Consumer trust in an Internet store *

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The study reported here raises some questions about the conventional wisdom that the Internet creates a "level playing field" for large and small retailers and for retailers with and without an established reputation. In our study, consumers recognized differences in size and reputation among Internet stores, and those differences influenced their assessments of store trustworthiness and their perception of risk, as well as their willingness to patronize the store. After describing our research methods and results, we draw some implications for Internet merchants.

1. Introduction

Internet commerce is claimed to reduce the advantages of scale of large retailers, to lower the costs of entering international consumer markets, and perhaps to reduce the strength of established retailers by allowing new merchants to enter and leave quickly [62,24]. But these speculations appear to overlook the importance of the relationship between the consumer and the merchant in this new form of direct marketing. Quelch and Klein [49, p. 70] note that "Trust is a critical factor in stimulating purchases over the Internet, especially at this early stage of commercial development". Keen [37] argues that the most significant long-term barrier for realizing the potential of Internet marketing to consumers will be the lack of *consumer trust*, both in the merchant's honesty and in the merchant's competence to fill Internet orders. Trust is a critical factor in any relationship in which the trustor (e.g., consumer) does not have direct control over the actions of a trustee (e.g., merchant or store), the decision is important, and the environment is uncertain [20,44]. Building on the social psychology and industrial marketing tradition, we define "trust" as "a trustor's expectations about the motives and behaviors of a trustee" [21, p. 37].

Since the inception of commercial activity on the Web, security has been perceived by some to be a significant barrier to the emergence of a consumer mass market

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on the Internet [36]. However, Peterson et al. [48] argue that the issue of transaction security is a short-term technological problem. Rather, the substantive long-term issue is: "How do you know whom to trust? In a virtual world, the issue of trust gets magnified" [24, p.18].

The two major questions in this research are:

- Is trust a significant antecedent of consumer attitudes toward an Internet store and intended shopping behavior?
- What influences a consumer to have trust in an Internet store?

This paper explores the relationship perspective of Internet consumer commerce. At the center of this relationship perspective is the concept of trust. To date, research on Internet-based consumer behavior has addressed primarily the flow aspects of the shopping experience to build customer loyalty [31], the consumer's information and decision support requirements [1], and site attributes intended to increase store traffic [62] and sales [41,32]. This paper is complementary to these existing perspectives. In the next section, we review literature on trust and present a research model and hypotheses. The third section outlines the research methodology, the fourth section reports the research results, and the final section discusses the limitations and implications of the research.

2. Conceptual framework: Trust in buyer–seller relationships

The focus of this paper is the antecedents and consequences of consumer trust in an Internet store. This paper focuses solely on the consumer's perceptions of trust in a commercial store on the Internet, not trust in intermediaries or in third parties that might mediate between the consumer and the store.

Trust is a governance mechanism in exchange relationships that are characterized by uncertainty, vulnerability, and dependence [12]. Developmentally, relationship among parties who have had no prior association is expected to emerge incrementally and to begin with small actions that initially require little reliance on trust. If the actions are reciprocated, trust tends to spiral upward; if they are not reciprocated, trust spirals downward [55]. Trust has been found to affect the behavior of consumers [51] as well as industrial buyers, even in situations where the buyer's switching costs are low [16]. In the marketing literature, trust is traditionally studied both in terms of trust in the salesperson and in terms of trust in the seller organization [46]. When the salesperson is absent from or peripheral to the selling and buying process, as is generally the case with Internet stores [41], then the primary target of the consumer's trust is the merchant organization itself [16].

Figure 1 presents the research model for the study. The model hypothesizes that consumers' trust in an Internet store affects their willingness to patronize the store. The model is consistent with exchange theory [60] and balance theory [29], as well as the theories of reasoned action [4] and planned behavior [2,3]. According to exchange

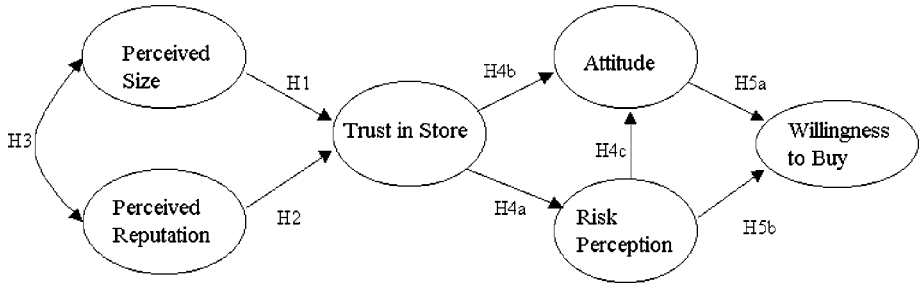

Figure 1. Research model of consumer trust in an Internet-based store.

theory, individuals form associations on the basis of trust, and try to avoid exchange relationships that are likely to bring more pain than pleasure. Balance theory suggests that people tend to develop positive attitudes towards those with whom they have some prior association. The theories of reasoned action and planned behavior assert that behavior is influenced by behavioral intention, and that intention is determined by attitudes. Attitudes mediate between beliefs and intention, although beliefs can also have a direct effect on intention. Also consistent with these fundamental theories, our model assumes that the consumer–merchant relationship is voluntary.

Figure 1 qualifies much of the discussion about Internet commerce in both the popular and academic press, which deems the Internet suitable for consumer marketing where sellers are small, geographically dispersed, and unknown to the buyers. Figure 1 suggests that willingness to buy from such sellers (i.e., intention to behave) is contingent on the sellers' ability to evoke consumers' trust (i.e., belief). Consumers will be less likely to patronize stores that fail to create a sense of trustworthiness. Trust is associated with lower perceived risk of shopping at the site, and trust is expected to be affected by the consumer's perceptions of the size and reputation of the store.

For trust to exist, the consumer must believe that the seller has both the ability and the motivation to reliably deliver goods and services of the quality expected by the consumer. This belief may be more difficult for an Internet merchant to engender than it is for a conventional merchant. For example, selling via the Internet reduces the resources required to enter and exit the marketplace. From the literature on industrial marketing we learn that trust is built in the eyes of the customer when the seller invests in dedicated resources for the relationship, and when there are frequent one on one interactions between the buyer and representatives of the seller's organization [21]. In Internet commerce, consumers rarely deal directly with any sales people. Essentially, customers depend on an impersonal electronic storefront to act on their behalf [17]. A consumer's trust in an Internet store may therefore be conceptualized as the consumer's trust directly in the store, or the store's trustworthiness. We will use the terms "consumer trust" and "trustworthiness of the store" interchangeably in this paper.

