & Lee, 1999; Nabih et al., 1997). On the other hand, psychological barriers are related to incongruences caused by the new product with the individual's belief structures or risk-acceptance levels, as shown in exhibit 1. Different authors have used functional and psychological barriers to investigate the adoption/resistance of modern innovations, such as internet and mobile banking (Kuisma et al., 2007; Laukkanen, 2015), electric car (Wiedmann et al., 2011) green innovations such as electricity micro generation technologies (Claudy et al., 2010a, 2010b), and the purchase of experience goods online (Lian & Yen, 2013).

Depending on the context, different barriers are suggested as more prominent, but all barriers were proven to have some impact on the consumers' decision to adopt or resist the innovation. Kleijnen, Lee and Wetzels (2009), for instance, investigated such functional and psychological barriers with consumers, and found that perceived risks is the most important reason for individual to resist innovations (functional and economic risks are the most relevant types of risks), followed by Product Usage patterns.

Exhibit 1: sources of AIR, based on Talke and Heidenreich (2014)

Functional Barriers	
Value	refers to a perceived lack of relative advantage or superior performance by the innovation over existing alternatives
Complexity	how difficult to understando and/or use the innovation is perceived to be
Trialability	relates to the perceived difficulties in testing the innovation prior to adoption
Compatibility	emerges if a innovation is perceived as incompatible with existent and past products
Co-Dependence	emerges if an innovation is perceived to depend too heavily on additional products for full functionality
Visibility	refers to the difficulty of observing other consumers using the product
Communicability	reflects a perceived ineffectiveness when describing the benefits or shortcomings of the innovation
Amenability	arises when an innovation seems to have limites potential to be modified, updated, or tailored to specific needs
Realisation	occurs if the time span before the benefits of the innovation become manifest is perceived as too long
Psychological Barriers	
Norm	occurs if an innovation is perceived as violating group norms, or societal and family values
Image	relate to unfavorable associations attributed to innovation, such as brand, manufacturer, origin
Usage	emerges if the innovation is not compatible with existing workflows, practices, or habits
Information	relates to perceived information asymmetries that make consumers uncertain of unwanted consequences
Perceived Risks	related to the uncertainties and potential side effects of adopting the innovation
	physical risk: harm to person or property
	economic risk: the higher the cost of the innovation, the higher the risks
	functional risk: innovation's performance uncertainty
	social risk: social ostracism or peer ridicule generated by the innovation

However, resistance to innovation may happen in two distinct moments: (1) at later stages of the consumer decision process (i.e. AIR), or (2) at the very beginning of the process,

prior to any decision taking (Bagozzi & Lee, 2005, 1999). Such possibility indicates that when consumers are exposed to an innovation, they may react by resisting it, which indicates a different form of resistance to innovations.

2.1.2. Passive Innovation Resistance

Consumers resisting the innovation as soon as they are exposed to it may be a "consumer's predisposition to resist innovation prior to new product evaluation" (Heidenreich & Spieth, 2013, p. 3). Therefore, it is proposed that consumers' resistance to innovations is not only an active process but also a passive process, which then leads to the name Passive Innovation Resistance. "Passive Innovation Resistance seems to be different from a product-specific resistance that evolves from a comprehensive product evaluation. Instead, it is seen to be more of a common predisposition to resist innovations" (p. 4), being an antecedent of AIR, and negatively related to consumer innovativeness (Heidenreich & Spieth, 2013). Considering it is a consumer's predisposition, it has been found to also correlate to the Big Five Personality Traits – negatively correlated with extraversion, agreeableness and openness to experience, and positively correlated to conscientiousness and neuroticism (Heidenreich & Handrich, 2015), which indicates that it may be considered innate.

One of the dimensions of PIR is considered to be inclination to resist changes, which is an adopter-specific dimension (Heidenreich & Spieth, 2013; Talke & Heidenreich, 2014). Innovations naturally modify the individual's routine, because it implies that things necessarily will be carried on in a different manner. Thus, resisting to innovations might be a form of resisting to changes. As a personality trait, resistance to changes has been found to result from four factors: (1) routine seeking (RS), related to the incorporation and importance of routine in an individual's day-to-day life; (2) emotional reaction to imposed change (ER), that is, how consumers' emotional reactions to change are, measured through items of psychological resilience and reluctance to lose control; (3) short-term focus (STF), which indicates how the individual perceives the short-term inconveniences brought by the innovation; and (4) cognitive rigidity (CRi), related to the frequency and ease with which the individual change his/her mind (Oreg, 2003).

PIR is also dependent on a situation-specific dimension to account for factors other than those within consumers' control. Consumers might resist innovations if they experience high levels of satisfaction with the current form of solution to their needs, which may

vary according to the situation (Ellen et al., 1991; Sheth, 1981). So, PIR's second dimension is status-quo satisfaction (Heidenreich & Kraemer, 2015a; Heidenreich & Spieth, 2013; Talke & Heidenreich, 2014), which may refer to consumer's satisfaction with current product (SQSP) and also with current innovations (SQSI). The addition of such dimension allows better predictions of consumer behavior as to the adoption of innovations (Heidenreich & Kraemer, 2015b).

Exhibit 2: sources of PIR, based on Talke and Heidenreich (2014)

Inclination to Resist Change (IRC)	
routine seeking	individual's tendency to resist change because s/he avoids unfamiliarity
emotional reaction to imposed change	relates to the individual's need for stimulation and novelty
short term thinking	individual's posture to resist change and avoid more effort in the short term
cognitive regidity	a form of stubborness and unwillingness to consider alternative ideas or perspectives
Status-Quo Satisfaction (SQS)	
satisfaction with extent of innovation	relates to how much the personnal need for innovation is satisfied or not
satisfaction with existing product	relates to the degree of satisfaction with available technological products

Based on these two dimensions (exhibit 2), four different types of PIR may be described: (1) Cognitive Passive Resistance (high IRC and low SQS), (2) Low Passive Resistance (low IRC and low SQS), (3) Situational Passive Resistance (low IRC and high SQS), e (4) Dual Passive Resistance (High IRC and High SQS). The lowest adoption intention rate is found in consumers presenting dual passive resistance, followed by consumers with cognitive and situational resistances. Consumers with low passive innovation resistance present the highest rates for adoption intention (Heidenreich et al., 2016).

Literature, therefore, suggests that both active and passive consumer's resistance to innovation are of cognitive nature. However, such processes may be impacted by irrational factors (Oreg & Goldenberg, 2015). Accordingly, emotions have been reported to be an important aspect of consumers' decision process (Bagozzi et al., 1999; Forgas, 1995; Richins, 1997; So et al., 2015). More specifically, regarding the adoption of innovations, it has been proposed that innovations promote paradoxes in consumer's perceptions (i.e.: (a) control/chaos, (b) freedom/enslavement, (c) new/obsolete, (d) competence/incompetence, (e) efficiency/inefficiency, (f) fulfills/creates, needs, (g) assimilation/isolation, (h) engaging/disengaging) that generate emotional responses, such as stress (Mick & Fournier, 1998). Thus, consumers may resist innovation to avoid these emotional responses (Bagozzi & Lee, 1999).

Confirming the importance of emotional aspects in consumers' relationship with innovations, the Technology Acceptance Model (Davis, Bagozzi, & Warshaw, 1989; Davis, 1989; Venkatesh & Davis, 2000) had its prediction power increased when the

Pleasure-Arousal-Dominance (PAD) model of emotions (Bakker et al. 2014; Mehrabian, 1996; Mehrabian & Russell, 1974; Russell & Mehrabian, 1977) was incorporated into it (Ferreira et al., 2014; Kulviwat et al., 2007; Venkatesh, 2000). So, there are multiple indications that resistance of innovation may not be an all-cognitive process.

2.3. The Role of Affect in Consumer Behavior

Emotions have been described as a mechanism whose role is to enhance an organism's chance of survival (Plutchik, 1980), and have been described as an important piece in understanding consumer behavior (Forgas, 1995; Gardner, 1985; Mehrabian, 1996; Mehrabian & Russell, 1974; Mogilner et al., 2012).

Different terms have been used to refer to emotions, such as affect, emotions, and mood. Even though such terms may be considered as synonymous by some, it is important to distinguish among them. Emotion is defined as "a mental state of readiness that arises from cognitive appraisals of events or thoughts" (Bagozzi et al., 1999, p. 184), and is often expressed physically (e.g., in gestures, posture, facial features). Emotions are intentional, in the sense that it always refers to something, and relate to action tendencies. In turn, mood is different from emotions because it lasts longer and, normally, possess a lesser intensity. Thus, "moods are often resistant to changes in events surrounding them" (Bagozzi et al., 1999, p. 188). As for affect, it is considered a more general term, broader, embracing different mental processes. It is an "umbrella of positive and negative sentiments, emotions, feelings and moods that are experienced in many different circumstances and have an influence in the way we reason and make decisions" (Perlusz, 2004, p. 845).

Some authors see emotions as the result of appraisal processes comprised of different dimensions (Roseman [1991] proposes five dimensions, whereas Smith and Ellsworth [1985] propose six), being the combination of such dimensions what makes each emotion unique (Bagozzi et al., 1998; Roseman, 1991; Smith & Ellsworth, 1985). Thus, emotions are the result of the interpretation of environmental stimuli and will lead to some type of decision on the individual's part.

However, as part of the Stimulus-Organism-Response (S-O-R) model, Mehrabian and Russel (1974) proposed a simpler model, comprised of only three dimensions: (1) pleasure, (2) arousal, and (3) dominance (PAD model). The environmental stimuli (e.g.:

store environment [Jang & Namkung, 2009], online shopping environment [Peng & Kim, 2014], visual merchandising [Ha & Lennon, 2010]) will activate the senses, which in turn will generate affective responses (i.e. pleasure, arousal and dominance) that may be of either positive or negative nature. As a result, consumer will respond with an approach-avoidance behavior. Havlena and Holbrook (1986) compared the PAD model with other models, and found results that favor Mehrabian and Russel's model in terms of reliability, and internal and external validities.

As for PAD's first dimension, any stimulus may be placed along a continuum of pleasure-displeasure, which "indicates the relative predominance of positive versus negative affective states across a representative sample of life situations" (Mehrabian, 1996, p. 265), meaning that emotions may be described simply in terms of positive or negative feelings. It has been argued that pleasure is the most affect-laden dimension of all three, and responsible for explaining a large portion of the variance in consumer's responses to appraisals (Bakker et al., 2014; Russell & Pratt, 1980)

Also, emotions may be termed as arousing or non-arousing, which reflects an individual's degree of excitement (Vieira, 2008). However, it is controversial whether arousal is indeed an emotional dimension. Bakker et al. (2014) understand that, based on the operationalization of such construct made by Mehrabian (1996), it is possible to infer that arousal might be a cognitive-laden construct, since it is defined as a combination of mental and physical alertness and physical activity. Clore, Ortony and Foss (1987) also defend that arousal is not an emotional state, since they argue that emotions cannot be defined by descriptors that refer to bodily states such as sleepy and droopy. Nonetheless, arousal has been widely used in the literature of marketing and psychology to measure an individual emotional state, and has been reported as effective (Chaudhuri & Micu, 2014; Ferreira et al., 2014; Holbrook & Batra, 1987; Jang & Namkung, 2009; Mehrabian, 1978, 1996; Russell & Mehrabian, 1978; Vieira, 2008).

The third dimension is Dominance, which refers to a "person's characteristic feelings of control and influence over his life circumstances versus feelings of being controlled and influenced by others or events" (Mehrabian, 1996, p. 266). This dimension is also controversial, and has been suggested to have little influence on emotions (Russell & Pratt, 1980; Vieira, 2008). However, just as in the case of arousal, multiple studies have tested dominance's effect on emotions, and have presented positive results (Bradley &

Lang, 1994; Edell & Burke, 1987; Ferreira et al., 2014; Jang & Namkung, 2009; Mehrabian, 1978, 1996; Russell & Mehrabian, 1978). Yani de Soriano and Foxall (2006) suggest that dominance is as important as pleasure and dominance in describing emotions, and that one possible explanation for the belief that dominance has little impact on emotions is the fact that researchers might favor pleasure and arousal dimensions, not relying on dominance for their analysis, which then causes dominance to always explain little of model's variance. Thus, instead of a two dimensional structure of emotions suggested by some authors (Russell & Pratt, 1980; Vieira, 2008), Bakker et al. (2014) suggest the maintenance of a three dimensional one.

The S-O-R model, therefore, predicts that affect influences individuals' responses to the environment, and it has been suggested that such influence varies according to the individual's processing conditions (Forgas, 1995; Petty et al., 1993; Shiv & Fedorikhin, 1999). The Affect Infusion Model (AIM) predicts that processing choices are determined by three groups of variables: (a) the target, (b) the judge, and (c) the judgmental situation (Forgas, 1995), which are the same variables that impact AIR and PIR (i.e. innovation, consumer and situation) and that will indicate whether individuals use either Low or High Infusion information processing strategies.

Low Infusion Strategies (LIS) are used when individuals base their judgmental decisions solely on cognitive basis (e.g.: repeated purchases), whereas High Infusion Strategies (HIS) depend on emotions and moods to assist individuals on their decision-making (e.g.: a new product purchase). In HIS, emotion and mood are used both in simplified and extensive information-processing processes. In simplified processes, the infusion of affect should assist judgment in situations of low familiarity with the target, low personal relevance, and lack of appropriate processing resources, such as time. Affect infusion in situations such as these allows individuals to make decisions with an extra piece of information, the affect itself (Forgas, 1995; Shiv & Fedorikhin, 1999). On the other hand, in extensive information-processing tasks, where it is assumed that individuals will rely on cognitive processes to make better decisions, Petty et al. (1993) reported that positive mood produces more positive judgments because it "influences attitudes indirectly by modifying the positivity of thoughts in the high elaboration conditions" (Petty et al., 1993, p. 5).

Opposite to what Appraisal Theorists suggest and in line with the findings of Forgas (1995) and Petty et al (1993), Zajonc (1980) reports that affective reactions to stimuli may precede cognitive processing, which is "consistent with evolutionary psychology and the theory that emotions serve to ensure a readiness to respond, such as with approach/avoidance behaviors or by motivating and guiding further information processing" (Kwortnik & Ross, 2007, p. 325). Perlusz (2004) suggests that individuals will rely on cognitive processing only in negative affect situations, which will lead to more complex appraisals of the situation to find more adequate solutions. But, in situations of positive affect, individuals simplify their information-processing processes, which makes them more susceptible to their affective states.

In line with that argument, happiness has been found to determine consumer's choices of products such as music, tea, and water. More specifically, the meaning of happiness attributed by the individual, if it is related to exciting or calming states, impacts on the individual's choice of exciting or calming products (Mogilner et al., 2012). Such findings are also consistent with Gardner (1985)'s argument that the consumer's mood states will impact his/her recall and evaluation of marketing stimuli, as well as his/her behavior. Also, consumers' hopefulness impacts on their motivations, self-regulation mechanisms and risk taking behavior (MacInnis & Chun, 2006; MacInnis et al., 2004), propensity to indebtedness (Barros & Botelho, 2012), and on their attitudes towards brand and products (MacInnis & De Mello, 2005).

2.3. Affect and Resistance to Innovation

Consumers' resistance to innovation may present itself either in a passive or in an active manner (Heidenreich & Handrich, 2015; Heidenreich & Spieth, 2013; Talke & Heidenreich, 2014). According to Heidenreich and Spieth (2013), PIR is related to adopter- and situation-specific barriers, whereas AIR concerns product-specific barriers, which are all cognitive laden contexts. However, it is proposed herein that affect may play an important role in both passive and active resistance to innovations, and to better explore such proposal, the impact of affect on PIR and AIR will be discussed separately

2.3.1. Study 1: Affect and Passive Resistance to Innovation

Researchers have long been discussing forms to decrease consumers' resistance to innovation, given that companies could benefit from greater rates of adoption (Bagozzi

& Lee, 2005; Garcia et al., 2007; Ram, 1989; Ram & Sheth, 1989). Such researchers all focused on the active resistance aspect of consumers' behavior. More recently, it was suggested that decreasing consumers' PIR would cause AIR levels to decrease as well (Heidenreich & Spieth, 2013), which lead to investigations on different ways to decrease PIR (Heidenreich & Kraemer, 2015a).

Considering the four types of PIR (Heidenreich & Handrich, 2015; Heidenreich & Kraemer, 2015b; Heidenreich et al., 2016; Heidenreich & Spieth, 2013; Talke & Heidenreich, 2014), that are based on the construct's two dimensions, some specific tools have been proven to decrease different types of consumers' PIR (Heidenreich & Kraemer, 2015a). Cognitive-Passive Resistance, which is characterized by high levels of IRC and low levels of SQS, may be reduced using benefit comparison, whereas mental simulation may reduce Situational-Passive Resistance, which presents low levels of IRC and high levels of SQS. However, it is the proposal of this research that affective states may also influence the impact of PIR on AIR, and investigating such phenomenon may lead to new forms of lower PIR's impact.

It has been confirmed that consumers' level of happiness influences product choices (Mogilner et al., 2012), consumers' level of hope might influence how s/he will perceive product's claims (de Mello & MacInnis, 2005; MacInnis et al., 2004), and consumers' level of optimism/pessimism influences the outcome of an ad perception (Chaudhuri et al., 2010), all of which confirm the propositions of Forgas (1995) and Gardner (1985) that affective states are an important piece in consumer's information processing.

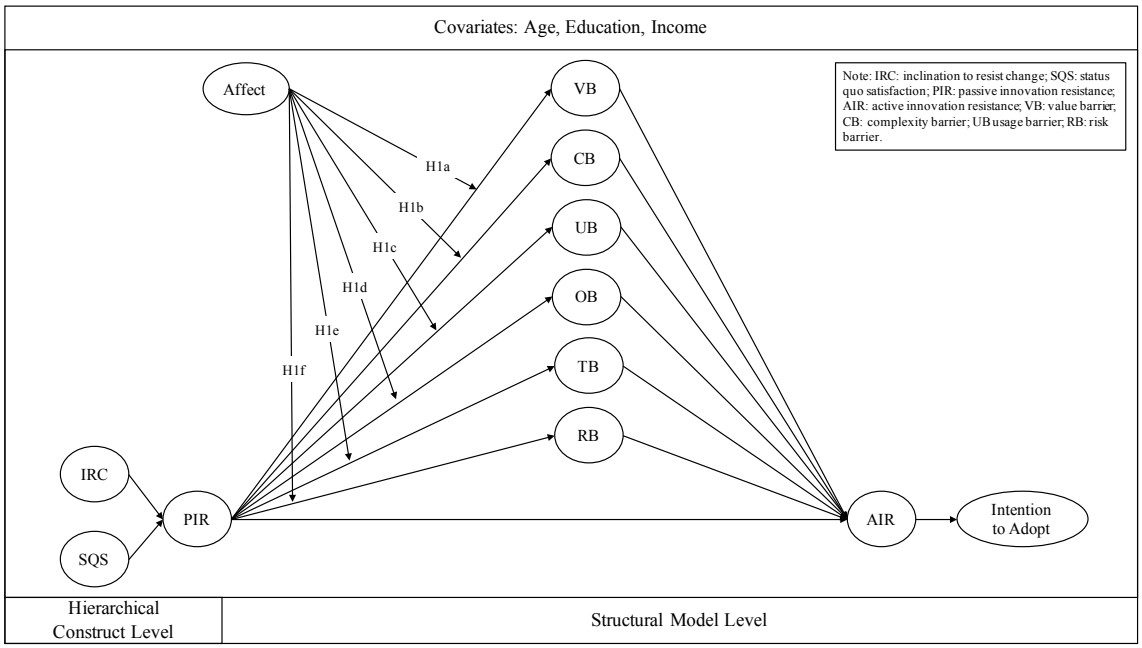
The Affect Infusion Model (Forgas, 1995) suggests that High Infusion Strategies, the kind that is used by consumers when shopping for new products, depend on emotions and moods to assist individuals on their decision-making. In HIS, emotion and mood are used both in simplified and extensive information-processing processes. Even in extensive information-processing tasks, such as gathering and assessing information about a new innovative product, Petty et al. (1993) reported that positive affect influences consumer's judgments by introducing positivity to the process. Thus, it is proposed herein that affective states will moderate the relationship between PIR and AIR.

However, the relationship between PIR and AIR has been shown to be mediated by some variables pertaining to the functional and psychological barriers. Higher levels of PIR will impact consumer's assessment of the innovation's perceived superiority to extant

alternatives (value barrier), consumer's understanding of how the innovation works and should be operated (Complexity Barrier), consumer's evaluation of how compatible with their needs and lifestyle the innovation is (Value Barrier), consumer's perception of how observable the results of using the innovation would be (Observability Barrier), consumer's evaluation of how easy it would be to try the innovation out before purchasing it (Trialability Barrier) and the assessment of all risks involved in acquiring the innovation (Risks Barriers), which in turn would increase AIR (Heidenreich & Spieth, 2013). Therefore, as shown in figure 1, it is hypothesized that:

H_1: affective state will moderate the relationship between PIR and AIR mediated by (a) value barrier, (b) complexity barrier, (c) usage barrier, (d) observability barrier, (e) trialability barrier, and (f) risk barrier.

Figure 1: proposed model and hypothesis for Study 1



Also, this research aims to validate Heidenreich and Spieth (2013)'s model in different contexts as those of their original research (respondents were German, and a technology product was used as stimulus). To do that, the model will be tested in the United States, that presents significant cultural differences compared to Germany (Grunert & Scherlorn, 1990; Güliz & Belk, 1996; Hofstede, 1984), and using not only a technology product as context, but also an innovative service (Kuisma et al., 2007; Laukkanen, 2015; Nov & Ye, 2008).

2.3.2 Study 2: Affect and Active Innovation Resistance

As for Active Innovation Resistance, the most explored form of resistance in literature (Bagozzi & Lee, 2005; Bagozzi & Lee, 1999; Bartels & Reinders, 2011; Claudy et al., 2010b; Garcia & Calantone, 2002; Ram, 1989; Ram & Sheth, 1989), it takes place after consumers have had the opportunity to evaluate the innovation. Such evaluation is regarded mostly as a cognitive process in which consumers will balance innovations' pros and cons and decide whether to adopt it or not. In case they do not adopt the innovation, either immediately or in the long term, it is said they resisted it.

Despite much evidence of the influence of affect on consumer's decision making (Batra & Ray, 1986; Edell & Burke, 1987; Forgas, 1995; Hirschman & Holbrook, 1982), Bagozzi and Lee (1999)'s model is the only one to suggest that emotions may influence the decision to adopt or resist an innovation. According to them, such emotions take place after consumer's evaluation of the innovation, and will be used as information by the consumer when s/he is deciding whether to adopt or not an innovation. In line with that proposal, Mehrabian, Russel and their colleagues (Mehrabian & Russell, 1974; Russell & Mehrabian, 1977; Russell & Mehrabian, 1978; Russell & Pratt, 1980) suggest that consumers will always react to any given stimuli in an emotional way, and that such emotions will be rooted in three different aspects: (1) pleasure, (2) arousal, and (3) dominance. The combination of these three dimensions will imply in different emotion, both positive and negative.

An individual may, therefore, evaluate an innovation as beneficial regarding its features, but decide not to adopt it because of the emotions elicited by it, as the opposite may take place as well, and a cognitive evaluation of the product present reasons for the consumer to resist it, but the emotions elicited by it lead to its adoption. Therefore, an innovation might be adopted/resisted by both cognitive and affective reasons. That indicates that Active Innovation Resistance is a two-dimension construct: (1) Cognitive Active Resistance (CAR), which is caused by cognitive barriers to adoption, and (2) Affective Active Resistance (AAR), caused by affective barriers to adoption.

A review of the literature concerning Resistance to Innovation indicates that, cognitively, consumers may resist an innovation due to product attributes as well as to risks perceived regarding such innovation (Heidenreich & Spieth, 2013; Ram & Sheth, 1989; Talke & Heidenreich, 2014). As far as product attributes, several barriers have been identified

(Heidenreich & Spieth, 2013; Ostlund, 1974): (1) value barrier, which exists when consumer does not perceive the innovation as offering superior performance than existing alternatives; (2) complexity barrier, that takes place when consumers find the innovation complex to understand and to use; (3) usage barrier, that relates to Rogers (2003)'s Compatibility dimension of successful innovations, indicating that consumers do not perceive the innovation as being compatible with previous experiences and/or threatens to disrupt established usage patterns; (4) observability barrier, which encompasses consumer's view of how difficult disseminating the innovation to other might be; and (5) trialability barrier, which indicates how difficult consumers perceive that trying out the innovation before purchase is.

As far as the perception of risk is concerned, it has been suggested that consumers high on innovation resistance are expected to overestimate the risk associated with the innovative product (Heidenreich & Spieth, 2013). Risk, defined as a "subjectively determined expectation of loss: the greater the probability of this loss, the greater the risk thought to exist for an individual" (Mitchell, 1999, p. 168), may cause consumers who perceive it to experience pre-purchase uncertainty as to type and degree of expected loss resulting from the purchase and use of any given good or service (Murray & Schlacter, 1990). As a construct, Perceived Risk has been described as being a multi-dimensional (Jacoby & Kaplan, 1972; Kaplan, Szybillo, & Jacoby, 1974; Roselius, 1971), comprising six different dimensions: (1) financial, related to the perception consumer may have that s/he will lose money if purchases such product; (2) performance, related to the risk that the product won't function as expected; (3) social, which regards the chances of the product altering what other think of the consumer; (4) physical, related to product safety to consumers' health; (5) psychological, concerned with consumers' self-image; and (6) convenience, related to the perception that the time it takes consumers to purchase the product might be wasted. However, it has been found that performance risk correlates with overall Perceived Risk, meaning that employing performance risk as an approximation of overall Perceived Risk is a supported practice (Lutz & Reilly, 1974).

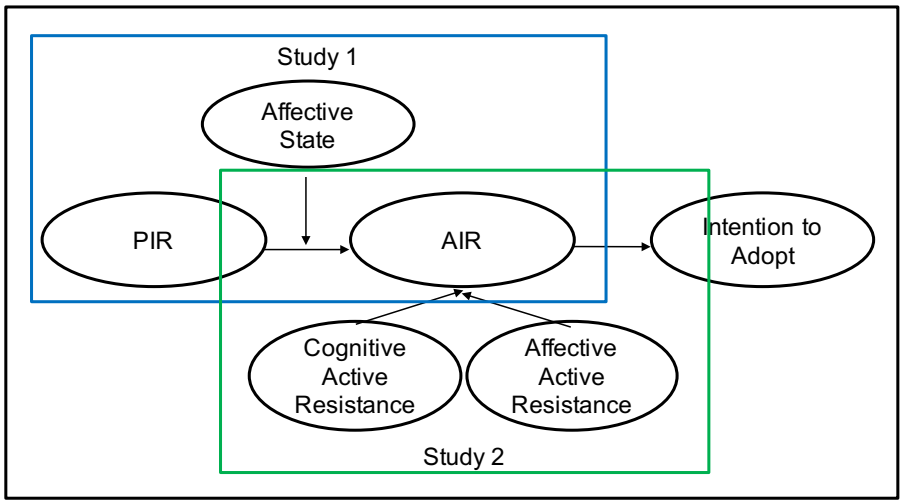
As for the Affective Active Resistance, a review of the literature concerning affect indicates that emotions as an appraisal are best suited for this study, considering that AIR takes place as consumers evaluate an innovation (Bagozzi & Lee, 1999; Heidenreich & Handrich, 2015; Heidenreich & Spieth, 2013; Ram & Sheth, 1989). Therefore, based on the research of Mehrabian and his colleagues (Mehrabian, 1978, 1996; Mehrabian &

Russell, 1974; Russell & Mehrabian, 1978; Russell & Pratt, 1980), the PAD model will be used as an initial model to evaluate the affect generated by innovation, considering that the PAD model has been found to produce better results in terms of reliability, and internal and external validities (Havlena & Holbrook, 1986).

