Why Do Internet Users Stick with a Specific Web Site? A Relationship Perspective

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ABSTRACT: To prevent users from switching to competitors, on-line companies in the B2C market are implementing various technologies and investing substantial resources to enhance the "stickiness" of their Web sites. The authors propose that users stick with a Web site through a process of developing a relationship with it. Thus, sticking with a Web site reflects a persistent Web site-user relationship. Theories from social psychology and relationship marketing are used to develop a model of Web site stickiness from the user's perspective. The model focuses on the relationship between user and Web site, with commitment and trust as key mediating variables. A total of 239 users responded to a survey concerning Web site stickiness. The survey results supported all the hypotheses generated from the model and explained 70 percent of the variance in stickiness intention. There was a significant association between intention to stick with a Web site and commitment to and trust in the Web site. Implications for theory and practice are discussed.

KEY WORDS AND PHRASES: Commitment, continuous use, partial least squares, relationships, trust, Web site stickiness.

With the increasing diffusion and penetration of Internet technologies, using Web sites has become an integral part of many individuals' social lives. Many people now use Web sites as their sole source of news and information, and more and more people use the Web to search for and buy products and services. Blogs and on-line communities provide additional social outlets on-line. For a variety of reasons, the Internet makes it relatively easy to switch from one Web site to another Web site that provides similar products or services. Some users, however, "stick" to a specific Web site (e.g., CNN.com, Amazon.com, or KBB.com) and do not switch to others that provide similar services or content (e.g., MSNBC.com, BN.com, or Edmunds.com), whether from lack of motivation or simple inertia. E-commerce studies investigating lack of switching behavior from the user's perspective have found that user satisfaction is an important factor [11]. However, as has long been recognized, satisfaction does not always predict continuous purchasing and repeated patronage [62, 67]. If a customer has many available choices, satisfaction will not always keep him or her from switching to other alternatives [40].

Recently, a *relational* view of user–Web site interactions (or on-line business-to-consumer [B2C] relationships) has emerged in e-commerce research and information systems (IS) literature [10, 42]. As a transition from the transactional view (satisfaction paradigm) of user–Web site interaction, the relational view aims to examine social and psychological factors (such as trust) in on-line B2C interactions (e.g., [32]). A similar debate between transactional

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exchange, emphasizing post-purchase satisfaction (e.g., [40]), and relational exchange, stressing customer trust and loyalty (e.g., [62]), has also recently been advanced in the marketing literature [2, 65, 67, 82, 83]. Following this relational view of the interactions between a Web site and its users, the present study continues the line of inquiry into the determinants of why individuals stick to Web sites.

Based on Oliver's definition of customer loyalty [67], "stickiness" can be defined from the user's side as repetitive visits to and use of a preferred Web site because of a deeply held commitment to reuse the Web site consistently in the future, despite situational influences and marketing efforts that have the potential to cause switching behavior. Previous definitions of Web site stickiness focus on the business side [21]. The definition presented here, however, can be thought of as using a Web site in a user's normal activity or embedding a Web site within a user's routine, which is similar to the notion of continuous use [18]. This definition of stickiness and the relational view of user–Web site interactions make it possible to develop a research model based on two relationship theories: the investment model from social psychology and commitment-trust theory from relationship marketing [62, 76]. Both of these theories are centered on the role of commitment and its effect on various behaviors in social and business relationships. The aim of the present research is to answer two questions: (1) What relational and psychological factors can explain an individual's propensity to stick to a Web site? (2) How do these factors influence stickiness?

Literature Review

On-Line Business-to-Consumer Studies

The importance of studying on-line B2C relationships has been recognized in previous studies. From a practical perspective, acquiring consumers is more expensive on the Internet than in conventional channels [74]. In the last several years, many studies have revealed facets of on-line B2C relationships from two different perspectives [32]. The first perspective views a Web site as an information technology. Thus, such factors as perceived usefulness (PU) and perceived ease of use (PEU) from the technology acceptance model (TAM) [22] have been applied in empirical studies with integration of factors unique to the on-line environment (e.g., [31]). The second perspective treats a Web site as a hybrid of information technology and the on-line business behind the Web site. Empirical studies have therefore integrated technological factors of the Web site and factors explaining on-line B2C relationships. For example, Gefen, Karahanna, and Straub developed an integrated model of trust and TAM [32]. Bhattacherjee has investigated the joint significant effects of satisfaction and PU [11]. In addition, recent e-commerce research has paid special attention to the role of satisfaction in on-line businesses [7, 11, 46].

The literature review of relevant studies conducted for the purposes of the present paper is summarized in Table 1. It examined 31 empirical studies that investigated B2C relationships from a social-psychological perspective rather

Study	Dependent variable	Independent variable	Research method	Study context	Subject	View
Ba and Pavlou [6]	Trust and price premiums	Feedback and product price	Field study / experiment	eBay	Experienced users	Transactional
Balasubramanian et al. [7]	Satisfaction	Price, trust disposition, competence, security, trustworthiness	Field study	brokers	Experienced users	Relational
Bhattacherjee [11]	IS continuance intention	Satisfaction and PU	Field study	bank	Experienced users	Transactional
Bhattacherjee [12]	Willingness to transact	Trust and familiarity	Field study	amazon and bank	Experienced users/ customers	Relational
Cao et al. [14]	Satisfaction	Price, satisfaction with ordering process	Panel data	bookstore	Experienced users	Transactional
Chen and Hitt [15]	Switching and attrition	Personalization, ease of use, quality, breadth of offerings, cost, Web usage, use of multiple brokers	Panel data	brokers	Registered users	Transactional
Devaraj et al. [24]	Channel preference	PU, PEU, time, ease, price, service quality, all mediated by satisfaction	Experiment / field study	retailers	Potential customers	Transactional
Gefen [30]	Customer loyalty	Trust, service quality, risk, switching cost	Field study	amazon	Experienced users	Relational
Gefen and Straub [31]	Intended inquiry and purchase	PU, PEU	Field study	bookstore	Experienced users	Transactional
Gefen et al. [32]	Intended use	Trust, PU, PEU	Field study	general e-commerce sites	Experienced users	Relational
Griffith et al. [33]	Shopping intention	Involvement, attitude, product evaluation	Field study/ experiment	apparel retailers	Experienced users	Relational
Gupta et al. [34]	Channel switching	Differences in price, channel-risk, delivery time, search effort, evaluation effort	Field study	four types of websites	Experienced users	Transactional

(continues)

Table 1. On-Line Business-to-Consumer Literature Review.

Table 1. (continued)

Study	Dependent variable	Independent variable	Research method	Study context	Subject	View
Hong et al. [35]	Performance experience	Information format, shopping task	Experiment	grocery	Potential online shoppers	Transactional
Jiang and Benbasat [37]	Perceived diagnosticity, flow	Visual control, functional control	Experiment	retailer	Potential online shoppers	Transactional
Khalifa and Liu [46]	Satisfaction (pre- and post-adoption)	Expectation disconfirmation, perceived performance, desire disconfirmation	Field study (longitudinal)	knowledge community	Users (from inexperienced to experienced)	Transactional
Kim et al. [48]	Trust (initial and ongoing)	Reputation, assurance, quality (information and service). For ongoing trust, these factors are also mediated by satisfaction	Field study	bookstore	Potential customer and repeated customer	Relational
Kohli et al. [49]	Satisfaction	Time saving, cost saving	Experiment	retailer, airline	Potential online shoppers	Transactional
Koufaris [50]	Unplanned purchases and intention to return	Perceived control, perceived enjoyment, concentration, PU, PEU	Field study	bookstore	Potential customers	Transactional
Lee et al. [52]	Satisfaction	Socio-psychological value (enjoyment, convenience), economic value (cost, time), product value (quality)	Field study	general e-commerce sites	Experienced users	Relational
Lee and Turban [53]	Trust in internet shopping	Trustworthiness (merchant and internet), contextual and individual factors	Field study	general Internet shopping	Potential customers	Transactional
Lee et al. [54]	Switching behavior	Use of alternatives, time of use, duration of use, degree of use, gender	Panel data	portal	Experienced users	Transactional

