

Consumer resistance to innovation – a behavioral reasoning perspective

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Dublin Energy Lab (DEL) Seminar 24 February 2015



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Published in the *Journal of the Academy of Marketing Science*
2014 online

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Innovation adoption and resistance

Why behavioral reasoning theory (BRT)?

Model and hypotheses

Methodology

Findings

Discussion of findings

INNOVATION ADOPTION AND RESISTENCE

Behavioral theories around innovation include:

Diffusion of innovation theory (DOI; Rogers 1962)

Theory of reasoned action (TRA; Fishbein and Ajzen 1975)

Technology acceptance model (TAM; Davis 1989)

In general, diffusion of innovation (DOI) studies can be broadly classified into research around innovation adoption (Rogers 1962) and consumer resistance to innovation (Ram and Sheth 1989).

Table 1
Innovation adoption and resistance factors

Adoption factors

Innovation attributes/benefits:

Relative advantage

Compatibility

Complexity

Trialability

Observability

Perceived usefulness

Perceived ease of use

Resistance factors

Functional barriers:

Usage barriers

Value barriers

Risk barriers (financial,
performance, social)

Psychological barriers:

Tradition and norm barriers

Image barriers

Table 1 Innovation adoption and resistance factors

| Adoption factors | Definition | Resistance factors | Definition |
|-------------------------------|--|---|--|
| <i>Innovation Attributes</i> | | <i>Functional Barriers</i> | |
| Relative Advantage | Degree to which an innovation is perceived as being better than the idea/product it supersedes | Usage Barriers | Degree to which an innovation is perceived as requiring changes in consumers' routines (Ram and Sheth 1989) |
| Compatibility | Degree to which an innovation is perceived as consistent with existing values, past experiences, life styles and needs of potential adopters | Value Barriers | Degree to which an innovations' value-to-price ratio is perceived in relation to other product substitutes (e.g., Molesworth and Suortti 2002) |
| Complexity | Degree to which an innovation is perceived as relatively difficult to understand and use | Risk Barriers Financial Performance Social | Degree of uncertainty in regard to financial, functional and social consequences of using an innovation (e.g., Posavac et al. 2007) |
| <i>Psychological Barriers</i> | | <i>Psychological Barriers</i> | |
| Trialability | Degree to which an innovation may be experimented with on a limited basis | Tradition and Norm Barriers | Degree to which an innovation forces consumers to accept cultural changes (Day and Herbig 1992) |
| Observability | Degree to which the results of an innovation are visible to others (Rogers 1962) | Image Barriers | Degree to which an innovation is perceived as having an unfavorable image (e.g., Ram and Sheth 1989) |
| Perceived Usefulness | Degree to which using a particular system would enhance job performance | | |
| Perceived Ease of Use | Degree to which using a particular system would be free from effort (Davis 1989) | | |

Reasons for and against adoption – logical opposites?

The majority of diffusion of innovation (DOI) studies to date tend to neglect factors that lead to consumer resistance to innovations (e.g., Garcia et al. 2007; Ram and Sheth 1989; Sheth 1981; Antioco and Kleijnen 2010; Kleijnen et al. 2009).

These studies focus on measuring pro-adoption cognitions rather than anti-adoption influences, “assuming that the latter will simply be the exact opposite of the former” (Chazidakis and Lee 2013).

However, scholars have argued that while this complementarity assumption may hold in the case of (adoption) intentions or attitudes (e.g. “I like...” v. “I don’t like...” statements), it does not hold in the case of underlying cognitions such as reasons for and reasons against behaviors (Sutton 2004) ... EV example; implication for marketing.

Reasons for and against adoption – logical opposites?

A growing body of evidence in social psychology (Westaby et al. 2010), decisional balance theory (Janis and Mann 1977), cost-benefit models (Thaler 1999), and reason theory (Westaby and Fishbein 1996; Westaby 2005) all suggest that consumers evaluate both reasons for and reasons against when engaging in behaviors such as innovation adoption.

Further, experimental studies have shown that consumers not only differentiate between reasons for and against, but also evaluate the potential costs of adopting an innovation disproportionately higher than its potential benefits—a phenomenon widely known as “loss aversion” (Gourville 2006; Tversky and Kahneman 1974).

Reasons for and against adoption – logical opposites?

