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Household technology adoption in a global marketplace: Incorporating the role of espoused cultural values

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Abstract This paper extends prior research in household technology adoption by incorporating the role of espoused cultural values. Specifically, we theorize that espoused cultural values–individualism/collectivism, masculinity/femininity, power distance, uncertainty avoidance, and long-term orientation—play an important role in affecting consumers' behaviors by altering consumers' belief structures—attitudinal beliefs, normative beliefs, and control beliefs. Our theoretical model predicts that the impact of consumers' belief structures on household technology adoption intention varies across consumers with different cultural values. Propositions are provided to explain how different cultural mechanisms moderate the relationships between consumers' beliefs and household technology adoption intention. The paper concludes with theoretical implications, future research directions, and practical implications.

Keywords Household technology adoption · Espoused culture · Belief structures · Intention · Consumer behavior

1 Introduction

The 21st century has seen the penetration of personal computers (PCs) in our lives, ushering in a burgeoning population of "technology aware" consumers (Chapman 2007). According to Gartner, the US PC market has experienced tremendous growth in recent years[1]. With increasing globalization and the inevitable flattening of the world (Friedman 2005), companies in the PC market are increasingly seeking to extend their reach beyond US borders. Forrester estimates that there will be more than 2 billion PCs worldwide by 2015, with an annual growth rate of more than 12% between 2003 and 2015 (Chapman 2007). China, India, Brazil, and Russia lie at the epicenter of the growing global PC market and are projected to account for 775 million of the 2 billion PCs by 2015. Clearly, PCs are not only widely used in developed countries, but also, increasingly, in developing countries with large populations, such as China and India. These countries have a rapidly growing middle class with rising disposable incomes (Fishman 2005). In India alone, it is estimated that the current middle class of 50 million will grow to 583 million in 2025, accounting for a total income of US$1.1 billion, 11 times greater than current total income (Farrell and Beinhocker 2007). China too is projected to have a rising middle class with annual income as high as US$53,900 by 2015 (BusinessWeek 2007).

With this substantial increase in purchasing power, this middle class will comprise a large proportion of household technology consumption. This technology-savvy consumer base uses PCs at home to search for information, stay connected with friends, play games, and/or conduct online business. In addition, the adoption of PCs in households facilitates participation in business-to-consumer (B2C) and consumer-to-consumer (C2C) e-commerce. As PC companies compete to gain marketshare in this lucrative global market, it is important for them to understand the factors

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[1] Recent estimates suggest a growth rate of 4.7% for the 3rd quarter of 2007 from the same period the previous year.

that promote technology adoption in households. Therefore, as these companies extend their reach across geographic boundaries, consideration of cultural factors becomes a strategic imperative in global market penetration.

In comparison to technology adoption in organizations, household technology adoption has received little research attention to date. A few studies have investigated the factors that affect household technology adoption (e.g., Brown and Venkatesh 2005; Brown et al. 2006; Venkatesh and Brown 2001). The model of adoption of technology in households (MATH) provides a comprehensive theoretical model of technology adoption in households (Venkatesh and Brown 2001). MATH predicts household technology adoption by focusing on how different kinds of belief systems (i.e., attitudinal beliefs, normative beliefs, and control beliefs) affect adoption intention and adoption behaviors. The extended MATH model (Brown and Venkatesh 2005) builds upon the original MATH model by explicitly incorporating and theorizing the role of some relevant household characteristics—i.e., demographic and socio-economic factors—to enrich our understanding of household technology adoption.

While MATH and the extended MATH have done an excellent job in explaining household technology adoption, there is still room for advancing our understanding of this phenomenon in light of the complexities embodied in households. Indeed, Venkatesh and Brown (2001) and Brown and Venkatesh (2005) call for future research to conduct a more in-depth examination of the characteristics of households to get a better understanding of household decision-making on technology adoption. One major limitation of MATH, and its variant, is that it is focused on a US-based consumer population. It does not account for cultural variations that might influence technology adoption in households. Thus, the purpose of this paper is to address this gap by integrating cultural considerations into MATH. We employ theory on espoused national cultural values to explain differences in household technology adoption. *Espoused national culture* is defined as the extent to which an individual embraces certain nationally conceptualized cultural values (Srite and Karahanna 2006). Integrating a cultural perspective into MATH is important for two reasons. First, it identifies potential boundary conditions for this theory, expanding its applicability to contexts outside the U.S. It is important to understand how MATH might operate in different cultural contexts. Prior research has demonstrated the importance of cultural factors in the adoption of technology in organizations (e.g., Ford et al. 2003; Gallivan and Srite 2005; Rose and Straub 1998; Srite and Karahanna 2006). Second, it is important to consider cultural factors in household decision making about innovations. Different cultural value systems can drive people to behave differently, even with respect to the same technology. For example, household decision makers with long term orientation may pay more attention to the fast development of the technology and thus harbor greater concern about the short lifecycle of the new technology.