How can an Internet site evoke trust in the eyes of the consumer? *Size* and *reputation* have been most frequently named as factors evoking buyer trust towards seller organizations in traditional industrial buyer–seller relationships [21]. Do per-

ceived size and reputation effect consumer trust in an Internet store? Some Internet merchants certainly seem to think so. They publish stories and customer testimonials on their sites attesting to their reputation, and invest in web-page banners boasting of their size:

> " Welcome to the earth's biggest bookstore... 1.5 million books in print & 1 million out-of-print books". (*Amazon.com*)
> "Welcome to CDnow, the world's largest music store". (*Cdnow.com*)

2.1. Perceived size

The literature suggests that a store's size assists consumers in forming their impressions regarding the store's trustworthiness. What matters in forming those impressions is the consumer's perception of the store's size, rather than the store's actual size (for example, its sales volume or the number of products for sale). Thus, in this study, we are interested in the consumers' perception of the store's size, and how this perception affects their trust in the store. In traditional marketing channels, a buyer (i.e., trustor) uses size as a signal that a seller (i.e., trustee) can be trusted [21]. The perception of large organizational size implies that other buyers trust the organization and conduct business successfully with it. This experience of others is taken as a reason to trust that an organization will deliver on its promises [21]. Large size also signals that the firm should have the necessary expertise and resources for support systems such as customer and technical services; the existence of these systems encourages trust [16]. Large size might be also used to signal that the store is able to assume the risk of product failure and to compensate buyers accordingly. In addition, large sellers should be able to control their suppliers, again increasing the perception of product or service reliability and credibility. Finally, large sellers have more resources invested in their business and hence are perceived by a trustor to have more to lose than smaller firms by acting in an untrustworthy way. Although not hypothesized here, the effect of size on trust might be contingent on the merchandise type. The more uncertainty, ambiguity, or ongoing dependence on the merchant (e.g., for after sales support) inherent in the type of merchandise, the more importance the consumer might place on the store's resources, and hence the greater the influence of the perceived size of the store in determining its trustworthiness. Our simple hypothesis is:

> *H1: A consumer's trust in an Internet store is positively related to the store's perceived size.*

2.2. Reputation

Reputation, like size, is conceptualized as the consumer's perception of a store's reputation, where "reputation" is defined as the extent to which buyers believe a selling organization is honest and concerned about its customers [21]. Again, the marketing literature argues that reputation is a valuable asset that requires a long-term investment of resources, effort, and attention to customer relationships; a good reputation also signals

past forbearance from opportunism [57]. Firms with a good reputation are perceived to be reluctant to jeopardize their reputational assets by acting opportunistically[1] [14]. The costs of untrustworthy behavior are perceived to be higher for firms that already have a good reputation, particularly if the network of buyers is small or there is a high chance of communication or interaction among the buyers [8]. In the industrial buyer context, the seller's reputation has been positively related with the buyer's trust in the seller [6,27]. In the Internet marketing context, Quelch and Klein [49] argue that Internet consumers will favor sites that represent a merchant with which the consumer is already familiar from traditional channels. Lohse and Spiller [41] speculate that the reputation of the physical store will influence the perceptions of an online site. Hence, we hypothesize:

H2: A consumer's trust in an Internet store is positively related to the store's perceived reputation.

Perceived size and reputation are expected to be related. As noted above, larger stores might be perceived as being more reputable. Because of natural growth limitations, larger stores might have been around longer, and longevity might increase the chances that the consumer has had prior experience with the merchant in other channels or has heard of the merchant in the context of the new channel. Prior association tends to increase positive affect as well as positive cognition of the other party [29]. Hence, the larger the store's size, the more likely the consumer might associate a favorable reputation with the store. Equally, stores having favorable reputations might attract more business than stores offering similar merchandise and prices, but not having favorable reputations. Hence, the more the consumer associates a favorable reputation with a store, the larger the store might become. Therefore we hypothesize:

H3: An Internet store's perceived size is related to the store's perceived reputation.

2.3. Risk perception and attitudes

Trust is interwoven with risk [45], and both are based on perceptions [28]. Although some level of risk is inevitable if there is a need to trust, trust has also been defined as the expectation that an exchange partner will not engage in opportunistic behavior [12]. Hence, one of the consequences of trust is that it reduces the consumer's perception of risk associated with opportunistic behavior by the seller [27]. Risk perception refers to the "trustor's belief about likelihoods of gains and losses outside of considerations that involve the relationships with the particular trustee" [44, p. 726].

High levels of trust by buyers have been found to stimulate favorable attitudes and behavior [5,51]. Macintosh and Lockshin [43] found that a consumer's trust in a store impacted the consumer's attitudes towards that store. Exchange partners who are

[1] Opportunism is defined as "self-interest with guile" [63, p. 6] and includes such behaviors as distorting information and failing to fulfill promises and obligations [34].

socially bonded have highly favorable attitudes towards each other [34]. We argue that this is because trust reduces the perceived risk of being mistreated by the store [6], and the low perception of risk in turn influences the attitudinal orientation of the consumer toward the store. Hence, we hypothesize that the following will take place:

H4A: Higher consumer trust towards an Internet store will reduce the perceived risks associated with buying from that store.
H4B: Higher consumer trust towards an Internet store will generate more favorable attitudes towards shopping at the store.
H4C: The lower the consumer's perceived risk associated with buying from an Internet store, the more favorable the consumer's attitudes towards shopping at that store.

2.4. Purchase intentions

The theory of reasoned action (TRA) and the theory of planned behavior (TPB) presume that volitional behavior is determined by intentions to act (see, for example [2, 4,9]). A major determinant of intentions, in turn, is the actor's attitudes towards the behavior[2]. TRA and TPB have been evaluated and supported in many contexts [2], including IT usage behavior [59]. Internet shopping behavior shares the volitional nature of the phenomena that TRA tries to explain and predict. Thus, for the purpose of comparing various Internet shopping sites, we assume that the degree to which people express their intentions to buy from a certain site relative to other sites is a reasonable predictor of actual purchase behavior from this site relative to the others. According to the TRA, a shopper's intention to buy is preceded by the shopper's attitudes toward the purchase. Thus, we expect to find positive relationships between attitudes towards an Internet store and willingness to buy from that store.

H5A: Favorable attitudes towards an Internet store will increase the consumer's willingness to purchase from that Internet store.

The theory of planned behavior also suggests that a consumer may be willing to buy from an Internet store which is perceived as low risk, even if the consumer's attitudes towards that merchant are not highly positive. Conversely, a consumer may not be willing to buy from a merchant perceived as being high risk, even in the presence of positive attitudes towards that merchant. The direct influence of perceived risk on intention is related to the notion of perceived behavioral control in the theory of planned behavior [2,3]. Perceived behavioral control reflects the degree to which an individual feels that successfully engaging in the behavior is completely up to them. In the Internet shopping context, the perceived risk associated with shopping in the store may reduce the consumers' perception of control, and the extent to which this occurs might negatively influence willingness to shop. In summary, we hypothesize

[2] Intentions are also predicted by what people believe that important others think of the intended behavior. We do not deal with this part of TRA here.

that perceived risk helps shape attitudes but also has an independent, direct influence on the intended behavior.