Chazidakis and Lee (2013), for example, argue that “focusing on reasons as opposed to related constructs such as beliefs [Ajzen 1991] ... offers advantages because they can be measured at a more context-specific level and they can also capture self-justification and defense mechanisms that are otherwise left unaccounted for, in models of buyer behavior [Westaby 2005].”

WHY BEHAVIORAL REASONING THEORY (BRT)?

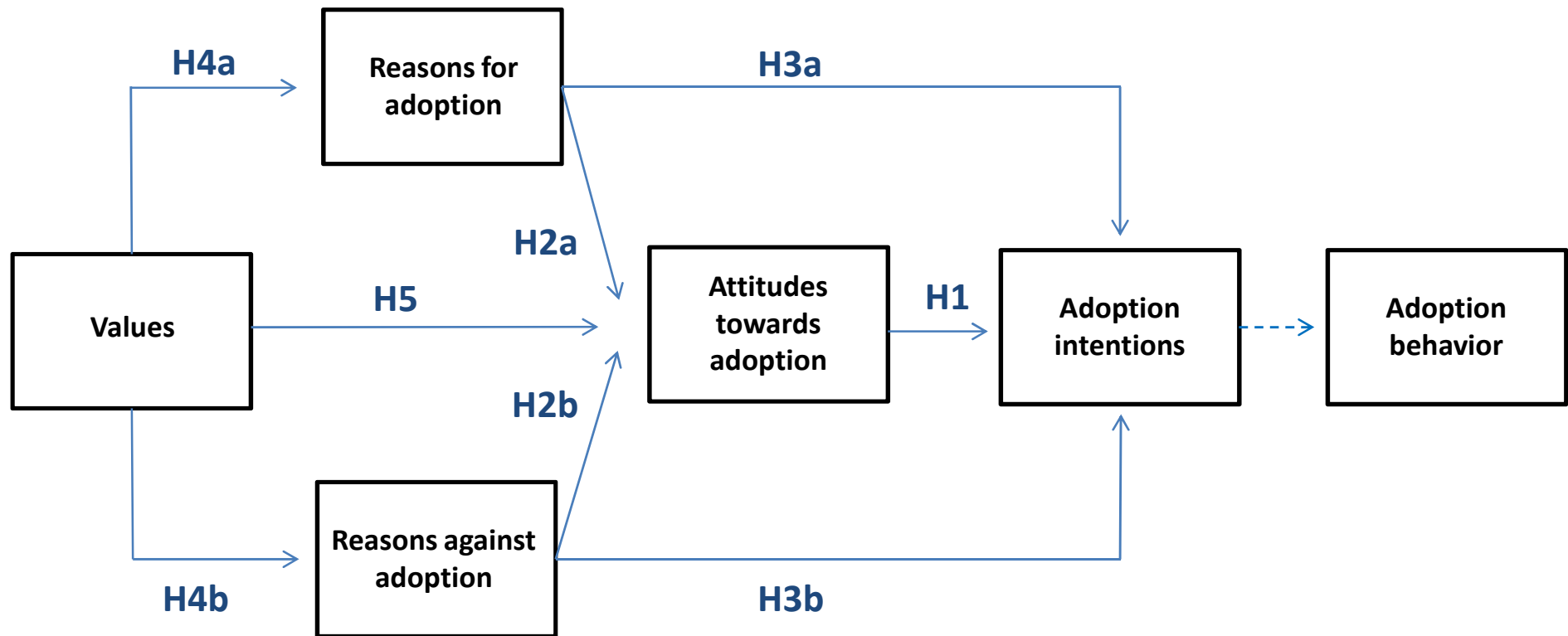
Behavioral reasoning theory (BRT) tests the relative influence of both *reasons for* and *reasons against* adoption in a context-specific manner, and evaluates the influence of these conceptually distinct psychological antecedents in a single behavioral decision framework (Westaby 2005).

More importantly, studies have found that behavioral reasoning theory explains variance in people's intentions over and above that of traditional models like the theory of reasoned action (Westaby et al. 2010; Westaby 2005).

MODEL AND HYPOTHESES

Figure 1

Theoretical model based on behavioral reasoning theory



Source: adapted from Westaby, 2005

Summarizing the hypothesized relationships...

In line with behavioral models like TRA, global constructs like attitudes are seen as a key predictor of behavior (H1).