The importance of affect in consumer behavior (Bagozzi et al., 1999; Batra & Ray, 1986; Batra & Stayman, 1990; Chaudhuri et al., 2010; de Mello & MacInnis, 2005; Ferreira et al., 2014; Holbrook & Batra, 1987; Kulviwat et al., 2007; Kwortnik & Ross, 2007; Lee et al., 2011; MacInnis & De Mello, 2005; Mick & Fournier, 1998; Moons & De Pelsmacker, 2012; Perlusz, 2004; Shiv & Fedorikhin, 1999; Venkatesh, 2000) indicates that including emotions in the measure of resistance to innovations will improve its explanatory and predictive power. Thus, this study aims to investigate and confirm such expectations.

This research, therefore, is twofold. In Study 1, the moderating role of affective state in the relationship between PIR and AIR will be investigated, whereas in Study 2 the impact of affect on consumers' evaluation of the innovation will be examined (figure 2).

Figure 2: research model for Studies 1 and 2



3. EMPIRICAL INVESTIGATIONS

This chapter will discuss both method and results of both studies. Firstly, the moderating role of affective state (Study 1) will be discussed. Next, Cognitive and Affective Active Resistance (Study 2) are presented and discussed.

3.1. Passive Innovation Resistance and Affect (Study 1)

3.1.2. Method

A web-based survey was developed to explore the variables in the conceptual model, investigating whether affective state moderates the relationship between PIR and AIR. The use of such uniform data collection procedure allows to control for response styles (Adler, 1983) and have been successfully used in marketing research recently (e.g., Heidenreich & Handrich, 2015; Heidenreich & Spieth, 2013; Völckner et al., 2010).

A questionnaire was created on Qualtrics platform in which respondents were initially asked to answer questions belonging to the PIR scale, followed by the PANAS scale. Next, respondents were presented either to the product or service stimuli and asked to fill out the questionnaire comprising the scales for value, complexity, usage, observability, trialability and risk barriers. The software SmartPLS 3.0 was used to estimate all necessary values.

3.1.3. Sampling

A convenience sample extracted from the data-base of an American private research company was used to investigate the hypothesis herein. A total of 180 usable responses were obtained for the product setting, 86 of them given by male respondents, averaging 32.7 years of age, and 94 by female respondents, with an average age of 38.7. Fifty three percent of the respondents have some sort of college degree, whilst 34.4% either did not finish high school or did not finish college. Almost 50% of the respondents have an income between U$10,000 and U$50,000 per year, and the remaining 50% are evenly spread throughout other income tiers (for more detail, refer to Appendix A).

For the service setting, a total of 191 usable responses were obtained, 47.6% of them given by male respondents, averaging 32.2 years of age, and the remaining 52.4% by female respondents, with an average age of 36.5. A little over 47% of the respondents have some sort of college degree, whilst 37.7% either did not finish high school or did

not finish college. Almost 46% of the respondents have an income between U$10,000 and U$50,000 per year, and the remaining 50% are evenly spread throughout other income tiers (for more detail, refer to Appendix B).

3.1.4. Procedure and Data Analysis

3.1.4.1. Stimuli

To create a realistic setting and enhance external validity, the stimuli for the innovative product and service were chosen according to four requirements: (1) it should be a real product/service; (2) respondents should be able to afford it; (3) the innovation should be perceived as presenting some variation toward extant alternatives; (4) it should require behavioral change from the respondents (Im, Bayus, & Mason, 2003). For the product stimulus specifically, a fifth requirement was that it should be a consumer electronic, since this is a category perceived as high tech and innovative (Gatignon & Robertson, 1991).

As the stimulus for innovative product, the Zuta Pocket Printer was selected for fulfilling all the requirements. Zuta is a crowdfunded product that was recently launched at the price of US$199 and that consists of a portable bluetooth activated printer that prints anything anywhere. A description of the Zuta Pocket Printer was developed using a generic picture and three brief paragraphs describing its features and benefits (Hoeffler, 2003) (appendix C). Respondents were asked to indicate in a 5-point Likert scale, anchored by “fully disagree” and “fully agree”, how much they agreed that the Zuta Pocket Printer required a behavioral change from the adopter (mean = 2.99, *SD* = 1.16) and represented a variation toward the current form of attending the same need (mean = 3.58, *SD* = 1.01), validating the stimulus.

As for the innovative service, Barclaycard Grab + Go, a service that streamlines the shopping experience by removing the need to physically check out every time the shopper purchases something, was chosen. A description of the Barclaycard grab + Go was also developed using a generic picture and three brief paragraphs describing its features and benefits (Hoeffler, 2003) (appendix D). Respondents were also asked to indicate in a 5-point Likert scale, anchored by “fully disagree” and “fully agree”, how much they agreed that the Barclaycard Grab + Go required a behavioral change from the adopter (mean =

3.23, *SD* = 1.08) and represented a variation toward the current form of attending the same need (mean = 3.89, *SD* = 1.17), also validating the stimulus.

3.1.4.2. Measures

The measures for Active Innovation Resistance (Peracchio & Tybout, 1996), Intention to Adopt (Kulviwat et al., 2007), Value Barrier (Rijsdijk et al., 2007), Complexity Barrier (Davis, 1989), Usage Barrier (Meuter et al., 2005), Observability Barrier (Agarwal & Prasad, 1999), Trialability Barrier (Moore & Benbasat, 1991) and Risk Barrier (Grewal et al., 1994) were taken from existing three-item, 7-point scales. Such scales were chosen for presenting content and face validities congruent with the objectives of this research. For both Product (Study 1A) and Service (Study 1B) Settings, all items loaded above the threshold of 0.707 in their respective measures (Chin, 1998b, 2010), except for two items in Study 1A and two items in Study 1B. In Study 1A, item 2 of the Observability scale loaded 0.699 but was kept in the model since the scale's average variance extracted (AVE) was well above the threshold of 0.500 (Hair et al., 2013); and item 3 of the Trialability scale loaded 0.593 and was removed from the measure, increasing its AVE from 0.463 to 0.637. The removal of such item had no impact on content validity if the scale, considering the existence of two other items measuring the same aspect of consumers' perceptions. All other scales presented good AVE (table 1). In Study 1B, item 2 of the Observability scale loaded 0.619, and item 3 of the Trialability scale loaded 0.677, but both items were kept given both scales' AVE was above 0.500.

Affective state was measured using the PANAS Scales (Watson, Clark, & Tellegen, 1988), which consist of two ten-items, 5-point scales, one to measure positive affect and one to measure negative affect. Results indicate that all items loaded above the threshold of 0.707 in their respective measures (Chin, 1998b, 2010), except for items 6 (Study 1A: 0.687; Study 1B: 0.614) and 10 (Study 1A: 0.685; Study 1B: 0.624) in the Positive Affect scale. Even though the scale presented AVE above 0.500, both items were removed from the measure in both settings due to the existence of eight more items in the measure, and the scale's AVE went from 0.551 to 0.598 in Study 1A, and from 0.555 to 0.604 in Study 1B (table 2). In support of discriminant validity, both Positive and Negative Affect AVE's were larger than the common variances of this variable with the other one (Fornell & Larcker, 1981) in both settings.

Affective state was measured as a second-order construct, formed by positive and negative affect, which were modeled as reflective first-order constructs. To evaluate whether a formative indicator influences the latent variable, the significance of second-order weights was verified using bootstrapping methods (Chin, 1998b). In Studies 1A and 1B, both dimensions showed significant weights, indicating that both dimensions contribute to affective state (Hair et al., 2017), even though the negative affect dimension contributes with a larger weight. Considering both indicators are formative, it is necessary to rule out multicollinearity (Chin, 1998b). Thus, the variance inflation factor (VIF) was calculated to exclude multicollinearity, and the highest VIF in the measurement model was 4.391 in Study 1A and 3.958 in Study 1B, which is below the threshold of 10 (Chin, 2010; Hair et al., 2013).

Table 1: performance of the measures for AIR, Intention to Adopt, VB, CB, UB, OB, TB, RB (Study 1)

Construct	Item		Product Setting					Service Setting				
			Mean (SD)	Loading	Significance	AVE	CR	Mean (SD)	Loading	Significance	AVE	CR
Active Innovation Resistance (Peracchio & Tibault, 1996)	What is your overall judgment of this product?	Very negative - Very positive (r)	3.89 (0.86)	0.936	<0.001	0.868	0.952	4.18 (1.05)	0.937	<0.001	0.888	0.960
		Very bad - Very good (r)	3.94 (0.89)	0.938	<0.001			4.14 (1.03)	0.945	<0.001		
		Very unfavourable - Very favourable (r)	3.92 (0.97)	0.920	<0.001			4.17 (1.10)	0.945	<0.001		
Intention to Adopt (Kulviwat et al., 2007)	How likely do you feel it is that you would purchase this product?	Very unlikely - Very likely	3.18 (1.33)	0.955	<0.001	0.885	0.959	3.36 (1.38)	0.946	<0.001	0.882	0.957
		Highly improbable - Highly probable	3.16 (1.32)	0.955	<0.001			3.36 (1.41)	0.961	<0.001		
		Impossible - Possible	3.58 (1.25)	0.913	<0.001			3.77 (1.24)	0.909	<0.001		
Value Barrier (Rijsdijk et al., 2007)	This product offers advantages that are not offered by competing products. (r)		2.53 (1.36)	0.837	<0.001	0.684	0.866	3.13 (1.71)	0.870	<0.001	0.791	0.919
	This product is, in my eyes, superior to competing products. (r)		3.41 (1.48)	0.822	<0.001			3.30 (1.66)	0.913	<0.001		
	This product solves a problem that I cannot solve with competing products. (r)		3.11 (1.67)	0.821	<0.001			3.51 (1.76)	0.884	<0.001		
Complexity Barrier (Davis, 1989)	I believe it would be easy to get this product to do what I want it to do. (r)		3.21 (1.49)	0.850	<0.001	0.686	0.867	2.84 (1.55)	0.898	<0.001	0.733	0.891
	Overall, I believe this product would be easy to use. (r)		2.78 (1.41)	0.873	<0.001			2.61 (1.50)	0.889	<0.001		
	Learning to use this product would be easy for me. (r)		2.56 (1.35)	0.757	<0.001			2.40 (1.33)	0.775	<0.001		
Usage Barrier (Meuter et al., 2006)	Using this product is compatible with my lifestyle. (r)		3.14 (1.67)	0.922	<0.001	0.846	0.943	3.01 (1.75)	0.927	<0.001	0.848	0.944
	Using this product is completely compatible with my needs. (r)		3.24 (1.62)	0.925	<0.001			3.15 (1.79)	0.912	<0.001		
	This product fits wellwith the way I like to get things done. (r)		3.17 (1.61)	0.912	<0.001			3.14 (1.83)	0.923	<0.001		
Observability Barrier (Agrawal & Prasad, 1997)	I would have no difficulty telling others about the results of using this product. (r)		2.54 (1,40)	0.823	<0.001	0.624	0.832	2.69 (1.61)	0.901	<0.001	0.624	0.830
	I believe I could communicate to others the consequences of using this product. (r)		2.85 (1.47)	0.699	<0.001			2.93 (1.53)	0.619	<0.001		
	I would have no difficulty explaining why using this		2.74 (1.41)	0.841	<0.001			2.85 (1.66)	0.823	<0.001		
Trialability Barrier (Moore & Benbasat, 1991)	I know where I can go to satisfactorily try out this product. (r)		3.88 (1.83)	0.731	<0.001	0.637 (0.463)	0.778	3.73 (2.00)	0.803	<0.001	0.570	0.799
	I don't really have adequate opportunities to try out this product.		3.84 (1.84)	0.708	<0.001			3.43 (1.91)	0.781	<0.001		
	Before deciding to use this product, I would be abe to properly try it out. (r)		2.87 (1.46)	0.593*	<0.001			2.93 (1.64)	0.677	<0.001		
Risk Barrier (Grewal et al., 1994)	I am not confident that this product will perform as described.		4.33 (1.70)	0.883	<0.001	0.794	0.921	3.98 (1.84)	0.893	<0.001	0.785	0.917
	I am not certain that this product will work satisfactorily.		4.39 (1.63)	0.900	<0.001			3.92 (1.84)	0.879	<0.001		
	I doubt whether the product is reliable in use.		4.05 (1.65)	0.890	<0.001			3.79 (1.84)	0.886	<0.001		

Note: significance tested with Bootstraping (n=5000)

* removed item; AVE calculated with (in between brackets) and without it; CR calculated without it.

Passive Innovation Resistance is conceptualized as a Type II third-order construct, with reflective measures for the first-order factors – since items are representations of the underlying construct and are highly correlated – and formative measures for the second- (IRC and SQS) and third-order (PIR) factors (Heidenreich & Handrich, 2015; Jarvis,

MacKenzie, & Podsakoff, 2003). The second-order IRC dimension consists of four first-order dimensions: RS, ER, STF, and CRi. The second-order SQS dimension consists of two first-order dimensions: SQSP and SQSI. Each of the six first-order dimensions are measured using three-item scales (Heidenreich & Handrich, 2015).

Table 2: results from the pre-test of PANAS scales (Study 1A)

		Product Setting					Service Setting				
Construct	Item	Mean (SD)	Loading	Significance	AVE	CR	Mean (SD)	Loading	Significance	AVE	CR
Positive Affect	Enthusiastic	2.98 (1.23)	0.751	<0.001	0.598	0.923	2.85 (1.17)	0.820	<0.001	0.604	0.924
(Watson, Clark, &	Interested	3.57 (1.07)	0.749	<0.001	(0.551)		3.39 (1.07)	0.782	<0.001	(0.555)	
Tellegen, 1988)	Determined	3.54 (1.15)	0.773	<0.001			3.46 (1.19)	0.703	<0.001		
AVE = 0.598 (0.551)	Excited	2.70 (1.22)	0.751	<0.001			2.53 (1.22)	0.754	<0.001		
CR = 0.923	Inspired	2.78 (1.25)	0.715	<0.001			2.75 (1.23)	0.779	<0.001		
	Alert	3.47 (1.13)	0.687*	<0.001			3.44 (1.03)	0.614*	<0.001		
	Active	3.17 (1.14)	0.733	<0.001			3.03 (1.21)	0.764	<0.001		
	Strong	2.81 (1.18)	0.829	<0.001			2.85 (1.29)	0.778	<0.001		
	Proud	2.56 (1.25)	0.739	<0.001			2.66 (1.28)	0.797	<0.001		
	Attentive	3.68 (1.05)	0.685*	<0.001			3.60 (0.99)	0.624*	<0.001		
Negative Affect	Scared	1.57 (1.01)	0.879	<0.001	0.661	0.951	1.47 (0.88)	0.863	<0.001	0.635	0.946
(Watson, Clark, &	Afraid	1.52 (0.92)	0.847	<0.001			1.53 (0.93)	0.805	<0.001		
Tellegen, 1988)	Upset	1.69 (0.97)	0.815	<0.001			1.82 (1.04)	0.836	<0.001		
AVE = 0.661	Distressed	1.84 (1.09)	0.856	<0.001			1.86 (1.06)	0.842	<0.001		
CR = 0.951	Jittery	1.77 (1.10)	0.769	<0.001			1.72 (1.00)	0.722	<0.001		
	Nervous	1.85 (1.10)	0.817	<0.001			1.84 (1.07)	0.801	<0.001		
	Ashamed	1.43 (0.84)	0.783	<0.001			1.49 (0.89)	0.846	<0.001		
	Guilty	1.50 (0.99)	0.815	<0.001			1.53 (0.96)	0.795	<0.001		
	Irritable	1.91 (1.01)	0.788	<0.001			2.00 (1.06)	0.795	<0.001		
	Hostile	1.53 (0.97)	0.752	<0.001			1.42 (0.78)	0.699	<0.001		

Note: significance tested with Bootstraping (n=5000)

* removed items; AVE calculated with (in between brackets) and without them; CR calculated without them.

Product Setting		
Discriminant Validity	NegAffect	PosAffect
Negative Affect	**0.813**	
Posistive Affect	-0.034	**0.774**
CR	0.951	0.923
AVE	0.661	0.598

Service Setting		
Discriminant Validity	NegAffect	PosAffect
Negative Affect	**0.797**	
Posistive Affect	-0.128	**0.777**
CR	0.946	0.924
AVE	0.635	0.604

Note: significant at p<0,001; significance tested with Bootstraping (n=5000)

Product Setting		
Second-Order Measurement Model		
	PANAS	
	(VIF = 4.391)	
Construct	Weights	Significance
Positive Affect	0.595	<0.001
Negative Affect	0.824	<0.001

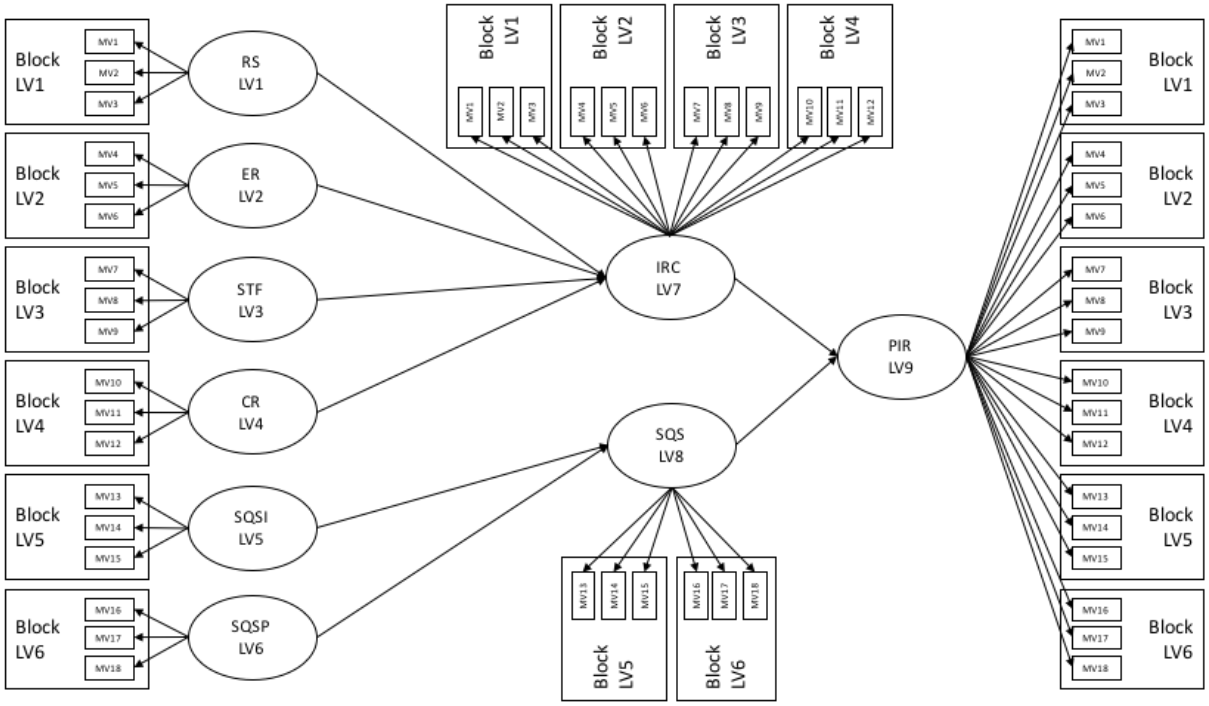
Service Setting		
Second-Order Measurement Model		
	PANAS	
	(VIF = 3.958)	
Construct	Weights	Significance
Positive Affect	0.647	<0.001
Negative Affect	0.850	<0.001

Note: significance tested with Bootstraping (n=5000)

The PIR scale was set-up using the hierarchical component model approach, through the use of the repeated indicator approach (Lohmöller, 1989). For that, three steps were taken: (1) the first-order latent variables (RS, ER, STF, CRi, SQSI, SQSP) were constructed by relating them to their respective block of manifest variables using mode A (reflective) in the outer model; (2) the second-order latent variables (IRC, SQS) were constructed by relating them to the blocks of their respective underlying variables using mode B

(formative), and repeating the appropriate first-order latent variable's block of manifest variables in each second-order variable; (3) the third-order latent variable (PIR) was constructed by relating it to its underlying variables using mode B as well, and repeating the manifest variables blocks of all first-order latent variables (figure 3). By doing this, it was possible to estimate the hierarchical model using PLS path modeling and assess the scale's psychometric properties of the latent variables and their structural relationships. All estimations were calculated using the centroid weighting scheme, which is most adequate for type II models (Becker et al., 2012; Hair et al., 2017; Heidenreich & Handrich, 2015).

Figure 3: PIR construct conceptualization (Study 1)



Error terms have been ommited to simplify the representation of the model.
Note: Manifest (MV) and Latent (LV) variables have been numbered consecutively.

Initial analysis indicated that the loadings for all latent variables exceeded the cutoff threshold of 0.707 (Chin, 2010), except item 1 (Study 1A: 0.207; Study 1B: 0.311) of the CRi latent variable scale, which was removed, improving the scale's AVE from 0.482 to 0.740 in Study 1A, and from 0.482 to 0.679 in Study 1B (table 3). Content validity was not impacted by this removal, considering that item 1 was only the reverse version of item 2 in the scale, which might have been the very cause of the non-significant item loading. For construct reliability, the composite reliability was calculated for all first-order constructs. Composite reliability indices were high, ranging between 0.850 and 0.912 in Study 1A and between 0.836 and 0.917 in Study 1B, above the threshold of reliability at

0.700 (Chin, 2010; Hair et al., 2013). For convergent validity, the AVE of all first-order latent-variables was calculated, and the values found are well above the cutoff threshold of 0.500 (Chin, 2010), ranging from 0.721 to 0.776 in Study 1A and from 0.630 to 0.786 in Study 1B. Furthermore, on both studies, each first-order latent variable's AVE was larger than the common variances of this latent variable with any other variable in the model, supporting discriminant validity as well (Fornell & Larcker, 1981) (table 3).

Next, the fit of the second- and third-order formative constructs was assessed. To evaluate whether a formative indicator influences the construct, the significance of the estimated second- and third-order weights was determined using bootstrapping methods (Chin, 1998; Hair et al., 2013) with 5000 subsamples. The outer weights can be interpreted as the indicators' relative importance in the summated scale that represents the latent higher-order variable (Sarstedt et al., 2009). For the second-order IRC factor, the second-order weights and significance show that ER, RS, STF and CRi (in that order) contribute significantly to IRC at $p < 0.001$ in Study 1A, whereas in Study 1B, RS and ER switch positions. Both SQSI and SQSP constructs show significant weights of 0.499 and 0.699, respectively, in Study 1A, and of 0.548 and 0.680 in Study 1B. For the third-order PIR latent variable, results also indicate that both IRC and SQS constructs contribute significantly in Study 1A, presenting weights of 0.858 and 0.521 (table 3). In Study 1B, however, SQS showed a non-significant path of 0.007, as IRC presented a significant at $p<0.001$ path of 0.999, indicating that PIR is the same as IRC. As already mentioned, formative items call for a multicollinearity check. Thus, VIF was calculated for each second- and third-order construct, and the highest value found was 2.534 in Study 1A and 2.959 in Study 1B, indicating that no multicollinearity exists (Chin, 2010; Hair et al., 2013). Overall, these results confirm the good psychometric properties of the PIR scale and indicate that it is suitable for further analysis of the herein hypothesized structural relationships.

Table 3: performance of the measures PIR (Study 1)

Construct	Item Label	Item	Product Setting					Service Setting				
			Mean (SD)	Loading	Significance	AVE	CR	Mean (SD)	Loading	Significance	AVE	CR
Routine Seeking	MV1	I generally consider changes to be a negative thing.	3.61 (1.79)	0.886	<0.001	0.721	0.885	3.06 (1.50)	0.814	<0.001	0.630	0.836
	MV2	I like to do the same old things rather than try new and different ones.	3.89 (1.65)	0.855	<0.001			3.65 (1.56)	0.797	<0.001		
	MV3	I'd rather be bored than surprised.	3.57 (1.80)	0.804	<0.001			3.26 (1.71)	0.769	<0.001		
Emotional Response to Imposed Change	MV4	If I were to be informed that there's going to be a significant change regarding the way things are done at work, I would probably feel stressed.	4.57 (1.61)	0.869	<0.001	0.760	0.905	4.44 (1.71)	0.859	<0.001	0.750	0.900
	MV5	When I'm informed of a change of plans, I tense up a bit.	4.41 (1.64)	0.882	<0.001			4.18 (1.59)	0.903	<0.001		
	MV6	When things don't go according to plans, it stresses me out.	4.84 (1.61)	0.863	<0.001			4.66 (1.68)	0.834	<0.001		
Short-Term Focus	MV7	Often, I feel a bit uncomfortable even about changes that may potentially improve my life.	3.98 (1.64)	0.853	<0.001	0.721	0.886	3.73 (1.72)	0.876	<0.001	0.759	0.904
	MV8	When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.	4.08 (1.58)	0.802	<0.001			3.87 (1.68)	0.837	<0.001		
	MV9	I sometimes find myself avoiding changes that I know will be good for me.	3.99 (1.73)	0.890	<0.001			3.93 (1.70)	0.900	<0.001		
Cognitive Rigidity	MV10	I often change my mind. (r)	4.41 (1.52)	0.207*	<0.001	0.740	0.850	4.29 (1.55)	0.311*	0.527	0.679	0.808
	MV11	I don't change my mind easily.	4.39 (1.43)	0.820	<0.001	(0.482)		4.24 (1.57)	0.868	<0.001	(0.482)	
	MV12	My views are very consistent over time.	4.98 (1.32)	0.855	<0.001			4.73 (1.44)	0.777	<0.001		
Status-Quo Satisfation toward Innovations	MV13	Overall, my personal need for innovations in the field of technological products has been by far not covered in the past. (r)	4.56 (1.46)	0.852	<0.001	0.722	0.884	4.74 (1.49)	0.858	<0.001	0.786	0.917
	MV14	Overall, I consider the number of innovations in the field of techonological products as being too low. (r)	4.63 (1.60)	0.857	<0.001			4.81 (1.65)	0.920	<0.001		
	MV15	Overall, I consider the pace of innovations in the field of technological products as being too low. (r)	4.55 (1.62)	0.838	<0.001			4.89 (1.60)	0.881	<0.001		
Status-Quo Satisfation toward Products	MV16	In the past, I was very satisfied with available technological products.	4.91 (1.35)	0.884	<0.001	0.776	0.912	4.90 (1.40)	0.843	<0.001	0.721	0.904
	MV17	In my opinion, past technological products were completely satisfactory so far.	4.64 (1.39)	0.878	<0.001			4.49 (1.46)	0.839	<0.001		
	MV18	Past technological products fully met my requirements.	4.61 (1.36)	0.880	<0.001			4.53 (1.50)	0.865	<0.001		

Note: significance tested with Bootstraping (n=5000)
* removed item; AVE calculated with (in between brackets) and without it; CR calculated without it.

