New Media & Society

Commercial markets as communication markets: uncertainty reduction through mediated information exchange in online auctions

Additional services and information for *New Media & Society* can be found at:

Email Alerts: http://nms.sagepub.com/cgi/alerts

Subscriptions: http://nms.sagepub.com/subscriptions

Reprints: http://www.sagepub.com/journalsReprints.nav

Permissions: http://www.sagepub.com/journalsPermissions.nav

Citations (this article cites 26 articles hosted on the
SAGE Journals Online and HighWire Press platforms):
http://nms.sagepub.com/cgi/content/abstract/9/3/401#BIBL

ARTICLE

Commercial markets as communication markets: uncertainty reduction through mediated information exchange in online auctions

ANDREW J. FLANAGIN
University of California at Santa Barbara, USA

Abstract

This research conceptualizes behaviors in online commercial transactions as communication acts intended to reduce uncertainty between interactants. Uncertainty reduction theory and predicted outcome value theory are used to contextualize individuals' motivations and behaviors in the risky and uncertain environment of online consumer-to-consumer (C2C) auctions. Data from 6477 randomly-selected auctions conducted over eBay.com indicate that more commodity information leads to more, and higher, final bids; higher seller reputation results in fewer bids for less money; and greater system security features result in fewer bids. Additionally, holding item type constant, much more variance in final bid price and bid activity can be explained by these factors as item value increases, although important differences in the direction of relations emerge as well. Based on these findings, current theoretical perspectives on uncertainty reduction are extended to the environment of computer-mediated communication and interpretations are offered to explain individuals' behaviors in initial encounters in online auctions.

As the means and forms of computer-mediated communication
(CMC) proliferate, so too do relationships online between individuals.
Paramount to the success of these relationships is the efficient exchange of
relevant personal information among interactants. Yet, several early
perspectives on CMC argue that technological characteristics inhibit
individuals' capacity to exchange information effectively (see Culnan and
Markus, 1987 and Walther, 1996 for reviews). Moreover, most current
perspectives consider only the direct and explicit interaction between
individuals in CMC environments. However, just as CMC environments
potentially can support rich communication in spite of potentially reduced
cues, they also have the capacity to provide novel means for individuals to
exchange important relational information indirectly. These capabilities
remain underexamined by extant CMC research.

Various mechanisms of interpersonal information exchange via
contemporary media offer substantial opportunities for the development of
online relationships (Ramirez et al., 2002; Tidwell and Walther, 2002). In
addition, although direct interaction is emphasized in the study of most
face-to-face (F2F) and CMC environments, the efficient exchange of
information becomes particularly important in situations where direct
communication between individuals is unwieldy, non-normative, or
otherwise problematic. This research extends these two relatively new CMC
concerns by considering indirect online information exchange in the context
of consumer-to-consumer (C2C) commercial endeavors.

This intersection is examined by considering initial online commercial
interactions in terms of the indirect exchange of relevant information, which
is framed as a communication act intended to reduce uncertainty between
interactants. To do so, C2C commercial transactions are conceived as high
uncertainty encounters involving substantial risk. Uncertainty reduction
theory (Berger, 1979; Berger and Calabrese, 1975) and predicted outcome
value theory (Sunnafrank, 1986a, 1990) are used to contextualize individuals'
motivations and behaviors in this risky environment. Through their
application, commercial markets are explored in terms of their utility as
communication markets and hypotheses are formed that interpret
individual behaviors in this domain. Users' behavioral data from a popular
online auction site are used to test these hypotheses and conclusions are
drawn that extend current theoretical perspectives on uncertainty reduction
to the CMC environment.

C2C COMMERCIAL TRANSACTIONS AS HIGH-UNCERTAINTY ENCOUNTERS

In C2C e-commerce transactions individuals conduct business directly with one another, typically with the aid of a third party acting as a communication intermediary who does not guarantee the transaction or vouch for the interactants. In essence, C2C commercial transactions entail recurrent initial encounters among strangers who are at significant risk, given the financial and psychological costs of failed transactions and the relative lack of relevant, available information. Thus, engaging in C2C e-commerce requires that at least one party takes a substantial risk and invests trust in someone about whom little is known.

Nonetheless, C2C e-commerce is burgeoning, primarily in the form of online auctions. Leading online auction sites such as eBay (www.ebay.com) report that approximately 500,000 items are sold daily, resulting in more than 170 million annual transactions where individuals exchange nearly $15 billion worth of merchandise (Adler, 2002; eBay, 2003). C2C online auctions enable individuals to assume the roles of seller or buyer easily, which may be performed by the same individual at the same time (although not in the same auction; for overviews of various online auction models, issues and differences between online and live F2F auctions, see Adelaar, 2000; Lucking-Reiley, 1999; Yokoo and Fujita, 2001). A seller places a commodity up for auction for a set time period (usually a week or so) by submitting basic auction information: product description, payment terms, auction length and an optional, undisclosed minimum reserve price. By viewing this information on the web, interested buyers can bid on the item at their convenience within the auction period. Buyers' and sellers' names are concealed through 'user IDs' and bids increase in set increments until the end of the designated auction time when, assuming that any reserve price has been met, the highest bidder agrees to purchase the item. The logistics of item payment and exchange are then left to the high bidder and the item's initial owner, although it is almost universal that payment must be rendered and confirmed prior to item delivery.

One striking difference between traditional F2F auctions and e-commerce auctions is that a potential buyer has no opportunity to inspect the commodity or meet the seller before entering into the transaction. To reduce some of the uncertainty inherent in this venue, many auctions have descriptions and pictures of the item available to potential bidders. eBay also features a means of feedback by which users can describe their experience with another user at the completion of the commercial transaction. This feedback is calculated to derive a user rating score, which is shown next to the user ID in all auctions for both buyers and sellers.

In this manner, online auctions create a highly risky environment for users, which is mitigated to a degree by features designed to reduce this uncertainty

and promote greater trust among parties (Brinkman and Siefert, 2001). Using this system, auction sites such as eBay have proven to be extremely popular and successful (Adler, 2002). Framed as high-risk, uncertain encounters, individual behaviors in C2C e-commerce transactions can be illuminated by theories that address uncertainty reduction and the perceived outcome values of interactions with previously unknown others, as outlined next.