However, BRT offers a more complete understanding by including reasons for and against adoption, which influence behavior indirectly via attitudes (H2a; H2b), and directly via intentions (H3a; H3b).

People's personal values are seen as the underlying cognitions, which influence people's reasoning (H4a; H4b) as well as their attitudes (H5).

BRT thus allows for distinct psychological processes, or paths in behavioral decision making, which may vary depending on the decision context such as the type of innovation (Westaby 2005, p. 103).

METHODOLOGY

In order to test the hypotheses we conducted two studies. Both studies were undertaken with different sample populations in the Republic of Ireland, and they varied significantly in regard to the object of enquiry (i.e., innovation) and method, thus adding to the validity and reliability of the findings.

Study 1 was conducted with a sample of n=254 house owners in Ireland, who were questioned about their intentions to purchase a renewable energy system, i.e., micro wind turbines. Micro wind turbines can be characterized as high-involvement product innovations, which can be installed on or near residential buildings in order to generate electricity from wind.

The data were collected by a professional market research company via computer-assisted telephone interviews (CATI).

Study 2 was conducted with students and staff (n=379) at a major Irish university, who were asked about their intention to adopt a service innovation: car sharing. Car sharing is an innovative service that provides people in urban areas with short-term access to cars. Consumers who sign up to a car sharing service can locate a nearby car via the internet or an app on their smartphone, open and unlock it via their smartphones, drive it, and later park it at a location of their convenience.

The data were collected via a web-survey, which was sent to a convenience sample of students and (academic and non-academic) staff via the university's internal server.

Why choose these innovation contexts?

First, both innovations, one a product the other a service, have experienced relatively *sluggish uptake* by consumers in Ireland, suggesting that individuals have valid reasons against adopting both micro wind turbines and car sharing.

Second, both car sharing and micro wind turbines *constitute high-involvement innovations* as adoption requires significant information processing and cognitive engagement by the consumer.

In **Study 1**, 8% of respondents stated that they were likely or very likely to adopt micro wind turbines, while in **Study 2**, 42% of respondents agreed or strongly agreed that they would adopt car sharing in the future.

Measures: intention, attitude and values

In both studies the dependent variable *intention*, as well as the global construct *attitude*, were assessed via measures regularly used in behavioral intention frameworks (Fishbein and Ajzen 1975; Westaby et al. 2010; Westaby 2005).

Further, values in **Study 1** were operationalized as people's *perceived value compatibility*, which reflects people's beliefs that a new technology is in line with their overall value system (Karahanna 2006).

In **Study 2**, values reflected people's *general openness to change* (e.g. Schwartz 2006).

Measures: reason elicitation studies

Reasons, on the other hand, are context and innovation specific, and thus they needed to be elicited via exploratory qualitative research, which was conducted prior to the surveys.

Such qualitative elicitation studies allow researchers to develop categories representing reasons for and against in the main survey. Also, they allow researchers to formulate items for the main surveys.

Measures: reason elicitation studies

Study 1 micro wind turbines

Conducted 20 face-to-face interviews with a convenience sample of home owners in Dublin, Ireland.

Reasons For (RF): energy cost savings; environmental benefits; being independent.

Reasons Against (RA): high up-front costs (value barrier); perceived incompatibility (usage barrier); uncertainty (risk barrier).

Measures: reason elicitation studies

Study 2 car sharing

Conducted a focus group with 8 students and members of staff at a major Irish university.

Reasons For (RF): save money; convenience; flexibility

Reasons Against (RA): availability (usage barrier); security issues (risk barrier)

Table 9 Measurement instrument: Study 2 (car sharing)