Luo and Seyedian [56]	Satisfaction	Contextual marketing, privacy, customer orientation, value	Field study/ intercept survey	general Internet shopping	Experienced users	Relational
McKinney et al. [59]	Satisfaction	Performance, expectation, disconfirmation, mediated by information satisfaction and system satisfaction	Experiment	travel agent	Potential customers	Transactional
McKnight et al. [60]	Trusting intentions	Trusting beliefs, institution-based trust, disposition to trust	Experiment	legal advice site	Potential customers	Transactional
Pavlou [68]	Intention to transact and actual transaction	PU, PEU, trust, risk	Field study	general websites	Experienced users	Relational
Pavlou and Gefen [69]	Intention to transact, actual transaction behavior	Risk, trust	Field study	amazon	Experienced users	Relational
Pennington et al. [70]	Purchase intent	Attitude, trust	Experiment	retailer	Potential online shoppers	Transactional
Ramaswami et al. [71]	Information search and purchase	Satisfaction, willingness, knowledge, confidence, income, time	Field study	financial service	Experienced users	Transactional
Shim et al. [81]	Satisfaction	Service, available contact, convenience/simplicity	Field study	retailer	Experienced users	Transactional
Suh and Han [85]	Behavioral intention and actual use	Attitude and trust	Field study	bank	Experienced users	Relational
Tan and Teo [86]	Intention to use	Attitude, subjective norms, perceived behavioral control	Field study	bank	Experienced users/ bank customers	Relational

Notes: A study is classified as relational if it indicates a social-psychological perspective (including trust, loyalty, attitude, and customer orientation as dependent or independent variables) and if experienced users of the same Web site were investigated. However, a study based on calculus-based trust is not considered to be relational [6].

than an economic perspective. The studies were published from 2000 to 2004 in *Information Systems Research*, *International Journal of Electronic Commerce*, *Journal of the Association for Information Systems*, *Journal of Management Information Systems*, *Management Science*, and *MIS Quarterly.*

The review suggests that previous research has given more attention to satisfaction and trust than any other variable. Satisfaction and trust are the second and third most investigated dependent variables (in eight and four studies, respectively), following behavioral intention (in 11 studies). They were also used as independent variables in four and eight studies, respectively. Kim, Xu, and Koh were the only researchers to examine both satisfaction and trust in the same study [48]. As mentioned above, satisfaction does not always predict continuous purchasing, and it is a necessary but not sufficient factor for customer retention [40, 63]. Industry surveys have also shown that satisfaction is not enough to predict continuous purchases [73]. Thus, other variables are also important in on-line B2C relationships.

Following the studies by Benbasat and DeSanctis [10], Coviello, Brodie, Danaher, and Johnston [19], and Sirdeshmukh, Singh, and Sabol [83], the 31 studies were classified as either transactional or relational. The classification was based on the dependent variable, the independent variable, the study motivation, and the features of the subjects/respondents (*see Table 1*). This showed that there was significant interest in the relational view (12 studies), even though the majority (19 studies) were from the transactional view. Only two of the 31 studies captured consumer stickiness as the dependent variable, using "continuance intention" or "customer loyalty" [11, 30]. Bhattacherjee investigated stickiness from a transactional view, with satisfaction and perceived usefulness as predictors [11]. Gefen used a mixed viewpoint, including three transactional factors (service quality, switching cost, and risk) and one relational factor (trust) [30]. The dearth of literature investigating on-line consumers' stickiness for Web sites from a relational perspective calls attention to the need for additional empirical evidence of this phenomenon. We will now provide some background on the relational view.

Relational View of User–Web Site Interactions

The transactional view of B2C relationships emphasizes the one-time provision of economic benefit, profit, efficiency, and effectiveness of the interaction to attract and satisfy consumers. In contrast, the relational view emphasizes the building and continuous maintenance of the relationship between a user and the Web site through personalized social and psychological exchanges [2, 10, 65, 82, 83]. Previous studies of user–Web site interactions recognized that a Web site can be considered as a representative of a business, and thus the user–Web site relationship is similar to the B2C relationship [32]. Here it is posited that there is also a relationship between the Web site and the user. In most instances, users do not contact anyone on the e-vendor side, but simply rely on the Web site and treat it as the business representative. Previous literature suggested that users do not perceive a Web site as separate from the e-vendor supporting it [32]. Thus, a user's relationship with a Web site is not

separate from the relationship with the e-vendor. Additional support for this proposition is provided by several streams of literature.

First, recent studies in human-computer interaction have found that some users regard computers as social entities [61, 72]. They do not perceive the computer as a "black box," but see it as a teammate, a specialist, and full of personality [72]. Thus, interactions between users and computers may be expected to follow social rules, such as politeness and flattery [61, 72]. Moreover, social processes such as attachment, involvement, understanding, and social identity have been found in human-computer interactions [47]. The user displays a relational orientation toward the computer itself, rather than toward the people who program the software on the computer [72]. Treating a Web site as a social actor has also been justified in a recent study by Kumar and Benbasat, who suggest that relationship communication between users and a Web site can be developed given proper Web site design [51]. They describe such a relationship using the concept of "para-social presence"—"a sense of understanding, connection, involvement, and interaction" between the users and the Web site [51, p. 12].

Second, the human motivation to form interpersonal attachments and the need to belong are also found in the interactions between people and objects such as a brand [8, 28]. According to the theory of personal relationships, three essential elements must be present in a relationship between a Web site and a user [45]. The first element is interdependence. In the context of Web site use, the user depends on the Web site to meet particular needs and requirements, such as collecting information and seeking expert advice. The Web site depends on the user to input information such as feedback, comments, and reviews. The Web site also depends on users to purchase or consume its products and services. The second element is interaction. In the process of providing input and receiving output from the Web site, the user follows programmed interactive dialogs and interfaces to interact with the Web site, such as providing feedback and comments, participating in on-line communities, and engaging in real-time chatting. The third element is attribution to dispositions of the other party. A user who receives correct and consistent output from a Web site (e.g., on-time delivery of the right information, products, and services) may attribute the Web site's performance to the Web site itself or to the Web site vendor's reliability and credibility.

Based on this background, one would expect a relationship to develop between users and Web sites. The next section discusses the relationship theories that underlie the proposed research model.

Relationship Theories

Two theoretical perspectives provide the basis for the research model: the investment model for interpersonal relationships and commitment-trust theory for marketing relationships [62, 76]. Both theories investigate the role and effect of commitment in relationships. As discussed above, an individual's interaction with a Web site may be similar to his or her social interaction with another person. This makes the investment model an important theoretical

foundation for the present research. Commitment-trust theory is also important because the relationship between an individual and a Web site is a business-to-consumer (marketing) relationship. These two theories are consistent because of the principal role of commitment in both of them.

The Investment Model

The investment model is a theory concerning the formation and maintenance of interpersonal relationships [76]. It represents an individual's experience and long-term persistence with a relationship. Commitment is a central construct in the model and is defined as the "intent to persist in a relationship, including long-term orientation toward the involvement as well as feelings of psychological attachment" [77, p. 359].

There are three antecedent factors of commitment in the model. The first antecedent is satisfaction, defined as the positive affect or attraction to a relationship. People will be more satisfied with a relationship if the rewards it provides are continuously higher than the costs and exceed expectations [76]. Satisfaction is positively associated with the commitment to a relationship. The second antecedent is the quality of the alternatives, defined as "the perceived desirability of the best available alternative to a relationship" [77, p. 359]. Quality of alternatives is influenced by the perceived rewards and costs of alternative relationships. The investment model proposes that people become more committed to a relationship when they perceive the alternatives as unavailable, poor, unacceptable, or undesirable. A negative relationship exists between higher quality of alternatives and commitment. The third antecedent is investment size, defined as "the magnitude and importance of the resources that are attached to a relationship" [77, p. 359]. People become more committed to a relationship if they invest numerous resources in it. Substantial investment helps lock the individual into the current relationship. Investment size is positively associated with commitment.

In the original investment model, the outcome was the probability of persisting in a relationship [77]. The model was extended to many types of prorelationship motivations and behaviors, such as accommodative behavior, shared cognition, and willingness to sacrifice [78]. Empirical studies have provided support for the model in various fields, such as employee turnover [78].

