



Generalizations on consumer innovation adoption: A meta-analysis on drivers of intention and behavior

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ABSTRACT

Previous research has shown that consumer intentions to adopt innovations are often poor predictors of adoption behavior. An important reason for this may be that the evaluative criteria consumers use in both stages of the adoption process weigh differently. Using construal level theory, we develop expectations on the influence of innovation characteristics across the intention and behavior stages of the adoption process. Using meta-analysis, we derive generalizations on drivers of intentions and actual innovation adoption behavior. The results show important differences across both stages. Consumers show higher levels of adoption intention for innovations that are more complex, better match their needs, and involve lower uncertainty. However, consumers are found to actually adopt innovations with less complexity and higher relative advantages. Adopter demographics are found to explain little variance in adoption intention and behavior, whereas adopter psychographics are found to be influential in both stages. These findings have implications for innovation adoption theory, for managers involved in new product and service marketing, and for future research on innovation adoption.

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1. Introduction

Understanding whether and why consumers will adopt a new product or service is a critical insight for managers involved in marketing innovations. It is common practice to obtain such an understanding based on market research of consumers' attitudes toward the innovation and their purchase intention. However, many marketers have found out the hard way that consumers who "talk the talk" in surveys do not always "walk the walk" when it comes to innovation adoption. Consider for example the videophone. As early as 1964, AT&T tested its version of this innovation, the *Picturephone*, during the New York World Fair (Schnaars & Wymbs 2004). Market researchers interviewed almost 700 individuals making transcontinental videophone calls. Respondents rated the service favorably, and 45% indicated a need for the service at home. However, the launch of the innovation in the consumer market failed, as few consumers adopted the innovation. After a later unsuccessful launch in the business market, AT&T eventually decided to terminate the *Picturephone* by the mid-1970s. The case of the videophone can hardly be considered an isolated example. A recent report by Synovate that reviewed studies on product purchase intention and behavior from diverse categories, such as fast moving consumer goods, cars, PCs,

appliances, clothing, and home furnishings, suggested that "91% of the variance [in purchase behavior] is not captured by purchase intent" (Synovate 2007, p. 4).

Managerial practice shows that intentions are often used as proxy measures for adoption behavior (Van Ittersum & Feinberg 2010; Young, DeSarbo, & Morwitz 1998). The case of the videophone painfully illustrates that market research showing favorable evaluation and high adoption intention of an innovation can be misleading. Indeed, academic research on the adoption of innovations has shown that intentions are far from perfect predictors of behavior. A meta-analysis by Sheppard, Hartwick, & Warshaw (1988) reported a correlation of .53 between intention and behavior. Moreover, Morwitz, Steckel, and Gupta (2007) found that the correlation between intention and behavior was significantly lower for new products than for existing ones. Several reasons have been suggested for this gap (e.g., Morwitz et al., 2007; Sun & Morwitz, 2010; Van Ittersum & Feinberg, 2010), including consumers' change of intentions over time (Morrison, 1979), the use of biased estimates in research (Van Ittersum & Feinberg, 2010), and the inability of the consumer to anticipate unexpected events that may affect the adoption decision (Morwitz et al., 2007).

Typically, the evaluation of a product or service, such as an innovation, is a goal-directed process in which consumers evaluate its attributes with certain use purposes and situations in mind (e.g., Gardial, Scott Clemons, Woodruff, Schumann, & Burns, 1994; Vandecasteele & Geuens 2010). Innovation adoption is best represented by a process of multiple stages through which an individual

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passes, from first awareness to continued use of the innovation (Rogers, 2003). During this complex decision process, the potential adopter forms perceptions of the characteristics of the innovation (e.g., Castaño, Sujan, Kacker, & Sujan 2008; Wood & Lynch 2002) and weighs them in a choice decision (e.g., Bettman 1979). At different stages of the innovation adoption process, use purposes and situations may be perceived differently, thus affecting the weight of evaluative criteria in the decision process. Consumers may therefore weigh attributes differently in situations of purchase intention versus purchase behavior, resulting in an imperfect relationship between intention and behavior (Gollwitzer 1999). For example, in the case of the videophone, the high quality of personal visual communication may have led consumers to a favorable pre-adoption evaluation of the innovation, indicating high adoption intentions, whereas the importance of its perceived costs may have prevented consumers from actual purchase. Thus, it is best to distinguish intention and behavior as distinct dependent variables (Bemmaor 1995; Jamieson & Bass 1989) that represent different, subsequent stages of the innovation adoption process (Rogers, 2003).