RELATIONAL INFORMATION AND UNCERTAINTY REDUCTION

Uncertainty reduction theory (Berger, 1979; Berger and Calabrese, 1975) explains the manner in which individuals reduce the uncertainty inherent in new relationships by specifying the interaction rituals that people develop to cope with this recurring situation. According to uncertainty reduction theory, because people are unable to control or predict relationships with certainty at their outset, they attempt to reduce the anxiety that this causes by seeking information that functionally reduces the uncertainty.

Berger (1979) specifies three strategies to alleviate the uncertainty of initial encounters between individuals. Passive strategies (e.g. social comparison) rely on unobtrusive observation, where uncertainty is reduced by witnessing behaviors and drawing conclusions based on the observation of an individual's actions. Active strategies (e.g. seeking relevant information directly from others) differ from passive strategies in that they require individuals to exert some type of effort to obtain uncertainty-reducing information. Finally, interactive strategies (e.g. verbal interrogation) require that individuals engage in some form of direct contact with one another.

To reduce uncertainty individuals will be especially attentive to others' behaviors when there is high 'incentive value' that could benefit them by some type of reward available from another person. In Berger's assessment,

> efforts will be made to find out more about the person with high incentive value so that the perceiver can develop strategies for obtaining rewards from him. As perceived reward value of a person increases, the perceiver will increase his level of monitoring of the other's communicative behaviour. (1979: 128)

Thus, when important rewards are at stake, motivations to reduce uncertainty are especially pronounced and can result in increased monitoring efforts.

Predicted outcome value theory (Sunnafrank, 1986a, 1986b, 1990) emphasizes the behavioral element of relations, arguing that increasing positive relational outcomes is the primary goal of interpersonal relationships rather than uncertainty reduction. In this view, uncertainty reduction is conceived as a means by which individuals can predict future relational outcomes accurately, thus maximizing their 'outcome value'. According to Sunnafrank, 'uncertainty-reduction efforts . . . result from individuals' desires to maximize relational outcomes' (1986a: 12). Thus, Sunnafrank suggests that

the predicted outcome value of a relationship is the key to understanding initial encounters between strangers.

Although uncertainty reduction theory and predicted outcome value theory differ in their conceptualization of the role of uncertainty reduction in initial interpersonal encounters, both perspectives recognize that when others have something of value, individuals will pursue the relationship and relevant information in order to attain potential rewards. In predicted outcome value theory, the prediction of future outcome values is framed as the key reason for pursuing relational growth (Sunnafrank, 1986b), whereas in uncertainty reduction theory outcome values are viewed as equally important to relationship development as uncertainty reduction, which operates independent of outcome values (Berger, 1986). Regardless of this difference, both views suggest that reducing uncertainty in initial encounters is crucial, either for goal maximization or due to high incentive value. Thus understood, uncertainty reduction theory and predicted outcome value theory can be applied profitably to C2C commercial transactions, in order to interpret individual attitudes and behaviors in the relatively high-risk, initial interpersonal encounters endemic to such situations.

UNCERTAINTY REDUCTION, OUTCOME VALUE, AND MEDIATED INFORMATION EXCHANGE IN C2C COMMERCIAL TRANSACTIONS

Recent views of CMC note that contemporary media can promote effective online relationships, often in innovative ways (Ramirez et al., 2002; Tidwell and Walther, 2002). Particularly when direct communication between individuals is challenging or problematic, alternative forms of communication become crucial. In online venues such as C2C auctions, where communication is constrained by technical and normative forces, CMC has the capacity to provide novel means for individuals to exchange important relational information indirectly. Accordingly, commercial markets can be viewed simultaneously as *communication markets* in which relevant relational information is exchanged effectively among interactants. This perspective extends the traditional view of CMC beyond direct and explicit point-to-point interaction between individuals, and highlights alternative communication strategies that guide interpersonal interaction in reduced-cues environments.

Viewed in this way, uncertainty reduction theory and predicted outcome value theory provide a framework within which to understand individuals' initial interactions in the context of online auctions.[1] Due to the goal-oriented nature of C2C e-commerce, which involves substantial financial and psychological risk, incentive value and outcome maximization assume a primary role in this environment. Noting this motivational dimension of information-seeking, Kellermann and Reynolds argue that 'wanting knowledge rather than lacking knowledge is what promotes information-seeking in initial

405

encounters with others' (1990: 71). One outcome of this, consistent with uncertainty reduction theory and predicted outcome value theory, is that individuals are likely to focus heavily on obtaining information that is relevant to behavioral uncertainty reduction in order to reduce risk by increasing trust.

Trust, or the 'perception of the degree to which an exchange partner will fulfill the transactional obligations in situations characterized by risk or uncertainty' (Bailey et al., 2003: 312–13) is crucial for computer-mediated transactions among strangers. Boyd acknowledges this transactional view of trust, arguing that 'trust is so greatly influenced by experience that the real and quintessential challenge . . . is in prompting first-time trusting behavior'. Accordingly, he notes that 'the online trust situation is particularly difficult' (2003: 401).

Nonetheless, by examining the use of CMC for social information–sharing through the lens of uncertainty reduction theory, Ramirez et al. (2002) specify a number of strategies to reduce the uncertainty inherent in online encounters. For example, passive strategies include 'lurking' in chatrooms or being 'blind copied' on email messages. Active strategies involve means of indirect information–gathering such as webpage scanning and inquiries of third–parties through email as means of reaching those familiar with the target of the inquiry. However, as Ramirez et al. note, the relatively sparse social networks of CMC, as compared to F2F environments, limit the effectiveness of third–party inquiries. They also added the active strategy of 'extraction' performed by search engine or other queries that yield information about a subject via data on the web. Finally, interactive strategies for uncertainty reduction in CMC entail direct interaction between individuals, via electronic communication technologies.

Not all of these strategies are prominent when considering uncertainty reduction strategies in C2C online auctions. Compared with other forms of CMC (and especially with F2F interactions), initial encounters in C2C auctions are significantly more constrained in the potential range of options available to participants and in the means and nature of interaction. Consequently, as demonstrated by several theories of CMC (e.g. the Social Identity Model of Deindividual Effects (SIDE) model, Spears and Lea, 1992, 1994; the social information–processing view, Walther, 1992; and the 'hyperpersonal' perspective, Walther, 1996), what few cues are available become particularly salient and important in forming attitudes and determining behaviors. These cues may originate from many sources in computer-mediated exchange and can be communicated effectively online among individuals.