Product Setting	RS	ER	STF	CR	SQSI	SQSP
RS	**0.849**					
ER	0.600	**0.871**				
STF	0.605	0.694	**0.849**			
CRi	0.344	0.312	0.164	**0.860**		
SQSI	-0.186	-0.111	-0.189	-0.105	**0.849**	
SQSP	0.201	0.116	0.058	0.238	0.379	**0.881**
CR	0.885	0.905	0.886	0.850	0.884	0.912
AVE	0.721	0.760	0.721	0.740	0.720	0.776

Service Setting	RS	ER	STF	CRi	SQSI	SQSP
RS	**0.793**					
ER	0.620	**0.866**				
STF	0.634	0.586	**0.871**			
CRi	0.175	0.284	0.317	**0.684**		
SQSI	-0.263	-0.178	-0.263	-0.308	**0.887**	
SQSP	0.171	0.088	0.112	0.024	0.319	**0.849**
CR	0.836	0.900	0.904	0.808	0.917	0.904
AVE	0.630	0.750	0.759	0.679	0.786	0.721

Note: significant at p<0,001; significance tested with bootstraping (n=5000)

Product Setting

Second-Order Measurement Model

	IRC (VIF = 2.534)		SQS (VIF = 2.225)	
Construct	Weights	Significance	Weights	Significance
RS	0.352	<0.001	--	--
ER	0.382	<0.001	--	--
STF	0.343	<0.001	--	--
CRi	0.163	<0.001	--	--
SQSI	--	--	0.499	<0.001
SQSP	--	--	0.699	<0.001

Third-Order Measurement Model

	PIR (VIF = 2.225)	
Construct	Weights	Significance
IRC	0.999	<0.001
SQS	0.007	0.686

Service Setting

Second-Order Measurement Model

	IRC (VIF = 2.236)		SQS (VIF = 2.959)	
Construct	Weights	Significance	Weights	Significance
RS	0.352	<0.001	--	--
ER	0.380	<0.001	--	--
STF	0.389	<0.001	--	--
CRi	0.146	<0.001	--	--
SQSI	--	--	0.548	<0.001
SQSP	--	--	0.680	<0.001

Third-Order Measurement Model

	PIR (VIF = 2.188)	
Construct	Weights	Significance
IRC	0.858	<0.001
SQS	0.521	<0.001

Note 1: significance tested with Bootstraping (n=5000)
Note 2: VIF value shows the highest value found

3.1.4.3. Structural Model

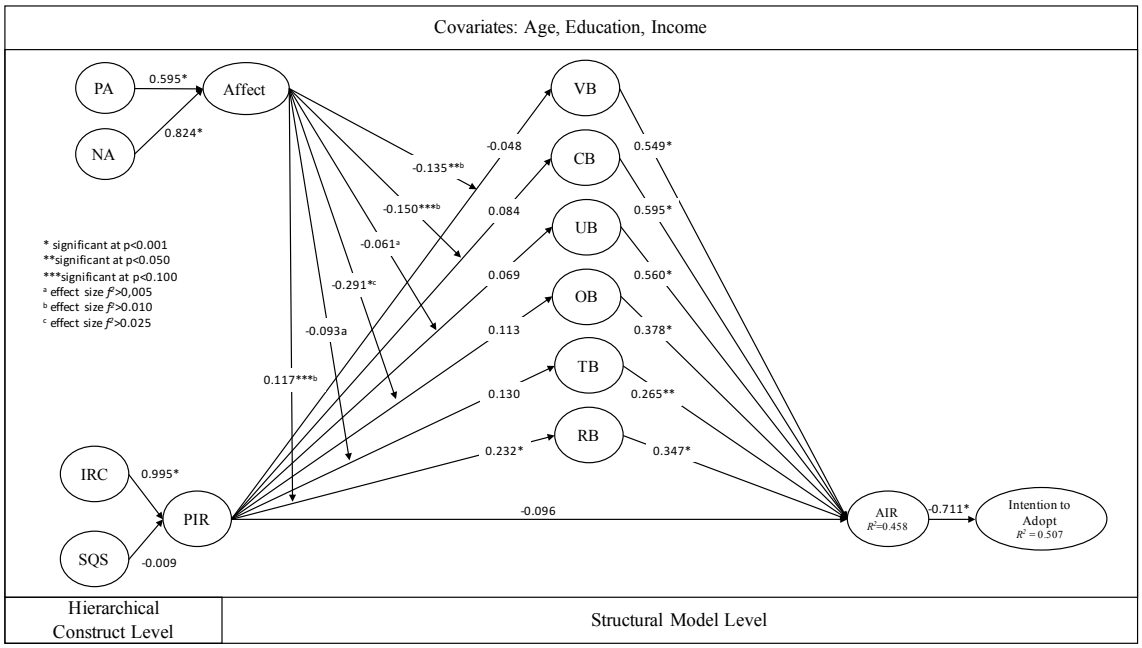
3.1.4.3.1. Study 1A: Product Setting

The assessment of the structural model had the purpose of investigating the hypothesis suggested herein. Considering one of the objectives of this study was to test Heidenreich

and Spieth (2913)'s model in different contexts, the model proposed by the authors was replicated, but in a different country and, therefore, in a somewhat different culture, and with a different innovation stimulus, even though it is still a technological product, as Heidenreich and Spieth (2013) used. The results of all estimations are summarized in figure 4.

The structural model and the hypothesis were tested using SmartPLS 3.0 through the examination of the path coefficients and their significance. The estimations fit the data properly. Both AIR (0.458) and Intention to Adopt (0.507) presented adequate R^2 indices, both significant at p<0.001, indicating that the exogenous variables' combined effects on the endogenous latent variable are above moderate (Hair et al., 2011). As for the predictive relevance of the model, the blindfolding approach was used (Hair et al., 2013), and Q^2 values of 0.365 and 0.419 were found for AIR and Intention to Adopt respectively, both being above zero, indicating the model presents predictive relevance for both endogenous variables.

Figure 4: results of the structural model (Study 1A)



To assess whether Value, Complexity, Usage, Observability, Trialability and Risk Barriers mediate the relationship between PIR and AIR, a simple mediation analysis was undertaken for the specific indirect effect of each barrier, and then the total indirect effect was also evaluated. In the simple mediation analyses, the indirect effect of each mediating variable was calculated by manually multiplying the path coefficients found connecting

the independent variable (PIR) to the mediating variables (Value, Complexity, Usage, Observability, Trialability and Risk barriers) and the mediating variables to the dependent variable (AIR). Such indirect effect was then tested for significance via manual computing of each effect's standard error (Hair et al., 2013). As for the total indirect effect, the same procedure was followed, except it was with the summed values of all specific indirect effects (Hair et al., 2013). The moderator variable was not included in the model for this assessment, as the nature of the relationship between variables may differ for models with and without the moderator when using the two-stage approach for testing moderation effect (Hair et al., 2013).

Different from the results found by Heidenreich and Spieth (2013), that found significant mediating effects for all barriers except Trialability, only the specific indirect effect of the Risk Barrier was found to be significant at $p<0.05$ (table 4), all others being non-significant. Considering the total indirect effect between PIR and AIR, the mediation of all product-specific barriers is non-significant as well. It is important to emphasize that Heidenreich and Spieth (2013) assessed the significance of the mediating effect using the z-statistic approach (Sobel, 1982), which is not the procedure indicated for such analysis in the PLS-SEM method, given its dependence on normal distribution and on larger samples. The best suited approach for PLS-SEM is the bootstrapping of the sampling distribution of the indirect effect, which not only makes no assumptions about the shape of the of the variable's distribution or the sample size, but will also yield higher statistical power compared with the Sobel test (Hair et al., 2013).

To assess the hypothesis of this study, a moderation effect analysis was performed for all mediating paths in the model, even for those which are non-significant. To generate the interaction term, it was used the two-stage approach, which is the indicated one when the objective is to test for the significance of the moderating effect (Chin et al., 2003; Hair et al., 2013). Then, non-parametric bootstrapping with 500 subsamples was used to assess the significance of the interaction term, because that is what will determine whether the suggested moderating variable moderates the relationship between the two variables. Next, the strength of the moderating effect was determined (table 5).

Table 4: product-specific barriers indirect effect (Study 1A)

	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (|O/STERR|)	P Values
PIR -> AIR via VB	-0.014	-0.012	0.031	0.453	0.651
PIR -> AIR via CB	0.022	0.023	0.022	1.003	0.316
PIR -> AIR via UB	0.010	0.011	0.027	0.453	0.698
PIR -> AIR via OB	-0.006	-0.004	0.015	0.377	0.706
PIR -> AIR via TB	0.011	0.012	0.016	0.712	0.477
PIR -> AIR via RB	0.046	0.047	0.021	2.188	0.029
Total Indirect Effect	0.069	0.077	0.075	1.080	0.280

In the two-stage approach, the path coefficient between the independent and the dependent variables represent the strength of such relationship when the moderator variable has a value of zero, and is referred to as simple effect. When the level of the moderator variable is increased, or decreased by one standard deviation unit, the simple effect is expected to change by the size of the interaction term's effect. In the case of positive (negative) moderating effects, the relationship between dependent and independent variables become stronger (weaker). Thus, even in the case of non-significant mediation effects, the moderator variable may present a significant effect.

Table 5: affect moderating effect of the mediation role of the adoption barriers (Study 1A)

	Moderating Effect		
	Path Coefficient	Significance	Effect Size (f^2)
Value Barrier	-0.135	0.087	0.018
Complexity Barrier	-0.150	0.074	0.023
Usage Barrier	-0.061	0.415	0.004
Observability Barrier	-0.291	<0.001	0.089
Trialability Barrier	-0.093	0.181	0.009
Risk Barrier	0.117	0.077	0.014

In the case of moderated mediation, Hair et al. (2013) indicate that there needs to be evidence of a significant moderation of the path linking the independent variable to the mediator variable (i.e. PIR to the Product-Specific Barriers). In line with H_{1a} - H_{1f}, respondents affective state moderated the relationship between PIR and each product-specific barrier, except for Usage and Trialability. The interaction term's influence on Value, Complexity and Risk barriers are significant at $p<0.1$, whereas its influence on the Observability barrier is significant at $p<0.001$, which would validate H_{1a}, H_{1b}, H_{1d} and H_{1f} (see appendix E for slope plots).

General guidelines for assessing the effect size (f^2) suggests that values of 0.02, 0.15, and 0.35 indicate small, medium and large effect sizes (Cohen, 1988); however, Kenny (2015) suggests that 0.005, 0.01, and 0.025 constitute more realistic standards for small, medium and large effect sizes, respectively, given that the average effect size in tests of moderation is 0.009 (Aguinis et al., 2005). Against that background, the size of the effect of the moderator variable on the Observability mediating path is large (0.089), whereas it is of medium to large size in the cases of Value (0.018), Complexity (0.023) and Risk barriers (0.014), as may be seen in table 5.

However, Hayes (2015) has recently suggested that it is necessary to consider the effect of the moderator variable on the indirect effect as a whole rather than on one element of the mediating effect alone, and he proposed the Index of Moderated Mediation to make that assessment[1]. Thus, the moderating effect on all mediating paths were tested (table 6) and, in line with the results obtained from the evaluation of the mediating paths, the only moderated mediation found to be significant (at $p<0.05$) is the moderating effect on the RB mediating path.

Table 6: index of moderated mediation for all mediating paths (Study 1A)

	Original Sample (O)	Sample Mean (M)	Standard Error	T Statistics (|O/STERR|)	P Values
PIR -> AIR via VB	-0.026	-0.019	0.060	0.436	0.663
PIR -> AIR via CB	0.050	0.036	0.076	0.657	0.512
PIR -> AIR via UB	0.039	0.040	0.057	0.673	0.501
PIR -> AIR via OB	0.043	0.047	0.036	1.199	0.231
PIR -> AIR via TB	0.034	0.039	0.029	1.203	0.230
PIR -> AIR via RB	0.081	0.082	0.032	2.498	0.013

Therefore, as hypothesized in H_{1f}, affect moderates the relationship between PIR and AIR mediated by Risk Barrier, which indicates that affect may indeed play an important role in consumers' decision process towards innovation. It would be expected that the moderation index presented a negative sign, which would indicate that the more positive the affective state, the less the risk barrier would impact AIR. However, considering that the Negative Affect dimension presented a larger weight

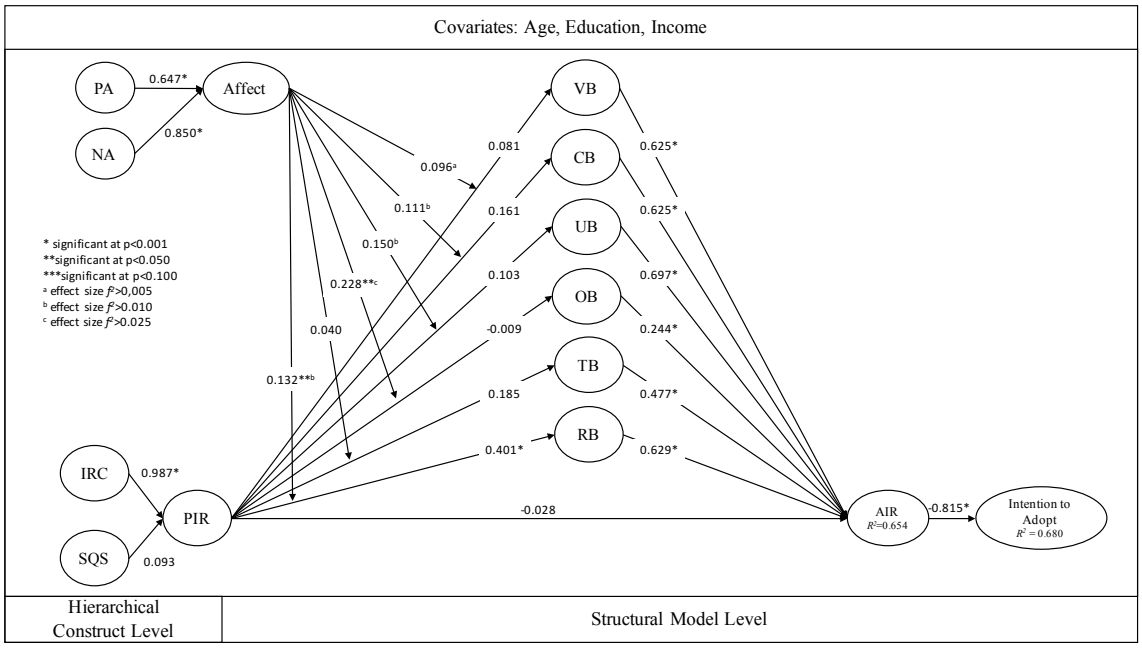
[1] The index of moderated mediation is defined as follows: $w = p_1 . p_2 + p_2 . p_5 . M$, where p_1 is the path linking the independent variable to the mediator variable, p_2 is the path linking the mediator variable to the dependent variable, p_5 is the path linking the interaction term to the mediator variable, and M is the moderator variable latent score.

on Affect than Positive Affect (figure 3), that expectation reversed, and a positive sign was expected, and that expectation was also confirmed.

3.1.4.3.2. Study 1B: Service Setting

The assessment of the structural model was conducted in the same manner as in Study 1A. It was also determined a different context to evaluate the model proposed by Heidenreich and Spieth (2013). In this case, not only the country was different, but also the innovation stimulus, since it was not a technological product but a service. As in Study 1A, the model proposed by Heidenreich and Spieth (2013) was not fully confirmed. The results of all estimations are summarized in figure 5.

Figure 5: results of the structural model (Study 1B)



The structural model and the hypothesis were tested using SmartPLS 3.0, through the examination of the path coefficients and their significance. Both AIR (0.654) and Intention to Adopt (0.680) presented proper R^2 indices, both significant at p<0.001, indicating that the exogenous variables' combined effects on the endogenous latent variable are from moderate to large (Hair et al., 2011). As for the predictive relevance of the model, the blindfolding approach was used (Hair et al., 2013), and Q^2 values of 0.516 and 0.562 were found for AIR and Intention to Adopt respectively, both being above zero, indicating the model presents predictive relevance for both endogenous variables. The R^2 and Q^2 values found in Study 2 indicate a better fit of the model than in Study 1A.

As it was done in Study 1A, to assess whether Value, Complexity, Usage, Observability, Trialability and Risk Barriers mediate the relationship between PIR and AIR, a simple mediation analysis was undertaken for the specific indirect effect of each barrier, and then the total indirect effect was also evaluated. The moderator variable was not included in the model for this assessment (Hair et al., 2013).

Different from the results found by Heidenreich and Spieth (2013), that found significant mediating effects for all barriers except Trialability, but like the results of Study 1A, only the specific indirect effect of the Risk Barrier was found to be significant at $p<0.001$ (table 7), all others being non-significant. However, different from Study 1A, the total indirect effect between PIR and AIR was found to be significant at $p<0.05$, mainly because of the strength of the Risk Barrier mediating path.

Table 7: product-specific barriers indirect effect (Study 1B)

	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics (|O/STERR|)	P Values
PIR -> AIR via VB	0.014	0.014	0.022	0.654	0.513
PIR -> AIR via CB	0.063	0.058	0.047	1.350	0.175
PIR -> AIR via UB	0.042	0.042	0.043	0.952	0.327
PIR -> AIR via OB	-0.019	-0.011	0.035	0.549	0.584
PIR -> AIR via TB	0.021	0.024	0.023	0.899	0.369
PIR -> AIR via RB	0.112	0.103	0.035	3.193	0.001
Total Indirect Effect	0.234	0.230	0.100	2.339	0.020

To assess the hypothesis of this study, a moderation effect analysis was performed for all mediating paths in the model, even for those which are non-significant. To generate the interaction term, it was used the two-stage approach, which is the indicated one when the objective is to test for the significance of the moderating effect (Chin et al., 2003; Hair et al., 2013). Then, non-parametric bootstrapping with 500 subsamples was used to assess the significance of the interaction term, because that is what will determine whether the suggested moderating variable moderates the relationship between the two variables. Next, the strength of the moderating effect was determined (table 8).

In the case of moderated mediation, Hair et al. (2013) indicates that there needs to be evidence of a significant moderation of the path linking the independent variable to the mediator variable (i.e. PIR to the Product-Specific Barriers). Respondents' affective state moderated the relationship between PIR and Usage, Observability and Risk barriers, which would be in line with H_{1c}, H_{1d} and H_{1f}. The interaction term's influence on Usage

Barrier is significant at p<0.1, whereas its influence on the Observability and Risk barriers is significant at p<0.05 (see appendix F for slope plots).

Table 8: affect moderating effect of the mediation role of the adoption barriers (Study 1B)

	Moderating Effect		
	Path Coefficient	Significance	Effect Size (f^2)
Value Barrier	0.096	0.237	0.009
Complexity Barrier	0.111	0.245	0.014
Usage Barrier	0.150	0.069	0.024
Observability Barrier	0.228	0.028	0.054
Trialability Barrier	0.040	0.644	0.001
Risk Barrier	0.132	0.048	0.018

General guidelines for assessing the effect size (f^2) suggests that values of 0.02, 0.15, and 0.35 indicate small, medium and large effect sizes (Cohen, 1988); however, Kenny (2015) suggests that 0.005, 0.01, and 0.025 constitute more realistic standards for small, medium and large effect sizes, respectively, given that the average effect size in tests of moderation is 0.009 (Aguinis et al., 2005). Against that background, the size of the effect of the moderator variable on the Observability mediating path is large (0.054), whereas it is of medium to large size in the cases of Usage (0.024) and Risk barriers (0.018), as may be seen in table 8.

As it was done in Study 1A, Hayes (2015)'s Index of Moderated Mediation was calculated to verify the significance of the moderation effect on the indirect effect as a whole for all mediating paths. Once again, as in Study 1A, the only moderating effect found to be significant was that on the RB path. (table 9), confirming H_{1f} and the moderating role affect may play in the relationship between PIR and AIR.

Table 9: index of moderated mediation for all mediating paths (Study 1B)

	Original Sample (O)	Sample Mean (M)	Standard Error	T Statistics (|O/STERR|)	P Values
PIR -> AIR via VB	0.048	0.049	0.070	0.694	0.488
PIR -> AIR via CB	0.098	0.088	0.076	1.288	0.198
PIR -> AIR via UB	0.068	0.072	0.069	0.988	0.324
PIR -> AIR via OB	-0.004	0.003	0.034	0.128	0.898
PIR -> AIR via TB	0.088	0.083	0.057	1.539	0.124
PIR -> AIR via RB	0.250	0.247	0.046	5.387	<0.001

3.1.5. Discussion

There were two major questions in this stage of the research. The first one regards the validation of the model proposed by Heidenreich and Spieth (2013) through the

replication of such model in different contexts. The second research question aims to examine the impact that affective state has on the relationship between PIR and AIR via its mediating variables (Heidenreich & Spieth, 2013).

First, to validate Heidenreich and Spieth (2013)'s model, it was replicated in two different contexts: (1) place and (2) type of stimulus. As for place, the original model was tested in Germany, and its replication took place in United States, a country which possesses different cultural aspects (Grunert & Scherlorn, 1990; Güliz & Belk, 1996; Hofstede, 1984). As for stimulus type, not only an electronic device was tested, but also an innovative service.

Granted that different statistical analysis were undertaken to analyze the results, it was found that only the mediating path via Risk Barrier was significant, which contradicts the results obtained by Heidenreich and Spieth (2013). Thus, results indicate that the model proposed by them may be more susceptible to cultural aspects than to different types of innovations. Even though results were the same for both innovation stimuli, the relationships proposed by the authors did not hold in a country with different cultural context. Germany and USA differ mainly on individualism (USA being more individualistic than Germany) and uncertainty avoidance (Germany presenting higher uncertainty avoidance index than USA), indicating that Germany presents a more tightly knit social framework and lives by stricter behavioral rules (Hofstede, 1984). Such differences may impact the way Germans and Americans relate to innovation (a deeper discussion on this subject is beyond the scope of this research).

Second, to examine the impact of affective state on the relationship between PIR and AIR via its mediating variables, the Index of Moderated Mediation was calculated for all mediation paths (Hair et al., 2013; Hayes, 2015), and it was found that the only mediation path confirmed to be significant, which is that of the Risk Barrier, is moderated by the affective state, confirming the hypothesis of this study. Results indicate that more positive affective states will decrease the impact of consumers' PIR on their evaluation of the innovative product or service, which is in line with the argument that affect play an important role in consumer's decisions and behaviors (Bagozzi et al., 1999; Forgas, 1995; Kwortnik & Ross, 2007; Perlusz, 2004; Petty et al., 1993; Shiv & Fedorikhin, 1999). More specifically, emotions and moods have been suggested to influence how consumers evaluate products (MacInnis & De Mello, 2005; Mogilner et al., 2012) and advertising

(Batra & Ray, 1986; Batra & Stayman, 1990; Gardner, 1985; Holbrook & Batra, 1987), which is consistent with its influence on how consumers perceive and accept innovations.

These findings may indicate a new perspective on how managers may plan the launch and promotion of new products and services aiming to reduce consumers' resistance to innovations, since previous studies mainly took cognitive aspects in consideration (Bagozzi & Lee, 2005; Heidenreich & Kraemer, 2015a; Ram, 1989).

3.2. Active Innovation Resistance and Affect (Study 2)

Study 2 intends to examine the existence of both Cognitive and Affective forms of consumers' Active Innovation Resistance and validate the higher explanatory and predictive power of a construct which combines both forms of AIR in comparison to the current measure of AIR, which measures only the cognitive aspect. To do that, scales to measure both constructs were developed and then combined. This chapter, therefore, discusses the construction and validation of the scale. Initially, the content and face validities of the scale are discussed. Next, construct and criterion validities are presented. At last, the explanatory and predictive power of the scale is determined, and the results are discussed.

3.2.1. Scale Structure and Development of Items (Content and Face Validities)

The Active Innovation Resistance happens after consumers' appraisal of the innovation, and such appraisal elicits both cognitive and affective responses (Bagozzi & Lee, 1999; Mehrabian & Russell, 1974; Talke & Heidenreich, 2014). An individual may evaluate an innovation as beneficial regarding its features, but decide not to accept it because of the emotions elicited by it, as the opposite may take place as well, and a cognitive evaluation of the product present reasons for the consumer to resist it, but the emotions elicited by it lead to its acceptance. Therefore, an innovation might be accepted/resisted by both cognitive and affective reasons. That indicates that Active Innovation Resistance is a two-dimension construct: (1) Cognitive Active Resistance (CAR), which is caused by cognitive barriers to adoption, and (2) Affective Active Resistance (AAR), caused by affective barriers to adoption, reason why it will be referred to as AIRc+a from now on.

A review of the literature concerning Resistance to Innovation indicates that, cognitively, consumers may resist an innovation due to product attributes, also known as functional barriers, as well as to risks perceived regarding such innovation, also known as psychological barriers (Heidenreich & Spieth, 2013; Ram & Sheth, 1989; Rogers, 2003;

Talke & Heidenreich, 2014). As far as product attributes, several barriers have been identified (Heidenreich & Spieth, 2013; Ostlund, 1974): (1) value barrier, which exists when consumer does not perceive the innovation as offering superior performance than existing alternatives; (2) complexity barrier, that takes place when consumers find the innovation complex to understand and to use; (3) usage barrier, that relates to Rogers (2003)'s Compatibility dimension of successful innovations, indicating that consumers do not perceive the innovation as being compatible with previous experiences and/or threatens to disrupt established usage patterns; (4) observability barrier, which encompasses consumer's view of how difficult disseminating the innovation to other might be; and (5) trialability barrier, which indicates how difficult consumers perceive that trying out the innovation before purchase would be.