H5B: Reduced perceived risks associated with buying from an Internet store will increase a consumer's willingness to purchase from that Internet store.

2.5. Control variables

Although the study focuses on the antecedents and consequences of consumer trust in an Internet store, previous research suggests that several other variables might affect attitudes and willingness to shop in an Internet store. Studies involving TRA have shown that past behavior has both a mediated effect through attitudes and a direct effect on intentions and behavior [10]. A consumer's past experience on the Internet in general, or shopping on the Internet specifically, might have generated knowledge and consequences that reinforce the consumer's behavior and shape and moderate the consumer's beliefs, attitudes, and willingness to shop in Internet stores. Prior studies on electronic shopping systems have found the predisposition towards computers in general to be a significant determinant of adoption and use of new forms of shopping (e.g., [23,38,39,52,53]). Research on new technology adoption has consistently found attitudes towards computers to be a significant determinant of adoption and use, although some studies have found the relationship to weaken as users gain experience with the technology [61]. In traditional retail channels, shopping orientation has been found to be among the most influential predictors of consumer patronage behavior [18]. Research on direct shopping modes (e.g., catalog shopping) suggests that those who generally do not have positive shopping orientation will have more positive attitudes towards direct shopping modes [19,33], although some studies have found just the opposite [54]. Finally, the perceived risk of a store might be attributable to a consumer's general risk attitudes towards the Internet. Hence, as control variables, we included in the study the frequency of Internet usage, the frequency of Internet shopping, shopping enjoyment in general, attitudes towards computers, past direct shopping experience (e.g., catalog and TV shopping), and web-shopping risk attitudes.

3. Methodology

To assess the research model in figure 1, we used an experiential survey approach to collect data from a group of undergraduate and MBA students in Australia. The participants were recruited in two ways. First, one hundred and twenty students responded to announcements made in undergraduate and MBA information systems and computer science courses and to posters placed on campus noticeboards. This group took part in supervised sessions held in a computer lab at the Australian university where they were enrolled. The lab was equipped with Pentium workstations, 17-inch monitors, and high speed access to the university backbone network. Each of these participants was paid A$10 (about US$7.00 at the time of the sessions) to spend 2 hours

Table 1
Demographic profile of study participants.

Sex	female	66
	male	118
Average age	22.35 range = 18 to 48 median = 20 mode = 18	
Average years of post-secondary education completed	2.45 range = 1 to 5 (note: in Australia most undergraduate degrees take three years to complete; joint or double degrees typically take five years)	
Average years of working experience	3.86 range = 0 to 30 median = 2 77% had at least 1 year experience	
Country of residence	Australia	78.3%
	Indonesia/Malaysia	14.6%
	Other	7.1%
Home country	Australia	47.8
	Indonesia/Malaysia	22.3
	Hong Kong	10.4
	Other	19.5
Average number of countries visited	5.0 Median = 4.0 Range = 0–30 93% traveled to at least one other country, 87% to at least two countries	

engaged in a variety of World Wide Web shopping activities and to complete several questionnaires; in addition, random drawings were held to award one undergraduate and one MBA student a prize of A$100.

The second group consisted of sixty-four students at another Australian university who completed the shopping activities and questionnaires voluntarily at the request of their instructors in electronic commerce courses. These students used facilities either in their university computer lab or at home. The volunteers received no pay for participating, but were given a follow-up briefing by one of the researchers on the goals and methods of the experiment.

Overall, then, the study included 184 participants. The demographic profile of the participants is summarized in table 1 and the sample's World Wide Web experience is summarized in table 2. The demographic profile reflects the multi-culturalism of Australian tertiary education and the relative youth of the sample. Almost all partic-

Table 2
Degree of Internet experience among study participants.

% with Internet access	95.1%	
% Accessing Internet from. . .	home	58.9%
	office	5.2%
	university	94.8%
	other	0%
Prior use of Web browsing software	98%	
Average months of prior use	18	
Frequency of browser usage	Once	0.6%
	A few times	9.4%
	About once a month	3.9%
	A few times a month	10.0%
	Once a week	7.8%
	A few times a week	47.8%
	Every day	20.6%
Attitude towards browsing the Internet	Very positive	17.2%
	Positive	57.8%
	Neither	22.2%
	Negative	2.2%
	Very negative	0.6%
Prior purchases through the World Wide Web	10.9% (42% of which only once)	

ipants had previous exposure to the Internet although relatively few had engaged in commercial transactions on the Internet.

3.1. Experimental tasks

Web pages were created that outlined the shopping tasks and provided links to various shopping sites. Pointers to the shopping sites and instructions for study participants are available at http://www.mbs.unimelb.edu.au/mbsresea/cmit/internet_shopping/page1.htm.

The participants performed four shopping activities: (1) selecting and buying a book as a gift for a friend, (2) buying a specified book for a course, (3) planning a holiday trip to Helsinki, Finland, and (4) planning a work-related trip to Sydney, Australia. For each activity, the participants were offered four different Internet sites. For the book buying activities, the participants were offered a choice of *Amazon.com*, the UK-based *Internet Bookshop*, *Glee Books* in Sydney, and *DA Information Services* in Melbourne, while for the travel activities the choices were *Finnair*, the Australian airline *Qantas*, the well-known Australian travel agent *Flight Centre*, and the Internet-based travel service *TravelWeb*. It was recommended, but not required, to visit each of these sites. After each of the four shopping activities, the participants were asked to fill out a brief questionnaire describing their experiences. Participants were told

that they were not required to make a purchase, although they could do so if they wished using their own credit card. The shopping tasks were meant to be typical of those that a consumer might routinely perform. We included both book and travel sites because these two merchandise categories are argued to be suitable for Internet-based retail commerce [48]. The selection of two different types of stores also allowed us to explore the effects of store type on the model variables. It might be argued that the travel task is not realistic for young students with little or no income. However, as the data in table 1 show, the study's sample is made up mostly of young persons with both work and travel experience. We believe that these people are experienced at buying both books and travel packages and are therefore well suited to the shopping tasks included in the research.

The participants' assessments of perceived size and reputation were based on their own impressions of the sites as well as on the summary page that was available for each site. The summary page captured sales figures, number of products available, location, and the date when the business had been founded (see appendix B). This study did not systematically control "size" and "reputation" of the store sites although the summary information was intended to generate perceptions of size and reputation. All of the information on the summary pages was extracted from the sites themselves and summarized in the separate web site that participants visited before visiting the store itself. For example, among the book sites, only Amazon.com and the Internet Bookstore divulged their sales (US$15 million and US$ 850,000 respectively); the other two sites did not. Amazon.com, the Internet Bookstore, and DA Information Services listed the number of available titles, Amazon claiming over 2.5 million titles, the Internet Bookstore nearly a million, and DA Information Services "hundreds of thousands". Glee Books did not list the number of titles.