With regard to C2C auctions, several communication strategies exist that may serve to reduce uncertainty between users in their early encounters. For example, Bailey et al. (2003) note that user feedback profiles, user achievement awards and other information, third–party payment options and insurance, member tenure data, and product descriptions can reduce uncertainty and increase trust in unknown others in auction transactions.

In addition, it is possible to obtain email addresses in most online auctions that enable direct contact between parties prior to bidding, although time constraints and other factors suggest that this strategy is rarely used. Although some of these uncertainty reduction strategies are easily classified (e.g. clearly, emailing another user is interactive), others are not as clearly specified (e.g. feedback profiles may be primarily active or passive, depending on their specific instantiation)[2], suggesting a continuum of uncertainty reduction strategies online rather than discrete categories.

Thus, in online auctions people are viewed primarily in terms of their incentive value, and uncertainty reduction efforts are used primarily as a means of maximizing outcome value. Moreover, the ability to predict behavioral outcomes accurately is crucial to determining whether to engage in the risky endeavor of C2C e-commerce. Participating in transactions is rational under conditions of sufficiently high incentive value, coupled with sufficiently low risk. Risk can be mitigated by the reduction of uncertainty, achieved through indirect information exchange among interactants, resulting in increased trust. Such mitigation is imperative in C2C e-commerce, since 'the antidote to perceived risk is trust and transactions on the Internet are rife with perceived risk' (Boyd, 2003: 392; see also Brinkman and Siefert, 2001).

Overall, the myriad strategies for uncertainty reduction in online auctions suggest distinct types of trust germane to C2C online auctions. For example, research has shown that risk may be reduced by relevant commodity information (Roselius, 1971; Shimp and Bearden, 1982; Tan, 1999); through vicarious experience which may serve as the basis of personal trust (Boyd, 2003); and from system or structural features which serve to bolster trust in parties by means of external assurances (Bailey et al., 2003; Boyd, 2003). Thus, commodity trust, personal trust, and system trust all may be present through information available in C2C auctions and, if achieved, should logically result in specific auction outcomes.

Commodity trust: reducing commodity uncertainty

Research has demonstrated that consumers reduce risk and develop trust in consumer decision-making through 'risk relievers', or the methods by which people obtain relevant information about commodities (Roselius, 1971; Shimp and Bearden, 1982; Tan, 1999). Recognized brand name, endorsements or reference groups, product warranties, and the involvement of trusted third parties have been shown to help consumers to develop commodity trust (Roselius, 1971; Shimp and Bearden, 1982). Shimp and Bearden (1982), for example, found that consumers rely on product usage experience or word-of-mouth assurances to reduce the level of risk associated with product purchases (see also Roselius, 1971).

However, as already noted, many of the risk relievers available to consumers in traditional commercial transactions are typically absent in online auctions.

Consequently, people engaging in C2C auction transactions are likely to attend heavily to what product information is available. Thus, consistent with uncertainty reduction theory and predicted outcome value theory formulations, product information can result in presumptions on which trust can be founded in online transactions (Bailey et al., 2003). In this manner, elevated trust, resulting from the existence of commodity information, should have an attendant outcome effect on buyer behaviors in C2C auctions such that bid price and bid activity increase, as proposed in Hypothesis 1:

> H1$_{a-b}$: Auctions that offer more information about the commodity for sale will have: (a) a higher final bid price; and (b) a greater number of bids.

Personal trust: reducing seller uncertainty

Just as more information about the product may relieve a buyer's perceived risk, so too may increased information about the seller. Personal trust is developed as a result of feedback mechanisms that enable members of a user community to share their collective experiences (see Boyd, 2002 for a related argument). For example, personal trust in online auctions is gained typically through 'credentialing' behaviors, whereby people are able to share their experiences with the party in question via electronic means with others who might consider entering into future transactions with the target individual. To be most effective, credentialing takes place among those with long-term relationships and the expectation of future interaction, is captured and distributed in a manner that makes feedback visible to others in the future, and is used to guide 'trust decisions' (Resnick et al., 2000). In this manner, 'vicarious experience might even allow for the problem–free experiences of others to become the basis for one's own trusting behavior' (Boyd, 2003: 399). Credentialing is effective due to cheap and effective means of communication. In essence, 'the Internet substitutes a much better distribution of what information there is for the much more limited, but more reliable information of traditional retail markets' (Resnick and Zeckhauser, 2002: 316). Thus, credentialing enables people to reduce uncertainty about others, even in the absence of first-hand experience with them.

Considering web–based auctions specifically, evidence suggests that indicators of positive reputation can result in higher bid prices, more bid activity, items that are more likely to sell, and fewer problematic transactions (Bajari and Hortacsu, 2003; Houser and Wooders, 2000; McDonald and Slawson, 2002; Melnik and Alm, 2002; Resnick and Zeckhauser, 2002; Standifird, 2001) and that indicators of negative reputation can result in lower bid prices or fewer bids (Bajari and Hortacsu, 2003; Brinkman and Siefert, 2001; Lucking–Reiley et al., 2000; Standifird, 2001), although studies have suggested also that the feedback ratings calculated by auction sites such as eBay are sub-optimal (Dellarocas, 2001; Resnick and Zeckhauser, 2002).

Overall, credentialing behaviors in online auctions are an effective means of establishing and sharing reputational information, which can serve to reduce uncertainty, even in initial encounters among strangers. Uncertainty reduction can increase perceived trust, resulting in more auction bids and ultimately higher auction prices. Hypothesis 2 proposes that this relationship is manifested through individual reputation:

> H2$_{a-b}$: Auctions where sellers have a more positive reputation will have:
> (a) a higher final bid price; and (b) a greater number of bids.