| Construct | Items | Mean | Std. dev | Skewness | Kurtosis |
|-----------------------------|---|----------------|-------------------|--------------------|--------------------|
| Adoption Intention | I will use car sharing in the future. I can see myself using car sharing in the future. | 2.92 3.15 | 1.095 1.211 | 0.170–0.147 | –0.475–0.902 |
| Attitude | Generally speaking, car sharing services are a great idea. Car sharing services offer a lot of benefits. | 3.98 4.02 | 0.897 0.805 | –0.800–0.717 | 0.657 0.934 |
| RF – Financial | Because I do not want to spend money on a car. Because of the low running costs. | 3.28 3.75 | 1.278 1.009 | –0.408–0.878 | –0.953 0.304 |
| RF – Convenience | Because it is more convenient than owning a car. Because it gives me greater flexibility. Because it makes my life easier. | 2.77 3.52 3.29 | 1.256 1.220 1.182 | 0.194–0.512–0.385 | –1.044–0.699–0.754 |
| RF – Flexibility | Because public transportation facilities are not convenient. Because I have limited access to public transportation. | 3.20 2.78 | 1.250 1.305 | –.172 0.172 | –1.030–1.088 |
| RA – Safety | Because I am worried about the safety of the car. Because I am worried about the security of my personal data. Because I am worried about liability in case of an accident. | 3.20 3.07 3.47 | 1.224 1.253 1.171 | –0.188–0.059–0.483 | –0.947–1.023–0.604 |
| RA – Availability | Because I would be worried that no car is available when I actually need one. Because I cannot make a reservation upfront. | 4.03 3.43 | 1.023 1.357 | –0.979–0.341 | 0.411–0.717 |
| Values – Openness to Change | I like surprises and I am always looking for new things to do. I look for adventures and like to take risks. | 3.82 3.55 | 0.858 1.111 | –0.642–0.238 | 0.286–0.644 |

FINDINGS

The hypotheses from both studies were analyzed via structural equation modeling in AMOS 18, following Gerbing and Anderson's (1988) two-step approach.

In a first step, reliability and unidimensionality of the measurement instrument were established, and then the hypothesized structural relationships between the constructs were tested in a second step.

Confirmatory factor analysis

First, we established the measurement properties (i.e., reliability, convergent validity, discriminant validity, as well as common method bias) of the all constructs via confirmatory factor analyses. Results suggest that model 1 and model 2 both provide a good overall fit.

Study 1: CFI=0.99; TLI=0.98; RMSEA=0.029; χ^2/df (285.6/236)=1.21

Study 2: CFI=0.99; TLI=0.98; RMSEA=0.032; χ^2/df (149.5/107)=1.40

All factor loadings were statistically significant and above the cut-off value of 0.5. More importantly, all measures show high reliability and convergent validity, with composite reliabilities (CR) and average variances extracted (AVE) exceeding the recommended standard of 0.7 and 0.5 for all constructs respectively (Bagozzi and Yi 2012).

Second-order constructs

Reasons were modelled individually as second-order factor constructs (e.g., Marsh and Hocevar 1985). Thus, the relative influence of specific reasons in consumers' adoption decisions could be measured. Such second-order factor models provide a more parsimonious and interpretable model (e.g., Chen et al. 2005).

The unidimensionality of the second-order models was established via confirmatory factor analyses. Findings for both Study 1 and Study 2 suggest that the proposed higher-order structure of reasons for and against fits the data well.