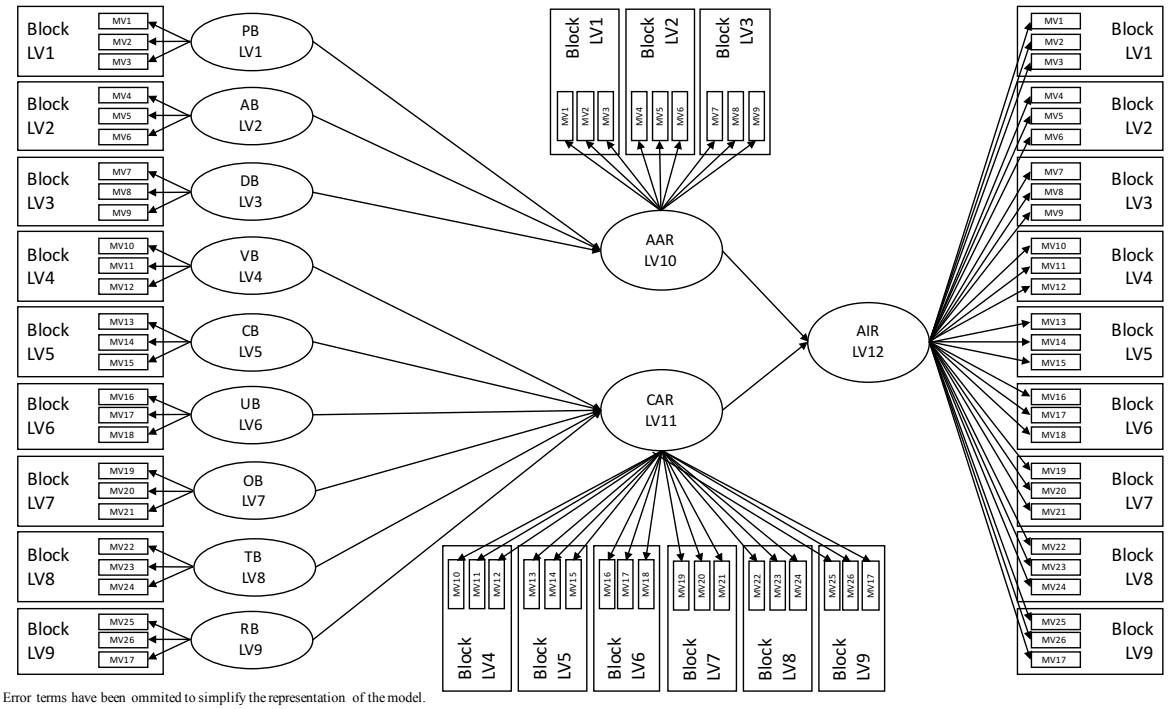
As far as the perception of risk is concerned, it has been suggested that consumers high on innovation resistance are expected to overestimate the risk associated with the innovative product (Heidenreich & Spieth, 2013). Risk, defined as a "subjectively determined expectation of loss: the greater the probability of this loss, the greater the risk thought to exist for an individual" (Mitchell, 1999, p. 168), may cause consumers who perceive it to experience pre-purchase uncertainty as to type and degree of expected loss resulting from the purchase and use of any given good or service (Murray & Schlacter, 1990). As a construct, Perceived Risk has been described as being a multi-dimensional (Jacoby & Kaplan, 1972; Kaplan et al., 1974; Roselius, 1971), comprising six different dimensions: (1) financial risk, (2) performance risk, (3) social risk, (4) physical risk, (5) psychological risk, and (6) convenience risk. However, it has been found that performance risk, related to the risk that the product won't function as expected, correlates with overall Perceived Risk, meaning that employing performance risk as an approximation of overall Perceived Risk is a supported practice (Lutz & Reilly, 1974). Thus, the CAR dimension is defined as having six sub-dimensions: (1) Value Barrier; (2) Complexity Barrier; (3) Usage Barrier; (4) Observability Barrier; (5) Trialability Barrier; and (6) Risk Barrier, defined as performance risk only.

As for the Affective Active Resistance, a review of the literature concerning affect indicates that emotions as an appraisal are best suited for this study, considering that AIR takes place as consumers evaluate an innovation (Bagozzi & Lee, 1999; Heidenreich & Handrich, 2015; Heidenreich & Spieth, 2013; Ram & Sheth, 1989). Havlena and Holbrook (1986) investigated different typologies of emotion in consumer behavior, and

concluded that the PAD (Pleasure-Arousal-Dominance) model presented the best results. Thus, based on the research of Mehrabian and his colleagues (Mehrabian, 1978, 1996; Mehrabian & Russell, 1974; Russell & Mehrabian, 1978; Russell & Pratt, 1980), the PAD model was used as an initial model to evaluate the affect generated by innovation.

The Dominance dimension, which has been suggested to have little influence on emotions (Russell & Pratt, 1980; Vieira, 2008) was kept in the model. Multiple studies have tested dominance's effect on emotions, and have presented positive results (Bradley & Lang, 1994; Edell & Burke, 1987; Ferreira et al., 2014; Jang & Namkung, 2009). Also, it has been found that consumers present paradoxical feelings towards innovations, such as control/chaos (Mick & Fournier, 1998), and present discomfort and insecurity as to the level of control technology will allow them (Parasuraman, 2000; Parasuraman & Colby, 2015), which indicates that the Dominance dimension should be kept in the model. Thus, AIRc+a is modeled as a 3rd order construct, with formative dimensions (figure 6).

Figure 6: the AIRc+a model (Study 2)



Error terms have been ommited to simplify the representation of the model.
Note: Manifest (MV) and Latent (LV) variables have been numbered consecutively.
Note: PB, Pleasure Barrier; AB, Arousal Barrier; DB, Dominance Barrier; VB, Value Barrier; CB, Complexity Barrier; UB, Usage Barrier; OB, Observability Barrier; TB, Trialability Barrier; RB, Risk Barrier.

The CAR dimensions already present measurement instruments that have been developed and tested in the literature. Thus, as in Studies 1A and 1B, the scales for Value Barrier (Rijsdijk et al., 2007), Complexity Barrier (Davis, 1989), Usage Barrier (Meuter et al., 2005), Observability Barrier (Agarwal & Prasad, 1999), Trialability Barrier (Moore &

Benbasat, 1991) and Risk Barrier (Grewal et al., 1994), all three-item 7-point scales, were used, since they are adequate to measure the intended phenomenon.

As for the AAR dimensions, items were developed based on the PAD model, which presents 18 semantic differential items, being six items for each dimension described above (Mehrabian & Russell, 1974). The semantic differential items were transformed into a sentence, so that it would be of similar form to the scales used in CAR dimension. The sentences were then submitted to two English native speaking judges, who evaluated the wording and grammatical construction of each sentence. The necessary modifications were performed.

Next, two rounds of face validity test were conducted. In the first round, five Masters and PhD candidates from a private business school in São Paulo were invited to evaluate the items. A description of each dimension was given to each of them, along with the items, and then they were asked to point to what dimension each item belonged to (see appendix G for results). Next, the results were discussed, and it was suggested that the wording of two items was changed to make it clearer: (1) item 2 of the Pleasure Barrier dimension (substitute “pleases” for “annoys”), and (2) item 1 of the Arousal Barrier dimension (substitute “stimulated” for “motivated”).

The Qualitative round was followed by a Quantitative round that had two stages. In each stage, 51 respondents were asked to classify each item into the dimension they thought that item belonged to. For both stages, a convenience sample extracted from the data-base of an American private research company was used. In Stage 1, 40% of the sample are male, averaging 36.3 years of age, whilst the remaining 60% of the respondents are 35.3 years in average. Fifty percent of the respondents have some sort of college degree, whilst 40% either did not finish high school or did not finish college. Seventy four percent of the respondents have an income between U$10,000 and U$70,000 per year (for more details, refer to Appendix H). In Stage 2, 28 respondents were male, with an average age of 33.5 years, and 23 were female, averaging 37.2 years of age. Fifty one percent of the respondents have some sort of college degree, whilst 35.3% either did not finish high school or did not finish college. Almost 55% of the respondents have an income between U$10,000 and U$50,000 per year, and the remaining 45% are evenly spread throughout other income tiers (for more detail, refer to Appendix I).

Exhibit 3: items re-wording after Stage 1 of the qualitative round of Face Validity test

	Stage 1	Stage 2
P2	Thinking of purchasing _____ annoys me.	Thinking of purchasing _____ pleases me.
P4	I would feel contented when I acquire and use _____.	I would feel gloomy if I acquired and used _____.
P5	Learning about _____ caused me despair.	Learning about _____ made me feel hopeless.
P6	When I think of _____ I feel relaxed.	When I think of _____ I feel discomfort.
A4	After I learned about _____ I found it rather dull.	After I learned about _____ I felt lively.

In Stage 1, a cutoff limit for correct attributions by the respondents was established, and given the large number of respondents the limit was set at 65%. Five items did not reach the cutoff limit of accurate appointment by the respondents: P2, P4, P5, P6 and A4, items which had already been dropped in previous studies (Havlena & Holbrook, 1986; Kulviwat et al., 2007). Such items were reworded (exhibit 3) and then re-tested in Stage 2 (table 10). Item P2 had already shown limitations in the Qualitative Round, but it was tested in Stage 1 with the same wording, given most participants in the Qualitative round had accurately appointed it to the Pleasure Barrier. Item P5 had also been found to be dubious in the Qualitative round, but was also tested with the same wording in Stage 1. However, items P4, P6 and A4 had not indicated to be problematic in the Qualitative round.

Table 10: results of Stages 1 and 2 of the qualitative round of Face Validity test

	Stage 1				Stage 2			
	Pleasure	Arousal	Dominance	Correct attribution	Pleasure	Arousal	Dominance	Correct attribution
P1	36	4	11	71%	33	16	2	65%
P2	23	20	8	45%*	40	8	3	78%
P3	38	9	4	75%	40	8	3	78%
P4	28	12	11	55%*	30	12	9	59%
P5	24	16	11	47%*	16	18	17	31%**
P6	17	28	6	33%*	27	15	9	53%
A1	3	42	6	82%	3	45	3	88%
A2	10	36	5	71%	17	33	1	65%
A3	8	34	9	67%	8	38	5	75%
A4	19	26	6	51%*	9	39	3	76%
A5	7	36	8	71%	11	37	3	73%
A6	5	35	11	69%	6	37	8	73%
D1	5	7	39	76%	9	12	30	59%
D2	6	10	35	69%	6	4	41	80%
D3	6	10	35	69%	11	6	34	67%
D4	5	12	34	67%	10	10	31	61%
D5	4	8	39	76%	6	7	38	75%
D6	7	8	36	71%	11	7	33	65%

*Items that did not achieve the threshold limit of 65% and that were re-worded from Stage 1 to Stage 2
** Eliminated item

In Stage 2, item P2 and A4 performed well, surpassing the cutoff limit of 65% of correct attribution. Items P4 and P6 performed better, reaching more than 50% of correct attribution. Even though such items did not reach the cutoff limit, they were kept for the next round with the purpose of further evaluating them. Item P5, on the other hand, was

eliminated due to its poor performance. The final items of the scale were then validated again by a third English native speaker and may be seen in exhibit 4.

Exhibit 4: original, initial and final items after language check and Face Validity rounds

	Original items*	Initial Items	Final Items
Pleasure	Happy/Unhappy	The possibility of purchasing _____ makes me happy.	The possibility of purchasing _____ makes me happy. (reverse)
Barrier	Pleased/Annoyed	Thinking of purchasing _____ annoys me.	Thinking of purchasing _____ pleases me. (reverse)
	Satisfied/Unsatisfied	Purchasing _____ will truly satisfy me.	Purchasing _____ will trully satisfy me. (reverse)
	Contented/Melancholi	Acquiring and using _____ would get me contented.	I would feel gloomy if I acquired and used _____.
	Hopeful/Despairing	Learning about _____ got me despaired.	Learning about _____ caused me despair.
	Relaxed/Bored	When I think of _____ I feel relaxed.	When I think of _____ I feel discomfort.
Arousal	Stimulated/Relaxed	After appraising _____ I was very motivated.	After reviewing _____ I was very stimulated. (reverse)
Barrier	Excited/Calm	When I see _____ I feel no excitement at all.	When I see _____ I feel very calm.
	Frenzied/Sluggish	The thought of purchasing _____ gets me frantic.	The thought of purchasing _____ makes me feel frantic.
	Jittery/Dull	After I learned about _____ I found it quite dull.	After I learned about _____ I felt lively. (reverse)
	Wide-awake/Sleepy	As I got informed on _____ I felt quite sleepy.	Learning about _____ made me sleepy.
	Aroused/Unaroused	I saw _____ and felt very aroused.	I saw _____ and it did not excite me at all.
Dominance	In control/Cared for	The more I think about _____, the less in control I feel.	The more I think about _____, the more I believe I'll lose control.
Barrier	Controlling/Controlled	I believe _____ allows me better control of my life.	I believe _____ gives me better control of my life. (reverse)
	Dominant/Submissive	Purchasing _____ will make me submissive to technology.	Purchasing _____ will make me dependent on technology.
	Influential/Influenced	When I think of owning _____ I feel like I'll be more influential.	When I think of owning _____ I feel I'll be more influential. (reverse)
	Autonomous/Guided	I see _____ as a solution that takes autonomy away from people.	I see _____ as a solution that takes autonomy away from people.
	Important/Awed	_____ leaves me in awe.	_____ makes me feel less important.

* Meharabian & Russel (1974)

3.2.2. Testing for AAR discriminant and convergent validity

3.2.2.1. Method

At this first round of data collection, AAR scale was the only one being evaluated, considering it is a new measure altogether. Once again, a web-based survey was developed to assess the relationships amongst the constructs in the model. A questionnaire was created on Qualtrics platform in which respondents were initially presented to product stimulus and then asked to fill out the AAR scale, which is comprised of the sub-scales for pleasure, arousal and dominance barriers. The software SmartPLS 3.0 was used to estimate all necessary values.

3.2.2.2. Sampling

Once again, a convenience sample extracted from the data-base of an American private research company was used, this time to make the first round of the scale validation process. A total of 195 usable responses were obtained, 119 of them given by male respondents, averaging 33.4 years of age, and 76 by female respondents, with an average age of 34.9. Almost 54% of the respondents have some sort of college degree, whilst 36.9% have a college degree but did not finish college. More than 53% of the respondents have an income between U$10,000 and U$50,000 per year, and the remaining 47% are evenly spread throughout other income tiers (for more detail, refer to Appendix J).

3.2.2.3. Procedure and Data Analysis

3.2.2.3.1. Stimuli

To establish which product would be used as a stimulus for this round of data collection, a search in some of the most prominent blogs on innovation in the United States was carried out. The objective was finding a product that was being reviewed on most of them, that could be perceived by the respondents as innovative and new in the world. Again, as in Studies 1 and 2, the stimulus should (1) be perceived as presenting some variation toward extant alternatives and (2) require behavioral change from the respondents (Im, Bayus, & Mason, 2003).

The selected product for the stimulus was the Driverless Car, an innovation that has been broadly discussed in the United States as some companies already began testing it – Tesla, Google and Domino's Pizza being some of them. A description of the product was elaborated based on what the innovation blogs were saying about the product, and both rational and emotional aspects of the innovation were included in the description (Appendix K). As for the respondents' perceptions about the product's degree of innovativeness, they perceived it as presenting variation toward extant alternatives (mean = 3.03; *SD* = 1.26) and as requiring behavioral change from the respondents (mean = 3.55; *SD* = 1.12), validating the stimulus.

3.2.2.3.2. Measures

Affective Active Resistance is conceptualized as a Type II second-order construct, with reflective measures for the first-order factors and formative measures for the second-order factor (Jarvis, MacKenzie, & Podsakoff, 2003). The second-order AAR dimension consists of three first-order dimensions: Pleasure Barrier, Arousal Barrier, and Dominance Barrier. Each of the three first-order dimensions are initially measured using six-item, 7-point Likert scales.

To evaluate the psychometric properties of the hierarchical AAR construct, a null model with no structural relationships was initially specified (Hair et al., 2013; Wetzels et al., 2009). Next, the evaluation of the first-order constructs was carried out using the factor weighing scheme. Initial analysis indicated that the loadings for most latent variables exceeded the cutoff threshold of 0.707 (Chin, 2010), but some did not (table 11). In the Pleasure Barrier dimension, item P4 loaded below the cutoff limit (0.644) and was eliminated of the scale. Semantically, this item measured a somewhat similar aspect of consumers' emotions as item P1, thus it does not impact content validity of the scale. Kulviwat et al. (2007) removed the same item on their research for presenting poor

psychometric properties. Also, even though it loaded above the threshold value of 0.707, item P5 (0.747) was cut out of the model to keep all constructs as a 3-item construct and for being presenting the lowest loading among those items which surpassed the cutoff value. Again, such item was not part of Kulviwat et al. (2007)'s research, and will not impact the scale's content validity given its semantical proximity with the items left in the scale.

Table 11: AAR scale item performance and calibration (round 1)

				Full Scale				Reduced Scale			
Construct	Item Label	Item	Mean (SD)	Loading	Significance	CR	AVE	Loading	Significance	CR	AVE
Pleasure Barrier	P1	The possibility of purchasing _____ makes me happy. (r)	3.69 (1.72)	0.900	<0.001	0.906	0.662	0.938	<0.001	0.955	0.876
	P2	Thinking of purchasing _____ pleases me. (r)	3.73 (1.81)	0.898	<0.001			0.950	<0.001		
	P3	Purchasing _____ will trully satisfy me. (r)	4.01 (1.81)	0.851	<0.001			0.919	<0.001		
	P4	I would feel gloomy if I acquired and used _____.	2.72 (1.58)	0.644	<0.001						
	P5	When I think of _____ I feel discomfort.	3.39 (1.85)	0.747	<0.001						
Arousal Barrier	A1	After reviewing _____ I was very stimulated. (r)	3.57 (1.61)	0.840	<0.001	0.438	0.447	0.913	<0.001	0.894	0.739
	A2	When I see _____ I feel very calm.	3.89 (1.52)	-0.686	<0.001						
	A3	The thought of purchasing _____ makes me feel frantic. (r)	5.16 (1.56)	-0.438	<0.001						
	A4	After I learned about _____ I felt lively. (r)	3.89 (1.66)	0.829	<0.001			0.889	<0.001		
	A5	Learning about _____ made me sleepy.	2.40 (1.50)	0.359	<0.001						
	A6	I saw _____ and it did not excite me at all.	3.03 (1.61)	0.706	<0.001			0.771	<0.001		
Dominance Barrier	D1	The more I think about _____, the more I believe I'll lose control.	3.15 (1.73)	0.793	<0.001	0.810	0.420	0.769	<0.001	0.788	0.556
	D2	I believe _____ gives me better control of my life. (r)	3.90 (1.73)	0.728	<0.001			0.833	<0.001		
	D3	Purchasing _____ will make me dependent on technology.	4.68 (1.70)	0.559	<0.001						
	D4	When I think of owning _____ I feel I'll be more influential. (r)	4.48 (1.66)	0.537	<0.001						
	D5	I see _____ as a solution that takes autonomy away from people.	3.86 (1.65)	0.613	<0.001						
	D6	_____ makes me feel less important.	2.81 (1.60)	0.621	<0.001			0.619	<0.001		

Note: significance tested with Bootstraping (n=5000)

Items A2 (-0.686), A3 (-0.438) and A5 (0.359) of the Arousal Barrier were also dismissed from the scale. Items A2 and A3 not only were below the necessary threshold, but also presented a negative sign, indicating that respondents perceived it opposite to what it should have been. Item A2 presents the term 'calm', which was supposed to be the opposite of 'excited', but was perceived as a positive emotional state. Item A3 (frantic), also eliminated from Kulviwat et al. (2007)'s research for presenting poor performance as well, and item A5 (sleepy), removed from Havlena and Holbrook (1986)'s research, may be better suited for evaluating store environment rather than products or services, which may explain its poor performances on the AAR scale.

Items D3 (0.559), D4 (0.537) and D5 (0.613) of the Dominance Barrier dimension were dropped from the scale. These items removal will have little impact on the scale's content validity, since it measures aspects already tapped by the remaining items. Item D6 of the Dominance Barrier, despite having loaded below the threshold (0.621) was kept in the model to ensure the recommended minimum number items for a given construct, which is three (Costa, 2011; DeVellis, 2003) and for presenting the highest loading among those items which did not reach the cutoff limit.

Thus, the Pleasure Barrier dimension is measured by items P1, P2, and P3, bearing an AVE of 0.876 (versus 0.662 initially) and a CR of 0.955. The Arousal Barrier dimension is measured by items A1, A4, and A6, and present an AVE of 0.739 (versus 0.447 initially) and a CR value of 0.894. Finally, the Dominance Barrier is measured by items D1, D2, and D6, presenting an AVE value of 0.556 (versus 0.420 initially) and a CR of 0.788. Thus, all constructs present both AVE and CR values above the cutoff limit (AVE = 0.50, Fornell & Larcker, 1981; CR = 0.70, Chin, 2010), indicating that all three scales present convergent validity and construct reliability.

As for discriminant validity, each first order variable's AVE was larger than the common variances of this variable with the remaining variables in the model, in support for discriminant validity (Fornell & Larcker, 1981). When taking into consideration the items cross-loadings, all items loaded higher in their own dimension, also supporting discriminant validity (table 12).

Table 12: AAR dimensions results for discriminant validity (round 1)

	PB	AB	DB
Pleasure Barrier	**0.936**		
Arousal Barrier	0.782	**0.860**	
Dominance Barrier	0.727	0.580	**0.746**
CR	0.955	0.894	0.788
AVE	0.876	0.739	0.556

Note: significance tested with Bootstraping (n=5000)

	PB	AB	DB
P1	**0.938**	0.724	0.671
P2	**0.950**	0.764	0.689
P3	**0.919**	0.706	0.681
A1	0.719	**0.913**	0.502
A4	0.779	**0.889**	0.533
A6	0.485	**0.771**	0.459
D1	0.401	0.266	**0.769**
D2	0.789	0.672	**0.833**
D6	0.217	0.147	**0.619**

Note: significance tested with Bootstraping (n=5000)

Next, the fit of the second-order formative construct was assessed (table 13). To evaluate whether a formative indicator influences the construct, the significance of the estimated second-order weight was determined using bootstrapping methods (Chin, 1998; Hair et al., 2013) with 5000 subsamples. As mentioned previously, the outer weights can be interpreted as the indicators' relative importance in the summated scale that represents the latent higher-order variable (Sarstedt et al., 2009). For the second-order factor, the second-order weights and significance show that PB, AB and DB (in that order) contribute significantly to AAR at $p < 0.001$. As already mentioned, formative items call for a multicollinearity check. Thus, VIF was calculated for the second-order construct, and the highest value found was 4.635 indicating that no multicollinearity exists (Chin, 2010; Hair et al., 2013). Overall, these results confirm the good psychometric properties of the AAR scale.

Table 13: measurement model of AAR (round 1)

Second-Order Measurement Model		
	AAR	
	(VIF = 4.635)	
Construct	Weights	Significance
Pleasure Barrier	0.468	<0.001
Arousal Barrier	0.375	<0.001
Dominance Barrier	0.265	<0.001

Note 1: significance tested with Bootstraping (n=5000)
Note 2: VIF value shows the highest value found

3.2.3. Testing for AIRc+a construct validity

3.2.3.1. Method

At this second round of data collection, both AAR and CAR scales were evaluated. Once again, a web-based survey was developed to assess the relationships amongst the constructs in the model. A questionnaire was created on Qualtrics platform in which respondents were initially presented to product stimulus and then asked to fill out the AIRc+a scale, which is comprised of CAR and AAR dimensions and its sub-scales for value (VB), complexity (CB), usage (UB), observability (OB), trialability (TB) and risk (RB) barriers, as well as pleasure (PB), arousal (AB) and dominance (DB) barriers. The software SmartPLS 3.0 was used to estimate all necessary values.

3.2.3.2. Sampling

As done in previous studies, a convenience sample extracted from the data-base of an American private research company was used to make the second round of the scale validation process. A total of 190 usable responses were obtained, 97 of them given by male respondents, averaging 36.0 years of age, and 93 by female respondents, with an average age of 38.3. A little more than 53% of the respondents have some sort of college degree, whilst 35.3% have only got a high school degree. Almost 69% of the respondents have an income between U$10,000 and U$60,000 per year, and the remaining 31% are evenly spread throughout other income tiers (for more detail, refer to Appendix L).

3.2.2.3. Procedure and Data Analysis

3.2.2.3.1. Stimuli

The stimulus used in this step of the evaluations was also the driverless car, which showed a good performance in the previous round. Again, a brief description of the product was elaborated based on what the innovation blogs were saying about the product, and both

rational and emotional aspects of the innovation were included in the description (Appendix K). As for the respondents' perceptions about the product's degree of innovativeness, they perceived it as presenting variation toward extant alternatives (mean = 3.63; *SD* = 1.56) and as requiring behavioral change from the respondents (mean = 3.98; *SD* = 1.76), validating the stimulus.

3.2.2.3.2. Measures

The construct AIRc+a, is conceptualized as a Type II third-order construct, with reflective measures for the first-order factors and formative measures for the second- (AAR and CAR) and third-order (AIRc+a) factors (Heidenreich & Handrich, 2015; Jarvis et al., 2003). The second-order AAR dimension consists of three first-order dimensions: PB, AB and CB, as discussed in the previous section. The second-order CAR dimension consists of six first-order dimensions: VB, CB, UB, OB, TB and RB. Each of the nine first-order dimensions are measured using three-item, 7-point Likert scales.

The same procedure as that which was done for the PIR scale was followed for AIRc+a (table 14). The scale was set-up using the hierarchical component model approach, through the use of the repeated indicator approach (Lohmöller, 1989). For that, three steps were taken: (1) the first-order latent variables (PB, AB, DB, VB, CB, UB, OB, TB, RB) were constructed by relating them to their respective block of manifest variables using mode A (reflective) in the outer model; (2) the second-order latent variables (AAR, CAR) were constructed by relating them to the blocks of their respective underlying variables using mode B (formative), and repeating the appropriate first-order latent variable's block of manifest variables in each second-order variable; (3) the third-order latent variable (AIRc+a) was constructed by relating it to its underlying variables using mode B as well, and repeating the manifest variables blocks of all first-order latent variables. By doing this, it was possible to estimate the hierarchical model using PLS path modeling and assess the scale's psychometric properties of the latent variables and their structural relationships. As was the case of PIR, all estimations were calculated using the centroid weighting scheme, which is most adequate for type II models (Becker et al., 2012; Hair et al., 2017; Heidenreich & Handrich, 2015).

Table 14: AAR and CAR scales items performance (round 2)

Construct	Item Label	Item	Mean (SD)	Loading	Significance	AVE	CR
Pleasure Barrier	P1	The possibility of purchasing _____ makes me happy. (r)	3.82 (1.86)	0.962	<0.001	0.915	0.970
	P2	Thinking of purchasing _____ pleases me. (r)	3.96 (1.98)	0.966	<0.001		
	P3	Purchasing _____ will trully satisfy me. (r)	4.25 (1.95)	0.941	<0.001		
Arousal Barrier	A1	After reviewing _____ I was very stimulated. (r)	3.52 (1.68)	0.902	<0.001	0.741	0.895
	A2	After I learned about _____ I felt lively. (r)	3.89 (1.73)	0.919	<0.001		
	A3	I saw _____ and it did not excite me at all.	2.93 (1.79)	0.752	<0.001		
Dominance Barrier	D1	The more I think about _____, the more I believe I'll lose control.	3.54 (1.90)	0.844	<0.001	0.606	0.818
	D2	I believe _____ gives me better control of my life. (r)	4.09 (1.83)	0.861	<0.001		
	D3	_____ makes me feel less important.	2.61 (1.61)	0.602	<0.001		
Value Barrier (Rijsdijk et al., 2007)	V1	This product offers advantages that are not offered by competing products. (r)	2.81 (1.54)	0.835	<0.001	0.727	0.889
	V2	This product is, in my eyes, superior to competing products. (r)	3.73 (1.81)	0.843	<0.001		
	V3	This product solves a problem that I cannot solve with competing products. (r)	3.34 (1.71)	0.878	<0.001		
Complexity Barrier (Davis, 1989)	C1	I believe it would be easy to get this product to do what I want it to do. (r)	3.24 (1.55)	0.900	<0.001	0.817	0.930
	C2	Overall, I believe this product would be easy to use. (r)	3.08 (1.64)	0.933	<0.001		
	C3	Learning to use this product would be easy for me. (r)	3.07 (1.63)	0.877	<0.001		
Usage Barrier (Meuter et al., 2006)	U1	Using this product is compatible with my lifestyle. (r)	3.65 (1.98)	0.960	<0.001	0.902	0.965
	U2	Using this product is completely compatible with my needs. (r)	3.83 (1.97)	0.951	<0.001		
	U3	This product fits wellwith the way I like to get things done. (r)	3.71 (1.96)	0.938	<0.001		
Observability Barrier (Agrawal & Prasad, 1997)	O1	I would have no difficulty telling others about the results of using this product. (r)	3.01 (1.58)	0.876	<0.001	0.640	0.841
	O2	I believe I could communicate to others the consequences of using this product. (r)	2.98 (1.52)	0.749	0.038		
	O3	I would have no difficulty explaining why using this product may or may not be beneficial. (r)	2.93 (1.53)	0.769	<0.001		
Trialability Barrier (Moore & Benbasat, 1991)	T1	I know where I can go to satisfactorily try out this product. (r)	5.31 (1.94)	0.797	<0.001	0.557	0.790
	T2	I don't really have adequate opportunities to try out this product.	5.33 (1.71)	0.718	<0.001		
	T3	Before deciding to use this product, I would be abe to properly try it out. (r)	3.11 (1.54)	0.721	0.002		
Risk Barrier (Grewal et al., 1994)	R1	I am not confident that this product will perform as described.	4.44 (1.95)	0.865	<0.001	0.772	0.910
	R2	I am not certain that this product will work satisfactorily.	4.54 (1.90)	0.844	<0.001		
	R3	I doubt whether the product is reliable in use.	3.99 (1.86)	0.887	<0.001		

Note: significance tested with Bootstraping (n=5000)

To evaluate the psychometric properties of the hierarchical AIRc+a construct, a null model with no structural relationships was initially specified (Hair et al., 2013; Wetzels et al., 2009), and all evaluations of the first-order constructs were carried out using the factor weighing scheme. Initial analysis indicated that the loadings for all latent variables exceeded the cutoff threshold of 0.707 (Chin, 2010), except item D3 (0.602) of the Dominance Barrier scale, the same which had loaded below the threshold in the first evaluation of the scale. However, the item was kept in the model for two reasons: (1) to keep three indicators per latent variable, and (2) the lack of necessity to improve the scale's AVE, which is above the cutoff limit as is (table 14).