Commitment-Trust Theory

While the investment model describes general interpersonal relationships, commitment-trust theory is typically applied to business-to-business relationships and business-to-consumer relationships [62]. It is an important theory in relationship marketing research, focusing on the long-term relational exchanges between a focal company and its partners, such as suppliers and buyers, and its competitors.

Commitment and trust are important factors for the development of business relationships. Commitment-trust theory investigates the joint roles of

commitment and trust in marketing-channel relationships [62]. Commitment and trust are positioned as key mediating variables between five antecedent variables and five outcomes. Relationship commitment is "an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it" [62, p. 23]. Trust exists "when one party has confidence in an exchange partner's reliability and integrity" [62, p. 23]. Trust has a positive impact on and is a major determinant of relationship commitment.

In addition, relationship termination costs, relationship benefits, and shared values are the three antecedent factors of relationship commitment. Relationship termination costs, like investment size and quality of alternatives in the investment model, include all expected losses from relationship termination, lack of comparable alternatives, and potential switching costs to another relationship. Relationship benefits, like satisfaction in the investment model, measure the superior benefits, values, and performance delivered by the relationship partner. Shared values "is the extent to which partners have beliefs in common about what behaviors, goals, and policies are important or unimportant, appropriate or inappropriate, and right or wrong" [62, p. 25]. It is here posited that shared values are less important in a B2C relationship than in a B2B relationship, and thus this variable is not included in the research model.

Communication quality and opportunistic behavior are antecedents of trust [62]. Communication quality means sharing information between relationship partners in a timely, frequent, and accurate manner through informal or formal channels [5, 62]. Opportunistic behavior refers to any violation of promises about a party's appropriate or required behavior perceived by another party in a relationship [38]. These two factors are important in explaining different types of relationships in empirical studies [62, 91].

To summarize, commitment and trust are the most prominent factors in the formation, development, and maintenance of interpersonal relationships and marketing relationships. They are the keys for differentiating relational exchanges from purely economic exchanges and are necessary for pro-relationship behaviors and motivations [62, 78]. In the context of Web site use, commitment to and trust in a Web site are central to understanding why a user sticks to the Web site. The investment model and commitment-trust theory were the basis for the development of the research model and hypotheses described in the next section.

Model Development and Research Hypotheses

The model proposed to understand why an individual sticks to a Web site is shown in Figure 1. The outcome of the model is stickiness intention, that is, the intention to stick to a Web site. Information systems research has concluded that people's use of information technologies "can be predicted reasonably well from their intentions" [22, p. 997]. Using intention rather than actual behavior as the dependent variable has been justified in much empirical IS research [1, 32]. In the present study, stickiness intention is a measure of

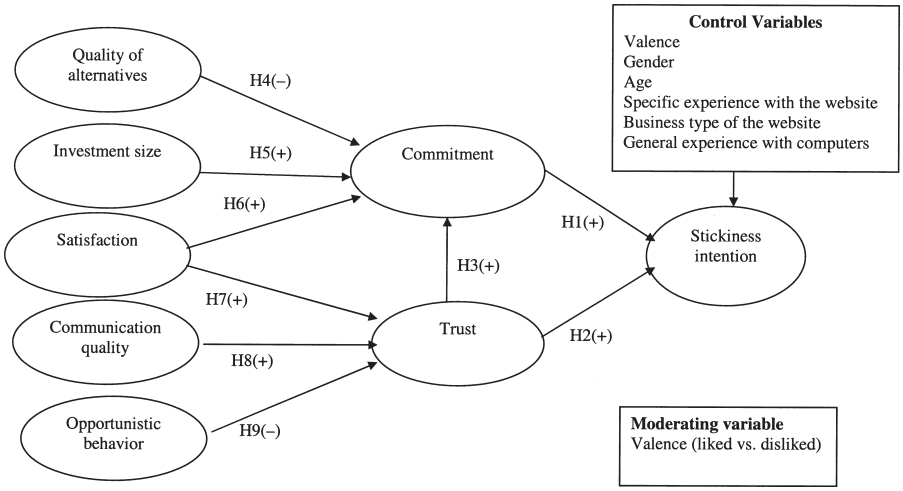

Figure 1. Research Model

an individual's intention to stick to (i.e., use) a Web site on a regular basis without stopping in the near future. Intentions "are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior" [3, p. 181].

Commitment

Commitment is the most direct and powerful predictor of persistence in a relationship [76]. Highly committed individuals feel strongly dependent on their partners and the relationship. They have a long-term orientation toward relationships that they expect to develop further in the future. They also show psychological attachments to partners because the benefit of staying in the relationship is mutual, so that the good elements for them are inseparable from the good elements for their partners [78]. In the relationship between a user and a Web site, if one has a sense of commitment to the Web site derived from past interactions with it, the commitment is very likely to drive one's future use of the Web site. With these findings in mind, the following hypothesis is proposed:

> *H1: Commitment to a relationship with a Web site is positively associated with stickiness intention.*

Trust

Trust is also a fundamental relationship-building and -maintaining mechanism. According to Deutsch, trust is the groundwork supporting all cooperative behaviors between relational parties [23]. It stems from one party's

perception of the other party's ability, integrity, and benevolence [57]. Trust exists when one party believes that the other is trustworthy and is confident about the other party's future behavior. It indicates that one party is willing to rely on "the words, actions, and decisions of the other party" [58, p. 25]. If trust is not properly fulfilled, the trusting party will experience unpleasant consequences [23]. Perceiving a lack of trustworthiness and confidence in the other party will reduce one's motivation to continue in the relationship. Previous studies of on-line B2C relationships have demonstrated the positive effect of trust on behavior intention [32]. Thus,

H2: Trust in a Web site is positively associated with stickiness intention.

High-level trust also reduces perceived uncertainty between relationship partners [57]. As partners' trust in one another increases, they are likely to take risks in the relationship, become more satisfied with their partner, and depend more on one another [90]. Such increased dependence will strengthen the subjective experience of commitment to the relationship. Research studies concerning both the investment model and commitment-trust theory have shown a positive association between trust and commitment [62, 78, 90].

H3: Trust in a Web site is positively associated with commitment.

Quality of Alternatives

Social scientists have long recognized that the presence of an attractive alternative will threaten the formation and stability of a relationship [76, 87]. If an individual's needs and requirements can be gratified better by another relationship than by the current one, the individual may investigate the alternative relationship, and this affects the level of commitment to the current relationship. People in close relationships report lower commitment to their current relationships if they have attractive alternatives [39]. On the other hand, people with poor, unsuitable, or undesirable alternatives are more likely to show strong commitment to their present relationships. Moreover, committed people tend to devalue the quality of alternatives and are reluctant to approach alternatives (to reduce internal cognitive and affective conflicts) [39, 76].

In the marketing channel literature, the quality of the outcome available from the best alternative relationship partner is one of the key variables in maintaining a buyer-seller relationship. Empirical studies have shown that a wide range of high-quality alternative suppliers is negatively associated with dependence on the present supplier in B2B contexts [5]. However, this construct has not been investigated in IS research. The quality of alternatives is similar to the availability of multiple on-line brokers, which is positively associated with switching behavior [15]. The construct proposed in this paper, however, captures more than the breadth of alternatives. In the context of Web site use, an individual may stick with a specific Web site because no alternative Web site is available Thus,

H4: Quality of alternative Web sites is negatively associated with commitment.

Investment Size

Partners may invest many different types of resources to promote the development of a relationship. These resources will be depreciated or lost if the relationship is broken. Thus, investment size may act as a psychological inducement to maintain a relationship. The notion of investment size is similar to that of termination costs in commitment-trust theory and switching costs or sunk costs [62]. People often feel locked into a costly course of action because of their investment in it and the losses expected if it is terminated. In online B2C relationships, switching costs have been found to be positively associated with customer loyalty [30].

An individual who has invested a great deal of time, effort, and money in a Web site may become psychologically stuck to it. A user who terminates use of a Web site will need to search for and learn how to use a new one. The cost of this process may include monetary investment in obtaining information about new Web sites and opportunity costs that could have been used for other activities. Significant cognitive effort may also be invested in searching, sorting, and filtering information and in adapting to the input and output interfaces of the new Web site.