Study 1: CFI=0.98; TLI=0.98; RMSEA= 0.032; χ^2/df (323.8/256)=1.27

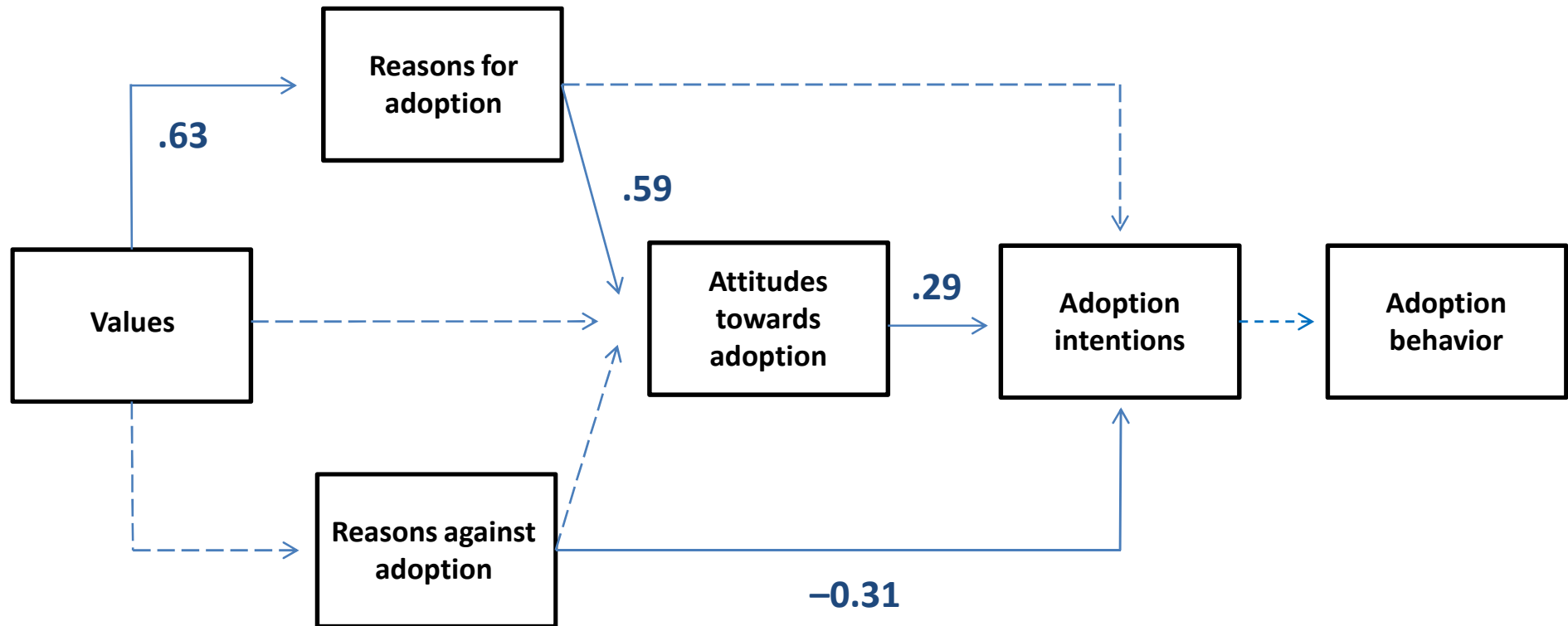
Study 2: CFI=0.98; TLI=0.97; RMSEA=0.039; χ^2/df (190.5/120)=1.59

Table 6 CFA with second-order factors reasons for and against – Study 2

| First-order construct | First-order | | | Second-order | |
|-----------------------|-------------|---------|-----------------|--------------|-----------------|
| | Indicator | Loading | <i>P</i> -value | Loading | <i>P</i> -value |
| <i>Reasons for</i> | | | | | |
| Financial benefits | Cost1 | 0.74 | — ^a | 0.80 | — ^a |
| | Cost2 | 0.89 | 0.001 | | |
| Convenience benefits | Con1 | 0.67 | 0.001 | 0.95 | 0.001 |
| | Con2 | 0.72 | 0.001 | | |
| | Con3 | 0.85 | — ^a | | |
| Flexibility benefits | Sub1 | 0.88 | — ^a | 0.46 | 0.001 |
| | Sub2 | 0.70 | 0.001 | | |
| <i>Reason against</i> | | | | | |
| Risk barrier | Saf1 | 0.76 | — ^a | 0.86 | 0.001 |
| | Saf2 | 0.78 | 0.001 | | |
| | Saf3 | 0.82 | 0.001 | | |
| Usage barrier | Avail1 | 0.71 | 0.001 | 0.61 | — ^a |
| | Avail2 | 0.72 | — ^a | | |