A rich body of research has developed in the past decades that addresses factors affecting innovation adoption decisions by consumers in marketing science (Hauser, Tellis, & Griffin 2006; Rogers, 2003). However, only more recently have insights into how antecedents of consumer innovation adoption differ between adoption process stages been developed in the literature (e.g., Alexander, Lynch, & Wang, 2008; Castaño et al. 2008; Wood & Moreau, 2006). Practitioners could substantially benefit from a better understanding of the antecedents of consumers' intentions to adopt an innovation versus those of their actual behavior. Although Tornatzky and Klein (1982) have previously provided insight on innovation adoption drivers based on a meta-analysis of academic research, their study did not discriminate between intention and behavior. Moreover, their study was conducted almost three decades ago, thus excluding a large body of research conducted since then. The objective of this paper is to shed more light on whether and, if so, how drivers of innovation adoption that have been considered as indicators of innovation acceptance in the literature vary across the intention and behavior stages of the adoption process. To do so, this study uses meta-analysis (e.g., Assmus, Farley, & Lehmann 1984) on antecedents of both adoption intention and adoption behavior. As such, this study aims to obtain more insight in a field of research (i.e., consumer innovation adoption) rather than in a specific relation. This meta-analysis focuses on studies in marketing literature that address the adoption of new products by consumers. We further assess whether and how contextual and methodological factors have moderated the effects found on innovation adoption. We generalize the findings of 77 studies related to consumer innovation adoption published in marketing from 1970 to mid-2007. This method allows us to obtain generalized findings on both adoption outcomes and their antecedents. The main results of this analysis include the following:

- Innovation characteristics have a strong but different effect on adoption process stages:
 - Benefits affect both intention and behavior, with compatibility being a stronger driver of intention and relative advantage of behavior;
 - Complexity has a positive effect on intention, but negatively affects adoption behavior;
 - Perceived uncertainty shows a stronger effect on intention than on adoption behavior.
- Adopter demographics show minor influence on innovation adoption.
- Adopter psychographics are found to be powerful drivers of innovation adoption, with respect to both intention and behavior.

This study contributes to the literature by showing that drivers of innovation adoption to a large extent affect intention and behavior

differently. Therefore, the findings show that it is important to take a dynamic perspective of innovation adoption. The study also suggests new directions for future research and provides implications for managers involved in new product and service marketing.

This paper is organized as follows. First, we provide the theoretical background of the study. Second, we discuss the procedures that were used to conduct the literature review and the development of the database and elaborate on the methods employed to analyze the data. Third, we present the findings of the meta-analysis pertaining both to the substantive information on the effects and the existence of contextual and methodological moderators. Fourth, we discuss the findings and draw implications for practitioners dealing with the marketing of new products. Finally, we discuss the limitations of the present study and implications for future research on innovation adoption.

2. Theoretical background

2.1. Antecedents of innovation adoption

In the literature, different theoretical models have been used to explain consumer innovation adoption. Typically, studies build upon Rogers' (2003) innovation diffusion theory, the Technology Acceptance Model (Davis, 1989), the Theory of Reasoned Action (Fishbein & Ajzen 1975) or the Theory of Planned Behavior (Ajzen, 1985). Innovation adoption can be defined as the consumer's decision to make full use of an innovation (Rogers, 2003). Although this definition implies the consumer's purchase behavior, both purchase intentions and actual purchase behavior have been used interchangeably to reflect adoption (Jamieson & Bass, 1989). We explicitly distinguish between 'adoption intention' and 'adoption behavior' to reflect different explained variables, and we refer to 'innovation adoption' to reflect both concepts. Adoption intention refers to a consumer's expressed desire to purchase a new product in the near future. It relates to the consumer's state of mind before actual purchase behavior has occurred and is based on the information and perceptions the consumer has at that time. Adoption behavior, on the other hand, refers to the (trial) purchase of an innovation (Rogers, 2003). Studies on adoption behavior typically analyze the perceptions and characteristics of consumers who have already purchased the innovation relative to those who have not. The latter may include non-adopters who either have a high or low intention to adopt or non-adopters who even lack awareness of the innovation.

In the innovation adoption literature, characteristics of the (potential) adopter and perceived characteristics of the innovation are found to be major drivers of innovation adoption (Gatignon & Robertson, 1985; Meuter, Bitner, Ostrom, & Brown, 2005; Rogers, 2003; Tornatzky & Klein, 1982). The number of different variables used to capture adopter characteristics is particularly large, as a lot of research has been devoted to finding traits of consumers that are likely to adopt an innovation. Adopter characteristics capture the personal traits that describe the (potential) adopter of an innovation, which can be divided into socio-demographics and psychographics. A wide range of socio-demographic characteristics has been used in research (Gatignon & Robertson, 1985; Rogers, 2003; Tornatzky & Klein, 1982). Many studies particularly focus on consumers' age, level of education and income. Other variables that are considered frequently include household size, gender, and family life cycle. Adopter psychographics including innovativeness, opinion leadership, media proneness, and involvement are among the variables most frequently used to explain adoption. Less frequently used variables include, for example, price consciousness, brand familiarity, self-confidence, and dogmatism. Innovation characteristics refer to the attributes consumers use to evaluate an innovation. In the innovation adoption literature, these are generally represented by the consumer's perception of the relative advantage, compatibility, complexity, trialability, observability (Rogers, 2003), and uncertainty or risk (Hoeffler, 2003; Ostlund, 1974) of the innovation. Table 1 provides definitions and

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