In summary, the purpose of this paper is to advance our understanding of household technology adoption by theorizing the role of espoused national culture. We believe the incorporation of espoused cultural values also contributes to the cultural intelligence literature, which seeks to leverage cultural differences for better strategic decision-making. Finally, our paper informs research in marketing, which has not incorporated espoused cultural differences into the understanding of consumers' purchasing behaviors. In the next section, we briefly review MATH and research on espoused culture. We then develop an integrated model of MATH and espoused cultural values.

2 Theoretical background

2.1 The Model of Adoption of Technology in Households (MATH)

MATH is built upon theories drawn from the information systems, marketing, and psychology disciplines. Perceived usefulness and perceived ease of use, two important technology-related beliefs, are drawn from the information systems literature. Consumer behavior theory was applied to understand individuals' purchasing intentions, such as concerns about cost and concerns about technology obsolescence, in the household technology market. The MATH model also draws on theory from psychology, specifically, the theory of planned behavior (TPB; Ajzen 1985, 1991), due to its suitability for explaining volitional behaviors in the context of household technology adoption.

In their investigation, Venkatesh and Brown (2001) found that MATH explains over 50% of the variance in intention to adopt household technology. They found a clear distinction between the factors that drive people to adopt household technology (such as utilitarian outcome expectations, hedonic outcome expectations, social influence) and those that inhibit consumers from adopting household technology (such as fear of obsolescence, justification of the investment). Among those factors that drive people to adopt household technology, utilitarian outcome expectations, hedonic outcome expectations, social outcome expectations, and social influence all significantly influenced current purchase intent, with status being the strongest determinant, followed by enjoyment, influence of friends and family members, and application for personal use. Among those factors that inhibit consumers from adopting household technology, information from mass media, rapid change of technology, high cost, and lack of

knowledge appear to be the most important factors that prevent people from developing current purchase intention. In terms of future purchase intention, utilitarian outcome expectation turned out to be the key driver, while rapid change of technology appeared to be the primary barrier. Furthermore, Venkatesh and Brown (2001) discovered that the behaviors of non-adopters were more consistent with their intentions than were the behaviors of adopters, indicating the strong effect of adoption inhibitors.

Building on MATH, the extended MATH conceptualized and theorized the roles of household demographic characteristics—i.e., marital status, age, income, and presence of children in the household—in enhancing our understanding of household technology adoption (Brown and Venkatesh 2005). The extended model explains an additional 24% of the variance over and above that explained by the original model. It adds to our understanding of household technology adoption by indicating that the effect of attitudinal, normative, and control beliefs on adoption varies as a function of marital status, age, income, and presence of children in the household. More specifically, Brown and Venkatesh (2005) found that the relationship between utilitarian outcome (in terms of application for personal use) and purchase intention was stronger for older people and married couples, while the use for work-related purposes also increases in importance with age until retirement time, at which point utility for work-related use is no longer relevant. The utility dimension becomes more important as the child's age increases. Application of technology for fun becomes less important while the application for status gain and perceived ease of use becomes more important as age increases. The impact of social influence on household technology adoption varies across age, income, and marital status such that the influence of others (i.e., friends, family, and other secondary source, but not including workplace referent) will become more important as age increases, especially for those who are married and those with low income. The concern of prices and fear of technological advances and declining cost become more important as age increases and income decreases. In sum, MATH and its extension give us a firm foundation for understanding the main drivers of technology adoption in households. However, incorporating the role of cultural factors will enhance our understanding of how this phenomenon unfolds across different cultural contexts.

2.2 Espoused cultural values

Following Schein's (1985a, 1985b) conceptualization, culture is defined as "belief systems that individuals have toward human's behavior, relationship, reality, and truth" (Leidner and Kayworth 2006, p. 359). These belief systems shape individuals' schemas about the world around them. Consequently, culture plays a subtle, yet powerful role in influencing people's social behaviors (Bartunek and Moch 1987; Leidner and Kayworth 2006). Culture has been studied at various levels of analysis including national, organizational, subunit, and individual.