System trust: reducing structural uncertainty

Although auction transactions take place between individuals, substantial structural means exist which can legitimate C2C e-commerce. Potential buyers may reduce their uncertainty about initial encounters if they are able to discern structural elements that serve to reduce the risk of engaging in transactions with others about whom little is known. Accordingly, Bailey et al. (2003) note that institutional indicators, such as seals of approval indicating endorsement by credible others, can result in the transfer of trust from an institutional to an exchange partner. Similarly, Boyd (2003) notes that 'institution-based trust' is composed of situational normality and structural assurances. Situational normality rests on the degree to which online transactions can be tailored to resemble similar, offline transactions. Structural assurances engender trust through the establishment of structures and promises designed to demonstrate the stability of a vendor.

Several such mechanisms that sanction or otherwise support transactions are intended to foster trust in e-commerce systems. Examples include the use of logos or other indicators that sellers are endorsed by a legitimate, neutral entity, payment alternatives such as credit cards that carry with them certain legal assurances, and third–party intermediary payment options. For example, PayPal (http://paypal.com/) offers secure payment options for online consumers and 'buyer protection' for eBay auctions, whereby buyers are eligible for free insurance coverage on C2C transactions if items are purchased using funds transferred through PayPal (see also BuySafe at http://www.buysafe.com). Hypothesis 3 recognizes the importance of system trust potentially achieved through structural means:

> H3$_{a-b}$: Auctions that are supported by more secure systems will have: (a) a higher final bid price; and (b) a greater number of bids.

Risk elevation

In online auctions, items of greater value may incur greater risk on the part of the bidder, due to increases in potential losses. Avoiding potential losses may increase incentive or outcome value on the part of bidders. As noted

earlier, uncertainty reduction theory suggests that in early encounters individuals will be especially attentive to others' behaviors when there is high incentive value and that greater efforts will be made to learn more about others under such circumstances. Moreover, monitoring of a person will increase with the perceived reward value of that person. In online auctions, monitoring focuses on the three avenues for gaining trust covered earlier. Thus, Hypothesis 4 proposes increased effects of commodity, personal, and system trust as item value increases, while controlling for item type, which could confound the proposed relationship:

> $H4_{a-b}$: While controlling for item type, the influence of commodity information, seller reputation, and system security on: (a) final bid price; and (b) number of bids will be greater in auctions featuring products of higher value.

METHOD
Sample and procedure

A random sample of auctions from the consumer-to-consumer auction site eBay (http://www.ebay.com) was collected for data analysis in 2002.[3] eBay assigns every auction a unique Uniform Resource Locator (URL), which varies only by a nine to 10-digit number embedded as part of the URL. Each number has a common three-digit prefix (that changes slowly over time as auctions accumulate). Twenty-three current, valid prefixes were determined by examining completed auction item numbers within URLs a few days prior to final data collection. For each of the prefixes, a computer script was used to randomly generate the last six to seven digits 1000 times, resulting in 23,000 numbers which corresponded to recently completed eBay auctions.[4]

In order to garner data from eBay, these randomly generated numbers were used to construct URLs which were utilized to download the webpage of each of the 23,000 randomly-selected auctions. An additional computer script was used to collect the necessary data from each of these pages. Prior to the final data collection the computer scripts were run four times, generating a small sample to test the accuracy of the procedure. Auctions that were not yet completed (those where the data collection date preceded the closing date for bids) and completed auctions with zero bids were not selected, although auctions that did not result in the sale of the product were included in the sample. This strategy yielded 6477 ($N=6477$) auctions which were used to test H1 to H3.

The data to test H4, which held item type constant, were collected during the same period, but from a census of all eBay auctions featuring pre-selected digital cameras that represented different value levels. Data were collected from 87 auctions ($N=87$), for three models of digital cameras. Each camera was described as 'new' in either the auction title or the item description. The 'high-priced' camera was the Fuji FinePix 4900 ($500–$1,000; $N=19$), the

'medium' priced model was the Kodak DX3700 ($200–$300; *N=37)* and the 'low' priced model was the Polaroid Digital Camera 320 (under $100; *N=31)*. The same computer scripts were used to capture and extract relevant data from this sample for analysis.

MEASURES
Commodity information

Information about the commodity was derived as a summative measure of the product pictures and descriptions present in auction listings. Raw scores based on the number of words and the number of pictures in the auction description were measured. These raw scores were calculated into two separate z-scores, the mean of which was used as the measure of commodity information.[5]

Seller reputation

As previously mentioned, eBay users have an opportunity to leave either positive or negative feedback based on their experience of interacting with other users. Seller reputation is calculated as the total positive comments minus the total negative comments from users (multiple ratings by a user are counted only once and neutral comments do not affect the score). This score was taken from each auction webpage.

System security

System security was measured by assessing the existence of a number of system security indicators that are potentially present in eBay auctions. First, some auctions indicate the option of using intermediary trusted third-party payment options (e.g. PayPal; see also Kollock, 1999; Palmer et al., 2000). Second, eBay sponsors two types of 'power seller logos' that may be placed on auction webpages by qualified sellers. The power seller logo is given to those users who 'achieve certain sales performance, maintain 98 percent positive feedback, and embrace the integrity of core eBay community values' (www.eBay.com). Two power seller logos may appear in any auction, one (a small power seller logo) is placed next to the seller's name and the other (more prominent) may appear in the item description. Third, transactions may be paid by credit cards, which carry with them certain legal assurances, if the seller provides this option. The acceptance of credit cards may be indicated either in the auction text or by the presence of a credit card icon. The existence of each of these indicators of system security was measured dichotomously and the mean of these five factors (the power seller logo and credit card indicators provided two options each, as noted) was used as the measure of system security.

411

Dependent variables

Item price was measured as the final bid price in US dollars for the commodity up for auction. The number of bids placed during the auction was collected from the bid history.

Control variables

A number of variables were statistically controlled, based on past research results. Vishwanath and Barnett (2001) found that reserve price auctions in eBay attract the participation of more bidders and increase initial price, final price (see also Gilkeson and Reynolds, 2003; Lucking-Reiley et al., 2000), and bidding intensity. In addition, following Standifird's (2001) study of eBay auctions, the number of days that the auction was open and the day of the week that the auction closed were also controlled in the analyses. The existence of a reserve price was measured dichotomously (where 0=the auction did not have a reserve price and 1=the auction had a reserve price); auction duration was calculated from the opening and closing days of the auction and the total length of the auction was recorded in days; and the day that the auction ended was measured dichotomously (where 0=weekend closing and 1=weekday auction close).