3.2. Procedures

Participants first completed a demographic questionnaire and a consent form, followed by reading a brief overview of the study. The participants were then pointed to the introductory page and told to begin. The shopping pages were presented in alphabetical order, but participants were free to complete the shopping tasks in any order. The most common reason for deviating from the standard sequence was slow, or occasionally no, response from a given site. During the data collection period, most participants were in fact unable to connect to the TravelWeb site[3]. For this reason, the data analyses deal only with the other seven sites. The number of valid observations per site is presented in table 3.

For all sessions lab assistants were present to answer questions, help the participants find specific sites, and assist in navigation over the Web. The laboratory sessions were held in groups of 10 to 24, and all data were collected over three weeks in July 1997.

[3] The site seemed to be under maintenance during the study's data collection period.

Table 3
Number of valid observations for each site.

	Amazon	DA	Glee	Int. Bks	Finnair	Fl. Cntr	Qantas
$n =$	145	152	145	141	156	147	158

3.3. Measures

Scales to measure each of the factors in the model were developed based on previous literature and using existing scales where possible. In particular, measures of attitude and intention were based on the suggestions of [26], measures related to size, reputation, and trust were based on the scales of Doney and Cannon [21], and scales related to risk perception were based on prior work by Sitkin and Weingart [56]. The study also included a number of control variables. Past experience with Internet was captured through items that measured the frequency of Internet browser usage and frequency of Internet based purchases. Internet Shopping, shopping enjoyment, attitudes towards computers, direct shopping experience, and web shopping risk attitudes were captured through scales that were constructed on the basis of past literature and are shown in appendix A.

The preliminary instrument was pilot tested and reviewed by faculty and post-graduate students for clarity and completeness. Modifications to refine and shorten the instrument were made based on these preliminary tests. The final set of items used for each construct is shown in appendix A.

The construct validity of the model's scales was evaluated using confirmatory factor analysis (CFA) on the pooled data from the seven sites. The CFA was conducted with AMOS ver. 3.6 [7]. The Chi-square value was significant (Chi-square $= 602.272$, df $= 89$, $p < 0.001$). A significant Chi-square, however, might be an artifact of the sample size, thus other fit indices are more indicative. We present six common fit indices, guidelines regarding the indices' recommended values, and the indices' values for CFA models in table 4. The indices indicate good overall fit to the data.

For construct validity, we examined the factor loadings of the model variable items on their underlying constructs. The loadings of thirteen of the 16 model variable items were above 0.7. The other three model variables had loadings of 0.6, again

Table 4
Fit indices, recommended values and the model values for the confirmatory factor analysis.

Fit index	Guidelines	Model's values
1. RMSEA	$<$0.08	0.075
2. NFI	$>$0.90	0.935
3. GFI	$>$0.90	0.931
4. AGFI	$>$0.90	0.895
5. Bollen's Delta 2	$>$0.90	0.944
6. RNI	$>$0.90	0.944

Table 5
Correlation matrix for the background variables and responses to Amazon.com and Finnair. Correlations for Amazon.com are to the right of the diagonal. Correlations for Finnair are to the left. The displayed correlations are significant at the 0.05 level.

Variable	1	2	3	4	5	6	7	8	9	10
1. Shopping enjoyment	–		0.38				0.21		0.21	
2. Attitudes towards computers		–					0.21	−0.15		
3. Direct shopping experience	(0.38)		–				0.17			
4. Web-shopping risk attitudes				–						
5. Reputation					–	0.62	0.60	−0.41	0.39	0.38
6. Perceived size					0.52	–	0.48	−0.39	0.38	0.31
7. Trustworthiness					0.71	0.43	–	−0.49	0.56	0.45
8. Risk perception					−0.42	−0.30	−0.52	–	−0.45	−0.51
9. Attitude			0.17		0.42	0.45	0.58	−0.58	–	0.64
10. Willingness to buy			0.30		0.16	0.23	0.27	−0.44	0.46	–

indicating good fit of the measurement model [15]. The reliabilities (Cronbach alpha's) of the control variables were somewhat lower: shopping enjoyment (0.78), attitudes towards computers (0.80), direct shopping experience (0.58), and web shopping risk attitudes (0.65).

Table 5 presents the intercorrelations among the study's model and control variables for two of the Internet sites. For the sake of brevity, we present only correlations regarding Amazon.com and Finnair. Only correlations significant at the 0.05 level are reported. The cells under the matrix's diagonal report correlations among variables in the Finnair site, whereas the cells above the diagonal report correlations that pertain to the Amazon.com site. Correlations among the control variables are reported in the upper-left portion of the table[4]. Correlations among the model's variables are reported in the lower-right portion. As can be seen, the pattern of correlations is similar for both sites. In general, the correlations among the control variables and between the model's variables and control variables are quite low. This might be partially due to somewhat low reliabilities of the control variables, particularly direct shopping experience and web-shopping risk attitudes. There are, however, strong correlations among the model's variables. This pattern of correlations is consistent across sites. For the remainder of the paper, we will focus on the model variables.

[4] In addition to the control variables reported in table 5, we also measured the participants' experience of Web-shopping. However, only about 11% had any prior experience of Web-shopping (see table 2), with only about 6% having bought more than once through the Internet. Due to the very small number of experienced buyers we could not perform meaningful correlational analysis of this variable with the other variables.

4. Results

We will first discuss the participants' preferences and a comparative evaluation of the visited sites. We will then analyze the fit between the data and our proposed model in figure 1.

4.1. Preferences

Table 6 presents the percentage of participants who most liked and least liked each of the four bookstore sites. It also shows the difference between, and the ratio of, these percentages. Clearly, two of the sites were generally liked by the participants while two other sites were for the most part not liked. Figure 2 displays the average scores on the model's variables for the four bookstores. The scores are on a 1 (low) to 7 (high) scale. The figure demonstrates the consistent pattern of relationships among

Table 6
Percentage of people who most liked/disliked a bookstore site, differences between percent most liked and percent disliked and ratio of most liked to least liked.