For construct reliability, the composite reliability was calculated for all first-order constructs. Composite Reliability indices were high, ranging between 0.790 and 0.970, above the threshold of reliability at 0.700 (Chin, 2010; Hair et al., 2013). For convergent validity, the AVE of all first-order latent-variables was calculated, and the values found are well above the cutoff threshold of 0.500 (Chin, 2010), ranging from 0.606 to 0.915

(table 14). Furthermore, each first-order latent variable's AVE was larger than the common variances of this latent variable with any other variable in the model, even though some high correlation values were found between some dimensions, supporting discriminant validity as well (Fornell & Larcker, 1981) (table 15).

Table 15: AIRc+a dimensions' results for discriminant validity (round 2)

	PB	AB	DB	VB	CB	UB	OB	TB	RB
Pleasure Barrier	**0.956**								
Arousal Barrier	0.773	**0.861**							
Dominance Barrier	0.756	0.622	**0.778**						
Value Barrier	0.792	0.695	0.681	**0.853**					
Complexity Barrier	0.614	0.515	0.548	0.662	**0.950**				
Usage Barrier	0.861	0.694	0.750	0.783	0.672	**0.950**			
Observability Barrier	0.233	0.190	0.163	0.259	0.432	0.234	**0.800**		
Trialability Barrier	0.432	0.321	0.338	0.375	0.418	0.429	0.234	**0.747**	
Risk Barrier	0.715	0.577	0.719	0.718	0.628	0.730	0.184	0.411	**0.879**
CR	0.970	0.895	0.818	0.889	0.930	0.965	0.841	0.790	0.910
AVE	0.915	0.741	0.616	0.727	0.817	0.902	0.640	0.557	0.772

Note: all values significant at $p < 0.001$; significance tested with Bootstraping (n=5000)

Next, the fit of the second- and third-order formative constructs was assessed. The significance of the estimated second- and third-order weights was determined using bootstrapping methods (Chin, 1998; Hair et al., 2013) with 5000 subsamples to evaluate whether a formative indicator influences the construct. The outer weights can be interpreted as the indicators' relative importance in the summated scale that represents the latent higher-order variable (Sarstedt et al., 2009). For the second-order AAR factor, the second-order weights and significance show that PB, AB, and DB (in that order) contribute significantly to AAR at $p < 0.001$ (table 16). As for the second-order CAR factor, the second-order weights and significance indicate that UB, CB, RB, VB, TB and OB (in that order) contribute significantly to CAR at $p<0.001$. For the third-order AIRc+a latent variable, results also indicate that both AAR and CAR constructs contribute significantly, presenting weights of 0.417 and 0.625 (Table 16).

As already mentioned, formative items call for a multicollinearity check. Thus, VIF was calculated for each second- and third-order construct, and even though high values of VIF were expected given the high correlation values found between some of the constructs, the highest value found was 5.830, which is below the threshold value of 10, indicating that no multicollinearity exists (Chin, 2010; Hair et al., 2013). Once again, these results confirm the good psychometric properties of the AIRc+a scale.

Table 16: measurement model for AIRc+a (round 2)

Second-Order Measurement Model				
	AAR		CAR	
	(VIF = 5.830)		*(VIF = 3.809)*	
Construct	Weights	Significance	Weights	Significance
PB	0.511	<0.001	--	--
AB	0.376	<0.001	--	--
DB	0.189	<0.001	--	--
VB	--	--	0.234	<0.001
CB	--	--	0.246	<0.001
UB	--	--	0.294	<0.001
OB	--	--	0.150	<0.001
TB	--	--	0.154	<0.001
RB	--	--	0.197	<0.001

Third-Order Measurement Model		
	AIR	
	(VIF = 4.038)	
Construct	Weights	Significance
AAR	0.417	<0.001
CAR	0.625	<0.001

Note 1: significance tested with Bootstraping (n=5000)
Note 2: VIF value shows the highest value found

Also, a redundancy analysis for convergent validity (Chin, 1998b) of the AIRc+a measure was carried out. When evaluating formative measurement models, the redundancy analysis assesses the correlation between the formative construct and a reflective measure of the same or similar construct. To perform the test, the formative construct should be modeled as an exogenous latent variable predicting an endogenous latent variable operationalized through reflective indicators. Therefore, AIRc+a was modeled as a predictor of AIRs (for details on the scale, please refer to table 17). The strength of the path coefficient linking the two constructs is indicative of the validity of the set of formative indicators as a measure of the construct. An ideal path coefficient of at least 0.80 (larger than 0.70, at least) is desired, which translates into and R^2 value of 0.64 (0.50). The path linking AIRc+a and AIRs presents a value of $\beta = 0.880$, indicating convergent validity for the AIRc+a construct (table 18).

Table 17: Scale performance for AffResp, AttHTP, AIRs, used in the Redundancy Test (round 2)

Construct	Item		Mean (SD)	Loading	Significance	AVE	CR
Affective Response	Very little pleasure - A lot of pleasure (r)		4.11 (2.03)	0.964	<0.001	0.880	0.973
(Nowlis & Shiv, 2005)	Very little joy - A lot of joy (r)		4.33 (2.00)	0.963	<0.001		
	Very little delight - A lot of delight (r)		4.06 (2.07)	0.950	<0.001		
	Very little ecstasy - A lot of ecstasy (r)		4.97 (1.96)	0.861	<0.001		
	Very little gratification- A lot of gratification (r)		4.18 (1.95)	0.948	<0.001		
Attitude Toward High Tech	Dislike - Like (r)		3.29 (2.02)	0.932	<0.001	0.660	0.948
Products	Unfavorable - favorable (r)		3.31 (2.01)	0.928	<0.001	(0.582)	
(Tybout et al., 2005)	Unreliable - Reliable (r)		3.28 (1.75)	0.889	<0.001		
	Low quality - High Quality (r)		2.39 (1.40)	0.768	<0.001		
	Not valuable - Valuable (r)		2.39 (1.52)	0.831	<0.001		
	Bad - Good (r)		3.21 (1.90)	0.930	<0.001		
	Undesirable - Desirable (r)		3.19 (1.98)	0.902	<0.001		
	Poor performance - Good Performance (r)		2.90 (1.56)	0.885	<0.001		
	Common - Advanced (r)		1.90 (1.25)	0.315*	<0.001		
	Outdated technology - Cutting edge technology (r)		1.48 (0.84)	0.188*	0.009		
	Not durable - Durable (r)		3.10 (1.39)	0.714	<0.001		
	Not impressive - Impressive (r)		2.42 (1.63)	0.793	<0.001		
	Simple - Sophisticated (r)		2.03 (1.17)	0.195*	0.064		
Active Innovation Resistance	What is your overall judgment of this product?	Very negative - Very positive (r)	3.31 (1.96)	0.893	<0.001		
(Peracchio & Tibault, 1996)						0.863	0.738
		Very bad - Very good (r)	3.26 (1.87)	0.966	<0.001		
		Very unfavourable - Very favourable (r)	4.42 (2,00)	0.854	<0.001		

Note: significance tested with Bootstraping (n=5000)
* - items eliminated; AVE calculated with (in between brackets) and without these items; CR calculated without the items

A redundancy test was also carried out for AAR and CAR scales. The AAR scale was linked to the scale of Affective Response (Nowlis & Shiv, 2005), which was developed and is used to measure a person's description of an emotional reaction to some stimulus with an emphasis on the most intense pleasurable feelings (for details on the scale, please refer to table 17). The path linking AAR and AffResp presents a value of $\beta = 0.797$, indicating convergent validity for the AAR construct (table 18). As for the CAR construct, it was linked to Attitude to High Tech Products (Tybout et al., 2005), a scale that measures a person's cognitive evaluation of a high technology product or at least a product that could be viewed as having a technology component to it (for details on the scale, please refer to table 17). The path linking CAR and AttHTP presents a value of $\beta = 0.870$, indicating convergent validity for the AAR construct (table 18).

Table 18: redundancy test results for AIRc+a, AAR, CAR (round 2)

	Path Coefficient	Significance
AIRc+a ⟶ AIRs	0.880	<0.001
CAR ⟶ AttHTP	0.870	<0.001
AAR ⟶ AffResp	0.797	<0.001

Note: significance tested with Bootstraping (n=5000)

3.2.2.4. Testing for AIRc+a Criterion Validity

In this section, the AIRc+a contruct is related to other constructs that should share the same level of abstraction and an association with consumers' attitudes toward

innovations. In doing so, the construct's nomological validity is evaluated. Next, the description of some of the related constructs and rationales for their potential relationship with AAR, CAR and AIRc+a.

3.2.2.4.1. Innovativeness

Researchers assume that innovativeness is a personality trait possessed, to a greater or lesser degree, by all members of society. Rogers (2003) defined innovativeness in terms of the length of time any given consumer takes to adopt a new idea. This definition views time to adopt as a surrogate for innovativeness, since it is assumed that by measuring time of adoption what is being measured is, in fact, such personality trait. However, only the act and time of adoption are observable, not the actual innovativeness, which is "a hypothetical construct postulated to explain and/or predict such observable phenomena, but existing only in the mind of this investigator at a higher level of abstraction" (Midgley & Dowling, 1978, p. 230). Thus, there is a distinction between what has been named Innate Innovativeness, which is the abstract construct (i.e. the personality trait) and the observable act of adopting an innovation, that has been named Actualized Innovativeness.

It has been argued that a third type mediates these two types of innovativeness, which is the Domain-Specific Innovativeness (Goldsmith & Hofacker, 1991). The basis for such argument is that an individual might display higher or lower levels of actualized innovativeness for different product categories, and the reason for that is the individual's level of interest and involvement with such category. Thus, any two persons displaying the same level of innate innovativeness might adopt one given product at different times, which may be explained by the Domain-Specific Innovativeness (DSI). Therefore, DSI is said to be the best predictor of innovative behavior (Goldsmith & Hofacker, 1991; Hoffmann & Soyez, 2010). For that reason, it is expected that DSI correlates negatively with AIRc+a.

Innate and Domain-Specific Innovativeness may be both influenced by cognitive and sensory aspects (Hirschman, 1980), which then indicates the existence of (1) Cognitive Innovativeness, that may be described as "the tendency to engage in and enjoy new experiences that stimulate thinking" (Venkatraman & Price, 1990, p. 295); and (2) Sensory Innovativeness, defined as "the tendency to engage in and enjoy internally generated experiences, such as fantasy and daydreaming, and externally available thrilling and adventurous activities" (Venkatraman & Price, 1990, p. 295). Cognitive

innovators enjoy thinking, and take great joy in solving day-to-day problems, whereas sensory innovators present a high level of stimulation, and seek new experiences to maintain their high arousal level (Pearson, 1970; Venkatraman & Price, 1990). Therefore, CAR is expected to correlate negatively with Cognitive Innovativeness, whereas AAR is expected to correlate negatively with Sensory Innovativeness. However, it is not expected a high correlation, given that many authors oppose to the idea that resistance is the obverse of innovativeness, since both processes are based on different mechanisms and may occur simultaneously (Claudy et al., 2015; Heidenreich & Handrich, 2015; Kleijnen et al., 2009; Oreg & Goldenberg, 2015; Ram, 1989).

3.2.2.4.2. Measures

Psychometric properties of the AIRc+a scale have already been discussed. The DSI scale also shows good psychometric properties (table 19), with indicator loadings all above 0.707 (Chin, 2010), ensuring AVE and CR values above the threshold. As for the Cognitive and Sensory Innovatiness scales, initially both showed an AVE value below the cutoff limit (0.494 and 0.483, respectively). So, the lowest loading score items were removed from both scales to improve its AVE value. Thus, items 4 and 7 were removed from the Cognitive Innovativeness scale, and item 4 and 6 were removed from the Sensory innovativeness scale, which improved its AVE values to 0.540 and 0.567 respectively.

Table 19: scale performance for AIRs, DSI, Cognitive and Sensory Innovativeness, used in the Criterion Validity (round 2)

Construct	Item	Mean (SD)	Loading	Significance	AVE	CR
Domain-Specific Innovativeness (Goldsmith & Hofacker, 1991)	In general, I am among the first in my circle of friends to buy a new technological product when it appears.	3.12 (1.95)	0.945	<0.001	0.672	0.851
	If I heard that a new technological product was available, I would not be interested enough to buy it. (r)	3.98 (1.95)	0.480	0.001		
	In general, I am the first in my circle of friends to know the brands of techonological products.	3.39 (1.95)	0.945	<0.001		
Cognitive Innovativeness (Venkatraman & Price, 1990)	Finding out the meaning of words I don't know. (e)	4,79 (1.63)	0.678	<0.001	0.540	0.875
	Trying to figure out the meaning of unusual statements. (i)	4.22 (1.78)	0.832	<0.001	(0.494)	
	Thinking about different ways to explain the same thing. (i)	4.13 (1.83)	0.800	<0.001		
	Figuring out the shortest distance from one city to another. (i)	4.15 (1.87)	0.635*	<0.001		
	Analyzing my own feelings and reactions. (i)	4.47 (1.74)	0.693	<0.001		
	Discussing unusual ideas. (i)	4.93 (1.59)	0.693	<0.001		
	Thinking about why the world is in the shape it is in. (i)	3.73 (1.81)	0.645*	<0.001		
	Figuring out how many bricks it would take to build a fireplace. (e)	2.96 (1.85)	0.697	<0.001		
Sensory Innovativeness (Venkatraman & Price, 1990)	Being on a raft in the middle of the Colorado River. (e)	3.34 (1.98)	0.792	<0.001	0.567	0.887
	Having a vivid dream with strange colors and sounds. (i)	4.50 (1.80)	0.663	<0.001	(0.483)	
	Riding the rapids in a swift moving stream. (e)	3.17 (1.95)	0.815	<0.001		
	Having a strange new feeling as I awake in the moring. (i)	3.18 (1.72)	0.599*	<0.001		
	Steering a sled down a steep hill covered with trees. (e)	2.86 (1.92)	0.745	<0.001		
	Dreaming that I was lying on the beach with the waves running all over me. (i)	4.81 (1.76)	0.459*	<0.001		
	Walking across a swinging bridge over a deep canyon. (e)	2.64 (1.89)	0.802	<0.001		
	Having vivid and unusual daydreams as I was riding along. (e)	4.24 (1.91)	0.689	<0.001		

Note: significance tested with Bootstraping (n=5000)

* - items eliminated; AVE calculated with (in between brackets) and without these items; CR calculated without the items

Regarding the structural relations, as shown in table 20, results are in line with the expectations. AIRc+a has a significant negative relationship with DSI (r = -0.317), CAR presents a negative relationship with cognitive innovativeness (r = -0.345), and AAR has a negative relationship with sensory innovativeness (r = -0.319). Thus, AIRc+a and its components CAR and AAR are related to but are different from other constructs commonly used in the innovation adoption literature.

Table 20: results for the AIRc+a criterion validity (round 2)

	Path Coefficient	Significance
AIRc+a → DSI	-0.317	<0.001
CAR → Cognitive Innovativeness	-0.345	<0.001
AAR → Sensory Innovativeness	-0.319	<0.001

Note: significance tested with Bootstraping (n=5000)

3.2.3. Explanatory and predictive power of AIRc+a

The AIRc+a scale is designed to measure individual differences in consumers' appraisal of innovations and their tendency to resist such innovations. Thus, it is important for marketers to understand whether such measures relate to adoption-related behavior. That concern is twofold, being of great importance the scale's ability to (1) explain and predict specific adoption-related behavior – in the case of this study, consumer's intention to adopt, which is a construct widely used in innovation adoption studies (e.g. Ferreira et al., 2014; Kulviwat et al., 2007) – and (2) explain and predict these behaviors beyond the level provided by existing constructs – in the case of this study, DSI, age, education and income. Domain-specific innovativeness was again employed in these studies to investigate the explanatory and predictive power of AIRc+a scale, given that it is defined as the individual's predisposition to innovate in any specific field and is expected to explain and predict consumer's intention to adopt innovations (Goldsmith & Hofacker, 1991; Hoffmann & Soyez, 2010).

3.2.3.1. Stimulus

The stimulus used in this study was different from that which was used in the previous rounds of the AIRc+a scale validation, and the reason for that is to test the scale's performance in a different context as well. Again, to create a realistic setting and enhance external validity, the stimulus for the innovative product was chosen according to the same five requirements of Study 1A: (1) it should be a real product; (2) respondents should be able to afford it; (3) the innovation should be perceived as presenting some

variation toward extant alternatives; (4) it should require behavioral change from the respondents (Im, Bayus, & Mason, 2003); and (5) it should be a consumer electronic, since this is a category perceived as high tech and innovative (Gatignon & Robertson, 1991). Thus, the stimulus used in this study was once again the Zuta Pocket Printer, which scored (mean = 3.03; *SD* = 1.26) in the requirement of behavioral change on the consumer's part, and (mean = 3.55; *SD* = 1.12) on the variation toward the current form of attending the same need. Therefore, the Zuta Printer was validated as a stimulus.

3.2.3.2. Sampling

For the last round of the scale validation, once again a convenience sample extracted from the data-base of an American private research company was used. A total of 186 usable responses were obtained, 78 of them given by male respondents, averaging 33.1 years of age, and 108 by female respondents, with an average age of 36.1. A little more than 48% of the respondents have some sort of college degree, whilst 40.9% either did not finish high school or did not finish college. Almost 47% of the respondents have an income between U$10,000 and U$50,000 per year, and the remaining 53% are evenly spread throughout other income tiers (for more detail, refer to Appendix M).

3.2.3.3. Measures

Initial analysis of the AAR and CAR dimensions as well of the other latent variables in the model (AIRs – the simpler 3-item scale used in previous studies – DSI and Intention to Adopt) indicated that the loadings for all latent variables exceeded the cutoff threshold of 0.707 (Chin, 2010), with a few exceptions. Confirming the instability of the Dominance Barrier measure, two items scored below the threshold; item 1 (0.068) was removed, improving the scale's AVE from 0.340 to 0.509 (table 21) and item 3 (0.250) was kept for two reasons: (1) not to have one dimension with one single item (Costa, 2011; DeVellis, 2003) and (2) because the item loading was significant at $p<0.1$. Also, item 2 of the Observability Barrier scale (0.686) and item 3 of the Trialability Barrier Scale (0.662) loaded below the threshold, but were kept considering the scale's adequate AVE. For construct reliability, the composite reliability was calculated for all first-order constructs. Composite reliability indices were high, ranging between 0.794 and 0.952, above the threshold of reliability at 0.700 (Chin, 2010; Hair et al., 2013). The exception again is the Dominance Barrier, which presented a CR of 0.611 for the reasons explained above. For convergent validity, the AVE of all first-order latent-variables was calculated,

and the values found are above the cutoff threshold of 0.500 (Chin, 2010), ranging from 0.509 to 0.884 (table 21).

Table 21: performance of the measures of AAR, CAR, AIRs, DSI and Intention to Adopt (round 3)

Construct	Item		Mean (SD)	Loading	Significance	AVE	CR
Pleasure Barrier	The possibility of purchasing _____ makes me happy. (r)		3.28 (1.78)	0.953	<0.001	0.884	0.958
	Thinking of purchasing _____ pleases me. (r)		3.33 (1.78)	0.955	<0.001		
	Purchasing _____ will trully satisfy me. (r)		3.76 (1.82)	0.911	<0.001		
Arousal Barrier	After reviewing _____ I was very stimulated. (r)		3.65 (1.83)	0.847	<0.001	0.680	0.864
	After I learned about _____ I felt lively. (r)		3.78 (1.76)	0.849	<0.001		
	I saw _____ and it did not excite me at all.		2.74 (1.71)	0.776	<0.001		
Dominance Barrier	The more I think about _____, the more I believe I'll lose control.		1.83 (1.32)	0.068*	0.960	0.509 (0.340)	0.611
	I believe _____ gives me better control of my life. (r)		3.66 (1.76)	0.976	<0.001		
	_____ makes me feel less important.		1.73 (1.26)	0.250	0.055		
Value Barrier (Rijsdijk et al., 2007)	This product offers advantages that are not offered by competing products. (r)		2.51 (1.46)	0.809	<0.001	0.724	0.887
	This product is, in my eyes, superior to competing products. (r)		3.22 (1.66)	0.875	<0.001		
	This product solves a problem that I cannot solve with competing products. (r)		2.88 (1.60)	0.867	<0.001		
Complexity Barrier (Davis, 1989)	I believe it would be easy to get this product to do what I want it to do. (r)		2.90 (1.52)	0.893	<0.001	0.730	0.889
	Overall, I believe this product would be easy to use. (r)		2.53 (1.34)	0.921	<0.001		
	Learning to use this product would be easy for me. (r)		2.31 (1.21)	0.738	<0.001		
Usage Barrier (Meuter et al., 2006)	Using this product is compatible with my lifestyle. (r)		2.96 (1.68)	0.937	<0.001	0.868	0.952
	Using this product is completely compatible with my needs. (r)		3.03 (1.74)	0.938	<0.001		
	This product fits wellwith the way I like to get things done. (r)		2.89 (1.60)	0.921	<0.001		
Observability Barrier (Agrawal & Prasad, 1997)	I would have no difficulty telling others about the results of using this product. (r)		2.38 (1.42)	0.816	<0.001	0.588	0.810
	I believe I could communicate to others the consequences of using this product. (r)		3.09 (1.69)	0.686	<0.001		
	I would have no difficulty explaining why using this product may or may not be beneficial. (r)		2.59 (1.57)	0.792	<0.001		
Trialability Barrier (Moore & Benbasat, 1991)	I know where I can go to satisfactorily try out this product. (r)		4.13 (2.10)	0.775	<0.001	0.564	0.794
	I don't really have adequate opportunities to try out this product.		3.47 (1.85)	0.809	<0.001		
	Before deciding to use this product, I would be abe to properly try it out. (r)		2.97 (1.44)	0.662	<0.001		
Risk Barrier (Grewal et al., 1994)	I am not confident that this product will perform as described.		3.87 (1.86)	0.906	<0.001	0.808	0.927
	I am not certain that this product will work		4.10 (1.84)	0.884	<0.001		
	I doubt whether the product is reliable in use.		3.84 (1.75)	0.907	<0.001		
Active Innovation Resistance (Peracchio & Tibault, 1996)	What is your overall judgment of this product?	Very negative - Very positive (r)	3.69 (0.82)	0.935	<0.001	0.871	0.953
		Very bad - Very good (r)	3.76 (0.90)	0.926	<0.001		
		Very unfavourable - Very favourable (r)	3.81 (0.99)	0.939	<0.001		
Intention to Adopt (Kulviwat et al., 2007)	How likely do you fell it is that you would purchase this product?	Very unlikely - very likely	3.36 (1.38)	0.961	<0.001	0.882	0.957
		Highly improbable - Highly probable	3.34 (1.39)	0.937	<0.001		
		Impossible - Possible	3.84 (1.21)	0.918	<0.001		
Domain-Specific Innovativeness (Goldsmith & Hofacker, 1991)	In general, I am among the first in my circle of friends to buy a new technological product when it appears.		4.00 (1.90)	0.922	<0.001	0.831	0.937
	If I heard that a new technological product was available, I would not be interested enough to buy it. (r)		4.53 (1.77)	0.907	<0.001		
	In general, I am the first in my circle of friends to know the brands of techonological products.		4.37 (1.87)	0.906	<0.001		

Note: significance tested with Bootstraping (n=5000)
* - item eliminated; AVE calculated with (in between brackets) and without this item; CR calculated without the item

Next, the fit of the second- and third-order formative constructs was assessed (Table 22). As done in previous studies, the evaluation as to whether a formative indicator influences

the construct, the significance of the estimated second- and third-order weights was determined using bootstrapping methods (Chin, 1998; Hair et al., 2013) with 5000 subsamples. The outer weights can be interpreted as the indicators' relative importance in the summated scale that represents the latent higher-order variable (Sarstedt et al., 2009). For the second-order AAR factor, the second-order weights and significance show that PB, AB and DB (in that order) contribute significantly to AAR at $p < 0.001$. For the second-order CAR construct, UB, CB, RB, VB, TB and OB (in that order) contribute significantly at $p<0.001$ to CAR. For the third-order AIR construct, both AAR and CAR constructs show significant weights of 0.417 and 0.625, respectively.

As already mentioned, formative items call for a multicollinearity check. Thus, VIF was calculated for each second- and third-order construct, and the highest value found was 6.982, which is below the cutoff limit of 10, indicating that no multicollinearity exists (Chin, 2010; Hair et al., 2013). Overall, these results confirm the good psychometric properties of the AIR scale and indicate that it is suitable for further analysis of the herein hypothesized structural relationships.

Table 22: measurement model of the AIRc+a scale (round 3)

Second-Order Measurement Model				
	AAR		CAR	
	(VIF = 6.982)		*(VIF = 5.725)*	
Construct	Weights	Significance	Weights	Significance
PB	0.470	<0.001	--	--
AB	0.351	<0.001	--	--
DB	0.283	<0.001	--	--
VB	--	--	0.232	<0.001
CB	--	--	0.257	<0.001
UB	--	--	0.295	<0.001
OB	--	--	0.107	<0.001
TB	--	--	0.122	<0.001
RB	--	--	0.238	<0.001

Third-Order Measurement Model		
	AIR	
	(VIF = 3.572)	
Construct	Weights	Significance
AAR	0.418	<0.001
CAR	0.620	<0.001

Note 1: significance tested with Bootstraping (n=5000)
Note 2: VIF value shows the highest value found

To evaluate the explanatory and predictive power of the AIRc+a scale, it was employed a hierarchical SEM analysis to predict intention to adopt (Bruner & Kumar, 2007;

Heidenreich & Handrich, 2015). Initially, to establish a baseline, Model 1 measures the effect that AIRs has on Intention to Adopt, along with the demographic variables (similar to what was done in Step 3 of Model 2). Next, Model 2 assess the AIRc+a performance, and the following steps were followed in such assessment:

1) Step 0: the effect of each variable on Intention to Adopt was calculated separately, aiming to assess their individual contribution.