Investment-size issues are mitigated by the fact that interface design and informational content are often quite similar across different Web sites. In addition, because of the emphasis on Web site usability design, it is relatively easy to switch to an alternative Web site and learn how to use it. As Chen and Hitt have found, a Web site's ease of use is positively associated with switching behavior because ease of use does not incur a sunk cost of learning [15]. However, given all the other costs, users may voluntarily reduce their choices to achieve higher efficiency, reduce information processing, and keep higher cognitive consistency [80]. Thus,

H5: Investment size is positively associated with commitment.

Satisfaction

As noted earlier, satisfaction is the positive affect one experiences in a relationship [77]. A relationship is more satisfying when it fulfills an important need. Greater satisfaction with a relationship should increase one's commitment to it. Building on the proposition of an association between satisfaction and commitment [76, 77], the following hypothesis is proposed:

H6: Satisfaction is positively associated with commitment.

A positive association between satisfaction and trust has also been found in the marketing literature. A retailer satisfied with the past outcomes of a relationship with a vendor will have an increased perception of the vendor's benevolence and credibility [29]. The overall satisfaction experienced from previous interactions predicts the individual's trust toward an organization.

For example, a salesperson's job satisfaction promotes trust in co-workers [91]. Based on these findings,

H7: Satisfaction is positively associated with trust.

Communication Quality

Communication quality refers to the timely sharing of meaningful information between Web site and users by means of formal and informal channels [62, 91]. Regular communication is a necessary condition for the formation, development, and maintenance of trust [58]. With more frequent and meaningful communication, a Web site and its users can exchange information more easily and a user can predict the Web site's behavior with some confidence and certainty [51]. Modern technologies have facilitated many different methods of communication between Web sites and users. These include Frequently Asked Questions, help files, privacy policy statements, terms of service, and feedback forums to answer users' basic questions. Web site users may also rely on other regular communication media, such as chat rooms, instant messages, e-mail, audio, and video to keep contact with the Web site. The performance of these communication channels will determine Web site users' perceptions of trust.

H8: Communication quality is positively associated with trust.

Opportunistic Behavior

Most researchers agree that trust is easier to destroy than to build [55]. A party to a relationship whose behavior is objectively credible will be perceived as more expert and more reliable by the other party [29, 57]. Similarly, violations of the other party's expectations, particularly repeated violations, can damage or destroy the trust belief [23]. People usually care about whether their partners keep their promises. Their assessments of the trustworthiness of partners will improve if the partner's behaviors are consistent with norms and responsibilities [57]. Any unexpected manipulation of information and failure to fulfill obligations constitutes opportunistic behavior [38]. Lewicki and Bunker suggest that negative events create "dissonant cognitions and negative feelings" [55, p. 167]. Morgan and Hunt [62] and Yilmaz and Hunt [91] found that minimal opportunism is highly correlated with trust in the partner. Thus,

H9: Opportunistic behavior is negatively associated with trust.

Control and Moderating Variables

Valence is the overall positivity or negativity of an individual's experience with a particular Web site. Positive valence with a Web site suggests positive

attitude, a factor that may exert strong influence on one's use of the Web site [17]. Negative valence, on the other hand, suggests avoidance and dissatisfaction. Previous studies have found that positive valence has a significant effect on behavioral intention and actual behavior [17, 65, 69]. Thus, valence may be expected to have a direct effect on stickiness intention.

Attribution theory suggests than valence has significant effects in the attribution process [89]. Positive valence and negative valence provide different explanations and interpretations for individuals' evaluations of their judgment, thinking, and behavior. Thus, valence can be expected to have a moderating effect on the relationships of the research constructs specified in the hypotheses developed above. Nijssen, Singh, Sirdeshmukh, and Holzmueller proposed and tested such moderating effects in the relationships among satisfaction, trust, value, and loyalty [65].

Several other control variables examined in previous studies have also been included: age, gender, specific experience with the investigated Web site, business type of the Web site, and general experience with computers.

Research Method

Sampling and Data Collection

The constructs in the research model were measured using survey questionnaires. The unit of analysis was a Web site user's intention to stick with a Web site. The respondents were student subjects in the college of business at a public university. The feasibility of using this study sample to investigate on-line behavior has been demonstrated in recent studies [1, 32]. Students are the most innovative users of Web sites and the most active segment of on-line shoppers [1, 32]. They have the freedom to choose between alternative sites and decide to use a particular Web site of their own accord, unlike the often mandatory use of an IS found in an organizational context. This population has widely adopted the World Wide Web for both educational and social purposes.

Both undergraduate and graduate students were surveyed, representing all the business majors in the college. Eight different business classes were selected, and the instructors agreed to give course credit to motivate successful completion of the survey. To ensure enough variation in the dependent variable, two different types of questionnaires were designed in advance. One version asked respondents to evaluate an e-commerce Web site they liked, while the other asked them to report a Web site they did not like. An e-commerce Web site was defined in the questionnaire as a Web site that conducts business transactions.[1] Each participant randomly received one version of the questionnaire. Depending on the version of the questionnaire, the respondent participants were asked to list three e-commerce Web sites they liked or three e-commerce Web sites they did not like. They were then to choose one of the three Web sites and answer survey questions that measured their perceptions and attitudes toward it. Finally, they were asked several demographic questions.

Two questions were asked to ensure that the respondent had experienced enough interactions with the reported Web site: (1) How long (number of

months) have you used this Web site? (2) During the time period you checked in question (1), how often did you visit this Web site? Respondents who used the reported Web site for less than three months and no more than 10 times were excluded from the study. Respondents who used the Web site for less than three months but more than 10 times, or for more than three months but fewer than 10 times, were kept in the sample.

Characteristics of the Web site were also examined. Web sites that did not have any competitors (e.g., the university's tuition payment site) or required high costs to use (e.g., financial service sites) were excluded. The business types were limited to five categories (news, retailer, airline, auction, and portal).

After incomplete questionnaires and questionnaires of respondents who did not meet the inclusion criteria were removed, 239 responses were available in the final sample.

Preliminary Investigation

Before the data for the study were collected, three rounds of preliminary investigation were conducted to test the validity of the scales (following Straub's guidelines [84]) and several other issues pertaining to research design. The first round checked the face validity of measures and scales adapted from prior validated instruments used in different studies. Personal interviews, in the form of open-ended general discussions in a semi-structured format with individual examination of items, were conducted with a small number of students and professors. Questions and problems concerning the format and wording of the questions were recorded, and appropriate changes were made to the questionnaire.

The second preliminary round investigated ways to increase the variance of the dependent variable of the research model. Two different methods were proposed. The first was based on the usage of a Web site. Respondents were randomly given questionnaires asking them to evaluate either a Web site they had used fewer than 10 times or one they had used more than 10 times. Twenty-two questionnaires were distributed (with 11 in each frequency-of-usage category). The results showed that 20 students had evaluated Web sites they wanted to use in the future, indicating that a usage-based scheme could not guarantee enough variation, and that students would not choose on their own to evaluate Web sites they did not want to use. The second method was based on the attitude toward the Web site. Respondents were given questionnaires that asked them to evaluate a Web site that they liked or did not like, again through random assignment. Eighteen questionnaires were distributed, with nine in each category. Nine students responded that they wanted to stick to the Web site in the future, and nine students answered that they did not want to stick with the Web site. This result indicated that the attitude-based scheme was better than the usage-based scheme in spreading the variance of the dependent variable. Therefore, the attitude-based scheme was adopted for data collection.

The third preliminary round was used to determine response time and whether the questionnaire could be successfully completed in the absence of the researcher. The questionnaire was distributed to and answered by 30 students in two graduate MIS classes without the presence of the researcher. The

results showed that students could finish the questionnaire without difficulty and that the completion time was about 20 minutes.

Measures

All the research constructs were measured using multiple-item seven-point Likert scales adapted from previous studies, with "strongly disagree" and "strongly agree" anchoring the scale. Minor modifications were made to fit the specific context of Web site users and Web sites in the present study. Specifically, stickiness intention was measured using a scale adapted from Agarwal and Karahanna [1]. Commitment and its antecedent factors (quality of alternatives and investment size) were measured using scales adapted from Rusbult, Martz, and Agnew [77] and Morgan and Hunt [62]. Trust and its antecedent factors (communication quality and opportunistic behavior) were measured using scales adapted from Morgan and Hunt [62] and Yilmaz and Hunt [91].

