Target and position article

Active innovation resistance: An empirical study on functional and psychological barriers to innovation adoption in different contexts

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ABSTRACT

Active innovation resistance is considered to be a main driver of innovation rejection, and traditionally related to five product-specific adoption barriers driving this negative attitude formation. While recent literature introduced a more comprehensive typology encompassing nine functional and eight psychological barriers driving active innovation resistance, an empirical validation of this framework is still missing. In order to close this research gap, we employed a two-study design. First, we conducted a qualitative study to empirically evaluate whether the typology including 17 adoption barriers encompasses all possible negative, product driven reactions of consumers within new product evaluations. Second, we used a quantitative large-scale study to assess the relative importance of each single product-specific adoption barrier within new product evaluations in the context of product and mobile service innovation. Both studies confirm that innovations are commonly rejected owing to these 17 product-specific adoption barriers. However, our results also highlight that functional and psychological barriers vary in their effect on adoption intention depending on whether a new product or service gets evaluated. This study provides first empirical evidence in favor of applying a more comprehensive typology of product-specific barriers when assessing effects of active innovation resistance on consumers' adoption behavior in future research.

1. Introduction

Launching an innovation is a process with an uncertain outcome. What is certain, however, is the fact that a launch can either positively or negatively influence a company's competitiveness (Bissola, Imperatori, & Colonel, 2014; Hansen, McDonald, & Mitchell, 2013). On the one hand, high revenues and sales numbers of new products and services can help a firm to achieve a profitable and outstanding market position (Markham & Lee, 2013). On the other hand, unexpected low revenues from new products and services can jeopardize a firm's competitiveness by, for instance, damaging a brand's overall performance (Liao, Chou, & Lin, 2015), causing significant misinvestments (Bayus, Erickson, & Jacobson, 2003), or prompting negative investor reactions (Urbig, Burger, Patzelt, & Schweizer, 2013). These product failure rates range at around 40%. Depending on a firm's context (e.g. industry or country), failure rates can be even higher (Castellion & Markham, 2013; Claudy, Garcia, & O'Driscoll, 2015; Heidenreich & Kraemer, 2015; Sandberg & Aarikka-Stenroos, 2014). Thus, the identification of the causes of product failure is a central challenge for managing a firm's innovation activities.

The literature affirms that most innovations fail due to rejection by consumers (Greenleaf & Lehmann, 1995; Kleijnen, Lee, & Wetzels, 2009; Laukkanen, Sinkkonen, & Laukkanen, 2008). In this case, consumers evaluate product specifications, leading to active innovation resistance (AIR) and subsequently to the decision to reject an innovation, while cognitively or physically dealing with it (Talke & Heidenreich, 2014). If there is a critical number of active innovation rejections in a target market, revenues from new products and services decrease significantly. Moreover new product and new service failures regularly endanger the firm's overall competiveness (Castellion & Markham, 2013). Thus, there is a need to understand product driven reasons against adoption, which are operationalized through product-specific adoption barriers driving AIR, which are subsequently referred to as AIR barriers (Laukkanen, 2016; Molesworth & Suortti, 2002; Ram & Sheth, 1989). This knowledge can help managers to avoid new product and service failures, enabling them to apply measures and to prevent consumer-driven innovation rejections caused by these AIR barriers (Heidenreich & Kraemer, 2016). Hence, such knowledge helps to decrease the uncertainty level in innovations' target markets in advance.

Since the relevance of adoption theory was established (Mittelstaedt, Grossbart, Curtis, & Devere, 1976; Rogers, 1976), there have been thorough discussions and empirical studies in academia that assess AIR barriers' effects (Claudy et al., 2015; Heidenreich & Spieth, 2013; Laukkanen, 2016). However, these studies are limited concerning the number of barriers considered and tested. In line with Ram and Sheth (1989), it has commonly been assumed that AIR comprises five product-specific barriers: usage, value, risk, tradition, and image barrier. Academic results show that these AIR barriers negatively affect the intention to adopt an innovation, which causes innovation rejection (Kleijnen et al., 2009; Laukkanen et al., 2008). Recent research additionally shows that these effects are twice as powerful as those of adoption factors, underlining the need to deepen knowledge about AIR barriers (Claudy et al., 2015). Motivated by these findings, we determine that too little is known about the comprehensiveness of Ram and Sheth's (1989) AIR typology. It seems indispensable to assess whether future research should further apply their typology or a more comprehensive AIR barrier set instead. This knowledge could help to improve the current understandings of AIR and to develop comprehensive approaches to avoid innovation failure in management practice. Building on discussions about expanding the widespread AIR typology of Ram and Sheth's (1989), Talke and Heidenreich (2014) outline an apparently comprehensive typology of 17 AIR barriers, which has not yet been empirically tested.

Hence, the objective of this paper is to empirically validate Talke and Heidenreich's (2014) framework with respect to its comprehensiveness. Furthermore, our study also strives to shed light on the relative importance of different AIR barriers in driving innovation rejections. From a theoretical point of view, our study thus contributes to the ongoing discussion on whether a more comprehensive view on AIR barriers is needed to enhance our understanding of consumer adoption behavior. From a managerial point of view, the study results can help firms to improve efforts in reducing AIR barriers prior to an innovation's launch. New product manager could reduce failure rates by implementing product specifics according to a barrier-driven product concept. Moreover, firms must manage a lack of resources; thus it forces them to limit the number of barriers that can be tackled. We tackle this challenge by assessing the relative importance of AIR barriers.