2) Step 1: demographic variables were included in the model, and the effect of CAR alone on Intention to adopt was calculated.

3) Step 2: all demographic variables were also included, along with AAR alone.

4) Step 3: demographic variables were included and AIRc+a's effect on Intention to Adopt was measured.

The objective is to evaluate which combination presents higher explanatory and predictive power. Three different indices are important to be evaluated: (1) R^2, representing the exogenous variable's combined effects on the endogenous variable, or the variance explained in the endogenous variable (the R^2adj is a criterion that avoids bias towards complex models, which may occur when there are more variables in any given model); R^2 values of 0,75, 0.50, and 0.25 have been considered to be substantial, moderate and weak (Hair et al., 2011; Hair et al., 2013; Henseler, Ringle, & Sinkovics, 2009); (2) f^2, referred to as effect size, which represents the change in R^2 when a specific exogenous variable is omitted from the model – as previously described, f^2 values of 0.02, 0.15 and 0.35 represent small, medium, and large effects (Chin, 1998b; Cohen, 1988) ; and (3) q^2, which functions in the same way as f^2, but referring to Stone-Geisser's Q^2 (Geisser, 1974; Stone, 1974), also known as out-of-sample predictive power or predictive relevance (blindfolding procedure is used to calculate Q^2); as a relative measure of predictive relevance, values of 0.02, 0.15 and 0.35 indicate that an exogenous latent variable has a small, medium, or large size, for a specific endogenous construct (Hair et al., 2013).

Table 23: Explanatory and Predictive Power of AIRc+a for Intention to Adopt (round 3)

	Model 1		Model 2									
	Step 1		Step 0			Step 1		Step 2		Step 3		
	R^2 = 0.517*					R^2 = 0.605*		R^2 = 0.632*		R^2 = 0.653*		
Independent	R^2 adj = 0.503*					R^2 adj = 0.594*		R^2 adj = 0.622*		R^2 adj = 0.643*		
Variables	β	*p*	β	*p*	R^2	β	*p*	β	*p*	β	*p*	f^2	q^2
AIRs	-0.544	<0.001	--	--	--	--	--	--	--	--	--	0.517	0.353
AIRc+a	--	--	-0.799	<0.001	0.639	--	--	--	--	-0.727	<0.001	1.111	0.692
AAR	--	--	-0.785	<0.001	0.617	--	--	-0.722	<0.001	--	--	0.990	0.633
CAR	--	--	-0.751	<0.001	0.564	-0.660	<0.001	--	--	--	--	0.856	0.558
DSI	0.333	<0.001	0.509	<0.001	0.260	0.207	0.001	0.125	0.041	0.139	0.019	0.040	0.024
AGE	-0.022	0.676	0.052	0.651	0.003	0.062	0.225	0.005	0.912	0.036	0.475	0.004	-0.002
EDUCATION	0.069	0.232	0.036	0.701	0.001	0.015	0.753	0.041	0.367	0.029	0.543	0.002	-0.004
INCOME	-0.088	0.157	0.116	0.311	0.014	-0.043	0.424	0.012	0.804	-0.019	0.692	0.001	0.000

* significant at p<0.001; significance tested with Bootstraping (n=5000)

As shown in table 23, AIRc+a presented the highest individual effect (Step 0: β = -0.799, p<0.001) on Intention to Adopt and was responsible for the highest explained variance for the exogenous variable (Step 0: R^2 = 0.639), indicating high explanatory power. After controlling for the demographic variables and adding DSI in the model, AIRc+a still presented a significant effect on Intention to Adopt (Step 3: β = -0.727, p<0.001). Comparing AIRc+a with other measures of AIR, the variance explained in Step 3, already corrected for model bias (R^2adj = 0.643), is higher than that which was found for the models featuring CAR along with DSI and demographic variables (Step 1: R^2adj = 0.594) and AAR along with DSI and demographic variables (Step 2: R^2adj = 0.622). Comparing with the existing measure of AIR (R^2adj = 0.503), AIRc+a presented better explanatory power as well. Thus, AIRc+a presents higher explanatory power than any of the evaluated alternatives. Even though all effect sizes may be considered large, the effect size yielded by AIRc+a (f^2 = 1.111) is the highest one compared to CAR (f^2 = 0.856), AAR (f^2 = 0.990) and AIRs (f^2 = 0.517), confirming AIRc+a higher explanatory power. As for the predictive power, Step 3 also yielded a higher value (q^2 = 0.692) than CAR (q^2 = 0.558), AAR (q^2 = 0.633), and AIRs (q^2 = 0.353), indicating a higher predictive power for the AIRc+a. Thus, the expectations that measuring AIR as the result of both cognitive and affective appraisals would provide better results were met.

One interesting finding is that Step 2, which is comprised of AAR, DSI and the demographic variables, presents better indices than Step 1, comprised of CAR, DSI and the demographic variables. Explanatory power is higher in Step 2 than in Step 1 (Step 1: R^2adj = 0.594; Step 2: R^2adj = 0.622), which is confirmed by larger effect size in Step 2 (Step 1: f^2 = 0.856; Step 2: f^2 = 0.990). Also, the predictive relevance is higher in Step 2 (Step 1: q^2 = 0.558; Step 2: q^2 = 0.633). This indicates that, contrary to mainstream belief in extant literature on consumer's resistance to innovation, affect exerts great impact on consumers' behavior towards innovative products, which is in line with research

indicating the influence of emotions on other aspects of consumer behavior and decision making (Bagozzi et al., 1999; Batra & Stayman, 1990; de Mello & MacInnis, 2005; Forgas, 1995; Holbrook & Batra, 1987).

As a last evaluation of the scale, Chin (1998a, 2010) suggests that the predictiveness of the model should be a priority. Thus, the analysis of path coefficients should take into consideration not only its significance, but also its strength. In that sense, standardized paths should be around 0.20, ideally above 0.30, to be considered meaningful. Both TB and OB dimensions loaded below 0.20 at all validations, which may indicate that these two dimensions could be eliminated from the model to improve its predictiveness. Therefore, one last test was carried out with the CAR scale, and TB and OB dimensions were removed from the model.

Results indicate that the third-order measurement model of the CAR scale show good psychometric properties. For the second-order AAR factor, the second-order weights and significance show that PB, AB, and DB (in that order) contribute significantly to AAR at $p < 0.001$ (table 24). As for the second-order CAR factor, the second-order weights and significance indicate that UB, CB, VB and RB (in that order) contribute significantly to CAR at $p<0.001$. For the third-order AIRc+a latent variable, results also indicate that both AAR and CAR constructs contribute significantly, presenting weights of 0.463 and 0.577 (figure 33). As for the multicollinearity check, the highest value found was 5.642, which is below the threshold value of 10, indicating that no multicollinearity exists (Chin, 2010; Hair et al., 2013). Once again, these results confirm the good psychometric properties of the AIRc+a scale.

Table 24: measurement model for reduced AIRc+a (round 3)

Second-Order Measurement Model				
	AAR		CAR	
	(VIF = 5.642)		*(VIF = 3.809)*	
Construct	Weights	Significance	Weights	Significance
PB	0.518	<0.001	--	--
AB	0.376	<0.001	--	--
DB	0.183	<0.001	--	--
VB	--	--	0.286	<0.001
CB	--	--	0.299	<0.001
UB	--	--	0.363	<0.001
RB	--	--	0.257	<0.001

Third-Order Measurement Model		
	AIR	
	(VIF = 4.093)	
Construct	Weights	Significance
AAR	0.463	<0.001
CAR	0.577	<0.001

Note 1: significance tested with Bootstraping (n=5000)
Note 2: VIF value shows the highest value found

As for the explanatory and predictive power of the reduced scale, the same procedure that was performed with the full scale was repeated for the reduced scale, but only for Model 2 and Steps 1 and 3, which had CAR in it. Results indicate that the elimination of the TB and OB latent variables improves the explanatory and predictive power of the AIRc+a scale (table 25). In Step 1, which only accounts for the effect of CAR, DSI and the demographic variables, the variance explained in Intention to Adopt increased from R^2 = 0.605 in the full model to R^2 = 0.625 in the reduced model. As for the effect size, value increased from f^2 = 0.856 to f^2 = 0.869. In Step 3, that takes into consideration AAR, CAR, DSI and the demographic variables, results were the same, and both R^2 and f^2 values increased with the reduced version of AIRc+a. As for the predictive power, values increased from q^2 = 0.558 to q^2 = 0.613 in Step 1, and from q^2 = 0.692 to q^2 = 0.733 in Step 3. These results validate a better explanatory and predictive power of the reduced AIRc+a. Again, just as with the full version of the CAR scale, AAR showed a better performance at explaining and predicting the intention to adopt, confirming its importance in understanding consumers' behavior towards innovations.

Table 25: Explanatory and Predictive Power of reduced AIRc+a for Intention to Adopt (round 3)

	model 2							
	Step 1		Step 2		Step 3			
	R^2 = 0.625*		R^2 = 0.632*		R^2 = 0.665*			
Independent	R^2 adj = 0.614*		R^2 adj = 0.622*		R^2 adj = 0.655*			
Variables	β	*p*	β	*p*	β	*p*	f^2	q^2
AIRc+a	--	--	--	--	-0.739	<0.001	1.185	0.733
AAR	--	--	-0.722	<0.001	--	--	0.990	0.633
CAR	-0.678	<0.001	--	--	--	--	0.869	0.613
DSI	0.201	0.001	0.125	0.041	0.133	0.020	0.037	0.024
AGE	0.077	0.150	0.005	0.912	0.042	0.426	0.005	-0.002
EDUCATION	0.018	0.718	0.041	0.367	0.033	0.470	0.001	-0.004
INCOME	-0.044	0.354	0.012	0.804	-0.017	0.700	0.003	0.000

* significant at p<0.001; significance tested with Bootstraping (n=5000)

3.2.4. Discussion

It was proposed herein that AIR, instead of being a cognitive-laden construct, was in fact impacted by both cognition and affect. In the attempt to develop a scale to measure consumers' different levels of AIR based on such assumption, a third-order conceptualization of consumers' AIR was suggested based on previous research on both resistance to innovations (Heidenreich & Spieth, 2013; Ram, 1987; Ram & Sheth, 1989; Sheth, 1981; Talke & Heidenreich, 2014) and affect (Bakker et al., 2014; Ferreira et al., 2014; Kulviwat et al., 2007; Mehrabian, 1996; Mehrabian & Russell, 1974; Russell & Mehrabian, 1978; Vieira, 2008). The investigations of the scale's relationship with other constructs as well as its explanatory and predictive power have yielded encouraging results. In different studies, the AIR scale has shown to be multidimensional, reliable, and able to provide convergent, discriminant and criterion validity.

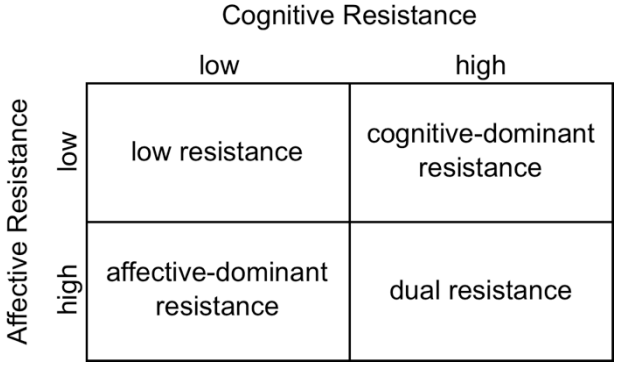
As suggested, AIR consists of two second-order dimensions, CAR and AAR, which together form consumers' decision to resist any given innovation after it has been appraised. In this respect, it seems that CAR has indeed a greater influence, since its third-order weight is higher than that of AAR. Based on extant literature, it was initially suggested that CAR is comprised of six dimensions, which was later reduced to four dimensions (Value, Complexity, Usage and Risk barriers). Their relative importance, from most to least important, is Usage Barrier, Complexity Barrier, Value Barrier and Risk Barrier, indicating that being consistent with consumers' lifestyle and needs surpasses being considered easy to use and better that competing alternatives, which are usually named the most important factors in an innovation (Rogers, 2003).

As for AAR, it was suggested that it is comprised of three dimensions, and the results indicate that all three dimensions are important, even though Pleasure and Arousal have shown to be far more important than Dominance. The Dominance dimension has been found to be controversial, and has been suggested to have little influence on emotions (Russell & Pratt, 1980; Vieira, 2008). However, multiple studies have presented positive results for the influence of dominance on affect (Bakker et al., 2014; Bradley & Lang, 1994; Edell & Burke, 1987; Ferreira et al., 2014; Jang & Namkung, 2009; Mehrabian, 1978, 1996; Russell & Mehrabian, 1978). Regarding consumers' reaction to innovations, Dominance perhaps is dependent on how disruptive the innovation is, and how much of a change in behavior it will require from the adopter. For instance, the nanotechnology applied to shampoo will require very little change in behavior and will pose virtually no threat to how consumer perceive the Dominance dimension, whereas the same may not be said about the autonomous car.

The relationships of AIRc+a, as well of CAR and AAR, with other constructs are in line with theoretical expectations, in support of both nomological and convergent validity depending of the constructs against which the measures were compared. Also, the scale's explanatory and predictive power were explored regarding the Intention to Adopt construct, and AIRc+a showed a better result than that of the AIRs scale, indicating the importance of considering an affective dimension when evaluating consumers' response to innovations. As a matter of fact, the AAR dimension showed better explanatory and predictive power than the CAR dimension, once again indicating the importance of the affective dimension in consumers' evaluation of innovative products.

Thus, considering that CAR and AAR are both important in forming consumers' active resistance to innovations, are independent dimensions, and that each may present either high or low levels, it may be suggested that four forms of AIR exist (figure 7). The combination of high levels of both CAR and AAR resistance will originate a dual resistance, the strongest form of resistance, whereas the combination of low levels of CAR and AAR will imply in consumers presenting low active resistance to innovation. When CAR is high and AAR is low, a cognitive-dominant resistance (CDR) is present, whereas affective-dominant resistance (ADR) is the result of low levels of CAR and high levels of AAR.

Figure 7: the four types of AIR based on different levels of CAR and AAR



4. CONCLUSION

The literature on the adoption of new products focuses on well-succeeded innovations and discuss the positive outcomes of innovations and the motivating factors within the adoption process. Also, it assumes that innovative products are always good and should be adopted by all consumers, who would be willing to accept all changes imposed by such innovation. Thus, there is a clear pro-change bias in the literature, which should be addressed by creating a better understanding of why consumers resist innovations.

Different forms of resistance have been suggested considering the point in time during which it occurs. Passive innovation resistance happens prior to innovation evaluation by the consumer and is caused by an adopter-specific inclination to resist changes and/or a situation-specific status-quo satisfaction, whereas active innovation resistance arises due to product-specific barriers that evolve during the evaluation process. Both passive and active resistance to innovation have been mostly described as having cognitive roots, disregarding the vastly investigated importance of emotions and moods in consumer behavior. This study suggests that, by incorporating affect into both passive and active innovation resistance models, a deeper understanding of adoption or rejection behavior may be achieved, expanding our current knowledge about consumer behavior in innovation-related decisions.

Firstly, it was investigated the role of affective state in the relationship between passive and active innovation resistance. Previous studies indicated that PIR is an antecedent of AIR, and it was suggested that affect played a moderating role in that relationship. Results confirm the moderating role of affect, and indicate that more positive affective states will decrease the impact of consumers' PIR on their evaluation of the innovative product or service, which is in line with the argument that affect play an important role in consumer's decisions and behaviors.

Secondly, it was suggested that AIR is a two-dimension construct comprising a cognitive and an affective dimension. Thus, AIR was modeled as a third order construct, comprised of two second-order constructs, Cognitive Active Resistance and Affective Active Resistance. By doing that, the impact of adding an affective dimension to active resistance could be assessed, and results indicated that the explanatory and predictive power of the AIR measure improved as suggested. As a matter of fact, considering solely the affective dimension provides better explanatory and predictive power that the cognitive dimension

alone, also confirming the importance of affect in consumers' behavior regarding innovations.

Investigating consumers' resistance to innovations is not important only to researchers – since it contributes to the innovation adoption literature – but also to managers, given the relevance of innovation in corporate strategies. Managers need to accept that consumers will most likely resist the innovations launched in the marketplace, whether prior to or after evaluating it. Thus, a better understanding of the reasons behind the adopters' resistance to innovation, as well as of its mechanisms, is of great importance to decrease the innovation's chances of failure. Different forms of reducing the impact of PIR (Heidenreich & Kraemer, 2015a) and AIR (Bagozzi & Lee, 2005; Ram, 1989; Talke & Heidenreich, 2014). However, none of them took emotions and moods into consideration.

Even though affective states are only temporary, which may suggest that it is not effective in reducing PIR, the priming of emotions as a marketing tactic would function just like the benefit comparison and mental simulation tactics presented by Heidenreich and Kraemer (2015a), and reduce PIR temporarily so that consumers feel more receptive to assessing the product. It would be fruitful to investigate how such instrument functions as to reduce the effects of PIR in future research, and whether it impacts the different types of PIR in a similar manner.

As for AIR, the tactics described in the literature involve assessing the barriers evoked by the innovation among consumers and design adequate instruments to overcome these barriers. However, the barriers which have been investigated are of cognitive nature (e.g. value, complexity, and usage barriers). However, given the impact that affect play in the evaluation of the new product, managers may also devise tactics aiming the emotions elicited by the innovation in the consumer to ensure better acceptance of the new product. Thus, forms to overcome the AAR should be further investigated to not only allow managers to better prepare for it, but also deepen our knowledge on acceptance and resistance to innovations.

Also, products may be of either utilitarian or hedonic nature (Batra & Ahtola, 1990; Hirschman & Holbrook, 1982; Spangenberg, et al., 1997) and such dichotomy impacts the way buyers relate to and use it (Crowley et al., 1992; Voss et al., 2003). Consumers react differently to products positioned as utilitarian or hedonic, since the needs to be

fulfilled differ in each situation. Utilitarian products are sought by consumers who seek fulfilling functional needs, whereas hedonic products are adequate for symbolic and/or experiential needs (Park, Jaworski, & MacInnis, 1986). Therefore, managers should take the different types of AIR into consideration when positioning products as hedonic or utilitarian, as different tactics may be needed to reduce resistance to innovation. Future research should investigate whether AAR and CAR impact utilitarian and hedonic products differently, mainly through affective-dominant resistance and cognitive-dominant resistance, and seek for alternatives to diminish its impacts.

Future research exploring different variables is also called for. The Affect Infusion Model (Forgas, 1995) suggests that affect will play a more decisive role in situations where there is little knowledge about the product or when there is the element of time pressure. Thus, it would be interesting to evaluate whether such variables may impact the way affect moderates the PIR-AIR relationship. Since the degree of disruptiveness has been suggested to influence the significance of the Dominance Barrier, it would be fruitful to investigate whether such assumption is true, thus validating the existence of one more variable to impact consumers' relationship with innovations.

REFERENCES

Adler, N. J. (1983). Cross-Cultural Management Research: The Ostrich and the Trend. *Academy of Management Review*, *8*(2), 226–232. http://doi.org/10.5465/AMR.1983.4284725

Agarwal, R., & Prasad, J. (1999). Are Individual Differences Germane to the Acceptance of New Information Technologies? *Decision Sciences*, *30*(2), 361–391.

Aguinis, H., Beaty, J. C., Boik, R. J., & Pierce, C. A. (2005). Effect size and power in assessing moderating effects of categorical variables using multiple regression: A 30-year review. *The Journal of Applied Psychology*, *90*(1), 94–107. http://doi.org/10.1037/0021-9010.90.1.94

Bagozzi, R. P., Baumgartner, H., & Pieters, R. (1998). Goal-directed emotions. *Cognition & Emotion*, *12*(1), 1–26. http://doi.org/10.1080/026999398379754

Bagozzi, R. P., Gopinath, M., & Nyer, P. U. (1999). The Role of Emotions in Marketing. *Journal of the Academy of Marketing Science*, *27*(2), 184–206. http://doi.org/10.1177/0092070399272005

Bagozzi, R. P., & Lee, K.-H. (1999). Consumer Resistance to, and acceptance of, Innovations. *Advances in Consumer Research*, *26*(1), 218–225. http://doi.org/10.1017/CBO9781107415324.004

Bagozzi, R. P., & Lee, K. H. (2005). How Can Marketers Overcome Consumer Resistance to Innovations? The Investigation of Psychological and Social Origins of Consumer Resistance to Innovations. *Journal of Global Academy of Marketing Science*, *15*(3), 211–231. http://doi.org/10.1080/12297119.2005.9707500

Bakker, I., van der Voordt, T., Vink, P., & de Boon, J. (2014). Pleasure, Arousal, Dominance: Mehrabian and Russell revisited. *Current Psychology*, *33*(3), 405–421. http://doi.org/10.1007/s12144-014-9219-4

Balachandra, R., & Friar, J. H. (1997). Factors for success in R&D projects and new product innovation: a contextual framework. *IEEE Transactions on Engineering Management*, *44*(3), 276–287. http://doi.org/10.1109/17.618169

Barros, L., & Botelho, D. (2012). Hope, Perceived Risk, and Propensity to Indebtness. *Brazilian Administration Review*, *9*(4), 454–474. http://doi.org/10.1017/CBO9781107415324.004

Bartels, J., & Reinders, M. J. (2011). Consumer Innovativeness and its Correlates: A Propositional Inventory for Future Research. *Journal of Business Research*, *64*(6), 601–609. http://doi.org/10.1016/j.jbusres.2010.05.002

Batra, R., & Ahtola, O. T. (1990). Measuring the Hedonic and Utilitarian Sources of Consumer Attitudes. *Marketing Letters*, *2*(2), 159–170.

Batra, R., & Ray, M. L. (1986). Affective Responses Mediating Acceptance of Advertising. *Journal of Consumer Research*, *13*(2), 234–249. http://doi.org/10.1086/209063

Batra, R., & Stayman, D. M. (1990). The Role of Mood in Advertising Effectiveness. *Journal of Consumer Research*, *17*(September), 203–214.

Bayus, B. L., Erickson, G., & Jacobson, R. (2003). The Financial Rewards of New Product Introductions in the Personal Computer Industry. *Management Science*, *49*(2), 197–210. http://doi.org/10.1287/mnsc.49.2.197.12741

Becker, J. M., Klein, K., & Wetzels, M. (2012). Hierarchical Latent Variable Models in PLS-

SEM: Guidelines for Using Reflective-Formative Type Models. *Long Range Planning*, *45*, 359–394. http://doi.org/10.1016/j.lrp.2012.10.001

Bradley, M., & Lang, P. J. (1994). Measuring Emotion: The Self-Assessment Semantic Differential Manikin and the. *Journal of Behavior Therapy and Experimental Psychiatry*, *25*(I), 49–59. http://doi.org/10.1016/0005-7916(94)90063-9

Bruner, G. C., & Kumar, A. (2007). Gadget lovers. *Journal of the Academy of Marketing Science*, *35*(3), 329–339. http://doi.org/10.1007/s11747-007-0051-3

Castellion, G., & Markham, S. K. (2013). Perspective: New Product Failure Rates: Influence of Argumentum Ad Populum and Self-Interest. *Journal of Product and Innovation & Management*, *30*, 976–979.

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. http://doi.org/10.2753/MTP1069-6679180403

Chaudhuri, A., & Micu, C. C. (2014). The effect of hedonic and utilitarian verbal descriptions and pictures on willingness to try an innovation : do emotions matter ? *Journal of Marketing Communications*, *20*(5), 307–324. http://doi.org/10.1080/13527266.2012.693120

Chin, W. W. (1998a). Commentary: Issues and Opinion on Structural Equation Modeling. *MIS Quarterly*, *22*(1), 1. http://doi.org/Editorial

Chin, W. W. (1998b). The Partial Least Squares Approach to Structural Equation Modeling. In G. A. Marcoulides (Ed.), *Modern Methods for Business Research* (pp. 295–336). Mahwah, NJ: Lawrence Erlbaum Associates.

Chin, W. W. (2010). How to Write Up and Report PLS Analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares* (pp. 655–690). Heidelberg: Springer. http://doi.org/10.1007/978-3-540-32827-8_29

Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A Partial Least Squares Latent Variable Modeling Approach for Measuring Interaction Effects: Results from a Monte Carlo Simulation Study and an Electronic-Mail Emotion/Adoption Study. *Information Systems Research*, *14*(2), 189–217. http://doi.org/10.1287/isre.14.2.189.16018

Claudy, M. C., Garcia, R., & Driscoll, A. O. (2015). Consumer resistance to innovation — a behavioral reasoning perspective. *Journal of the Academy of Marketing Science*, *43*, 528–544. http://doi.org/10.1007/s11747-014-0399-0

Claudy, M., Driscoll, A. O., Garcia, R., Mullen, M., Garcia, R., & Mullen, M. (2010a). Consumer Resistance to Green Innovations : Developing a New Scale and an Underlying Framework. In *35th Macromarketing Conference*. Wyoming.

Claudy, M., Driscoll, A. O., Garcia, R., Mullen, M., Garcia, R., & Mullen, M. (2010b). Exploring Antecedents of Consumer Resistance Towards Microgeneration Technologies in Ireland. In *2nd Annual Social Marketing Conference*. Galway.

Clore, G. L., Ortony, A., & Foss, M. a. (1987). The psychological foundations of the affective lexicon. *Journal of Personality and Social Psychology*, *53*(4), 751–766. http://doi.org/10.1037/0022-3514.53.4.751

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. *Statistical Power Analysis for the Behavioral Sciences*. Mahwah, NJ: Lawrence Erlbaum.

Cooper, R. G. (2011). *Winning at new products: Creating value Through Innovation*. *Basic Books* (Fouth Ed.). New York, NY. http://doi.org/10.1016/0024-6301(89)90185-4

Costa, F. J. (2011). *Mensuração e Desenvolvimento de Escalas: Aplicações em Administração*. Rio de Janeiro: Editora Ciência Moderna Ltda.

Crowley, A. E., Spangenberg, E. R., & Hughes, K. R. (1992). Measuring the Hedonic and Utilitarian Dimensions of Attitudes Toward Product Categories. *Marketing Letters*, *3*(3), 239–249.

Davis, F., Bagozzi, R., & Warshaw, P. (1989). User Acceptance of Computer Technology: a Comparison of Two Theoretical Models. *Management Science*, *35*(8), 982–1003. http://doi.org/10.2307/2632151

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340. http://doi.org/10.1016/S0305-0483(98)00028-0

de Mello, G., & MacInnis, D. J. (2005). Why and how consumers hope: Motivated reasoning in the marketplace. In S. Ratneshwar & D. G. Mick (Eds.), *Inside Consumption: Consumer Motives, Goals, and Desires* (pp. 44–56). London/New York: Routledge. http://doi.org/10.4324/9780203481295

DeVellis, R. F. (2003). *Scale Development - Theory and Applications* (2nd ed.). Thousand Oaks, California: Sage Publications.