Site	% Most liked	% Least liked	Difference	Ratio
Amazon.com	38.6	22.8	15.8	1.69
The Internet Bookshop	28.4	12.9	15.5	2.20
Glee Books	13.1	28.1	−15.0	0.47
D.A. Info Services	17.6	33.9	−16.3	0.52
No response	2.3	2.3		

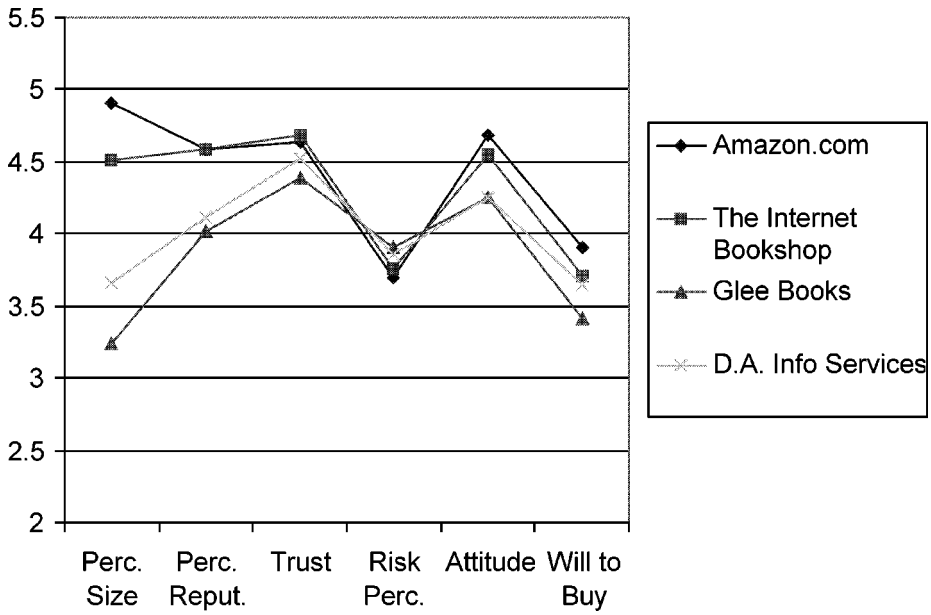

Figure 2. Average scores on the model's variables – bookstore sites.

the model's variables for all of the four sites. Note that some variables (e.g., perceived size) reflect higher variability among sites while differences among sites on other variables (e.g., perceived risk) have very small variance.

Table 7 displays means, medians, and modes of the participants' answer to the question "How likely would it be that you buy a ticket from this travel firm". Here too, in line with the bookstore sites, participants clearly expressed their preferences among the three sites. The pattern of scores on the model's variables is again similar for the three sites (see figure 3), although it is clear that one particular site (Qantas) is receiving considerably more extreme evaluations than the other sites (including the bookstore sites).

Table 7
Mean (standard deviation), median and mode of likelihood of buying a flight ticket from three sites.

Site	Likelihood of buying a ticket (1 = very unlikely, 7 = very likely)		
	Mean (S.D.)	Median	Mode
Finnair	3.28 (1.98)	3.0	2.0
Flight Centre	4.09 (2.09)	4.0	5.0
Qantas	4.81 (2.05)	5.0	6.0

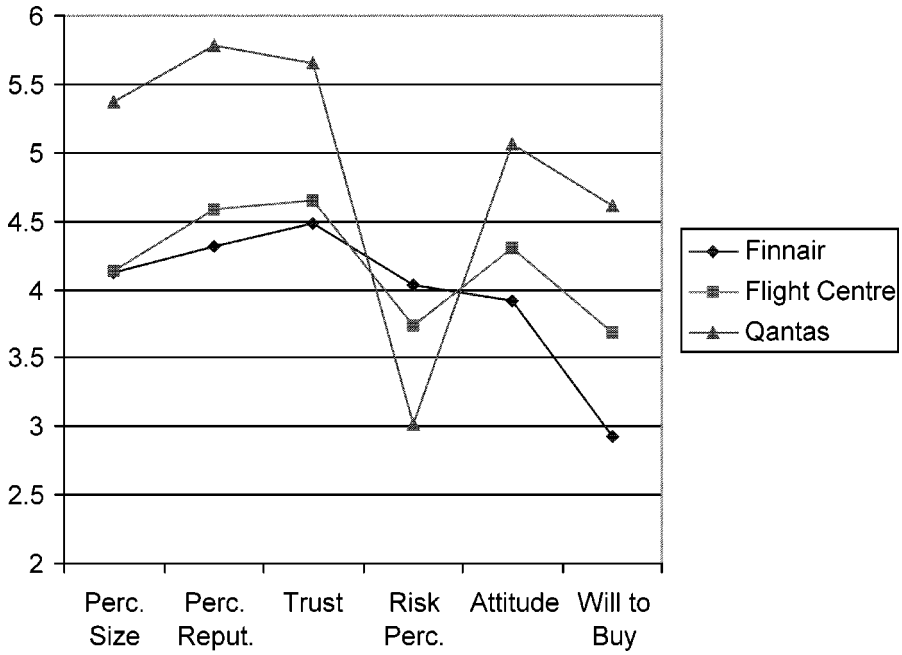

Figure 3. Average scores on the model's variables – airline and travel sites.

4.2. Testing the structural model

To test the correctness of our model, we conducted three tests of its fit to the experimental data obtained from the bookstore and the travel sites. The tests used structural equation modeling (SEM) techniques (cf. [15]) to examine the degree to which the model can be applied to both types of Internet stores. The logic of these tests as well as comprehensive discussion of SEM can be found in Bollen [11].

Test 1: Appropriateness to both bookstores and travel sites

The study's model (figure 1) was tested on the two data sets (bookstores and travel sites) simultaneously, using AMOS 3.6 with the maximum likelihood estimation method. The data consisted of 578 evaluations of bookstore sites and 458 evaluations of travel sites. Overall, the model provides a good fit to the data. The Chi-square statistic was 875.97 with 192 degrees of freedom ($p < 0.001$). Fit indices of the model are reported in table 8 along with the recommended guidelines. The fit indices are, in general, within the recommended guidelines, indicating that the model fits the data from both the bookstores and the travel sites.

Test 2: Testing for equivalence of path coefficients

After establishing that our model applies in general to both bookstores and travel sites, we wanted to test a stronger type of similarity between the two types of Internet stores. The next step in assessing such similarity is testing whether the strength of the path coefficients in the model is the same for both store types (cf. [11]). For this purpose, we estimated the model's parameters again, while forcing the path coefficients to be the same for both data groups. This procedure tests the model under the constraint that both data sets fit the path coefficients equally. If the path coefficients are in fact different for the bookstore data set and the travel sites data set, then the data will not fit the model well. This will be reflected by a significant decrease in the Chi-square value of the model.

The resulting model's Chi-Square was 893.39 with 199 degrees of freedom. The acceptability of the stricter model (the one that assumes equal strength of path coefficients) can be tested by comparing the difference between the Chi-square values of the first and the second tests ($893.39 - 875.97 = 17.42$). The result is distributed as

Table 8
Fit indices, recommended guidelines, and indices values of the analysis of the two data sets.