To empirically address the aforementioned research objectives, we structured this paper as follows. First, we outline the concept of AIR and define its functional and psychological barriers. Second, in study 1, we deductively assess the occurrence of both barrier types in new product evaluations using an explorative approach. Third, building on the qualitative results of study 1, we conducted an empirical large-scale study that encompasses two innovation types: technological product innovations and mobile service innovations. In doing so, we assess and evaluate the occurrence and importance of each previously identified AIR barrier accordingly to assess the need for a comprehensive AIR typology. We conclude with theoretical and managerial implications and outline ideas for future research.

2. Conceptual background

Discussing an innovation from an adoption behavior perspective involves assessing the causes and effects of an innovation's adoption (Nabih, Bloem, & Poiesz, 1997), rejection (Rogers, 2003), postponement (Greenleaf & Lehmann, 1995), or opposition (Davidson & Walley, 1985). Individual consumer resistance to innovation leads to these behavioral outcomes (Kleijnen et al., 2009). Thus, a product's outcome (success or failure) also depends on consumers' awareness or attitudes and their resistance (Claudy et al., 2015; Heidenreich & Spieth, 2013). According to the adoption process (Talke & Heidenreich, 2014), the literature discusses two innovation resistance types. First, passive innovation resistance leads to the rejection of an innovation prior to its evaluation (Bagozzi & Lee, 1999; Heidenreich & Handrich, 2015). As a result, the adoption process ends in its early stages, before persuasion

can lead to conscious decisions (Heidenreich, Kraemer, & Handrich, 2016). Second, if an individual has high readiness for the mental effort that innovation evaluation requires (Oreg, 2003), information can be evaluated in the persuasion stage. In this stage, a consumer evaluates different product specifics (Laukkanen et al., 2008). Thus, potential customers collect reasons for and against adoption. Such evaluation leads to attitude formation (Kleijnen et al., 2009). Attitudes are "the primary antecedents of intention" (Westaby, 2005, p. 99) and represent "global motives as they constitute broad substantive factors, which influence behaviors" (Claudy et al., 2015, p.532). Positive attitude formation leads to active innovation acceptance, whilst negative attitude formation causes AIR (Nabih et al., 1997). The outcomes of attitude formation form the basis for the decision stage (Kuisma, Laukkanen, & Hiltunen, 2007), in which consumers form their intentions to adopt or reject an innovation (Rogers, 2003). It is followed by the implementation stage, which comprises the final behavioral outcomes for consumers (Bagozzi, 1992).

Based on this adoption process, AIR barriers occur when a consumer evaluates an innovation. According to Ram and Sheth (1989), AIR barriers "paralyze […] [the consumers'] desire to adopt innovations" (p. 7) and can be classified into two types: functional and psychological barriers. While functional "barriers are more likely to arise if consumers perceive significant changes from adopting the innovation" (Ram & Sheth, 1989, p.7), psychological AIR barriers are primarily caused by psychological conflicts owing to a consumer's beliefs (Kleijnen et al., 2009). Past research shows that arising functional and psychological barriers cause higher AIR, which will likely lead to the rejection of innovations (Heidenreich & Spieth, 2013; Laukkanen, Sinkkonen, Kivijärvi, & Laukkanen, 2007; Wiedmann, Hennigs, Pankalla, Kassubek, & Seegebarth, 2011). For instance, if consumers think that a technology's upfront costs seem too high, value barriers arise and cause negative attitude formation, leading to a rejection of the innovation (Claudy et al., 2015). Moreover, an innovation's use is accompanied by the omission of a consumer's weekly routines or well-known processes, which can conflict with their existing experience, values and social norms. Thus, the innovation might be perceived as having a negative impact on their daily life. In this situation, tradition barriers arise and increase AIR, which subsequently leads to the rejection of an innovation (Laukkanen, 2016).

Previous studies underline the effects of AIR barriers on innovation rejections, and the importance of understanding and diminishing these barriers. Thus, research on AIR barriers point out the need for further assessment (Claudy et al., 2015; Laukkanen, 2016; Talke & Heidenreich, 2014). Notably, research typically builds on Ram and Sheth's (1989) narrow typology to assess AIR (Laukkanen, 2016; Lian & Yen, 2013; Elbadrawy & Aziz, 2011; Antioco & Kleijnen, 2010; Laukkanen & Kiviniemi, 2010; Laukkanen, Sinkkonen, & Laukkanen, 2009; Rudolph, Rosenbloom, & Wagner, 2004; e.g. Molesworth & Suortti, 2002). Based on this typology, it has generally been accepted that AIR has commonly comprised five barrier types: usage, value and risk (functional barriers), as well as tradition and image barriers (psychological barriers). However, AIR research also argues for a more comprehensive set of AIR barriers. For instance, Laukkanen and Kiviniemi (2010) argue that information should be considered in AIR research. They demonstrate that information gaps play a key role during innovation resistance formation. Moreover, some authors argue that risk barriers should be divided into more concrete barriers, for instance, economic risk, functional risk, personal risk, or social risk (Antioco & Kleijnen, 2010; Lunsford & Burnett, 1992; Talke & Heidenreich, 2014; Zsifkovits & Günther, 2015).

Building on this discussion, Talke and Heidenreich (2014) provide a comprehensive typology of 17 AIR barriers. There are nine *functional barriers* in this typology, which arise "as soon as a consumer perceives any product attributes as dysfunctional or inadequate for his or her personal needs and usage expectations" (Talke & Heidenreich, 2014, p. 899). *Value barriers* arise from comparing an innovation with its