Edell, J. A., & Burke, M. C. (1987). The Power of Feelings in Understanding Advertising Effects. *Journal of Consumer Research*, *14*(3), 421. http://doi.org/10.1086/209124

Ellen, P., Bearden, W., & Sharma, S. (1991). Resistance to technological innovations: An examination of the role of self-efficacy and performance satisfaction. *Journal of the Academy of Marketing Science*, *19*(4), 297–307. http://doi.org/10.1007/BF02726504

Ferreira, J. B., da Rocha, A., & da Silva, J. F. (2014). Impacts of technology readiness on emotions and cognition in Brazil. *Journal of Business Research*, *67*(5), 865–873. http://doi.org/10.1016/j.jbusres.2013.07.005

Forgas, J. P. (1995). Mood and judgment: The affect infusion model (AIM). *Psychological Bulletin*, *117*(1), 39–66. http://doi.org/10.1037/0033-2909.117.1.39

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurements error. *Journal of Marketing Research*, *18*(1), 39–50.

Garcia, R., Bardhi, F., & Friedrich, C. (2007). Overcoming Consumer Resistance to Innovation. *MIT Sloan Management Review*, *48*(4).

Garcia, R., & Calantone, R. (2002). A Critical Look at Technological Innovation Typology and Innovativeness Terminology: A Literature Review. *Journal of Product Innovation Management*, *19*(2), 110–132. http://doi.org/10.1016/S0737-6782(01)00132-1

Gardner, M. P. (1985). Mood States and Consumer Behavior: A Critical Review. *Journal of Consumer Research*, *12*(3), 281–300. http://doi.org/10.1086/208516

Gatignon, H., & Robertson, T. S. (1985). A Propositional Inventory for New Diffusion Research. *Journal of Consumer Research*, *11*(4), 849–867.

Gatignon, H., & Robertson, T. S. (1991). Innovative Decision Process. In T. S. Robertson & H. H. Kassarjian (Eds.), *Handbook of Consumer Behavior* (pp. 316–348). Englewood Cliffs,

NJ: Prentice Hall.

Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, *61*(1), 101–107. http://doi.org/10.1093/biomet/61.1.101

Goldsmith, R. E., & Hofacker, C. F. (1991). Measuring Consumer Innovativeness. *Journal of the Academy of Marketing Science*, *19*(3), 209–221. http://doi.org/10.1007/BF02726497

Gourville, J. T. (2006). Eager Sellers and Stony Buyers. *Harvard Business Review*, (July).

Grewal, D., Gotlieb, J., & Marmorstein, H. (1994). The Moderating Effects of Message Framing and Source Credibility on the Price-perceived Risk Relationship. *Journal of Consumer Research*, *21*(4), 145–153. http://doi.org/10.1086/209388

Grunert, S. C., & Scherlorn, G. (1990). Consumer values in West Germany underlying dimensions and cross-cultural comparison with North America. *Journal of Business Research*, *20*(2), 97–107. http://doi.org/10.1016/0148-2963(90)90054-H

Güliz, G., & Belk, R. W. (1996). Cross-cultural differences in materialism. *Journal of Economic Psychology*, *17*(1), 55–77. http://doi.org/10.1016/0167-4870(95)00035-6

Ha, Y., & Lennon, S. J. (2010). Online Visual Merchandising (VMD) Cues and Consumer Pelasure and Arousal: Purchasing versus Browsing Situation. *Psychology & Marketing*, *27*(2), 141–165. http://doi.org/10.1002/mar

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2013). *A Primer on Partial Least Squares Structural Equation Modeling*. Los Angeles, CA: Sage. Retrieved from http://www.amazon.de/Partial-Squares-Structural-Equation-Modeling/dp/1452217440

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *The Journal of Marketing Theory and Practice*, *19*(2), 139–152. http://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced Issues in Partial Least Squares Structural Equation Modeling*. Los Angeles, CA: SAGE.

Havlena, W. J., & Holbrook, M. B. (1986). The Varieties of Consumption Experience: Comparing Two Typologies of Emotion in Consumer Behavior. *Journal of Consumer Research*, *13*(3), 394–404. http://doi.org/10.1086/209078

Hayes, A. F. (2015). An Index and Test of Linear Moderated Mediation. *Multivariate Behavioral Research*, *50*(1), 1–22. http://doi.org/10.1080/00273171.2014.962683

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. http://doi.org/10.1111/jpim.12161

Heidenreich, S., & Kraemer, T. (2015a). Innovations—Doomed to Fail? Investigating Strategies to Overcome Passive Innovation Resistance. *Journal of Product Innovation Management*, (1), 1–21. http://doi.org/10.1111/jpim.12273

Heidenreich, S., & Kraemer, T. (2015b). Passive innovation resistance : The curse of innovation ? Investigating consequences for innovative consumer behavior. *Journal of Economic Psychology*, *51*, 134–151. http://doi.org/10.1016/j.joep.2015.09.003

Heidenreich, S., Kraemer, T., & Handrich, M. (2016). Satisfied and unwilling: Exploring cognitive and situational resistance to innovations. *Journal of Business Research*. http://doi.org/10.1016/j.jbusres.2016.01.014

Heidenreich, S., & Spieth, P. (2013). Why Innovations Fail — the Case of Passive and Active Innovation Resistance. *International Journal of Innovation Management*, *17*(5), 1350021-1-1350021–42. http://doi.org/10.1142/S1363919613500217

Henseler, J., Ringle, C. M., & Sinkovics, R. (2009). The Use of Partial Least SqauresPath Modeling in International Marketing. In *Advances in International Marketing* (Vol. 20, pp. 277–320).

Henseler, J., Wilson, B., Götz, O., & Hautvast, C. (2007). Investigating the moderating role of fit on sports sponsorship and brand equity: a structural model. *International Journal of Sports Marketing & Sponsorship*, *8*(4). http://doi.org/10.1108/IJSMS-08-04-2007-B005

Hirschman, E. C. (1980). Innovativeness, Novelty Seeking, and Consumer Creativity. *Journal of Consumer Research*, *7*(3), 283–295. http://doi.org/10.1086/208816

Hirschman, E. C., & Holbrook, M. B. (1982). Hedonic Consumption: Emerging Concepts , Methods and Propositions. *Journal of Marketing*, *46*(Summer), 92–101.

Hoeffler, S. (2003). Measuring Preferences for Products New. *Journal of Marketing Research*, *40*(4), 406–420.

Hoffmann, S., & Soyez, K. (2010). A cognitive model to predict domain-specific consumer innovativeness. *Journal of Business Research*, *63*(7), 778–785. http://doi.org/10.1016/j.jbusres.2009.06.007

Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management*, *1*(2), 81–99. http://doi.org/10.1007/BF01733682

Holbrook, M. B., & Batra, R. (1987). Assessing the Role of Emotions as Mediators of Responses to Advertising. *Journal of Consumer Research*, *14*(3), 404–420.

Im, S., Bayus, B. L., & Mason, C. H. (2003). An Empirical Study of Innate Consumer Innovativeness, Personal Characteristics, and New-Product Adoption Behavior. *Journal of the Academy of Marketing Science*, *31*(1), 61–73. http://doi.org/10.1177/0092070302238602

Jacoby, J., & Kaplan, L. B. (1972). The Components of Perceived Risk. In *Proceedings of the Third Annual Conference of the Association for Consumer Research* (pp. 382–393). Association for Consumer Research.

Jang, S. (Shawn), & Namkung, Y. (2009). Perceived quality, emotions, and behavioral intentions: Application of an extended Mehrabian-Russell model to restaurants. *Journal of Business Research*, *62*(4), 451–460. http://doi.org/10.1016/j.jbusres.2008.01.038

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, *30*(2), 199–218. http://doi.org/10.1086/376806

Kaplan, L. B., Szybillo, G. J., & Jacoby, J. (1974). Components of Perceived Risk in Product Purchase: a Cross-Validation. *Journal of Applied Psychology*, *59*(3), 287–291.

Kenny, D. A. (2015). Moderator Variables: an Introduction. Retrieved January 21, 2018, from http://davidakenny.net/cm/moderation.htm

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. http://doi.org/10.1016/j.joep.2009.02.004

Kuisma, T., Laukkanen, T., & Hiltunen, M. (2007). Mapping the reasons for resistance to Internet banking : A means-end approach. *International Journal of Information Management*, *27*, 75–85. http://doi.org/10.1016/j.ijinfomgt.2006.08.006

Kulviwat, S., II, G. C. B., Kumar, A., Nasco, S. A., & Clark, T. (2007). Toward a Unified Theory of Consumer Acceptance Technology. *Psychology & Marketing*, *24*(12), 1059–1084. http://doi.org/10.1002/mar.20196

Kwortnik, R. J., & Ross, W. T. (2007). The role of positive emotions in experiential decisions. *International Journal of Research in Marketing*, *24*(4), 324–335. http://doi.org/10.1016/j.ijresmar.2007.09.002

Laukannen, P., Sinkonnen, S., & Laukannen, T. (2007). Consumer Resistance to Internet banking: postponers, opponents and rejectors. *International Journal of Bank Marketing*, *24*(7), 419–427.

Laukkanen, T. (2015). How uncertainty avoidance affects innovation resistance in mobile banking: The moderating role of age and gender. *Proceedings of the Annual Hawaii International Conference on System Sciences*, *2015–March*, 3601–3610. http://doi.org/10.1109/HICSS.2015.433

Lee, S., Ha, S., & Widdows, R. (2011). Consumer responses to high-technology products: Product attributes, cognition, and emotions. *Journal of Business Research*, *64*(11), 1195–1200. http://doi.org/10.1016/j.jbusres.2011.06.022

Lian, J. W., & Yen, D. C. (2013). To buy or not to buy experience goods online: Perspective of innovation adoption barriers. *Computers in Human Behavior*, *29*(3), 665–672. http://doi.org/10.1016/j.chb.2012.10.009

Lohmöller, J.-B. (1989). *Latent Variable Path Modeling with Partila Least Squares*. Berlin: Springer-Verlag.

Lutz, R. J., & Patrick J. Reilly. (1974). An Exploration of the Effects of Perceived Social and Performance Risk on Consumer Information Acquisition. In S. Ward & P. Wright (Eds.), *Advances in Consumer Research* (pp. 393–405). Association for Consumer Research.

MacInnis, D. J., & Chun, H. E. (2006). Understanding Hope and its Implications for Consumer Behavior: I Hope, Therefore I Consume. *Foundations & Trends in Marketing*, *1*(2), 97–188. http://doi.org/10.1561/1700000005

MacInnis, D. J., & De Mello, G. E. (2005). The Concept of Hope and Its Relevance to Product Evaluation and Choice. *Journal of Marketing*, *69*(1), 1–14. http://doi.org/10.1509/jmkg.69.1.1.55513

MacInnis, D. J., de Mello, G., & Patrick, V. M. (2004). Consumer hopefulness: construct, relevance to internet marketing, antecedents and consequences. *International Journal of Internet Marketing and Advertising*, *1*(2), 174–195. http://doi.org/10.1504/IJIMA.2004.004019

Mehrabian, A. (1978). Measures of Individual differences in temperament. *Educational and Psychological Measurement*, *38*, 1105–1117.

Mehrabian, A. (1996). Pleasure-arousal-dominance: A general framework for describing and measuring individual differences in Temperament. *Current Psychology*, *14*(4), 261–292. http://doi.org/10.1007/BF02686918

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. Cambridge, MA: M.I.T. Press.

Meuter, M. L., Bitner, M. J., Ostrom, A. L., & Brown, S. W. (2005). Choosing Among Alternative Service Delivery Modes: An Investigation of Customer Trial of Self-Service Technologies. *Journal of Marketing*, *69*(2), 61–83. http://doi.org/10.1509/jmkg.69.2.61.60759

Mick, D. G., & Fournier, S. (1998). Paradoxes of Technology: Consumer Cognizance, Emotions, and Coping Strategies. *Journal of Consumer Research*, *25*(2), 123–143. http://doi.org/10.1086/209531

Midgley, D. F., & Dowling, G. R. (1978). The Innovativeness : The Concept and Its Concept Measurement. *Journal of Consumer Research*, *4*(4), 229–242.

Mitchell, V. (1999). Consumer perceived risk : conceptualisations and models. *European Journal of Marketing*, *33*(1), 163–195.

Mogilner, C., Aaker, J., & Kamvar, S. D. (2012). How Happiness Affects Choice. *Journal of Consumer Research*, *39*(2), 429–443.

Montaguti, E., Kuester, S., & Robertson, T. S. (2002). Entry strategy for radical product innovations: A conceptual model and propositional inventory. *International Journal of Research in Marketing*, *19*(1), 21–42. http://doi.org/10.1016/S0167-8116(02)00046-0

Moons, I., & De Pelsmacker, P. (2012). Emotions as determinants of electric car usage intention. *Journal of Marketing Management*, *28*(3–4), 195–237. http://doi.org/10.1080/0267257X.2012.659007

Moore, G. A. (2014). *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers* (3rd editio). New York, NY: Herper Collins. http://doi.org/10.1016/B978-0-240-81813-9.00009-4

Moore, G., & Benbasat, I. (1991). Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*. http://doi.org/10.1287/isre.2.3.192

Murray, K. B., & Schlacter, J. L. (1990). The impact of services versus goods on consumers' assessment of perceived risk and variability. *Journal of the Academy of Marketing Science*, *18*(1), 51–65. http://doi.org/10.1007/BF02729762

Nabih, M. I., Bloem, S. G., & Poiesz, T. B. C. (1997). Conceptual Issues in the Study of Innovation Adoption Behavior. *Advances in Consumer Research*, *24*, 190–197.

Nov, O., & Ye, C. (2008). Users' Personality and Perceived Ease of Use of Digital Libraries: the Case for Resistance to Change. *Journal of the American Society for Information Science and Technology*, *59*(5), 845–851. http://doi.org/10.1002/asi

Nowlis, S. M., & Shiv, B. (2005). The Influence of Consumer Distractions on the Effectiveness of Food-Sampling Programs. *Journal of Marketing Research*, *42*(2), 157–168. http://doi.org/10.1509/jmkr.42.2.157.62287

Nunnally, J., & Bernstein, I. (1994). *Psychometric Theory* (3rd Ed.). New York, NY: McGraw-Hill. Retrieved from http://scholar.google.com.vn/scholar?q=Psychometric+Theory+3rd&btnG=&hl=vi&as_sdt=0,5#0

Oreg, S. (2003). Resistance to change: Developing an individual differences measure. *Journal of Applied Psychology*, *88*(4), 680–693. http://doi.org/10.1037/0021-9010.88.4.680

Oreg, S., & Goldenberg, J. (2015). *Resistance to Innovation: Its Sources and Manifestations*.

Chicago: The University of Chicago Press.

Ostlund, L. E. (1974). Perceived Innovation Attributes as Predictors of Innovativeness. *Journal of Consumer Research*, *1*(2), 23–29. http://doi.org/10.1086/208587

Parasuraman, A. (2000). Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies. *Journal of Service Research*, *2*(4), 307–320. http://doi.org/10.1177/109467050024001

Parasuraman, A., & Colby, C. L. (2015). An Updated and Streamlined Technology Readiness Index: TRI 2.0. *Journal of Service Research*, *18*(1), 59–74. http://doi.org/10.1177/1094670514539730

Park, W., Jaworski, B. J., & MacInnis, D. J. (1986). Strategic Brand Concept-Image Management. *Journal of Marketing*. http://doi.org/10.2307/1251291

Pearson, P. H. (1970). Relationships between global and specified measures of novelty seeking. *Journal of Consulting and Clinical Psychology*, *34*(2), 199–204. http://doi.org/10.1037/h0029010

Peng, C., & Kim, Y. G. (2014). Application of the Stimuli-Organism-Response (S-O-R) Framework to Online Shopping Behavior. *Journal of Internet Commerce*, *13*(3–4), 159–176. http://doi.org/10.1080/15332861.2014.944437

Peracchio, L. A., & Tybout, A. M. (1996). The Moderating Role of Prior Knowledge in Schema-Based Product Evaluation. *Journal of Consumer Research*, *23*(3).

Perlusz, S. (2004). Emotions and technology acceptance: Development and validation of a technology affect scale. *IEEE International Engineering Management Conference*, 1–27. http://doi.org/10.1109/IEMC.2004.1407500

Petty, R. E., Schumann, D. W., Richman, S. a., & Strathman, A. J. (1993). Positive mood and persuasion: Different roles for affect under high- and low-elaboration conditions. *Journal of Personality and Social Psychology*, *64*(1), 5–20. http://doi.org/10.1037/0022-3514.64.1.5

Plutchik, R. (1980). *Emotion: A Psychoevolutionary Synthesis*. New York, NY: Harper and Row. Retrieved from http://www.amazon.com/Emotion-Psychoevolutionary-Synthesis-Robert-Plutchik/dp/0060452358

Prins, R., & Verhoef, P. C. (2007). Marketing Communication Drivers of Adoption Timing of a New E-Service Among Existing Customers. *Journal of Marketing*, *71*(3), 169–183. http://doi.org/10.1509/jmkg.71.2.169

Ram, S. (1987). A Model of Innovation Resistance. In M. Wallendorf & P. Anderson (Eds.), *Advances in consumer research* (Vol. 14, pp. 208–212). Provo, UT: Association for Consumer Research. http://doi.org/Article

Ram, S. (1989). Succesful Innovation Using Strategies to Reduce Consumer Resistance: An Empirical Test. *Journal of Product Innovation Management*, *6*, 20–34.

Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations: the marketing problem and its solutions. *Journal of Consumer Marketing*, *6*(2), 5–14. http://doi.org/10.1108/EUM0000000002542

Richins, M. L. (1997). Measuring Emotions in the Consumption Experience. *Journal of Consumer Research*, *24*(2), 127–146.

Rijsdijk, S. a., Hultink, E. J., & Diamantopoulos, A. (2007). Product intelligence: its conceptualization, measurement and impact on consumer satisfaction. *Journal of the Academy of Marketing Science*, *35*(3), 340–356. http://doi.org/10.1007/s11747-007-0040-6

Rogers, E. M. (1976). New Product Adoption and Diffusion. *The Journal of Consumer Research*, *2*(4), 290–301. http://doi.org/10.2307/2488658

Rogers, E. M. (2003). *Diffusion of innovations*. *Newyork Free Press* (5th Editio). New York, NY: Free Press. http://doi.org/citeulike-article-id:126680

Roselius, T. (1971). Consumer Rankings of Risk Reduction Methods. *Journal of Marketing*, *35*(1), 56–61.

Roseman, I. J. (1991). Appraisal Determinants of Discrete Emotions. *Cognition & Emotion*, *5*(3), 161–200. http://doi.org/10.1080/02699939108411034

Russell, J. A., & Mehrabian, A. (1977). Evidence for a Three-Factor Theory of Emotions. *Journal of Research in Personality*, *11*, 273–294. http://doi.org/10.1016/0092-6566(77)90037-X

Russell, J. A., & Mehrabian, A. (1978). Approach-Avoidance and Affiliation as Functions of the Emotig Quality of an Environement. *Environment and Behavior*, *10*(3), 355–387. http://doi.org/10.1177/0013916578103005

Russell, J. A., & Pratt, G. (1980). A description of the affective quality attributed to environments. *Journal of Personality and Social Psychology*, *38*(2), 311–322. http://doi.org/10.1037/0022-3514.38.2.311

Sarstedt, M., Schwaiger, M., & Ringle, C. M. (2009). Do We Fully Understand the Critical Success Factors of Customer Satisfaction with Industrial Goods? - Extending Festge and Schwaiger's Model to Account for Unobserved Heterogeneity. *Journal of Business Market Management*, *3*(3), 185–206. http://doi.org/10.1007/s12087-009-0023-7

Shankar, V., Carpenter, G. S., & Krishnamurthi, L. (1998). Late mover advantage: How innovative late entrants outsell pioneers. *Journal of Marketing Research*, *35*(1), 54–70. http://doi.org/10.2307/3151930

Sheth, J. N. (1981). Psychology of Innovation Resistance: The Less Developed Concept (LDC) in Diffusion Research. *Research in Marketing*, *4*, 273–282.

Shiv, B., & Fedorikhin, A. (1999). Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making. *Journal of Consumer Research*, *26*(3), 278–292. Retrieved from http://www.jstor.org/stable/10.1086/209563

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality & Social Psychology*, *48*(4), 813–838. http://doi.org/10.1037/0022-3514.48.4.813

So, J., Achar, C., Han, D., Agrawal, N., Duhachek, A., & Maheswaran, D. (2015). The psychology of appraisal: Specific emotions and decision-making. *Journal of Consumer Psychology*, *25*(3), 359–371. http://doi.org/10.1016/j.jcps.2015.04.003

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, *13*, 290–312. http://doi.org/10.2307/270723

Spangenberg, E. R., Voss, K. E., & Crowley, A. E. (1997). Measuring the Hedonic and Utilitarian Dimensions of Attitude : A Generally Applicable Scale. In *Advances in*

Consumer Research (Vol. 24, pp. 235–241).

Stone, M. (1974). Cross-Validatory Choice and Assessment of Statistical Predictions. *Journal of the Royal Statistical Society*, *36*(2), 111–147. http://doi.org/10.2307/2984809

Szmigin, I., & Foxall, G. (1998). Three forms of innovation resistance : the case of retail payment methods. *Technovation*, *18*(6/7), 459–468.

Talke, K., & Heidenreich, S. (2014). How to Overcome Pro-Change Bias : Incorporating Passive and Active Innovation Resistance in Innovation Decision Models. *Journal of Product Innovation Management*, *31*(5), 894–907. http://doi.org/10.1111/jpim.12130

Tybout, A. M., Sternthal, B., Malaviya, P., Bakamitsos, G. A., & Park, S. (2005). Information Accessibility as a Moderator of Judgments: The Role of Content versus Retrieval Ease. *Journal of Consumer Research*, *32*(1), 76–85. http://doi.org/10.1086/426617

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, *11*(4), 342–365. http://doi.org/10.1287/isre.11.4.342.11872

Venkatesh, V., & Davis, F. D. (2000). Theoretical Acceptance Extension Model : Field Four Studies of the Technology Longitudinal. *Management Science*, *46*(2), 186–204. http://doi.org/10.1287/mnsc.46.2.186.11926

Venkatraman, M. P., & Price, L. L. (1990). Differentiating between cognitive and sensory innovativeness. *Journal of Business Research*, *20*(4), 293–315. http://doi.org/10.1016/0148-2963(90)90008-2

Vieira, V. A. (2008). Meta-Análise do Modelo Teórico "E-O-R" de Mehrabian e Russell (1974). *XXXII Encontro Da Anpad*, (1974), 1–16.

Völckner, F., Sattler, H., Hennig-Thurau, T., & Ringle, C. M. (2010). The Role of Parent Brand Quality for Service Brand Extension Success. *Journal of Service Research*, *13*(4), 379–396. http://doi.org/10.1177/1094670510370054

Voss, K. E., Spangenberg, E. R., & Grohmann, B. (2003). Measuring the Hedonic and Utilitarian Dimensions of Consumer Attitude. *Journal of Marketing Research*, *XL*(August), 310–320.

Watson, D., Clark, L. a, & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–70. http://doi.org/10.1037/0022-3514.54.6.1063

Wetzels, M., Odekerken-Schröder, G., & van Oppen, C. (2009). Using PLS Path Modeling for Assessing Hierarchical Construct Models: Guidelines and Empirical Illustration. *MIS Quarterly*, *33*(1), 177–195.

Wiedmann, K. P., Hennigs, N., Pankalla, L., Kassubek, M., & Seegebarth, B. (2011). Adoption barriers and resistance to sustainable solutions in the automotive sector. *Journal of Business Research*, *64*(11), 1201–1206. http://doi.org/10.1016/j.jbusres.2011.06.023

Yani-de-Soriano, M. M., & Foxall, G. R. (2006). The emotional power of place: The fall and rise of dominance in retail research. *Journal of Retailing and Consumer Services*, *13*(6), 403–416. http://doi.org/10.1016/j.jretconser.2006.02.007

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, *35*(2), 151–175. http://doi.org/10.1634/theoncologist.9-90005-10

Appendix A – Sample Profile: moderating effect of affect (product setting)

Age	
Average age	35,9
Average Age Male	32,7
Average Age Female	38,7

Education		
Less than high school degree	0	0,0%
High school degree	28	15,6%
Some college but no degree	34	18,9%
Associate degree in college (2-year)	32	17,8%
Bachelor's degree in college (4-year)	64	35,6%
Marter's degree	15	8,3%
Doctoral degree	5	2,8%
Professional degree (JD, MD)	2	1,1%

Sex		
Male	86	47,8%
Female	94	52,2%

Income		
Less than $10,000	6	3,3%
$10,000 to $19,999	25	13,9%
$20,000 to $29,999	25	13,9%
$30,000 to $39,999	20	11,1%
$40,000 to $49,999	19	10,6%
$50,000 to $59,999	17	9,4%
$60,000 to $69,999	17	9,4%
$70,000 to $79,999	14	7,8%
$80,000 to $89,999	10	5,6%
$90,000 to $99,999	7	3,9%
$100,000 to $149,000	19	10,6%
$150,000 or more	1	0,6%

Appendix B – Sample Profile: moderating effect of affect (service setting)

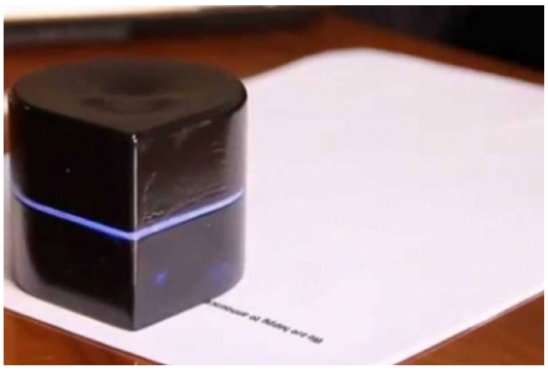
Age	
Average age	34,5
Average Age Male	32,2
Average Age Female	36,5

Education		
Less than high school degree	2	1,0%
High school degree	21	11,0%
Some college but no degree	49	25,7%
Associate degree in college (2-year)	19	9,9%
Bachelor's degree in college (4-year)	72	37,7%
Marter's degree	26	13,6%
Doctoral degree	0	0,0%
Professional degree (JD, MD)	2	1,0%

Sex		
Male	91	47,6%
Female	100	52,4%

Income		
Less than $10,000	17	8,9%
$10,000 to $19,999	14	7,3%
$20,000 to $29,999	24	12,6%
$30,000 to $39,999	22	11,5%
$40,000 to $49,999	27	14,1%
$50,000 to $59,999	12	6,3%
$60,000 to $69,999	15	7,9%
$70,000 to $79,999	17	8,9%
$80,000 to $89,999	14	7,3%
$90,000 to $99,999	10	5,2%
$100,000 to $149,000	12	6,3%
$150,000 or more	7	3,7%

Appendix C – Zuta Pocket Printer Description



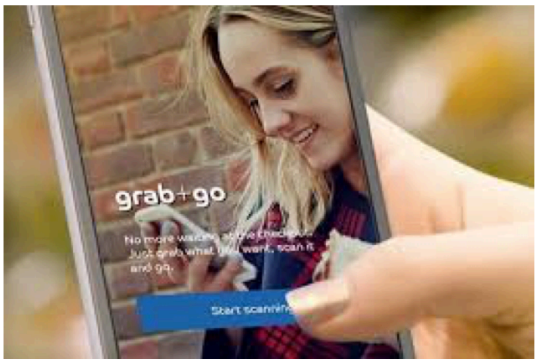
Zuta Pocket Printer

Everything today has gone mobile. Thanks to our smartphones, tablets and laptops we can leave our office while staying fully connected by doing work on the go. Well, almost... There is one device that got left behind and seemed to miss the "mobile revolution train": the printer.