RESULTS
Descriptive analyses

For the 6477 auctions examined in the general sample, the mean final bid price was 42.21 dollars (SD=218.80), the mean auction length was 6.25 days (SD=2.34) and there was an average of 4.11 bids per auction (SD=5.25). Auctions tended to end on a weekday (M=.67, SD=.47) and did not have a reserve price (M=.06, SD=.23). The mean word count in the item description of each auction was 170 (SD=163.46) and there were an average of 5.95 images per auction (SD=8.47). Sellers' mean feedback rating was 1392.86 (SD=4468.51); for buyers the feedback rating was 142.97 (SD=363.81). The mean number of days that sellers had been eBay members was 738.52 (SD=529.31) whereas buyers had been members an average of 767.02 days (SD=761.24). The mean system security score was .27 (SD=.28), signifying that typically between one and two system security indicators were present.

Bid price

$H1_a$ to $H3_a$ proposed that auctions that offer more information about the commodity for sale ($H1_a$), where sellers have a more positive reputation ($H2_a$), and that are supported by more secure systems ($H3_a$) will have higher final bid prices. To assess these hypotheses, a multiple regression analysis was performed with the existence of a reserve price auction, the number of days that the auction was open, and the day of the week that the

auction closed (weekday vs weekend) entered as a single block in order to control for their effects, followed by stepwise entry of commodity information, seller reputation, and system security.[6]

As shown in Table 1, two variables predicted bid prices after controlling for auction length, reserve price auctions and weekday or weekend auction completion (F [5, 6471]$=$294.26, $R^2=$.185, $p<$.001). Together, the control variables explained 14 percent of the variance in final bid price. Commodity information explained an additional 3 percent of the variance and seller reputation an additional 2 percent. Inspection of beta weights supports H1$_a$ but contradicts H2$_a$: although auctions that offer more information about the commodity for sale result in higher bid prices, those where sellers have a more positive reputation end in lower bid prices. There was no support for H3$_a$.

Number of bids

Table 2 shows the results for the analyses of H1$_b$ to H3$_b$, which were analyzed in the same manner and with the same control variables as H1$_a$ to H3$_a$. Three variables predicted the number of bids after controlling for auction length, reserve price auctions and weekday or weekend auction completion

• Table 1   Regression analysis with final bid price as dependent variable

VARIABLES	β	F CHANGE	R^2	R^2 CHANGE
Control variables (block entry)				
Reserve price auction	.336★			
Auction length	−.063★			
Weekday/weekend completion	.014			
		(357.06)★	.142	–
Independent variables				
Commodity information	.226★	211.63★	.169	.027
Seller reputation	−.142★	127.82★	.185	.016

$F=$294.26; $df=$5, 6471; ★$=p<$.001

• Table 2   Regression analysis with number of bids as dependent variable

VARIABLES	β	F CHANGE	R^2	R^2 CHANGE
Control Variables (block entry)				
Reserve price auction	.176★			
Auction length	.208★			
Weekday/weekend completion	−.001			
		(197.62)★	.084	–
Independent variables				
Seller reputation	−.082★	66.52★	.093	.009
System security	−.087★	12.23★	.095	.002
Commodity information	.066★	16.83★	.097	.002

$F=$116.21; $df=$6, 6470; ★$=p<$.001

413

(F [6, 6470]$=$116.21, $R^2=$.097, $p<$.001). Together, the control variables explained 8 percent of the variance in number of bids. Seller reputation explained an additional 1 percent of the variance, and system security and commodity information each explained a very modest amount of additional variance (0.2% each). Although all independent variables were statistically significant, only $H1_b$ was supported: auctions that offer more information about the commodity for sale have more bids, but auctions where sellers have a more positive reputation ($H2_b$) and those that are supported by more secure systems ($H3_b$) actually result in *fewer* bids.

Effects of value

$H4_{a-b}$ proposed that while holding item type constant, the variance explained by commodity information, seller reputation, and system security on final bid price and number of bids would be greater in auctions featuring products of higher value. As previously mentioned, item value was varied by pre-selection of commodities of different value ranges of the same item type. To test the hypothesis, the same multiple regression analyses and control variables were used as in H1 to H3: a separate regression was run for each of the three value levels, for each dependent variable, resulting in six regressions. Table 3 summarizes results for the tests of H4, which was supported. As item value increased, so too did the variance explained by commodity information, seller reputation, and system security, across both final bid price and number of bids.

DISCUSSION

This study examined the indirect exchange of information between strangers by framing behaviors in online commercial transactions as communication acts intended to reduce uncertainty between interactants. Commercial transactions, in the form of online auctions, were conceived as high uncertainty encounters involving substantial risk. Consistent with uncertainty reduction theory (Berger, 1979; Berger and Calabrese, 1975) and predicted outcome value theory (Sunnafrank, 1986a, 1990), it was hypothesized that individuals would focus heavily on obtaining information that is relevant to behavioral uncertainty reduction in order to reduce risk by increasing trust through three avenues: commodity information, seller information, and system security. Moreover, these factors were proposed to have greater impact as risk was elevated, when holding the specific auction commodity constant.

Support for the hypotheses was mixed. The results indicate that more commodity information leads to more, and higher, final bids; higher seller reputation results in fewer bids for less money; and greater system security features result in fewer bids. Additionally, when holding item type constant, much more variance in final bid price and bid activity can be explained by these factors as item value increases, although important differences in the direction of relations emerge as well. Specifically, when assessing low, medium

• Table 3   Summary of regression analysis variance explained results by item value

DEPENDENT VARIABLE=FINAL BID PRICE

Low value item (N=31)	
Variance explained, all control variables	.02
Additional variance explained, independent variables	.00
Total variance explained	.02
Medium value item (N=37)	
Variance explained, all control variables	.30
Additional variance explained, independent variables	
Seller reputation (β=.62)	.23
Total variance explained	.53
High value item (N=19)	
Variance explained, all control variables	.13
Additional variance explained, independent variables	
Seller reputation (β=.63)	.65
Commodity information (β=.50)	.14
Total variance explained	.92

DEPENDENT VARIABLE=NUMBER OF BIDS

Low value item (N=31)	
Variance explained, all control variables	.13
Additional variance explained, independent variables	.00
Total variance explained	.13
Medium value item (N=37)	
Variance explained, all control variables	.11
Additional variance explained, independent variables	
Seller reputation (β=.73)	.31
Total variance explained	.42
High value item (N=19)	
Variance explained, all control variables	.11
Additional variance explained, independent variables	
Seller reputation (β=1.43)	.45
System security (β=−.89)	.15
Commodity information (β=−.43)	.11
Total variance explained	.82

and high-value items of a single, specific type, seller reputation is positively and quite strongly related to bid price and the number of bids for medium and high-value items; commodity information is positively related to bid price but negatively related to number of bids for high-value items; and system security is negatively related to number of bids for high-value items.