In this paper, we are more interested in national cultural values because household technology adoption has become a global phenomenon. To date, the most popular conceptualization of national culture has been Hofstede's taxonomy which includes five dimensions: individualism/collectivism, masculinity/femininity, uncertainty avoidance, power distance, and long-term orientation (Hofstede 1980, 1983; Hofstede and Bond 1988). *Individualism/collectivism* reflects individuals' inclination for a social framework. Individualistic individuals prefer prioritizing their goals over those of the collective while collectivistic individuals anticipate that the group will take care of them in exchange for their loyalty and, therefore, prioritize the needs of the collective over their own. *Masculinity/femininity* originates from traditional sex-role stereotypes which portray men as less emotional but more independent and aggressive than women. In the current context, the conceptualization of masculinity/femininity is not bounded by biological gender differences but describe, in general, individuals' degree of preference for achievement, assertiveness, and material success. *Power distance* refers to the extent to which individuals with less power are willing to acknowledge differentials of power and inequality. *Uncertainty avoidance* refers to the extent to which individuals feel vulnerable to unpredictable and unknown situations. Finally, *long-term orientation* refers to an individual's plan and consideration for the future.

National cultural values have been widely employed as a boundary condition for numerous theoretical models in the management and IS literature. As an example, a study found that the relationship between organizational support and work outcome was stronger for employees with low power distance perception (Farh et al. 2007). A consistent body of literature has acknowledged that the relationship between satisfaction and commitment varied across different cultures (e.g., Clugston et al. 2000; Kanungo and Wright 1983; Lincoln and Kalleberg 1985). Within the IS literature, Srite and Karahanna (2006) recently found that the factors predicting technology use in organizations vary as a function of the cultural values held by employees (see also Rose and Straub 1998). In many cases, the cross-cultural studies involved two or more countries, but studies have also shown that there is plenty of within-country variation in cultural values (Au 1999; Hofstede 1980), suggesting that "people vary on pivotal psychological dimensions (e.g., PD beliefs, traditionality) both on a between-country basis and on a within-country basis" (Brockner 2005, p. 355). Previous studies have adopted this espoused culture view and have employed Hofstede's dimensions of

culture at the individual level (e.g., Bochner and Hesketh 1994; Cox et al. 1991; Gomez et al. 2000). In contrast to the management literature, there is a paucity of IS literature that discusses espoused cultural values in technology adoption research. As noted earlier, a recent exception is Srite and Karahanna (2006), who examined technology adoption at work by incorporating espoused cultural values. They found that social norms have a larger impact on intended behavior for individuals with high espoused femininity and high espoused uncertainty avoidance values. Moreover, they found that the effect of perceived ease of use on intended behavior is stronger for individuals with masculine values. Espoused culture is expected to play an important role in technology adoption at home. However, it is necessary to make it clear that theorizing the impact of espoused culture in the context of household technology adoption is not the same as theorizing its effects in the work context. Prior studies have shown that household technology adoption is significantly different from technology adoption at work (Brown and Venkatesh 2005; Venkatesh and Brown 2001). For example, adopters and non-adopters have different mindsets in the context of household technology adoption (Venkatesh and Brown 2001). Also, the effect of belief structures on household technology adoption varies across different contingent factors, e.g., age, income, children, and marital status (Brown and Venkatesh 2005). Table 1 summarizes the key constructs used in this paper from MATH and the espoused culture literature.

3 Theory development

In this section, we highlight the theoretical mechanisms linking beliefs, espoused culture, and household adoption of technology. We acknowledge the important role of household characteristics, such as marital status, age, income, and children, in shaping an individual's belief structures. However, for ease of exposition, and in the interest of maintaining a focus on the effects of espoused culture, we choose to leave these household characteristics out of our theoretical model. Figure 1 illustrates our proposed theoretical model.

3.1 Individualism/collectivism

Utilitarian outcomes Venkatesh and Brown (2001) define utilitarian outcomes as the degree to which an individual believes that a technology will improve the effectiveness of household activities. Such utility is reflected in the extent to which a technology may enable individuals to perform important household activities such as paying bills, purchasing household products, and conducting investment transactions. MATH suggests that greater perceptions of the utility of a technology for the household increase the likelihood of such a technology being accepted. The strength of the relationship between utilitarian outcomes and household technology adoption is expected to vary across individuals with individualistic versus collectivistic values. As noted earlier, individualistic people emphasize their own goals over those of the collective. As individuals with individualistic values are more independent in terms of making decisions, they are more likely to assess the usefulness of the technology on their own, without consulting other family members. Individualistic people tend to define usefulness of a technology with respect to their own needs, without consideration for the needs of the whole family (e.g., utility for the spouse or utility for the children). Thus, the utility of a technology is likely to carry significant weight for individualistic consumers when forming an intention to adopt. In contrast, individuals with collectivistic values are more likely to consult other members in the family about the technology. Upon hearing other views about the utility of a technology, such consumers may place others' views above their own in forming