The study makes a distinction between reflective scales and formative scales. The items or indicators of a reflective scale all depend on and are caused by the same latent construct, whereas those of a formative scale cause the changes in the latent scale [13, 16]. The scales for communication quality and opportunistic behavior were formative according to Morgan and Hunt [62] and Yilmaz and Hunt [91], who developed these scales based on previous studies [38]. All the other scales were reflective. The items used in the study are listed in Appendix A.

Regarding the control and moderating variables, valence was measured in terms of the version of the questionnaire (i.e., liked or disliked). Questions were also asked for age, gender, experience with the Web site measured by visiting frequency (how many times), and experience with computers measured as number of years. Business type was coded into the five categories noted earlier: 1—news, 2—retailer, 3—airline, 4—auction, and 5—portal. Except for experience with computers, which used a continuous scale, all the other variables used categorical scales.

Sample Characteristics

Sample statistics are shown in Table 2. No significant differences between the answers from different classes were found, so all the responses were pooled together in a single sample. Among the 239 responses, 137 participants reported their perceptions about Web sites they liked and 102 students responded about Web sites they did not like. Most of the participants had considerable experience with computers (M = 10.1 years), Web sites (M = 6.0 years), and e-mail (M = 5.5 years).

Data Analysis and Results

The study used partial least squares (PLS) as the statistical analysis method. PLS is a component-based estimation method used to analyze causal models.

Characteristics	Number (*N* = 239)	Percentage
Age		
<21	13	5.4
21-25	180	75.3
26-30	31	13.0
31-35	10	4.2
> 35	5	2.1
Gender		
Male	174	73
Female	65	27
Status		
Sophomore	3	1.3
Junior	24	10
Senior	177	74.1
Graduate	35	14.6
Total months usage experience		
< 3	8	3.3
3-6	38	15.9
7-12	59	24.7
13-24	79	33.1
> 24	55	23.0
Number of visits to Web site		
< 3	7	2.9
3-5	33	13.8
6-10	46	19.2
11-20	35	14.6
> 20	118	49.4
Valence		
Liked	137	57.3
Disliked	102	42.7
Business type		
news	13	5.4
retailer	119	49.8
airline	19	7.9
auction	44	18.4
portal	44	18.4
Total years of experience with IT	*Mean*	*Standard deviation*
Computer	10.1	4
Web	6	2.2
E-mail	5.5	2.1

Table 2. Sample Characteristics.

Like LISREL, PLS allows simultaneous examination of the measurement model and the structural model. That is, the relationships among the underlying research constructs and the items to measure these constructs can be specified together with the hypothesized relationships among the research constructs. PLS can also handle both reflective and formative scales, whereas LISREL lacks a good approach for modeling formative indicators [16]. PLS can also utilize single-item scales, which were used to measure the control variables in the current study. Thus, PLS-Graph 3.00 was used, following a two-step analysis approach [4]. Bootstrapping was the estimation procedure used to assess

the significance of factor loadings of reflective scales, weights of formative scales, and path coefficients of the structural model.

Scale Validation: The Measurement Model

Descriptive statistics for the measurement items are shown in Table 3. The standard deviation values for the endogenous construct, that is, stickiness intention, indicated that there were large variances to be explained. For the reflective scales, all the *t*-statistics of the factor loadings shown in Table 3 were significant at the $\alpha = 0.001$ level. Table 3 also shows the weights of the formative scale and their *t*-statistics. Two items for communication quality and three items for opportunistic behavior were significant at the $\alpha = 0.05$ level. This suggests that the indicators of the formative scale had significant effects on their respective latent variables.

Based on the results of the measurement model, the convergent validity, discriminant validity, and reliability of the reflective scales were analyzed following the guidelines from previous literature [27]. Reliability was assessed by composite reliability, which is similar to Cronbach's alpha but considers the actual factor loadings instead of assuming that each item is equally weighted. Composite reliabilities in the measurement model ranged from 0.91 to 0.99 (*see Table 3*) and were all above the minimum of 0.70 as suggested by Nunnally [66]. Convergent validity was assessed by examining factor loadings and average variance extracted. Convergent validity requires a factor loading greater than 0.70 and an average variance extracted of at least 0.50 [27]. As shown in Table 3, except for one item in the scale for trust, the factor loadings of the items in the measurement model all exceeded 0.70, and the average variances extracted were all from 0.68 to 0.96, thereby demonstrating adequate convergent validity. Discriminant validity of reflective scales was assessed by comparing the AVE of each individual construct with the shared variances between a single individual construct and all the other constructs [27]. Higher AVE of the individual construct than shared variances suggests discriminant validity. All the interconstruct correlations are shown as elements off the diagonal of the matrix in Table 4. Square roots of AVEs are shown on the diagonal. Comparing all the correlations and the elements on the diagonal, the results demonstrate adequate discriminant validity for all the reflective constructs.

The conventional methods for testing reliability and validity apply only to reflective scales [13, 16, 25, 36]. Following Diamantopoulos and Winklhofer [25] and Jarvis, MacKenzie, and Podsakoff [36], the multicollinearity between the indicators of each formative scale was tested. Table 5 shows the correlations of the indicators of the formative scales. A series of regression models was constructed. In each, one indicator was selected as the dependent variable and the other indicators were designated as independent variables. The variance inflation factor (VIF) of the coefficient of an independent variable measures the multicollinearity level. All the VIFs in the regression models were less than 10, the critical value for checking multicollinearity [9]. Thus, multicollinearity problems were not present in the formative scales.

Construct	Scale type	Item	Mean	*SD*	Loading or weight[a]	*SE*	*t*[b]	AVE[c]	C R[d]
Stickiness intention	Reflective	INTEN1	4.80	1.82	0.979	0.004	239.350	0.96	0.99
		INTEN2	4.86	1.80	0.982	0.005	180.584		
		INTEN3	4.89	1.77	0.979	0.005	204.085		
Commitment	Reflective	COMMT1	4.85	1.86	0.875	0.013	66.283	0.71	0.92
		COMMT2	3.60	1.93	0.883	0.018	50.346		
		COMMT3	3.77	1.86	-0.742	0.043	17.163		
		COMMT4	3.07	1.68	0.833	0.026	32.287		
		COMMT5	3.56	1.82	0.865	0.021	40.567		
Trust	Reflective	TRUST1	3.29	1.74	-0.687	0.050	13.787	0.73	0.93
		TRUST2	4.90	1.54	0.890	0.017	53.684		
		TRUST3	4.84	1.60	0.914	0.009	99.211		
		TRUST4	4.93	1.55	0.927	0.010	89.725		
		TRUST5	5.18	1.38	0.830	0.031	26.642		
Satisfaction	Reflective	SATIS1	4.68	1.97	0.945	0.006	153.339	0.81	0.95
		SATIS2	4.59	1.96	0.950	0.006	169.178		
		SATIS3	3.52	1.96	-0.850	0.024	36.011		
		SATIS4	4.17	1.65	0.874	0.015	59.063		
		SATIS5	4.71	1.70	0.868	0.020	42.676		
Quality of alternatives	Reflective	ALTER1	4.26	1.81	0.882	0.022	39.833	0.82	0.96
		ALTER2	3.97	1.89	0.927	0.013	73.782		
		ALTER3	3.87	1.81	0.889	0.020	44.833		
		ALTER4	4.14	1.78	0.932	0.012	80.803		
		ALTER5	4.42	1.85	0.887	0.017	50.905		

(continues)

Table 3. Measurement Model.