Relational information exchange, uncertainty reduction and online auction behavior

Consistent with uncertainty reduction theory and predicted outcome value theory perspectives, more textual and photographic information increases bid

415

price and activity, for the most part. In this manner, commodity information can be viewed as a means by which individuals decrease behavioral uncertainty through passive information-seeking in online auctions. Similarly, when looking only at one type of commodity (i.e. digital cameras), seller ratings are an extremely good predictor of both the final bid price and number of bids. Sellers with higher feedback ratings are much more likely to garner more bids on their goods and to sell them for more money. This is increasingly true for items of greater value, resulting in the tremendously high variance explained (65% for bid price and 45% for number of bids, after controlling for other factors). Again, for these particular auctions, uncertainty reduction appears to be occurring through information exchange about sellers' feedback ratings, which results in greater trust that culminates in higher bid prices and more bidding activity. Moreover, as incentive value increases, so too does monitoring via computer-mediated means, as evidenced by the increased impact of seller reputation. Overall, these results provide evidence for the existence of a communication market in which individuals are able to exchange relevant information effectively in spite of the highly-reduced cues environment of commercial C2C auctions.

However, the results also contradict uncertainty reduction theory and predicted outcome value theory conceptualizations. When assessing eBay auctions overall, higher seller ratings result in fewer auction bids and lower final bid prices. Similarly, greater system security features result in fewer bids and, when assessing one specific item type, system security features and commodity information are related negatively to the total number of bids for high-value items. A limitation of the current study is the lack of qualitative data that would enable a richer assessment of users' interpretations of their uncertainty reduction strategies in online auctions. Absent such perceptual data (e.g. impressions about commodity presentation or the level of desire for the commodity), it is difficult to discern precisely why traditional uncertainty reduction predictions are contradicted. Nonetheless, it is worthwhile to examine plausible explanations that may reconcile partially these supportive and contradictory findings, since they have the potential to provide insight into uncertainty reduction theories as applied to the context of C2C commercial transactions online.

Communication, uncertainty reduction, and two manifestations of eBay

Perceptions of the degree to which eBay is truly a C2C marketplace, as opposed to a business-to-consumer (B2C) sales venue, may moderate the effects of trust factors on buyers' behaviors. Indeed, substantial evidence suggests that eBay has strayed far from its roots as 'the nation's biggest yard sale', an early moniker touted by the company. For example, several auctions feature explicit identification as businesses, hyperlinks to company webpages, and other means to signal organizational affiliations. In addition, the fact that

seller ratings are much higher than buyer ratings, even though buyers have been members for a longer time on average, indicates that sellers are significantly more active eBay participants. Also, seller rating and system security measures are highly positively correlated ($.23$, $p<.001$), suggesting that sellers typically have at least some means in place that are associated often with business transactions (e.g. credit card acceptance). Finally, final bid price and seller rating are negatively correlated ($-.03$, $p<.05$), showing that the most active sellers typically sell low-cost items, which are more likely to be mass-produced commodities sold in large quantities across several auctions. Resnick and Zeckhauser note that their data similarly indicate that 'eBay must be attracting professional sellers who are deliberately acquiring items from other sources in order to sell them on eBay' (2002: 10) – a sentiment echoed by Standifird, who says that 'many of the sellers on eBay represent actual businesses and some even provide links to established web-based store fronts' (2001: 291).

This potential shift in eBay's identity may have an attendant effect on consumer behaviors, and the emergence of the 'professional' eBay seller may partially explain some of the mixed findings in this study. For example, the sale of mass-produced products in large quantities across several auctions may result in market saturation for some items, the result of which would be lower selling prices and fewer bids for more highly-rated sellers. Moreover, buyers may gravitate toward items and sellers that reflect eBay's original intent – connecting individuals who sell personal items that appeal to others. This suggests that shopping behaviors would concentrate on such individuals and on the types of commodities that they would typically offer for sale. The result would be increased bid activity and price for lower rated sellers who tend to lack secure system features for their auctions. However, and consistent with the data from this study, commodity information would become particularly important with less common items in an unknown condition.

The nature of the commodity is also an important factor in interpreting the results from this study, as evidenced for example by the opposite findings obtained for seller reputation depending on whether the analysis focused on a random sample of all eBay auctions or on a single, specific commodity (i.e. digital cameras).[7] In this case, it appears that examining a high-technology product in new condition may elicit the 'storefront' (B2C) dimension of eBay (as opposed to its original 'yard sale' (C2C) dimension), where seller reputation constitutes the main criterion on which consumers base their purchasing behaviors.

Based on these considerations, two manifestations of eBay may exist in the minds of buyers: one featuring truly C2C sales of relatively exclusive items, and another featuring relations comparable to B2C sales of mass-produced or relatively common commodities. Each manifestation, in turn, prompts users to invoke different means to mitigate risk through uncertainty reduction. Importantly, even though this explanation is internally consistent with the

data from this study, it requires qualitative user accounts to establish its validity and, consequently, must be viewed with appropriate caution.

Extension of CMC perspectives to uncertainty reduction in minimal cues environments

The findings from this study demonstrate that individuals actively seek information in initial encounters online as they do face-to-face, and employ a number of strategies using CMC to reduce uncertainty, although online auctions tend to favor those ranging from passive to somewhat active. This information contributes to behavioral uncertainty reduction and privileges outcome maximization, as evidenced by bidding behaviors. In addition, the explanations posited here suggest that uncertainty reduction occurs through slightly different information sources (commodity information, seller reputation, or system security), depending on ancillary information about interactional partners in initial encounters that can be gleaned from online auctions. Specifically, the relative 'professionalness' of sellers and characteristics of the commodity sought indicate that uncertainty reduction operates quite differently depending on these factors.