Table 1 Summary of key constructs and definitions

Construct	Definition
MATH	
Utilitarian outcomes	The extent to which using a PC enhances the effectiveness of household activities.
Hedonic outcomes	The pleasure derived from the consumption, or use, of a product.
Social outcomes	The public recognition that would be achieved as a result of adopting an innovation.
Social influence	The extent to which members of a social network influence one another's behavior.
Barriers	The extent to which a lack of knowledge, difficulty in using the technology, and cost concerns are barriers.
Espoused Cultural Values	
Individualism/collectivism	Reflects individuals' inclination to prioritize their own needs versus those of social others.
Masculinity/femininity	Individuals' degree of preference for achievement, assertiveness, and material success.
Power distance	The extent to which individuals with less power are willing to acknowledge differentials of power and inequality.
Uncertainty avoidance	The extent to which individuals are tolerant of unpredictable and ambiguous situations.
Long-term orientation	Refers to individuals plan and consideration for the future.

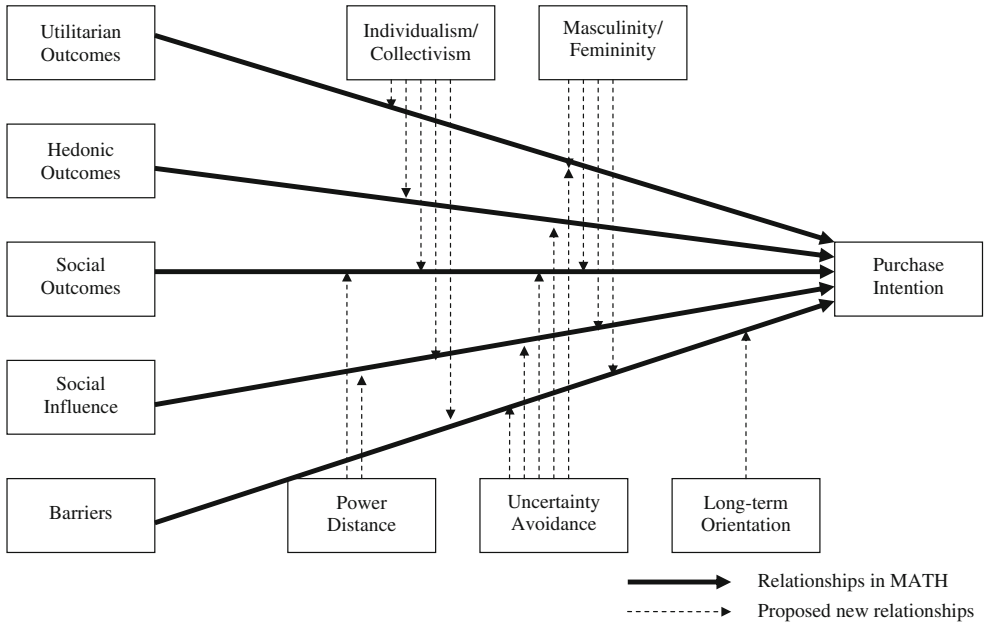

Fig. 1 A theoretical model of espoused culture and household technology adoption

their intention to adopt. Consequently, one's perceived utilitarian outcome of a technology may have little bearing on one's purchase intentions for that technology.

Proposition 1a *The relationship between utilitarian outcomes and technology adoption intention will be stronger for individuals with high espoused individualism than for those with high espoused collectivism*.

Hedonic outcomes Hedonic outcomes refer to the pleasure experienced during the consumption of a product (van der Heijden 2004; Venkatesh and Brown 2001). Venkatesh and Brown (2001) reasoned that consumers who expect to derive greater pleasure from using a technology are more likely to adopt it. This is particularly true of technologies that have high entertainment value (Venkatesh and Brown 2001). The effect of hedonic outcomes on technology adoption is expected to vary across individualistic versus collectivistic individuals. Consumers with individualistic values are more likely to define enjoyment in terms of their own entertainment needs while consumers with collectivistic values are more likely to define enjoyment in terms of entertainment value for the whole family. Such concern among collectivistic consumers suggests that family entertainment needs may supersede personal entertainment needs—particularly if such needs are divergent. Therefore, we propose:

Proposition 1b *The relationship between hedonic outcomes and technology adoption intention will be stronger for individuals with high espoused individualism than for those with high espoused collectivism.*