Not anymore. The Zuta Pocket Printer is a mobile printer that is easy and fun to use. It connects via Wi-Fi and works with any computer, tablet or smartphone. In order to print, you simply align the Zuta with the paper by placing it at the top left corner of the page. Once it's set up, you can use the Zuta app to print whatever documents you'd like. Weighing only 350 grams this printer is light enough to carry in a bag and makes printing on the go a reality. This will come in handy for students and other professionals who tend to find themselves unexpectedly looking for a place to print documents during the day.

Finally! Mobile printing is really here! A printer that goes where you go & prints from your phone on any size page! The future is now!

Appendix D – Barclaycard Grab + Go description



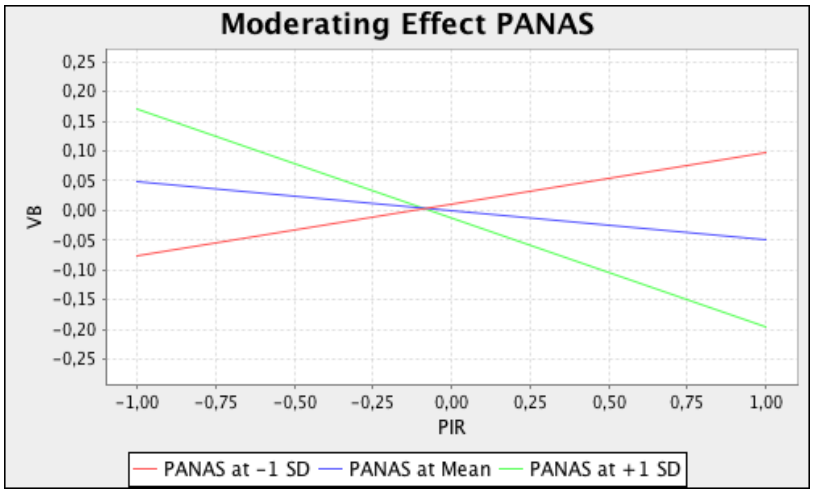
Barclaycard Grab + Go

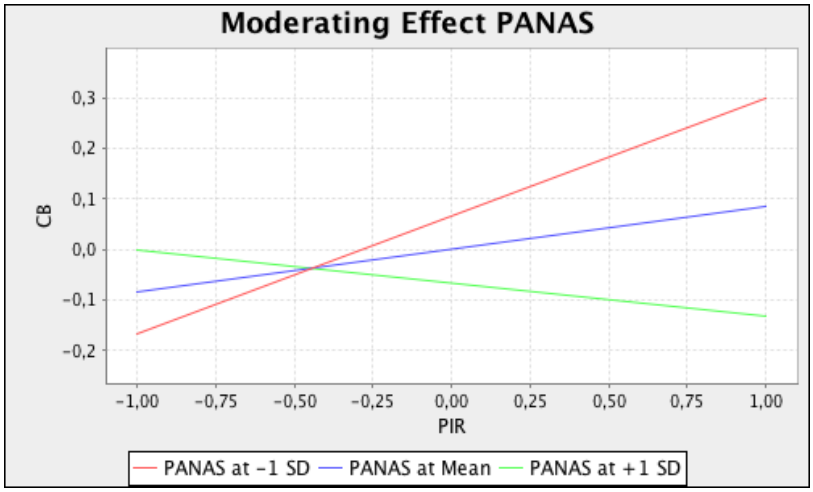
One of the key customer frustrations with shopping is the time spent lining up to pay for items they want to buy – especially when they are in a hurry. The way in which people shop and pay has evolved significantly over the past decade, and as the use of mobile and wearable payments grows, Barclaycard is developing technology that could put an end to the supermarket lines.

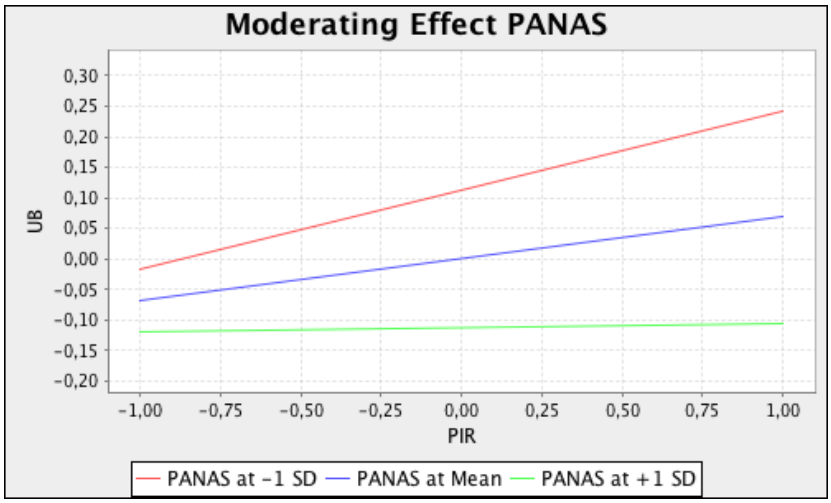
Using the latest technology, Barclaycard Grab+Go streamlines the shopping experience by removing the need to physically check out every time you want to buy something. Users download the Grab+Go app, create an account and pre-load their payment details, and then use their smartphone camera to scan the barcode on items as they go. When finished, they click 'I'm done' and walk out; payment is taken seamlessly and invisibly in the background and the receipt is stored in the app, so that you can prove you've paid for the items in your bag should the need arise.

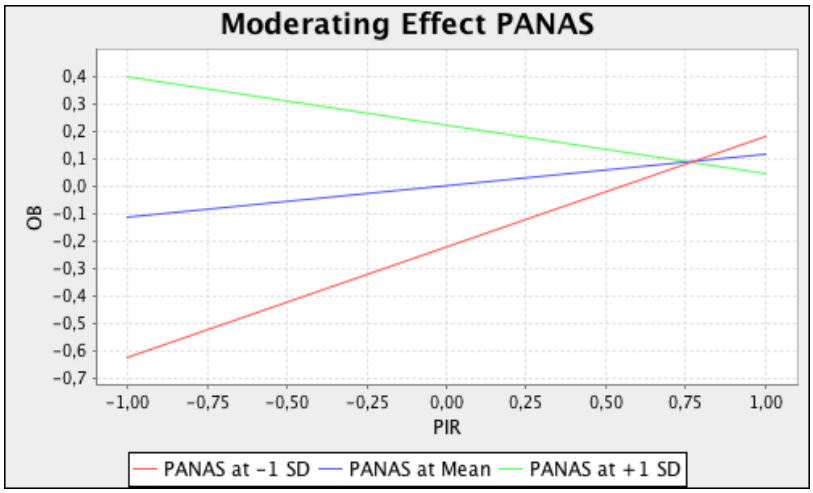
Finally! No lines and no checkout shopping is really here. The future is now!

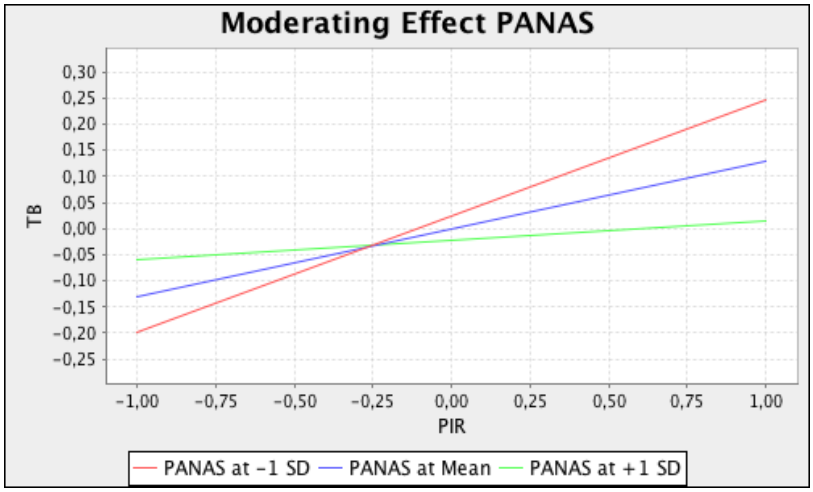
Appendix E – Slope Plots for the moderator effect on each of the mediation paths (Study 1A)

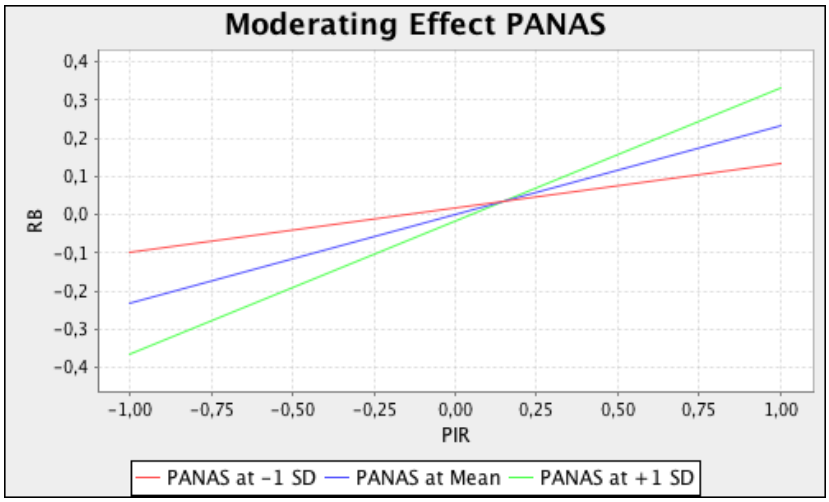




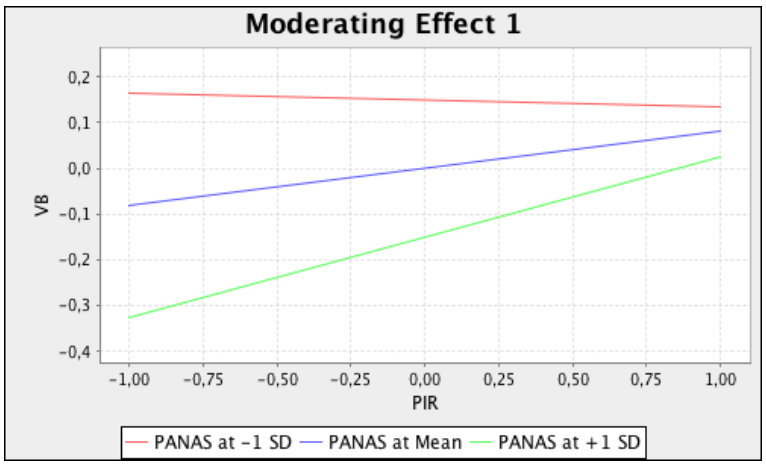


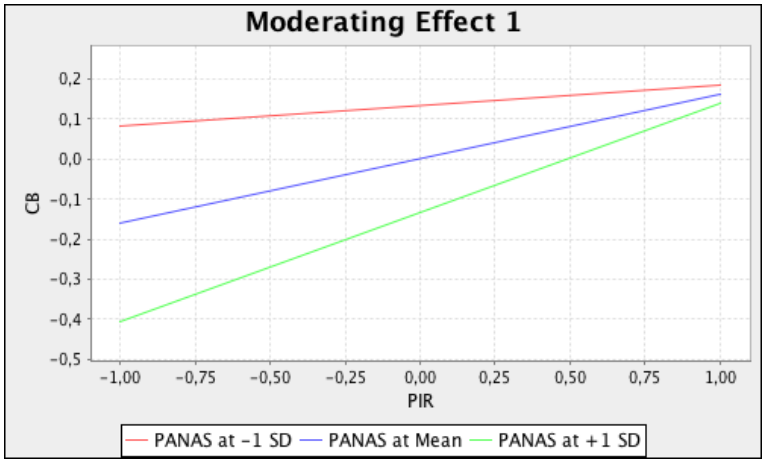

Moderating Effect PANAS
OB
0,4
0,3
0,2
0,1
0,0
−0,1
−0,2
−0,3
−0,4
−0,5
−0,6
−0,7
−1,00
−0,75
−0,50
−0,25
0,00
0,25
0,50
0,75
1,00
PIR
PANAS at −1 SD
PANAS at Mean
PANAS at +1 SD

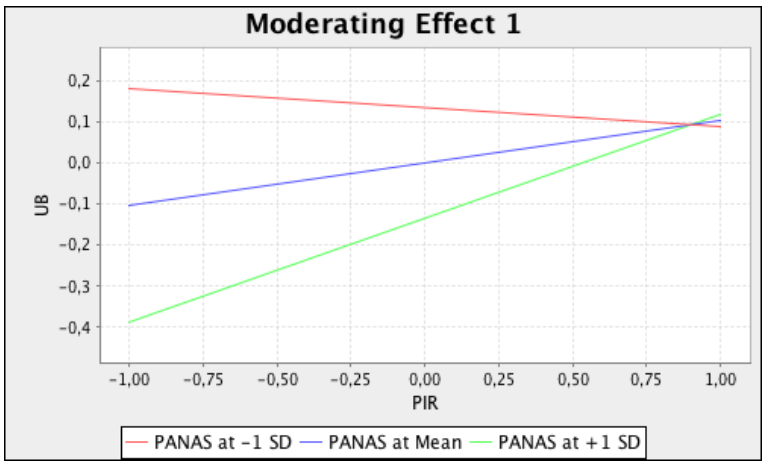

Moderating Effect PANAS
TB
0,30
0,25
0,20
0,15
0,10
0,05
0,00
−0,05
−0,10
−0,15
−0,20
−0,25
−1,00
−0,75
−0,50
−0,25
0,00
0,25
0,50
0,75
1,00
PIR
PANAS at −1 SD
PANAS at Mean
PANAS at +1 SD

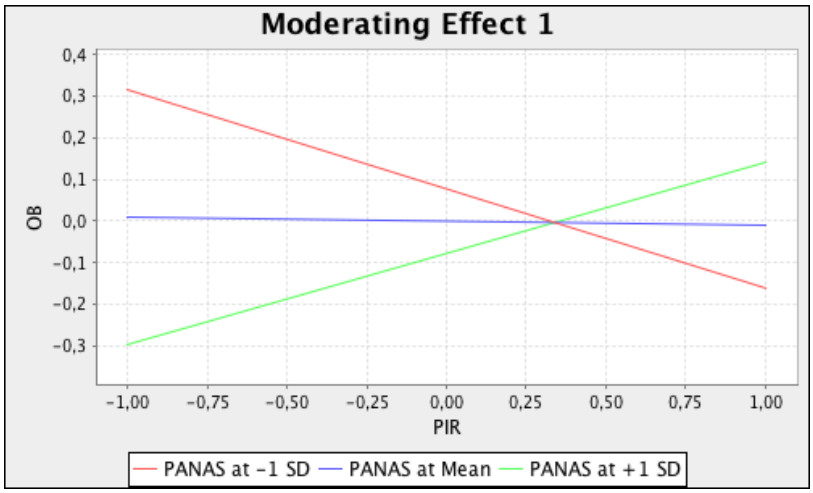

Moderating Effect PANAS
RB
0,4
0,3
0,2
0,1
0,0
−0,1
−0,2
−0,3
−0,4
−1,00
−0,75
−0,50
−0,25
0,00
0,25
0,50
0,75
1,00
PIR
PANAS at −1 SD
PANAS at Mean
PANAS at +1 SD

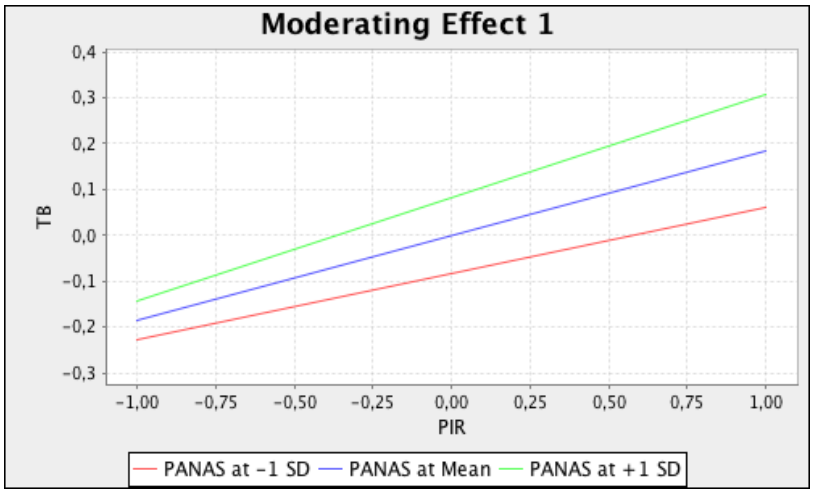
Appendix F – Slope Plots for the moderator effect on each of the mediation paths (Study 1B)

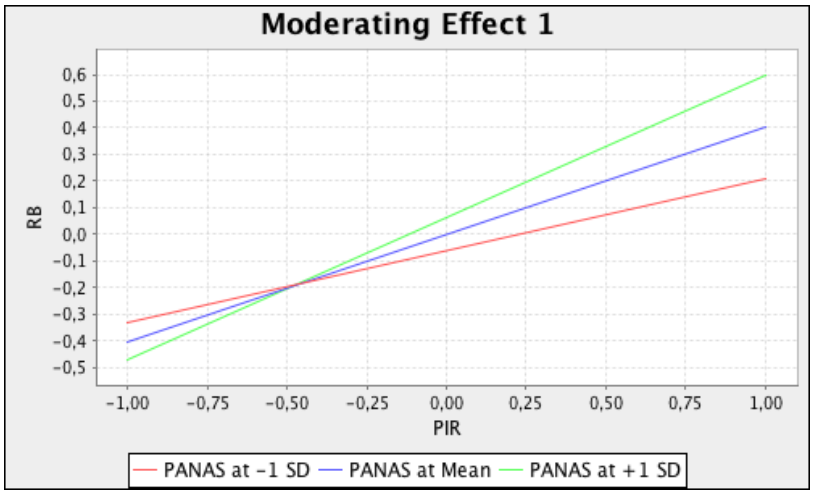







Moderating Effect 1
OB
PIR
PANAS at -1 SD
PANAS at Mean
PANAS at +1 SD


Moderating Effect 1
TB
PIR
PANAS at -1 SD
PANAS at Mean
PANAS at +1 SD


Moderating Effect 1
RB
PIR
PANAS at -1 SD
PANAS at Mean
PANAS at +1 SD

Appendix G: results of the Qualitative Round of Face Validity tests for the AAR scale

Item Label	Item	Pleasure Barrier	Arousal Barrier	Dominance Barrier	Comments
P1	The possibility of purchasing _____ makes me happy. (reverse)	5			ok
P2	Thinking of purchasing _____ annoys me.	3	2		change the word "annoys" to "pleases"
P3	Purchasing _____ will trully satisfy me. (reverse)	5			ok
P4	I would feel contented when I acquire and use _____. (reverse)	5			ok
P5	Learning about _____ caused me despair.	3	1	1	test the word "despair" to see the results
P6	When I think of _____ I feel relaxed. (reverse)		5		ok
A1	After reviewing _____ I was very motivated. (reverse)	3	2		change the word "motivated" to "stimulated"
A2	When I see _____ I feel very calm.		5		ok
A3	The thought of purchasing _____ makes me feel frantic. (reverse)		5		ok
A4	After I learned about _____ I found it rather dull.	1	4		ok
A5	Learning about _____ made me sleepy.		5		ok
A6	I saw _____ and it did not excite at all.		5		ok
D1	The more I think about _____, the more I believe I'll			5	ok
D2	I believe _____ gives me better control of my life.			5	ok
D3	Purchasing _____ will make me dependent on			5	ok
D4	When I think of owning _____ I feel I'll be more			5	ok
D5	I see _____ as a solution that takes autonomy away			5	ok
D6	_____ makes me feel less important.			5	ok

Appendix H - Sample Profile: Stage 1 of the Quantitative round of AAR Face Validity

Age	
Average age	35,6
Average Age Male	36,2
Average Age Female	35,3

Education		
Less than high school degree	1	2,0%
High school degree	7	13,7%
Some college but no degree	13	25,5%
Associate degree in college (2-year)	7	13,7%
Bachelor's degree in college (4-year)	18	35,3%
Marter's degree	3	5,9%
Doctoral degree	2	3,9%
Professional degree (JD, MD)	0	0,0%

Sex		
Male	21	41,2%
Female	30	58,8%

Income		
Less than $10,000	3	5,9%
$10,000 to $19,999	4	7,8%
$20,000 to $29,999	12	23,5%
$30,000 to $39,999	5	9,8%
$40,000 to $49,999	4	7,8%
$50,000 to $59,999	5	9,8%
$60,000 to $69,999	8	15,7%
$70,000 to $79,999	2	3,9%
$80,000 to $89,999	0	0,0%
$90,000 to $99,999	4	7,8%
$100,000 to $149,000	3	5,9%
$150,000 or more	1	2,0%

Appendix I - Sample Profile: Stage 2 of the Quantitative round of AAR Face Validity

Age	
Average age	35,2
Average Age Male	33,5
Average Age Female	37,2

Education		
Less than high school degree	1	2,0%
High school degree	5	9,8%
Some college but no degree	12	23,5%
Associate degree in college (2-year)	8	15,7%
Bachelor's degree in college (4-year)	18	35,3%
Marter's degree	6	11,8%
Doctoral degree	0	0,0%
Professional degree (JD, MD)	1	2,0%

Sex		
Male	28	54,9%
Female	23	45,1%

Income		
Less than $10,000	2	3,9%
$10,000 to $19,999	7	13,7%
$20,000 to $29,999	6	11,8%
$30,000 to $39,999	6	11,8%
$40,000 to $49,999	4	7,8%
$50,000 to $59,999	5	9,8%
$60,000 to $69,999	2	3,9%
$70,000 to $79,999	7	13,7%
$80,000 to $89,999	1	2,0%
$90,000 to $99,999	4	7,8%
$100,000 to $149,000	5	9,8%
$150,000 or more	2	3,9%

Appendix J - Sample Profile: Round 1 of the scale validation

Age	
Average age	34,0
Average Age Male	33,4
Average Age Female	34,9

Education		
Less than high school degree	0	0,0%
High school degree	37	19,0%
Some college but no degree	35	17,9%
Associate degree in college (2-year)	31	15,9%
Bachelor's degree in college (4-year)	74	37,9%
Marter's degree	14	7,2%
Doctoral degree	1	0,5%
Professional degree (JD, MD)	3	1,5%

Sex		
Male	119	61,0%
Female	76	39,0%

Income		
Less than $10,000	9	4,6%
$10,000 to $19,999	21	10,8%
$20,000 to $29,999	29	14,9%
$30,000 to $39,999	22	11,3%
$40,000 to $49,999	32	16,4%
$50,000 to $59,999	17	8,7%
$60,000 to $69,999	16	8,2%
$70,000 to $79,999	19	9,7%
$80,000 to $89,999	11	5,6%
$90,000 to $99,999	3	1,5%
$100,000 to $149,000	13	6,7%
$150,000 or more	3	1,5%

Appendix K: Driverless Car Description

Driverless Cars are coming

Cars are becoming increasingly intelligent and connected. Self-drive cars could be here sooner than we think. Google has already successfully had a 'driverless' car drive 190,000 miles round California – although a driver was there just in case. Audi has recently shown its version of a driverless car which enabled shared road/ pedestrian space by using high levels of inbuilt intelligence in cars as well as road surfaces.

Driverless cars could radically alter how we use our cars, as well as how many we own. Traffic density could increase as cars are 'platooned', i.e. grouped together on the roads to reduce space between them as well as drag and therefore fuel consumption – leaving drivers free to make the most of the journey time.

Self-drive cars would be programmable; once one journey is complete, rather than being parked, they could be sent off to do the next one – whether the school run or to pick up the shopping. Instead of paying to have our cars sitting doing nothing most of the time, they may be used 30%, 40% even perhaps 90% of the time. Reduced need for parking spaces could free up valuable land in cities and towns for more productive uses.

Roads may be safer. Each year sees a total of nearly 34,000 deaths on American roads, some 38,000 on European roads and car crashes are the main cause of death among young people – mainly as a result of driver error. Driverless cars may reduce accident numbers.

Loss of mobility is a significant issue for older people. Driverless cars could extend mobility safely, providing continued access to the community and independence thus reducing isolation and the likely on-costs of mental health and other problems.

Nonetheless, there are downsides as well. The computer in a driverless vehicle will know everywhere the vehicle goes. Ownership and access to this information is an issue. Insurance companies, parents, spouses, employers, law enforcement all could find numerous uses for this information. These issues are still being sorted with regards to GPS data, mobile phone data, and electronic tolling, and these technologies have been available for years.

There is the potential for an economic divide as well. If access to the technology is expensive many people that could benefit from the use of the technology, including the elderly and handicapped, may be excluded from access. This creates issues of social inequality.

And what about those people who just enjoy driving. The freedom to get in the car and drive to a destination. Will these people be penalized? If you self-drive will insurance and other fees be higher? How will the roads cope with both driverless and self-drive vehicles?

Driving is an emotional issue. While technology may enable vehicles to be driverless there are a number of other issues - emotional, social, economic and legal that arise. These issues create the larger challenges.

Appendix L - Sample Profile: Round 2 of the scale validation

Age	
Average age	37,1
Average Age Male	36,0
Average Age Female	38,3

Education		
Less than high school degree	0	0,0%
High school degree	21	11,1%
Some college but no degree	46	24,2%
Associate degree in college (2-year)	26	13,7%
Bachelor's degree in college (4-year)	75	39,5%
Marter's degree	17	8,9%
Doctoral degree	2	1,1%
Professional degree (JD, MD)	3	1,6%

Sex		
Male	97	51,1%
Female	93	48,9%

Income		
Less than $10,000	8	4,2%
$10,000 to $19,999	19	10,0%
$20,000 to $29,999	36	18,9%
$30,000 to $39,999	29	15,3%
$40,000 to $49,999	24	12,6%
$50,000 to $59,999	22	11,6%
$60,000 to $69,999	14	7,4%
$70,000 to $79,999	11	5,8%
$80,000 to $89,999	5	2,6%
$90,000 to $99,999	6	3,2%
$100,000 to $149,000	12	6,3%
$150,000 or more	4	2,1%

Appendix M - Sample Profile: Round 3 of the scale validation

Age	
Average age	34,8
Average Age Male	33,1
Average Age Female	36,1

Education		
Less than high school degree	1	0,5%
High school degree	20	10,8%
Some college but no degree	55	29,6%
Associate degree in college (2-year)	25	13,4%
Bachelor's degree in college (4-year)	65	34,9%
Marter's degree	17	9,1%
Doctoral degree	2	1,1%
Professional degree (JD, MD)	1	0,5%

Sex		
Male	78	41,9%
Female	108	58,1%

Income		
Less than $10,000	7	3,8%
$10,000 to $19,999	20	10,8%
$20,000 to $29,999	24	12,9%
$30,000 to $39,999	27	14,5%
$40,000 to $49,999	16	8,6%
$50,000 to $59,999	18	9,7%
$60,000 to $69,999	17	9,1%
$70,000 to $79,999	13	7,0%
$80,000 to $89,999	7	3,8%
$90,000 to $99,999	16	8,6%
$100,000 to $149,000	13	7,0%
$150,000 or more	8	4,3%