These findings are consistent with uncertainty reduction theory or predicted outcome value theory formulations and affirm that uncertainty reduction takes place through computer-mediated channels, in spite of the minimal cues available in CMC (see also Ramirez et al., 2002; Tidwell and Walther, 2002). A compelling finding of this study is that individuals appear to pay keen attention to the few communication cues available in C2C commercial transactions, successfully attending to the subtle (but important) information that does exist. Indeed, several theories of computer-mediated interaction suggest that the limited cues available in CMC are highly managed, scrutinized, and salient (Spears and Lea, 1992, 1994; Walther, 1992, 1996). Research also shows that CMC users demonstrate an ability to adapt to the restrictions inherent in the medium by using intimate uncertainty-reducing strategies and direct information-sharing strategies (Tidwell and Walther, 2002). Moreover, interactants using CMC 'use standard means of uncertainty reduction with slight modifications to accommodate channel differences' (2002: 342), confirming that with regard to uncertainty reduction in CMC, 'in the age of the Internet, the FtF [face-to-face] boundary is an anachronism' (2002: 321). However, this study extends these findings by demonstrating that in the grossly cues-impoverished environment of C2C commercial transactions, uncertainty reduction is still accomplished by careful attention to the relevant information exchanged among interactants.

The findings from this study also extend these theoretical perspectives and suggest modifications to uncertainty reduction theory as applied to C2C commercial transactions and other interactions characterized by minimal available cues. First, given the plethora of uncertainty reduction strategies

available in online auctions, their range must be expanded conceptually (see, for example, Ramirez et al., 2002). In this environment, uncertainty reduction tends toward more passive or active strategies, which often can be invoked simultaneously. To reflect the dynamics of online auction interaction more accurately, the relative lack of direct interaction among participants must be taken into account.

Second, the findings from this study demonstrate the existence of three distinct types of trust that serve to mitigate risk and reduce uncertainty. Commodity information, seller reputation, and system security all have an impact on bidders' behaviors. Moreover, they appear to take on different roles in this environment, depending on what type of commodity is being sold. Third and relatedly, the emphasis on behavioral uncertainty reduction toward outcome maximization is appropriate when assessing C2C commercial transactions. Indeed, the relative lack of concern for cognitive uncertainty reduction may account for the extremely high variance explained statistics found in this study, when focusing on known commodities of high value.

Finally, uncertainty reduction theory formulations in minimal cues environments should be modified to consider the perceived personalness of the encounter; a difference that is, surprisingly, treated as relatively invariant in uncertainty reduction theory conceptualizations of initial F2F encounters. The evidence from this study suggests that under conditions of less personal interactions (i.e. when eBay acts as a storefront), a positive reputation is most important to increase bids and prices, whereas under conditions of more personal interactions (i.e. in representative eBay auctions with non–professional sellers), the existence of sufficient commodity information achieves these ends. This implies that although both factors are a source of uncertainty reduction in initial online interactions, the 'personalness' of the encounter might be an important moderating factor theoretically that should be explored in greater depth in future research.

Overall, this study offers compelling, although mixed, evidence for uncertainty reduction theory formulations as applied to online auctions, provides a plausible reconciliation of these findings, and suggests theoretical extensions to uncertainty reduction perspectives within reduced–cues CMC environments. Future research, perhaps operating within the framework of more controlled experimental surroundings or using rich qualitative data from users, is required to develop and fully test the novel application proposed here. As forms of interaction proliferate that capitalize on social information–sharing via computer–mediated means, this knowledge becomes increasingly relevant and important.

Acknowledgements

Notes

1 It appears reasonable to conceive of auction interaction in terms of initial encounters: in a census of eBay auctions over several months, Resnick and Zeckhauser (2002) found that 99 percent of all buyer–seller pairs had no more than four transactions. Also, 89 percent of buyer–seller pairs that had done business with one another in the past had only one previous transaction.

2 For example, feedback on eBay is provided optionally by users at the conclusion of each transaction and the derived and up-to-date feedback rating appears on the webpage for each bidder and seller for each auction. In this case, although the provision of feedback is an active process, its use can be viewed as both passive (it appears without effort on the part of the user for their benefit on the auction page) and active (they have to make the effort to take advantage of the feedback, perhaps by probing specific feedback through links to subsidiary webpages). Moreover, other 'credentialing' systems confound the genre even more. Sites such as epinions.com (www.epinions.com) and Bizrate (www.bizrate.com), for example, collect and synthesize user feedback on experiences with B2C transactions, which users must seek out to take advantage of (see, for example, Lee et al., 2000 and Resnick et al., 2000 for information on online reputation systems).

3 Because past research has demonstrated that cultural differences among eBay users have an impact on trust and uncertainty avoidance (Vishwanath, 2003, 2004) and that culture is an important moderator in uncertainty reduction formulations (see Goldsmith, 2001), data were collected exclusively from the eBay United States auction site.

4 Data from all but one of the 39 existing eBay categories were used in the analyses: auctions for eBay Motors, which contains auctions for cars, trucks, motorcycles, and parts for each was excluded from the dataset due to HTML formatting features that inhibited data collection. Data were collected prior to the implementation of eBay's 'Buy It Now' feature, which enables bidders to purchase items for a set price and ends the auction prior to its established closing date and time.

5 Although it is plausible that more commodity information, if negative (e.g. pictures of damaged commodities or poorly-worded descriptions), could be harmful to bidding, it seems unlikely that negative commodity information was present to a degree that would have an impact on the findings of this study.

6 The distributions of some variables were highly skewed and, consequently, may have exhibited violations to multiple aggression analyses. To address these violations, logarithmic transformations were performed on seller rating, final bid price, number of bids, system security, and commodity information prior to regression analysis. These transformations resulted in skewness and kurtosis measures much closer to 0 and the residual plots exhibited patterns appropriate for regression analyses.