Social outcomes Social outcomes represent the social image that may result from adopting a technology (Rogers 1995; Venkatesh and Davis 2000). Venkatesh and Brown (2001) suggest that consumers who believe that owning a technology will enhance their relative power, status, and/or knowledge within a social group are more likely to adopt the technology. Individuals with collectivistic values have a preference for being connected to members of the group (Hofstede 1980, 1983; Srite and Karahanna 2006). Individuals who see themselves as connected to others would be more likely to care about their image in the group. They have a stronger desire for power elevation or knowledge improvement which would enhance their image and, thus, make them more accepted by members of the group (Venkatesh and Davis 2000). As a result, such individuals are more likely to place significant emphasis on social outcomes in forming their intention to adopt. In contrast, individuals with individualistic values may be less concerned about their social image within the group, given their relatively more independent outlook. Therefore, social outcomes are likely to play less of a role in technology adoption intention formation for individualistic consumers.

Proposition 1c *The relationship between social outcomes and technology adoption intention will be stronger for individuals with high espoused collectivism than for those with high espoused individualism.*

Social influence Social influence indicates how an individual's behavior is affected by others in a social network (Rice et al. 1990). According to Venkatesh and Brown (2001), the social pressure to adopt a technology can come

from a variety of sources including: family, friends, newspaper, and television. Information from such sources can be influential on a consumer's decision to adopt a technology. Because individuals with collectivistic values give more credence to others' opinions, their technology adoption decisions are more likely to be influenced by social forces such as word-of-mouth. Prior research has shown that collectivistic individuals are more inclined to engage in cooperative behaviors and information exchange than individualistic individuals (e.g., Chatman and Barsade 1995; Cox et al. 1991; Hofstede 1980; Kirkman and Shapiro 2001; Thomas 1999; Wagner 1995). Chow, Deng, and Ho (2000) found individuals in China (collectivistic) were more likely to share knowledge with in-group members than individuals in the U.S. (individualistic). In the process of cooperation and knowledge exchange, individuals are more likely to influence others and be influenced by others. In contrast, individuals with individualistic values are less connected with others and pay less attention to others' opinions. Consequently, they are less likely to be affected by other people's advice on technology adoption.

In contrast to collectivistic consumers, individualistic consumers are likely to be influenced by secondary sources of information (e.g., newspaper, TV, radio) about a technology. Information from such sources is free of the collective opinions embodied in social collectives. Thus, individualistic consumers are more likely to heed such sources of information where they need not let the opinions of social others supersede their own. Additionally, such sources of information represent an alternative to the opinions of family and friends.

Proposition 1d *The relationship between social influence (family and friends) and technology adoption intention will be stronger for individuals with high espoused collectivism than for those with high espoused individualism.*

Proposition 1e *The relationship between social influence (newspaper, TV, radio) and technology adoption intention will be stronger for individuals with high espoused individualism than for those with high espoused collectivism.*

Barriers MATH identifies three barriers relevant to household technology adoption: lack of relevant knowledge of the new technology, perceived ease use, and cost concern (Venkatesh and Brown 2001). Venkatesh and Brown (2001) note that these factors can impede the adoption of technology in households. We argue that the negative impact of these barriers on household technology adoption will be attenuated for individuals with collectivistic values. Individuals with espoused collectivism anticipate that the group will take care of them when they are in need of assistance. Consistent with collectivistic norms, such individuals are more willing to help each other (Kirkman and Shapiro 2001). Therefore, individuals with collectivistic values are more likely to help each other to acquire knowledge of the new technology, share useful advice on how to use the technology so that it is perceived to be easy to use, or even provide financial support to those who need it. Consequently, the barriers discussed above are more likely to be resolved for collectivistic individuals.

Proposition 1f *The relationship between barriers and technology adoption intention will be attenuated for individuals with high espoused collectivism.*

3.2 Masculinity/femininity

Utilitarian outcomes Hofstede et al. (1998) suggested individuals with feminine values focus on quality of life goals, nurturing, and modesty, whereas individuals with masculine values focus on goal achievement, material success, and assertiveness. This suggests that consumers with high masculinity are more likely to emphasize the utilitarian value of technology in their household adoption decisions, compared to consumers with high femininity. These individuals are primarily concerned about how the technology can help them perform household activities. If a new technology can make their lives better and easier—e.g., using the Internet to pay bills online could save a lot time—they are more likely to develop the intent to adopt the new technology. Indeed, Venkatesh and Morris (2000) found that compared to women, men tend to place more emphasis on utilitarian factors in considering technology usage. Consistent with this finding, Venkatesh, Morris, Sykes, and Ackerman (2004) found that masculine sex-typed individuals exhibit similar behavioral patterns to men in their decision making about technology.