Table 3. (continued)

Construct	Scale type	Item	Mean	*SD*	Loading or weight[a]	*SE*	*t*[b]	AVE[c]	C R[d]
Investment size	Reflective	INVES1	4.16	1.70	0.854	0.018	47.432	0.68	0.91
		INVES2	2.86	1.69	0.788	0.024	32.918		
		INVES3	3.13	1.65	0.789	0.028	28.230		
		INVES4	3.65	1.76	0.881	0.012	72.863		
		INVES5	3.63	1.79	0.799	0.041	19.481		
Communication quality	Formative	COMMU1	4.77	1.75	0.574	0.117	4.921	n.a.	n.a.
		COMMU2	5.03	1.56	0.341	0.119	2.873		
		COMMU3	3.46	1.55	-0.142	0.084	1.693		
		COMMU4	4.40	1.73	0.160	0.105	1.531		
		COMMU5	2.94	1.59	-0.057	0.091	0.631		
Opportunistic behavior	Formative	OPPOR1	2.96	1.53	0.140	0.090	1.557	n.a.	n.a.
		OPPOR2	2.68	1.50	0.103	0.102	1.012		
		OPPOR3	2.97	1.65	0.562	0.110	5.129		
		OPPOR4	2.57	1.43	0.357	0.108	3.308		
Valence	Control variable	Single item	1.43	0.5	1	0	n.a.	n.a.	n.a.
Age			2.22	0.7	1	0	n.a.	n.a.	n.a.
Gender			1.27	0.45	1	0	n.a.	n.a.	n.a.
Web site experience			3.93	1.22	1	0	n.a.	n.a.	n.a.
Business type			2.94	1.28	1	0	n.a.	n.a.	n.a.
Computer experience			10.1	4	1	0	n.a.	n.a.	n.a.

Notes: [a] For reflective scales, the standardized loading is provided. For formative scales, the weight of the linear combination is given. [b] *t*-statistics smaller than 1.96 are not significant at the 0.05 level. [c] AVE = Average variance extracted, not applicable to formative scale. [d] C.R. = Composite reliability, not applicable to formative scale.

	COMMT	INTEN	TRUST	SATIS	ALTER	INVES	COMMU	OPPOR	Gender	Age	Composite experience	Web experience	Valence	Business type
COMMT	0.842													
INTEN	0.757	0.980												
TRUST	0.612	0.652	0.854											
SATIS	0.724	0.795	0.774	0.900										
ALTER	-0.610	-0.628	-0.504	-0.648	0.906									
INVES	0.577	0.440	0.237	0.332	-0.367	0.825								
COMMU	0.505	0.504	0.682	0.627	-0.320	0.294	n.a.							
OPPOR	-0.473	-0.608	-0.719	-0.650	0.474	-0.115	-0.553	n.a.						
Gender	-0.017	0.081	0.019	0.033	0.019	-0.066	0.093	-0.085	n.a.					
Age	-0.046	-0.114	-0.081	-0.072	0.057	0.008	-0.137	0.076	0.021	n.a.				
Computer experience	0.032	-0.054	0.029	-0.032	-0.021	0.005	0.025	-0.032	0.012	0.164	n.a.			
Web experience	0.461	0.465	0.351	0.488	-0.314	0.434	0.279	-0.257	-0.253	0.080	0.009	n.a.		
Valence	-0.614	-0.679	-0.590	-0.809	0.600	-0.267	-0.487	0.528	0.005	0.005	0.005	-0.474	n.a.	
Business type	-0.055	-0.119	-0.103	-0.083	-0.038	0.045	-0.087	0.087	-0.121	-0.080	0.030	0.113	0.043	n.a.

Table 4. Inter-Construct Correlation.

Notes: Square root of average variance extracted (AVE) of reflective scale is shown on the diagonal of the matrix. Inter-construct correlation is shown off the diagonal. n.a.: not applicable to formative scale and single-item scale.

	COMMU1	COMMU2	COMMU3	COMMU4	COMMU5	OPPOR1	OPPOR2	OPPOR3	OPPOR4
COMMU1	1.000								
COMMU2	0.740**	1.000							
COMMU3	-0.236**	-0.284**	1.000						
COMMU4	0.633**	0.530**	-0.173**	1.000					
COMMU5	0.246**	0.236**	-0.106	0.372**	1.000				
OPPOR1	-0.286**	-0.313**	0.256**	-0.166*	0.078	1.000			
OPPOR2	-0.318**	-0.448**	0.354**	-0.257**	0.002	0.595**	1.000		
OPPOR3	-0.459**	-0.515**	0.317**	-0.354**	-0.105	0.488**	0.627**	1.000	
OPPOR4	-0.370**	-0.460**	0.265**	-0.298**	-0.073	0.533**	0.642**	0.646**	1.000

Table 5. Correlation of Formative Scales

** Correlation is significant at the 0.01 level. * Correlation is significant at the 0.05 level.

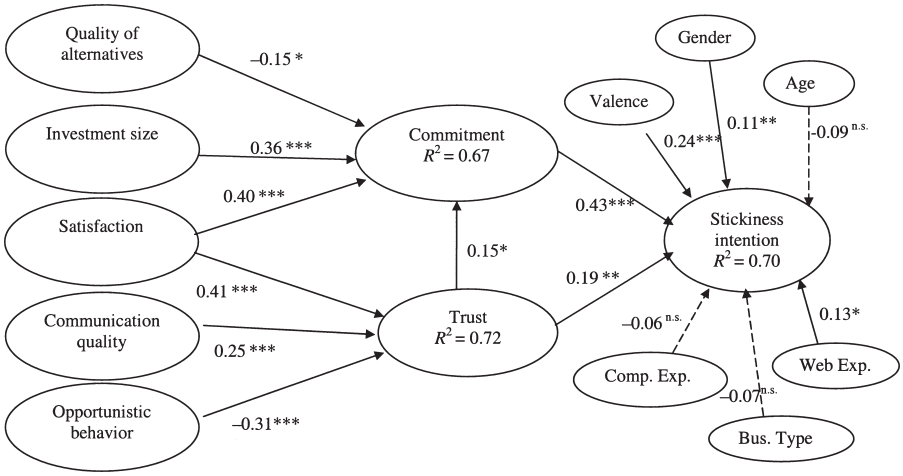

Figure 2. Hypotheses Testing: The Full Sample
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, n.s. = nonsignificant.

Hypothesis Testing

The Full Sample

The full sample was used to test the research hypotheses. The results are shown in Figure 2. The research model explained 70 percent of the variance in stickiness intention. Assessing the results in terms of paths, all the hypotheses were supported. First, commitment (coefficient = 0.43, $p < 0.001$) and trust (coefficient = 0.19, $p < 0.01$) had significant effects on stickiness intention. Thus, H1 and H2 were supported. Second, commitment was significantly associated with trust (coefficient = 0.15, $p < 0.05$), quality of alternatives (coefficient = –0.15, $p < 0.05$), investment size (coefficient = 0.36, $p < 0.001$), and satisfaction (coefficient = 0.40, $p < 0.001$). Thus, H3, H4, H5, and H6 were supported, and 67 percent of the variance of commitment was explained. Third, satisfaction (coefficient = 0.41, $p < 0.001$), communication quality (coefficient = 0.25, $p < 0.001$), and opportunistic behavior (coefficient = –0.31, $p < 0.001$) had significant effects on trust, explaining 72 percent of the variance. Thus, H7, H8, and H9 were supported.

Considering the control variables, valence (coefficient = 0.24, $p < 0.001$), gender (coefficient = 0.11, $p < 0.01$), and web experience (coefficient = 0.13, $p < 0.05$) had significant effects on stickiness intention. Age, computer experience, and business type of the Web site were not significant.

A model without the control variables was tested to examine the sole effects of commitment and trust on stickiness intention. The results of running this model were similar to those reported above, except for the values of two path coefficients (coefficient = 0.57, $p < 0.001$; coefficient = 0.30, $p < 0.001$) and the variance in stickiness intention explained (63%). The results are not shown here because of the length limits for this paper.

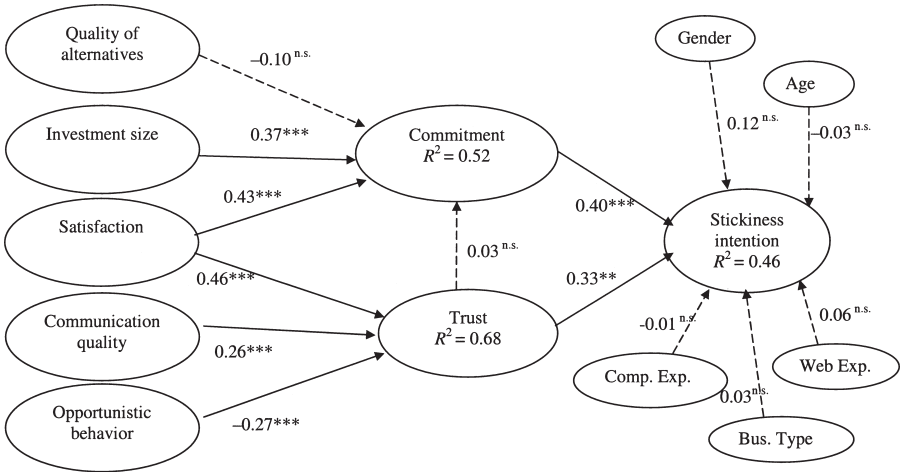

Figure 3. The Moderating Effect: Liked Group
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, n.s. = nonsignificant.