Fit index	Guidelines	Test 1's values	Test 2's values	Test 3's values
RMSEA	<0.08	0.059	0.058	0.058
NFI	>0.90	0.91	0.91	0.91
GFI	>0.90	0.90	0.90	0.90
AGFI	>0.90	0.86	0.87	0.87
Bollen's Delta 2	>0.90	0.93	0.93	0.93
RNI	>0.90	0.93	0.92	0.93

a new Chi-square variable with degrees of freedom equal to the difference in degrees of freedom between the two models [11]. This difference is statistically significant at the 0.01 level (Chi-square = 17.42, df = 7). Thus, despite the acceptable values of the fit indices (table 8), we conclude that the path coefficients are not equal for the data subsets of bookstores and travel sites.

Test 3: Testing for partial equivalence of path coefficients

Examination of the discrepancies in path coefficients between the bookstore data set and the travel sites data set suggests that they differ mainly on the paths that relate Perceived Reputation and Perceived Size to Trust. Hence, we tested the model while allowing the paths between Perceived Reputation and Perceived Size to Trust to be estimated separately (as in the first test). All other path coefficients were required to be the same (as in the second test). The resulting model's Chi-square was 884.79 with 197 degrees of freedom. The difference between the Chi-square values of this model and the first model is 8.82 with 5 degrees of freedom, which is not significant at the 0.10 level. In addition, all fit indices were at least as good as those obtained under test 1 (see table 8). These results support the supposition that other than the different path coefficients between Trust and its antecedents, the rest of the path coefficients are similar for both the bookstore sites data set and the travel sites data set.

The unstandardized path coefficients of this test are presented in figure 4 along the paths. Figure 4 supplies two coefficients for each of the paths between Perceived Size and Reputation and Trust. These are the paths that were allowed to be estimated separately for each data set, and hence have different coefficients for the bookstores

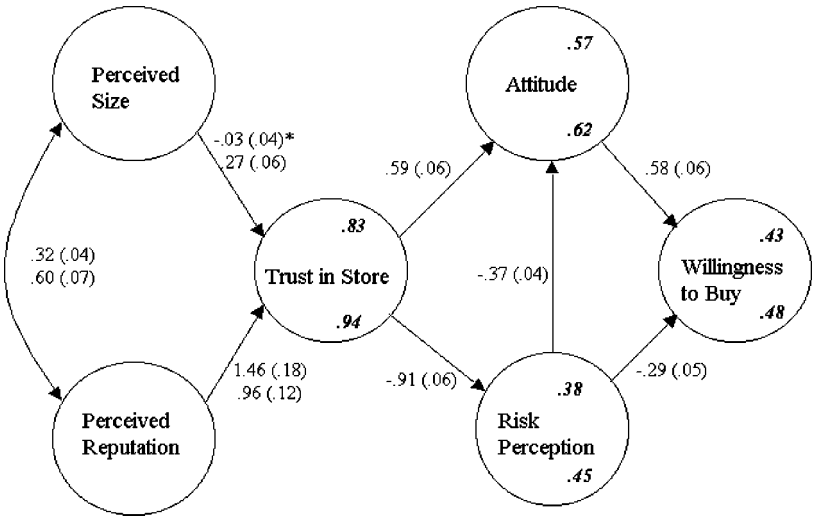

Figure 4. Path coefficients (standard errors) and explained variance for the study's variables. Where parameters were estimated separately for the bookstores and the travel sites data sets, the bookstores parameters appear above the travel sites parameters. All coefficients are significant at the 0.05 level except where indicated by (*).

and the travel sites. The upper coefficients that are reported in figure 4 for each of these paths belong to the bookstore sites, whereas the lower coefficients belong to the travel sits. There is one coefficient for each of the other paths (the paths that have the same value for both data sets). All path coefficients are significant at the 0.05 level except for the path between Perceived Size and Trust in the bookstore sites. In addition, figure 4 shows the explained variance (R^2) for each dependent variable in the model for both groups. The R^2 values are given in italics inside each dependent variable's oval. The bookstores' R^2 values are presented at the top of each oval and the travel site's values at the bottom. The model explains a very large proportion of the variance in Trust (0.83 and 0.94 for the bookstores and the travel sites respectively), and a medium to large proportion of the variance in the other variables.

5. Discussion

The results of this study provide support for the model presented in figure 1 and for the hypotheses regarding the directional linkages among the model variables. The model seems to hold for both bookstore sites and travel sites. The degree of relationship between the model variables is the same for both types of Internet stores with the exception of the antecedents of trust. However, the path coefficients among trust and the other dependent variables in the model (i.e., risk perception, attitude, and willingness to buy) were steady across store types, supporting the robustness of this portion of the model. Thus, the model appears to be a reasonable starting point for developing a theory of consumer trust in the Internet.

The perceived store size and perceived reputation seem to affect trust differently, depending on the type of the store. The effect of perceived store size on trust might be dependent on what the consumer is considering to buy. In case of books, the purchase is a few tens of dollars and there is relatively little ambiguity about whether the book received by the consumer is the same book as ordered. In the case of air travel services, a transaction might be many hundreds of dollars and there is more ambiguity and uncertainty in the purchase (routing, schedule, penalties for changes, etc.). That is, the more significant (i.e., expensive) and hence more unfavorable the outcome if the merchant does not behave as expected, the more consumers' trust might be influenced by size.

In the current study, the participants' perceptions of the sellers' sites varied. These variations in themselves might provide some additional insight for future studies. The book sites will be used as an example. Of the four bookstore sites, Amazon.com was perceived as the largest, followed by the Internet bookstore. DA Information services was deemed larger than Glee Books, but both were considered to be considerably smaller than the other two bookshops.

Compared to the large variability in the participants' perceptions of the perceived sizes of stores, participants showed less variability in their assessments of the stores' reputations. Amazon.com and the Internet Bookstore were rated about the same in reputation, and DA Information Services and Glee Books were also evaluated about the

same, although lower in reputation than the first two. The web sites and the summary page included information about size, but did not include reputational information in any consistent or obvious way. The lack of explicit information on reputation might explain why there was less variability in the data.

Variability in trust across the sites was smaller than variability in reputation and perceived size. This might suggest that there is some type of infrastructure-based trust factor at play, such as "Trust in the Internet" or more specifically "Trust in Internet-based bookstores", that moderates the effect of perceived size and reputation on consumer perceptions of trust. Such a factor would be somewhat related to Luhmann's [42] notion of system trust or Zucker's [64] concept of background institutional trust, which would be affiliated with the participants' overall propensity to trust businesses on the Internet or a certain group of stores on the Internet. Alternatively, convergence on trust might result from the fact that the two largest and most reputable bookstores were totally "virtual", while the other two also had physical presence in the resident country of the participants. Both Glee Books and DA Information Services are traditional booksellers in Australia, with stores in Sydney and Melbourne (home city for the participants) respectively. One might therefore cautiously speculate that the presence of physical stores nearby might increase consumers' trust in a seller's Internet store. The results on the travel sites are in line with these speculations (especially Qantas), although we cannot rule out alternative explanations. For example, it is possible that physical proximity in our study was convoluted with name recognition (of Glee, DA and Qantas). Thus, trust might be affected by recognition rather than (or in addition to) physical proximity[5].