Proposition 2a *The relationship between utilitarian outcomes and technology adoption intention will be stronger for individuals with high espoused masculinity than for those with high espoused femininity.*

Social outcomes Individuals with masculine values have a preference for achievement and material success (Hofstede et al. 1998). Status attainment is a socially recognized achievement and, therefore, is desirable for individuals with masculine values. If a new technology has significant positive implications for social outcomes, high masculinity consumers are more likely to factor this into their adoption decision, as it directly addresses their need for achievement and material success. For example, if there is high prestige associated with being knowledgeable, then

high masculinity consumers are more likely to adopt technology, to the degree that it enhances their knowledgeability. In contrast, individuals with feminine values are less concerned about achievement and material success, and thus, pay less attention to social status or are less motivated to improve social status. Social outcomes are likely to play less of a role in the adoption decision for such individuals.

Proposition 2b *The relationship between social outcomes and technology adoption intention will be stronger for individuals with high espoused masculinity than for those with high espoused femininity.*

Social influence Individuals with feminine values are more sensitive to others' feelings and care more about interpersonal relationships than those with masculine values (e.g., Hofstede et al. 1998; Srite and Karahanna 2006). These individuals like to spend time building relationships—an emotional process throughout which they may influence others and may be influenced by others (e.g., Hofstede et al. 1998). Consumers with feminine values are expected to place significant weight on advice from social others—e.g., friends and family—in making technology adoption decisions. This is consistent with Venkatesh and Morris (2000) and Venkatesh et al. (2000) who found that women tend to be more sensitive to others' opinions in forming technology usage intention. In contrast, individuals with masculine values may be less affected by emotional appeals (e.g., from friends), and instead rely more on their own cognitive thinking. They may prefer to collect information from diverse secondary resources and analyze it before making a decision. Therefore, they are more likely to be affected by mass media.

Proposition 2c *The relationship between social influence (friends and family) and technology adoption intention will be stronger for individuals with high espoused femininity than for those with high espoused masculinity.*

Proposition 2d *The relationship between social influence (newspaper, TV, radio) and technology adoption intention will be stronger for individuals with high espoused masculinity than for those with high espoused femininity.*

Barriers We argue that the negative impact of barriers on technology adoption intention will vary across masculine and feminine values. Individuals with masculine values tend to place an emphasis on monetary rewards or material benefits. Consequently, they would pay more attention to the cost of the new technology. Such cost concerns would probably have a stronger effect on such individuals. In contrast, people with feminine values pursue quality of life. When the new technology is perceived to be difficult to use or they are not familiar with it (lack of knowledge), they would think they need to spend extra time and effort to learn and understand it. Such extra time and effort may be perceived unfavorably or as a degradation to quality of life. As a result, they may be less motivated to purchase the new technology.

Proposition 2e *The relationship between barriers (cost concern) and technology adoption intention will be stronger for individuals with high espoused masculinity than for those with high espoused femininity.*

Proposition 2f *The relationship between barriers (perceived ease of use and lack of knowledge) and technology adoption intention will be stronger for individuals with high espoused femininity than for those with high espoused masculinity.*

3.3 Uncertainty avoidance

Individuals with high uncertainty avoidance values feel uncomfortable in unknown or unpredictable situations and they prefer to avoid such situations (Hofstede 1980, 1983). Adopting a new technology will be risky for them because there could be many unknown factors associated with adopting a new technology, e.g., is it really useful or better than the old technology? Is it really easy to use? Will it be obsolete in a short period of time? Etc. Without resolving all the unknown factors in the early stages of the decision making process, these individuals are less likely to be the early adopters of new the technology. In general, they prefer to delay their purchase until they have more information about the new technology. Although they may perceive the new technology as useful or entertaining, or they think using the technology might improve their self-image, they may cast doubt on such perception when they have not had any actual experience with the new technology. Therefore, we argue that the positive impact of utilitarian outcome expectation, hedonic outcome expectation, and social outcome expectation, on adoption intent will be attenuated for individuals with high uncertainty avoidance values. Moreover, when they feel they do not have much knowledge about the new technology, the cost is too high, or the technology is not easy to use, the concern of the unknown factors of the new technology would become more vivid and salient. For example, if they do not have much knowledge about the new technology and the future lifecycle of the new technology is unknown as well, the perception of risk associated with purchasing the new technology may increase. Therefore, we argue that the negative impact of barriers (i.e., lack of relevant knowledge about the technology, perceive ease of use, and cost concern) on technology adoption intention will be strengthened for individuals with high uncertainty avoidance values. Finally,

in order to resolve any uncertainty regarding a new technology, individuals with high uncertainty values are more likely to seek clarification by asking advice from their friends or family, or by seeking information from secondary resources (i.e., mass media). Hence, such social resources are likely to play a pivotal role in technology adoption decisions.