The Split Sample: Liked Group vs. Disliked Group

The test of the moderating effect of valence followed two steps. First, the full sample was split into two groups (liked and disliked), and each was tested separately. The results are shown in Figures 3 and 4. Second, the coefficients of the corresponding paths from the two separate models were compared. Following the approach suggested by Keil et al. [44], the significance of the coefficient difference was tested. As shown in Table 6, all the corresponding path coefficients from the two groups were significantly different at the 0.05 level. It seems obvious, therefore, that valence had a significant moderating effect on the research hypotheses.

Discussion

This study has investigated the role of relationship factors (i.e., commitment, trust, and their antecedent factors) on intention to stick to a Web site. The causal paths specified in the research model were all supported in the full sample and partially supported in the two groups (liked group and disliked group).

Commitment (H1) and trust (H2) were found to be significantly associated with stickiness intention, explaining 63 percent of the variance after the effects of control variables were removed. The 63 percent variance in stickiness intention explained by commitment and trust is similar to the 64 percent explained by TAM, trust, risk, and reputation [68], the 61 percent explained by TAM and trust [32], the 59 percent explained by trust, risk, service quality, and switching costs [30], and the 55 percent explained by TAM and flow [50]. This percentage was also much higher than the 41 percent of variance ex-

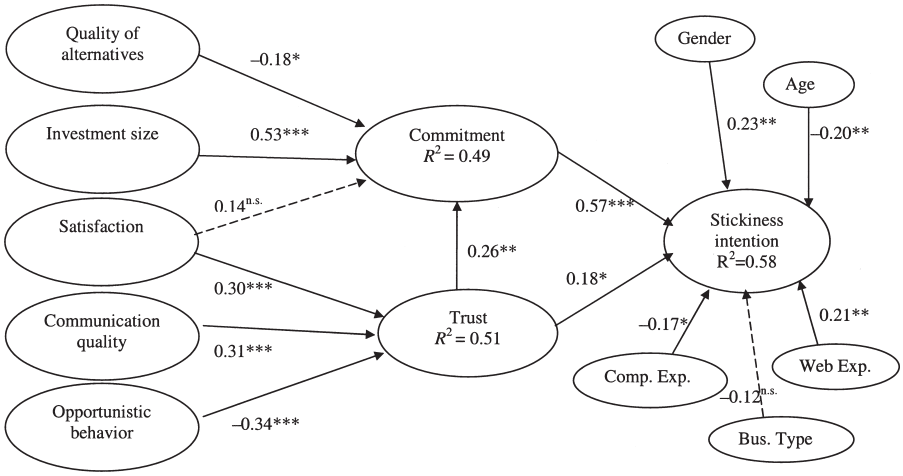

Figure 4. The Moderating Effect: Disliked Group

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, n.s. = nonsignificant.

	Path coefficient			
Hypothesis	**Full sample**	**Liked group**	**Disliked group**	**Difference**
H1	0.43***	0.40***	0.57***	0.17***
H2	0.19**	0.33**	0.18*	-0.15***
H3	0.15*	0.03 n.s.	0.26**	0.23***
H4	-0.15*	-0.10 n.s.	-0.18*	-0.08*
H5	0.36***	0.37***	0.53***	0.16***
H6	0.40***	0.43***	0.14 n.s.	-0.29***
H7	0.41***	0.46***	0.30***	-0.16***
H8	0.25***	0.26***	0.31***	0.05*
H9	-0.31***	-0.27***	-0.34***	-0.07*

Table 6. Hypotheses Test and Moderating Effect.

*$p < 0.05$. **$p < 0.01$. ***$p < 0.001$. n.s. = nonsignificant

plained by PU and satisfaction [11], the 31 percent explained by trust and familiarity [12], and the 20 percent explained by TAM [31].

The explanatory power of commitment (0.43 and 0.57 with and without control variables included, respectively) on stickiness intention was at least twice the power of trust (0.19 and 0.30, respectively). This finding is consistent with previous studies, in which the effect of trust seems less important than other included antecedents of behavioral intention. For example, in past studies the effect of trust was lower than the effects of PU, risk, reputation, attitude, and familiarity [12, 32, 68, 85]. In addition, the significant positive association between commitment and trust (H3) suggests that trust also has an indirect effect on stickiness intention, which is consistent with previous studies (e.g., [62, 90, 91]).

Trust (H3), perceived quality of alternative Web sites (H4), investment size (H5), and satisfaction (H6) explained 67 percent of the variance in commitment. Perceived quality of alternative Web sites (–0.15) and trust (0.15) seem to be less important than investment size (0.36) and satisfaction (0.40). H4 suggests that a Web site user's awareness of the quality and availability of alternative Web sites will reduce commitment to the present Web site. This finding provides some of the first empirical evidence for the cognitive limitation proposition explaining consumer loyalty [80], which means that committed Web site users may not be aware of alternative competing Web sites even though there may be many available. The study also found that investment in the present Web had a significant effect on commitment (H5), again consistent with previous studies [15, 30]. Although on-line switching costs are predictably lower than in traditional contexts, this study suggests that users still value the sunk costs they have placed in a current Web site and the potential switching costs when they decide whether to stick to a Web site or switch to another.

Trust was found to be significantly influenced by the quality of the communication between Web site users and the vendor (H8) and the opportunistic behavior of the Web site vendor (H9), consistent with the findings in other types of relationships [62, 91]. In evaluating a Web site vendor's trustworthiness, Web site users seem to be concerned with whether the vendor can communicate with them effectively. In the present study, communication quality was significantly predicted by timeliness (Item 1 and Item 2), suggesting that timeliness is a very important aspect of the communication with consumers. Further, the results showed that a vendor's opportunistic behavior, such as altering the facts slightly (e.g., violating privacy policy) (Item 1), delaying the delivery of products and services (Item 3), or breaking a service-level agreement (Item 4), can reduce or destroy Web site users' trust beliefs toward the vendor. Users would then reduce or stop their use of the Web site.

The significance of the several control variables is also important. The effect of valence on intention (0.24) was higher than the direct effect of trust (0.19), suggesting the importance of affect toward the Web site in the individual's experience. However, the total effect of trust (0.26 = 0.19 [direct effect] + 0.43 * 0.15 [indirect effect]) was similar to the effect of valence. Further, gender and experience with the evaluated Web site had impacts on the individual's intention to stick with the Web site. The effects of these factors were not significant for the liked group but were for the disliked group. The effect of business type of the Web site was not significant in the full sample or either of the two groups, indicating that the industry in which a Web site resides had no impact on stickiness.

These results suggest that the impact of the demographic profiles of Web site users is very complex. Therefore, it is necessary to note several additional demographic findings concerning the disliked group's stickiness that were consistent with previous studies [41]. First, females were more likely to express stickiness intention, which is consistent with the proposition that females are more relational [20]. Second, the more experienced in terms of age and years of experience with computers, the more likely a user is to discontinue use of the current Web site. Finally, the experience of users in this group with the evaluated Web site was positively associated with stickiness.

Conclusions

The study described in this paper developed and tested a research model of Web site users' stickiness intention. The factors influencing stickiness intention were explored. A different perspective was provided from which to understand the continuous patronage of a Web site by individual users. Before discussing the research and practical implications of the study's results, it is necessary to mention several limitations of the study.