CFI=0.98; TLI=0.97; RMSEA=0.039; χ^2/df (190.5/120)= 1.59^a Fixed Parameter

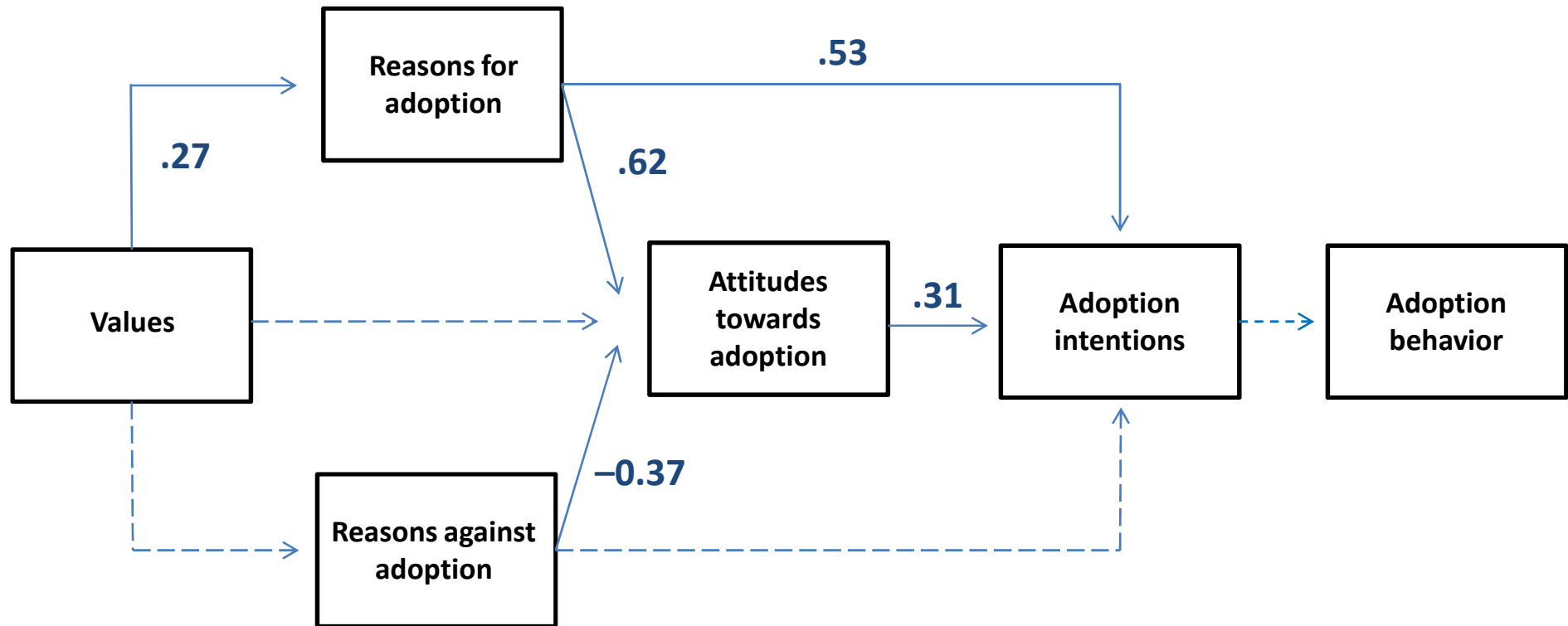
Figure 2
Significant paths in the structural model – Study 1 micro wind turbines



Fit statistics: $\chi^2 / df (328.73/258)=1.27$; CFI=0.98; TLI=0.98; RMSEA=0.033

Figure 2

Significant paths in the structural model – Study 2 car sharing



Fit statistics: $\chi^2 / df (202.99/121)=1.68$; CFI=0.97; TLI=0.97; RMSEA=0.042

A comment on results...

Overall, the findings support two of BRT's key premises in that (1) reasons for and against adoption are context specific and are qualitatively different from each other and (2) consumers use different psychological paths when evaluating different types of innovations.