Proposition 3a *The relationship between barriers and technology adoption intention will be stronger for individuals with high espoused uncertainty avoidance than for those with low espoused uncertainty avoidance.*

Proposition 3b *The relationship between social influence and technology adoption intention will be stronger for individuals with high espoused uncertainty avoidance than for those with low espoused uncertainty avoidance.*

Proposition 3c *The relationship between utilitarian outcomes, hedonic outcomes, social outcomes and technology adoption intention will be attenuated for individuals with high espoused uncertainty avoidance.*

3.4 Long term orientation

Individuals with long term orientation have a preference for future planning and cost saving (Hofstede and Bond 1988). These individuals not only seek information about the new technology for the time-being, but also want to know about its future. They want know about its longevity and its current and future price. If they think the life cycle is not very long, the price is high, or the price will probably go down in the future, their intent to purchase the new technology will be significantly reduced. Therefore, barriers such as fear of obsolescence and cost concerns are expected to play a significant role in technology adoption decisions for individuals with high long-term orientation (Venkatesh and Brown 2001).

Proposition 4 *The relationship between barriers (fear of obsolescence and cost concerns) and technology adoption intention will be stronger for individuals with high espoused long-term orientation than for those with low espoused long-term orientation.*

3.5 Power distance

Individuals from high power distance cultures are more likely to accept and expect differentials of power and inequality and they are more likely to be affected by the opinion of powerful individuals (Hofstede 1980, 1983). If powerful or high social status individuals think that adopting the new technology is necessary, high power distance consumers are more likely to conform to such views. This occurs through the compliance mechanism identified by Kelman (1958) and Venkatesh and Davis (2000). High power distance consumers recognize power differentials and understand that powerful actors have the ability to socially reward compliance or punish non-compliance. Hence, the effect of social influence would be stronger for individuals with high espoused power distance.

Because high power distance consumers acknowledge power differences and inequality, they also understand the benefits of occupying a higher position versus the disadvantages of holding a lower position in a social system. Therefore, high power distance consumers may develop a stronger desire to elevate their social status so as to obtain the advantages associated with it. This is consistent with the identification mechanism identified by Kelman (1958) and Venkatesh and Davis (2000). The effect of social outcome expectation—i.e., power elevation, status and knowledge enhancement—should be stronger for individuals with high espoused power distance.

Proposition 5a *The relationship between social outcomes and technology adoption intention will be stronger for individuals with high espoused power distance than for those with low espoused power distance.*

Proposition 5b *The relationship between social influence and technology adoption intention will be stronger for individuals with high espoused power distance than for those with low espoused power distance.*

4 Discussion

In this paper, we sought to extend Venkatesh and Brown's (2001) model of adoption of technology in households (MATH) by incorporating the role of espoused cultural values. Specifically, we integrated espoused cultural values as moderators of the relationship between the key predictors in MATH and household technology adoption intention. We reasoned that consumers who possess specific espoused cultural values would place more (or less) emphasis on different antecedents of adoption intention in their purchasing decisions. Our integrated theoretical model suggests that the degree to which household technology adoption decisions are driven by utilitarian outcomes, hedonic outcomes, social outcomes, social influence, and/or barriers is determined by the espoused cultural values of consumers.

By integrating espoused cultural values into MATH, this research makes a couple of important contributions to the literature. First, our integrated theory identifies boundary conditions for MATH. Based on a review of over two

decades of culture studies, Kirkman et al. (2006) note that, given the potential to uncover important insights about individual behaviors, investigation of the interaction effects of cultural values has been limited and should be an important next step for future research. Therefore, our paper specifically addresses this research gap and provides insights on how cultural values affect individuals' intention to purchase household technology. By incorporating the role of espoused cultural values, we expand the applicability of MATH to different cultural contexts. There is specific theoretical value in exploring the implications of espoused culture rather than national culture. It allows for the possibility of variability in cultural values among consumers within and across national boundaries. Such a view recognizes that technology consumers are not homogeneous in their cultural values and that their adoption decisions are likely to be driven by different factors.