6. Limitations

This study is one of the first to address the relationship aspects of Internet shopping from the consumer point of view. This early study suffers from many problems not uncommon in exploratory studies: measures, sample, procedures, tasks, and the lack of focus on the underlying processes. Although we built on measures from previous studies of trust in marketing channels, major modifications were needed because of the new context. The scale reliabilities of the study measures are between 0.6 and 0.8. Although future studies need to reexamine and refine the measures, these reliabilities are deemed acceptable for exploratory studies [46].

In this study many of the students had backgrounds in computer science, were frequent users of the Internet, and reported having had positive experiences with the Internet. The results of this study might therefore be conservative, given the youth and the Internet experience of the participants (tables 1 and 2). Older consumers, for

[5] One reviewer of this paper found it counterintuitive that a shopper would have more trust in a known travel agent (Flight Center) than in an unknown airline (Finnair). However, some national airlines in the Asian region are not perceived as safe; hence consumers in Australia may worry about unknown national airlines in general.

whom Internet is not a daily experience, might use perceived size and reputation as well as first hand familiarity with a merchant's physical store as even more important determinants of trust in Internet stores.

Our study procedures allowed an easy way for participants to shop in a relatively small number of stores. Pages were set up that allowed the participants easily to find the sites they were asked to visit and evaluate. These procedures likely biased the experience of the participants in a positive direction.

Due to the nature of the experiment (using real-world sites), certain potential antecedents of trust and willingness to buy were left uncontrolled. For example, site design, aesthetics and ease of use were not controlled or measured. While it is both important and interesting to measure how these variables affect our model's variables, we should note that there is a practical limit on the number of variables that any study can take into account. The results reported here present evidence on the nature of relationships among certain variables that were chosen according to the existing literature. Future studies are clearly needed to reveal the contribution of additional variables to the behavior of Internet consumers.

Finally, our study included Internet sites from only two retail domains: books and travel. The results may not be generalizable beyond the sites studied here and particularly beyond the domains studied here. One should note, however, that although the two domains are quite different in terms of the price of goods (a book versus a transpacific flight), delivery channels (digital versus physical goods distribution), and so on, the research model was supported across sites and in both domains. Finally, the model held across the sites when the data was pooled by all sites, by type of site, as well as by individual sites (the last results can be obtained from authors) even though the sites were residing in different countries. We obviously do not know whether the consumers were cognizant of those differences or whether their level of trust in all stores was influenced by their high trust in Australian consumer law, their assumption that they would not be subjected to fraudulent businesses by University professors, or their expectation that their credit card companies would prevent them from conducting business with untrustworthy sites.

7. Theoretical implications

Future models of Internet consumer behavior need to include the relationship aspects in addition to the flow [30] and information and decision support requirements [1]. Consistent with prior marketing theory on buyer trust in the industrial marketing context, perceived size and reputation appear to be significant determinants of consumer trust in an Internet-based store. Perceived size and reputation were strongly related in our study. However, the effect of reputation on trust was considerably stronger than the effect of perceived size on trust, particularly with bookstores. This prompts interesting questions regarding the relationship between these constructs.

The current results suggest that the presence of a physical store or the recognition of the merchant's name might have an effect on consumer trust in an Internet-based

store. Also, there might be some sort of infrastructure or Internet related "system trust" at play that moderates the effects of antecedents of trust on consumer trust. Future research needs to consider to what extent the prior experiences from traditional retail channels have influence on the consumer behavior in the Internet-based stores. Studies are also needed that explore empirically the underlying processes by which consumer trust is formed or developed, or how it evolves as the consumer interacts with an Internet store and actually purchases merchandise. The strongest forms of trust are generally evoked by repeated personal interactions by the exchange parties [21]. Studies are also encouraged to examine crosscultural differences in the effects of trust, reputation and risk. Finally, research needs to explore further the determinants of large store size and good reputation.

8. Practical implications

We believe that this study has practical implications for the ways in which online retailers might increase consumer trust and thereby increase the willingness of prospective customers to shop in this new retail environment. Since perceptions of the *size* and *reputation* of an Internet merchant are important to consumer trust in it, online retailers should do what they can to impress prospective customers with these two aspects of their operation. The welcome page of on-line retailer CDnow, for example, proclaims in no fewer than three different places that it is "the world's largest music store"[6], while online travel specialist travel.com.au bills itself as "the biggest travel site in Australia"[7]. Although such claims lack the definitiveness of a statement about number of titles stocked or dollars of sales revenue, they presumably go some way towards increasing consumer estimates of perceived size. Other indicators of perceived size, including number of physical locations or number of staff, might also be useful in this regard. For example, in a subtle twist on the Amazon.com claim of being the world's largest online retailer of books, Barnes & Noble headlines its site with the phrase "the world's largest bookseller online"[8].

Our findings suggest that perceived reputation is another important factor in creating consumer trust in an online merchant. Reputation might be particularly important for those merchants who are not, and perhaps do not wish to be, the largest in their field. Without an indication of large perceived size, prospective customers can be expected to be especially interested in a merchant's reputation. Sites sponsored by stores that already enjoy an excellent consumer reputation have a head start in this regard. Less well-known online retailers might be able to build and promote their reputations by describing their history (older being presumably better) and by quoting their policies for customer satisfaction, returns, and refunds. Online merchants also have the opportunity to collect and disseminate consumer testimonials regard-

[6] http://www.cdnow.com.
[7] http://www.travel.com.au/.
[8] http://www.barnesandnoble.com/.

ing the quality, value, and efficiency of their service. For example, the home page of the Edmund's company, a provider of consumer-oriented automobile information, includes a link to "Money-Saving Stories From Edmund's Readers!"[9]. The emails reproduced on that page[10] recently included one from Lynda, who says, "I just wanted to let you know how great this site is! I purchased a new Caravan last night for $200.00 over invoice". The ease of gathering such information online from consumers who have done their shopping online makes this approach particularly appealing.

Advising online merchants to tout their perceived size and reputation would seem trivial, were it not for the number of retailers who avoid doing either. During his trip to Australia in early 1998, Bill Gates, the CEO of Microsoft, was presented with a handmade stock whip by Australian Deputy Prime Minister Mr. Tim Fischer, who commented that it was exactly the sort of product that people will buy on the Internet – a specialized product made by, and available only from, a very small company in outback Australia, who according to the Deputy Prime Minister will now find a "global market" online[11]. With due respect to Mr. Fischer, and leaving aside the overall level of demand for handmade stock whips, we are skeptical. It is not at all obvious, based on our data, that electronic commerce will suddenly give the outback whip maker the same advantages available – both historically and now online – to the large, well-known retailer.