Figure 2
Significant paths in the structural model – Study 1 micro wind turbines

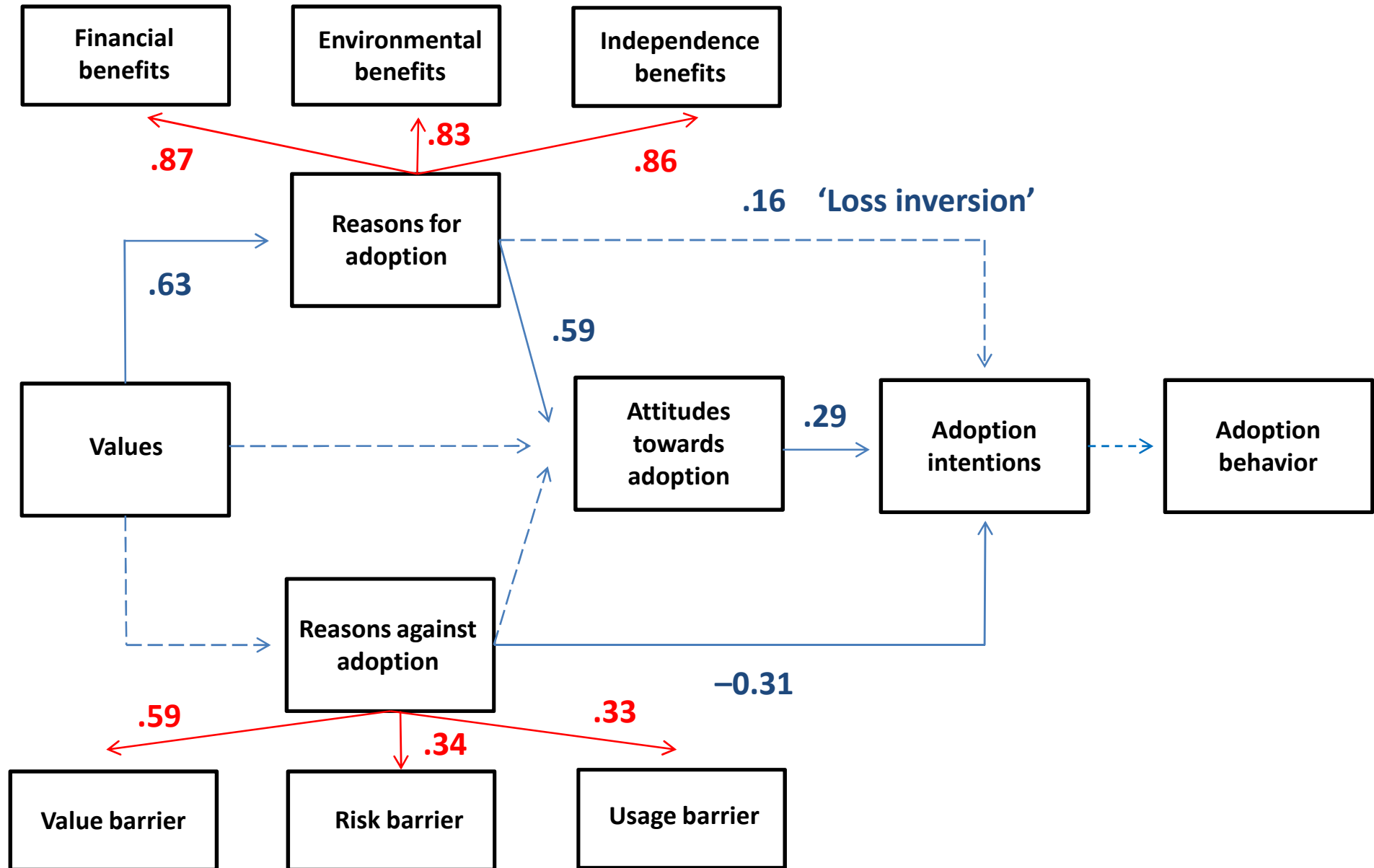
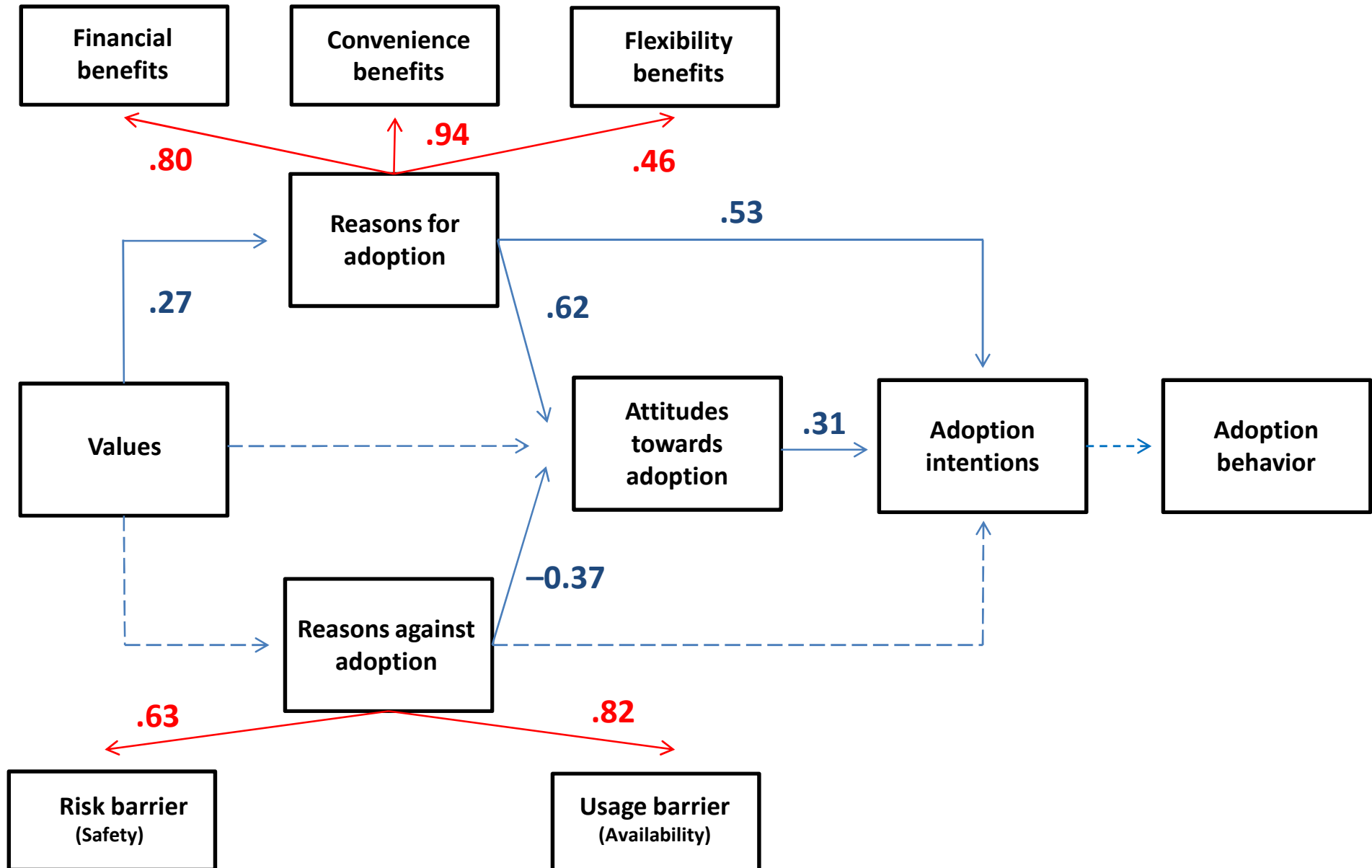