Limitations

The first limitation is that the study positioned and measured commitment and trust as unidimensional concepts, although studies from other disciplines recognize these two concepts as multidimensional. For example, the multidimensional aspects of trust have been discussed and tested in previous IS literature [32]. Commitment is also multidimensional in that it comprises affective, calculative, and normative dimensions. Future studies could investigate how different dimensions of these two concepts affect stickiness. The second limitation, deriving from the specially defined and selected student sample, concerns external validity. College students are the typical segment of users for diffusion of innovation research, but they may behave differently than organizational employees and other Internet users. Thus, the generalizability of the findings may be limited. Third, participants were allowed to use a variety of Web sites rather than a single site, and the distinctive features of the various sites may have influenced their perceptions and attitudes. However, the effect of business type of the Web site in the research model was controlled. The type of Web site was found to have no significant effect. Future studies could examine users from a single Web site to remove the effects of the differences between Web sites. Fourth, the study used only a survey with respondents' subjective measures to collect data. Thus, it assumed that each respondent provided reliable answers concerning the constructs in the model. All the potential problems with the survey method could have affected the study's findings. The final limitation results from the nature of a cross-sectional study. Longitudinal studies provide stronger methodological support for explorations of the causality of constructs in a model.

Implications for Research

This study has presented conceptual development and an empirical validation of Web site stickiness from the user's perspective. It contributes to the literature in several ways. First, the study makes a theoretical contribution by developing a research model anchored in the investment model and commitment-trust theory [62, 76]. Instead of depending upon available theories and models, such as the theory of reasoned action (TRA), the theory of planned behavior (TPB), or TAM, the model emphasizes the relational perspective of the interactions between Web sites and users [3, 22, 26]. The relational view

was found to be a plausible approach for investigating on-line consumer behavior. The study findings also contribute to the literature on interpersonal relationships and business relationships by providing empirical support for the application of commitment and trust in on-line B2C relationships [62, 78]. As in the traditional interpersonal and business contexts, commitment and trust were found to be significant in explaining individuals' intentions to stick with Web sites.

Second, the model provides explanatory power for explaining behavioral intention (63% of the variance explained by commitment and trust only) comparable to TRA, TPB, TAM, and other theories reviewed and compared by Venkatesh et al. [88]. With only two predictors for stickiness intention, the parsimony of the model is the same as or better than the above-mentioned theories. However, the research model has an important potential limitation, due to one of its underlying assumptions. Developing a relational orientation from individual users to a Web site takes time [55, 83]. Thus, the model may not be applicable to every stage of a user's interaction with a Web site. It may have less explanatory power in the initial stage of Web site use, although recent findings suggest that trust can develop quickly [60]. Future studies could examine the research model in both initial use and later use. Comparing users' pre-acceptance perceptions and post-acceptance perceptions might reveal more about the dynamics of commitment and trust.

Third, the model could be tested in other contexts with other types of information technologies. The current empirical study should be followed by using the model to investigate post-adoption behavior and continuous use of other types of IT. The two core constructs (commitment and trust) have been investigated extensively in the traditional B2B markets. It would be interesting to test the effects of these two factors in the on-line B2B environment. In the emerging consumer-to-consumer market, especially the on-line auction market, the relationship between buyer and seller may also be aligned to interpersonal relationships or business relationships and thus may be explained by the model. Previous human–computer interaction studies suggest that there are social interactions between computers and users [61, 72]. It would be useful to examine the model in users' interactions with off-line information systems either in a business environment or for home use. Since the constructs in the model are quite general, the model may help explain the relationship between IS professionals (e.g., system analysts) and end-users in the development process of an IS.

Fourth, unlike trust, which has drawn extensive attention from the research community because of its significant role in the e-commerce environment, commitment has not been fully investigated in on-line business relationships and IS implementation research [43, 64]. Perhaps a sense of commitment could be developed in the IS implementation process or innovation diffusion process [18, 75] . That is, future use of an IS is bounded by previous use of the IS and the beliefs and attitudes developed from previous use [79]. Future studies could investigate the role of commitment in technology use.

Finally, the antecedent factors of commitment and trust deserve further investigation. The effect of switching costs on on-line consumer and user be-

havior has been investigated recently [15]. However, how sunk costs and switching costs affect users is not known. Moreover, so far as can be determined, the present study is the first to investigate the effect of the quality of alternatives on use of Web sites. Integrating the effect of rival Web sites into the research model has broadened the understanding of technology use. The quality of alternatives may also be an important factor in the adoption and use of other general information technologies. The current understanding of how competing information technologies influence adoption and use of technology is inadequate. Previous experience with competing technologies is very important in individuals' adoption and use of the present technology. Future studies could investigate how users make adoption decisions when competing technologies are presented to them.

Implications for Practice

From a practical standpoint, the findings of this study will be helpful to Web site vendors. Switching costs on the Web are low, but vendors may nonetheless be able to retain customers if they take advantage of factors important to social relationships (commitment and trust). Often, however, vendors do not apply the concept of relational marketing, and some companies still follow the transactional view [19]. Web site vendors also need to pay special attention to the demographic information of those who do not like their Web sites. Male users and experienced users are especially likely to discontinue Web site use.

Although there is not much a vendor can do about the quality of its competition, encouraging consumers to increase their investments in a Web site will increase their commitment to the site and their intention to stick with it. Consumers' investments can be increased through personalization mechanisms that encourage them to enter personal data (a process they will not want to duplicate at many competing sites) and by enticing them to learn routines for processing transactions that are not easily transferable to competitors' sites. In addition to emphasizing technical features, such as system quality and service quality, Web site vendors need to minimize opportunistic behavior, such as slow response and disclosure of customer information, to improve Web site users' trust.

For the practice of human-computer interface design, this study shows that effective communication efforts by the business can improve the mutual understanding with consumers and thus improve their trust beliefs. A company may improve its on-line communication capability by utilizing available design features, such as customization, personalization, and interactivity, to collect, track, and update consumer profiles. These features may help in conducting relational communications, a very important factor in the development of on-line B2C relationships. Businesses also need to consider formal and informal ways to contact consumers from time to time.

In summary, this study has provided new theoretical and practical findings concerning the propensity of Internet users to stick to Web sites. Future studies will develop additional insights into this critical area of research.

NOTE

1. Whether a Web site is a pure virtual store or also has a physical presence is not critical. Previous empirical studies pooled Web sites with and without physical stores [7, 32, 68]. For example, Gefen, Karahanna, and Straub pooled amazon.com and bn.com in a survey of customers of bookstores [32]. Balasubramanian, Kohana, and Menon surveyed members of the American Association of Individual Investors (AAII) and included both purely on-line and hybrid brokers [7].

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Appendix A. Measurement Items

Scale	Item	Adapted from
Stickiness Intention (INTEN)	1. I plan to keep using this Web site in the future. 2. I intend to continue using this Web site in the future. 3. I expect my use of this Web site to continue in the future.	[1]
Commitment (COMMT)	1. I want this Web site to be available for a long time. 2. I am committed to this Web site. 3. I will not feel very upset if this Web site were to disappear in the future. 4. I feel attached to this Web site. 5. I am oriented toward the long-term future of this Web site.	[77]
Trust (TRUST)	In your relationship with the Web site, the Web site 1. cannot be trusted at times. 2. can be counted on. 3. has my confidence. 4. has high integrity. 5. is honest.	[62, 91]
Quality of Alternatives (ALTER)	1. An alternative Web site is appealing. 2. An alternative Web site is better than this Web site. 3. To my knowledge, another Web site is close to ideal. 4. An alternative Web site is attractive to me. 5. My needs could easily be fulfilled by an alternative Web site.	[77]
Investment Size (INVES)	1. I have put much time into using this Web site. 2. Many aspects of my life have become linked to this Web site. 3. I have invested a lot in learning how to use this Web site. 4. The time I have spent on this Web site is significant. 5. Compared to other Web sites, I have spent a lot of effort using this Web site.	[77]
Satisfaction (SATIS)	1. I feel satisfied with this Web site. 2. My experience with this Web site is very pleasing. 3. This Web site makes me frustrated. 4. This Web site makes me happy. 5. This Web site does a satisfactory job of fulfilling my needs.	[77]
Communication Quality (COMMU)	In the relationship with the Web site, the Web site 1. keeps me informed of new developments. 2. provides me with timely information. 3. hesitates to give me too much information. 4. frequently informs me of opportunities. 5. seeks my advice concerning its marketing efforts.	[62, 91]
Opportunistic Behavior (OPPOR)	In the relationship with the Web site, the Web site 1. alters the facts slightly. 2. promises to do things without actually doing them later. 3. fails to provide me with the support that it is obliged to provide. 4. breaks formal or informal agreements to its own benefit.	[62, 91]

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