Second, in integrating espoused cultural values into MATH, we outlined the specific psychological mechanisms through which such values moderate the relationship between the MATH predictors and household technology adoption intention. Specifically, we theorized that espoused individualism/collectivism, masculinity/femininity, power distance, uncertainty avoidance, and long-term orientation shape the schemata through which consumers see, and understand, the world around them. The extent to which one's schema is shaped by these espoused cultural values causes one to place greater weight on some MATH determinants than others in their household technology adoption decision making. For example, we theorized that the social outcomes associated with a technology would be a more important determinant of adoption intention for consumers with high espoused masculinity than it would be for those with high espoused femininity. The propositions we developed highlight the complexities associated with technology adoption across different cultural contexts.

Finally, this paper serves as a call to the marketing literature to incorporate espoused cultural values into their models of purchasing behavior. Our theoretical model suggests that the traditional drivers of purchase behavior may not have simple linear effects on purchase intentions. Rather, the predictive validity of various determinants of purchase behavior may vary as a function of the espoused cultural values embraced by consumers. Incorporating the role of espoused cultural values can enrich our understanding of consumer purchase behavior.

4.1 Theoretical implications and directions for future research

Our theoretical model has several important implications for research. First, this research highlights the importance of incorporating culture into our understanding of technology adoption in work and non-work settings. National cultural values are normally examined at the country level, but we argued individuals may embrace such values. We believe it is necessary to study espoused national cultural values when we are trying to understand individuals' behaviors in a global context and, therefore, encourage other research on individual behaviors to also include espoused national cultural values. One great benefit of conceptualizing espoused national cultural values is to understand and develop cultural intelligence, which aims to synergize individual cultural differences and maximize the benefits of a diverse cultural populace. By understanding the diverse requirements and preferences of individuals from different cultures, managers can be more effective in dealing with potential consumers of household technology. Therefore, this paper sheds light on how to develop cultural intelligence and make use of it in the context of household technology adoption.

Second, this research indicates that the relationships hypothesized in MATH are not simply linear in nature. These relationships can be potentially non-linear when cultural considerations are included. Future research is needed to test the theoretical model developed in this paper. Measures already exist to capture the MATH predictors as outlined in Venkatesh and Brown (2001) and Brown and Venkatesh (2005). Researchers can also draw from Srite and Karahanna (2006) to measure espoused cultural values. An empirical validation of the theoretical model would help us understand the complexities of household technology adoption.

Third, for ease of exposition, we deliberately refrained from considering the role of the household characteristics outlined by Brown and Venkatesh (2005) in our theoretical model. However, as Brown and Venkatesh (2005) found, such characteristics are important determinants of household technology adoption. Future research is needed to understand the interplay between the MATH predictors, espoused cultural values, and household characteristics. Such research could uncover some interesting three-way interactions. For example, one barrier that prevents household adoption of technology is cost concerns (Venkatesh and Brown 2001). This negative influence could be attenuated for families with children. These individuals may accept a higher price if they think the new technology can help their children develop intellectually, and such negative impact could be further attenuated for individuals with feminine values as those individuals pay more attention to their family and their children. Although a model incorporating all three of these factors would be fairly complex, it would significantly enrich our understanding of technology adoption in homes.

4.2 Practical implications

Our theoretical model also provides a few implications for managers. First, the consideration of cultural effects

suggests that the factors which predict consumer adoption of household technology can differ across cultural contexts. When managers understand the role of cultural values in affecting consumers' decision making, they can design better marketing strategies for consumers with different cultural values. Specifically, they can formulate more targeted marketing strategies as they penetrate markets in foreign countries. For instance, we noted that a high degree of collectivism would cause consumers to focus on the social implications of technology adoption. Managers looking to penetrate a highly collectivistic consumer base, such as that which might be found in China, would do well to emphasize the social status implications of their product.

Second, because of the possibility of within-country cultural differences, managers can segment the market by broadening their product offerings. For example, in a market of high power distance consumers and high individualistic consumer segments, managers may create one product line that emphasizes social outcomes and emphasize social influence in their marketing campaign, while another product line can be aimed at bolstering the utilitarian strengths of their product offering. This suggests that manufacturers should develop several models, or versions, of the same product which meet different market requirements. Such targeted strategies can help managers maximize the value generated by their marketing campaigns.

5 Conclusion

In this research, we sought to extend Venkatesh and Brown's (2001) model of adoption of technology in homes (MATH). In light of the growing global market for household technologies, we highlighted the importance of understanding the effects of cultural values on household technology adoption. We extended MATH by incorporating the role of espoused cultural values. We theorized that different espoused cultural values moderate the relationship between utilitarian outcomes, hedonic outcomes, social outcomes, social influence, and barriers, and household technology adoption intention. The extended theoretical model sheds light on the complexity of household technology adoption in a global context.

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