Appendix A: Items/scales of the model variables and control variables

Reputation
r1. This store is well known. (strongly disagree / strongly agree)*
r2. This store has a bad reputation in the market. (strongly disagree / strongly agree) [reverse]
r3. This store has a good reputation. (strongly disagree / strongly agree)

Perceived Size
s1. This store is a very large company. (strongly disagree / strongly agree)
s2. This store is the industry's biggest suppliers on the web. (strongly disagree / strongly agree)*
s3. This store is a small player in the market. (strongly disagree / strongly agree) [reverse]

Store Trustworthiness
t1. This store is trustworthy. (strongly disagree / strongly agree)

[9] http://www.edmunds.com/.
[10] http://www.edmunds.com/edweb/doitusef/success.html.
[11] The company in question is Mick's Whips. See http://www.ozemail.com.au/~whips/books.htm.
* Item dropped from the analysis.

t2. This store wants to be known as one who keeps promises and commitments. (strongly disagree / strongly agree)
t3. I trust this store keeps my best interests in mind. (strongly disagree / strongly agree)
t4. I find it necessary to be cautious with this store. (strongly disagree / strongly agree) [reverse]*
t5. This retailer has more to lose than to gain by not delivering on their promises. (strongly disagree / strongly agree)*
t6. This store's behavior meets my expectations. (strongly disagree / strongly agree)*
t7. This store could not care less about servicing a person from Australia. (strongly disagree / strongly agree)* [reverse]

Attitudes towards a Store
a1. The idea of using the Internet to shop from this store is appealing. (strongly disagree / strongly agree)
a2. I like the idea of using the Internet to shop from this store. (strongly disagree / strongly agree)
a3. Using the Internet to shop from this store is a good idea. (strongly disagree / strongly agree)

Willingness to Buy (WTB)
w1. How likely is it that you would return to this store's web site? (very likely / very unlikely)
w2. How likely is that you would consider purchasing from this store in the next 3 months? (very unlikely / very likely)
w3. How likely is it that you would consider purchasing from this store in the next year? (very unlikely / very likely)
w4. For this purchase, how likely is it that you buy from this store? (very unlikely / very likely)*

Risk Perception
rp1. How would you characterize the decision of whether to buy a product from this web retailer? (*significant opportunity / significant risk*)
rp2. How would you characterize the decision of whether to buy a product from this web retailer? (*high potential for loss / high potential for gain*) [reverse]
rp3. How would you characterize the decision of whether to buy a product from this web retailer? (*very positive situation / very negative situation*)
rp4. What is the likelihood of your making a good bargain by buying from this store through the Internet? (very unlikely / very likely) [reverse]*

Shopping Enjoyment
se1. I view shopping as an important leisure activity. (strongly disagree / strongly agree)
se2. I dislike shopping. (strongly disagree / strongly agree) [reverse]

se3. For me, shopping is a pleasurable activity. (strongly disagree / strongly agree)
se4. I would prefer somebody else to do my shopping. (strongly disagree / strongly agree) [reverse]

Attitudes towards Computers
ac1. Computers make work more interesting. (strongly disagree / strongly agree)
ac2. I enjoy interacting with computers. (strongly disagree / strongly agree)
ac3. Working with computers is fun. (strongly disagree / strongly agree)
ac4. I use computers for fun. (strongly disagree / strongly agree)

Direct Shopping Experience
ds1. I frequently buy products through television shopping channels. (strongly disagree / strongly agree)
ds2. I frequently watch infomercials on television. (strongly disagree / strongly agree)
ds3. I frequently buy products from printed catalogs. (strongly disagree / strongly agree)

Web-Shopping Risk Attitudes
wr1. I would feel safe completing commercial transactions over the Internet. (strongly disagree / strongly agree) [reverse]
wr2. There is too much uncertainty associated with shopping on the Internet. (strongly disagree / strongly agree)
wr3. Compared with other ways of shopping, buying on the Internet would be more risky. (strongly disagree / strongly agree)

Appendix B: The perceived size and reputation information for the Internet stores

(For each store, this information was extracted from the store's Internet Web site and placed in a page that participants accessed before accessing the store's web site itself.)

AMAZON.COM

Founded	1994
1996 Sales	US$ 15,750,000
Location	Seattle, Washington, USA
Titles Available	2.5 million
Special Features	Will ship anywhere
For Shop's Home Page	Click Here
To Return to Task	Click Here

DA INFORMATION SERVICES

Founded	1951
1996 Sales	not available
Location	Melbourne
Titles Available	"hundreds of thousands of titles from over 300 publishers"
Special Features	Will ship anywhere Deliveries by courier in Melbourne area
For Shop's Home Page	Click Here
To Return to Task	Click Here

GLEEBOOKS

Founded	1975
1996 Sales	not available
Location	Sydney
Titles Available	Unknown -- both new and used books available
Special Features	Will ship anywhere
For Shop's Home Page	Click Here
To Return to Task	Click Here

THE INTERNET BOOKSHOP

Founded	1994
1996 Sales	US $850,000
Location	Oxford, UK
Titles Available	894,000
Special Features	Will ship anywhere
For Shop's Home Page	Click Here
To Return to Task	Click Here

FINNAIR

Description	The National Airline of Finland
Founded	1923
1996 Revenues	FIM 7,182 million (AUS $1,845 million)
Headquarters	Helsinki, Finland
Special Features	Flight schedules and fares available International destinations include Singapore, Bangkok, and Tokyo
For the Company's Home Page	Click Here
To Return to Task	Click Here

FLIGHT CENTER INTERNATIONAL

Description	The market leader for the cost-conscious traveller
Founded	Not available
1996 Revenues	Not available
Headquarters	Australia (more than 300 locations around the world)
Special Features	Schedules and fares available on-line
For the Company's Home Page	Click Here
To Return to Task	Click Here

QANTAS

Description	The National Airline of Australia
Founded	1920
1996 Revenues	AUS $7,600 million
Headquarters	Sydney
Special Features	Flight schedules and fares available On-line services for frequent flyers
For the Company's Home Page	Click Here
To Return to Task	Click Here

TRAVEL WEB

Description	Internet travel booking service including airline flight reservations
Founded	1994
1996 Revenues	Not available (receives about 30,000 visits per day)
Headquarters	Dallas, Texas, USA
Special Features	Flight schedules and fares for more than 300 airlines On-line reservations available
For the Company's Home Page	Click Here
To Return to Task	Click Here

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