Figure 2
Significant paths in the structural model – Study 2 car sharing



DISCUSSION OF FINDINGS

Theoretical contribution...

(i) The focus is on reasons *against* adoption, which have rarely been addressed in empirical adoption of innovation studies. RF and RA are not just opposites of each other, but they are qualitatively distinct constructs which influence consumers' adoption decisions in different ways.

(ii) Tests the influence of *context-specific reasons*, instead of more broadly construed beliefs. Beliefs are not necessarily salient determinants of consumers' adoption or rejection decisions.

Beliefs about innovation characteristics have been widely criticized, and researchers have described them as garbage pail attributes “into which any of a number of innovation characteristics are dumped” (Tornatzky and Klein 1982).

Theoretical contribution... cont'd

(iii) Thirdly, a key premise of BRT is that it allows for *different psychological paths* in consumers' adoption decisions to be revealed in a comprehensive and useful way.

Much empirical research often oversimplifies psychological processes in consumers' decision making (e.g., Gregan-Paxton and Moreau 2003; Moreau et al. 2001; Wood and Moreau 2006).

On the other hand, models that are comprehensive enough to reflect reality adequately often become empirically untestable, e.g. Bagozzi et al.'s (2002) comprehensive model of consumer action.

Managerial contribution...

Focusing solely on the benefits might be a myopic viewpoint, particularly when innovations require customers to accept changes in product characteristics, or force them to change habits and routines, i.e. have significant downsides.

These anti-adoption factors represent distinct constructs, so managers need to address context-specific reasons against adoption. Further, consumers often weigh anti-adoption factors disproportionately higher than potential benefits, i.e. loss aversion.

Firms seeking to introduce resistant innovations, such as environmentally friendly products/services (e.g., **electric vehicles, organic foods, home-based alternative energy**), or innovations which require radical behavior change (e.g., **car sharing services, online banking, distance education massive online open courses**) should evaluate consumers' reasons for and reasons against adopting these types of innovations.

Managerial contribution...

Diffusion of screw-cap wine closures in Australian and NZ markets
(Garcia et al. 2007)

Barriers to bicycling in Dublin city
(Claudy and Peterson, *Journal of Public Policy and Marketing*, 2014)

Perceived danger; inconvenience; tackled through community-based measures

Questions?