7 A possible explanation for the discrepant findings from the random versus the targeted samples is that the former set of results is spurious (see Lucking-Reiley et al., 2000 and Resnick and Zeckhauser, 2002). More specifically if, for example, sellers with more positive feedback tend to auction less expensive items (and, by extension, sellers with more negative feedback tend to auction more expensive items), spurious negative correlations could result. Indeed, as noted earlier, in this study final bid price and seller rating were negatively correlated ($-.03$, $p < .05$), although this relation was not very strong and the variance explained by this relation was extremely low ($R^2 = .0009$). To assess the extent to which this might account for results in this study, post-hoc analyses were run in which the random dataset was repeatedly truncated to limit the effects of any relations that might prompt spurious results (e.g. the random dataset was limited to only high price items, to lower feedback sellers, to a combination of these, etc.).

None of these manipulations, however, indicated that the negative correlation between feedback and price strongly accounted for findings in the random dataset. Moreover, because this study focuses on uncertainty reduction within eBay as a whole and the very relations that might be considered to result in spurious results are potentially meaningful in their own right, the most holistic explanations must account for findings both in the random and the targeted samples, as undertaken here.

References

Adelaar, T. (2000) 'Electronic Commerce and the Implications for Market Structure: the Example of the Art and Antiques Trade', *Journal of Computer-mediated Communication* 5, URL (consulted 27 July 2005): http://jcmc.indiana.edu/vol5/issue3/adelaar.htm

Adler, J. (2002) 'The eBay Way of Life', *Newsweek*, 17 June, p. 51.

Bailey, B.P., L.J. Gurak and J.A. Konstan (2003) 'Trust in Cyberspace', in J. Ratner (ed.) *Human Factors and Web Development*, pp. 311–21. Mahwah, NJ: Erlbaum.

Bajari, P. and A. Hortacsu (2003) 'The Winner's Curse, Reserve Prices and Endogenous Entry: Empirical insights from eBay Auctions', *Rand Journal of Economics* 34(2): 329–55.

Berger, C.R. (1979) 'Beyond Initial Interaction: Uncertainty, Understanding and the Development of interpersonal Relationships', in H. Giles and R. St Clair (eds) *Language and Social Psychology*, pp. 122–44. Oxford: Basil Blackwell.

Berger, C.R. (1986) 'Uncertain Outcome Values in Predicted Relationships: Uncertainty Reduction Theory Then and Now', *Human Communication Research* 13(1): 34–8.

Berger, C.R. and R.J. Calabrese (1975) 'Some Explorations in Initial Interaction and Beyond: Toward a Developmental Theory of Interpersonal Communication', *Human Communication Research* 1(2): 99–112.

Boyd, J. (2002) 'In Community We Trust: Online Security Communication at eBay', *Journal of Computer-Mediated Communication* 7, URL (consulted 20 July 2004): http://www.ascusc.org/jcmc/vol7/issue3/boyd.html

Boyd, J. (2003) 'The Rhetorical Construction of Trust Online', *Communication Theory* 13(4): 392–410.

Brinkman, U. and M. Siefert (2001) 'Face-to-interface – the Establishment of Trust in the Internet: the Case of e-Auctions', *Journal of Sociology* 30(1): 23–47.

Culnan, M.J. and M.L. Markus (1987) 'Information Technologies', in F.M. Jablin, L.L. Putnam, K.H. Roberts and L.W. Porter (eds) *Handbook of Organizational Communication: an Interdisciplinary Perspective*, pp. 420–43. Newbury Park, CA: Sage.

Dellarocas, C. (2001) 'Analyzing the Economic Efficiency of eBay-like Online Reputation Reporting Mechanisms', in *Proceedings of the ACM Conference on Electronic Commerce*, pp. 171–9. Tampa, FL: ACM Press.

eBay (2003) 'Company Overview', URL (consulted 20 October 2003): http://pages.ebay.com/community/aboutebay/overview/index.html

Gilkeson, J.H. and K. Reynolds (2003) 'Determinants of Internet Auction Success and Closing Price: an Exploratory Study', *Psychology and Marketing* 20(6): 537–66.

Goldsmith, D.J. (2001) 'A Normative Approach to the Study of Uncertainty and Communication', *Journal of Communication* 51(3): 514–33.

Houser, D. and J. Wooders (2000) 'Reputation in Auctions: Theory and Evidence from eBay', University of Arizona, URL (consulted 1 October 2003): http://info-center.ccit.arizona.edu/~econ/working_papers/internet_auctions.pdf

Kellermann, K. and R.A. Reynolds (1990) 'When Ignorance Is Bliss: the Role of Motivation to Reduce Uncertainty in Uncertainty Reduction Theory', *Human Communication Research* 17(1): 5–75.

Kollock, P. (1999) 'The Production of Trust in Online Markets', in E.J. Lawler, M. Macy, S. Thyne and H.A. Walker (eds) *Advances in Group Processes* (Vol. 16), pp. 99–123. Greenwich, CT: JAI Press.

Lee, Z., I. Im and S. Lee (2000) 'The Effect of Negative Buyer Feedback on Auction Prices in Internet Auction Markets', in W. Orlikowski, S. Ang, P. Weill, H. Krcmar and J.I. Degross (eds) *Proceedings of the 21st International Conference on information Systems* (ICIS-00), pp. 286–7. Brisbane: Association for Information Systems.

Lucking-Reiley, D. (1999) 'Using Field Experiments to Test Equivalence between Auction Formats: Magic on the Internet', *American Economic Review* 89(5): 1063–80.

Lucking-Reiley, D., D. Bryan, N. Prasad and D. Reeves (2000) 'Pennies from eBay: the Determinants of Price in Online Auctions', Vanderbilt University Working Paper, URL (consulted 20 September 2003): http://eller.arizona.edu/%7ereiley/papers/ penniesfromebay.pdf

McDonald, C.G. and V.C. Slawson (2002) 'Reputation in an Internet Auction Market', *Economic Inquiry* 40(4): 633–50.

Melnik, M.I. and J. Alm (2002) 'Does a Seller's e-Commerce Reputation Matter? Evidence from eBay Auctions', *Journal of Industrial Economics* 50(3): 337–50.

Palmer, J.W., J.P. Bailey and S. Faraj (2000) 'The Role of Intermediaries in the Development of Trust on the WWW: the Use and Prominence of Trusted Third Parties and Privacy Statements', *Journal of Computer-mediated Communication* 5(3), URL (consulted 10 October 2003): http://www.ascusc.org/jcmc/vol5/issue3/palmer.html

Ramirez, A., J.B. Walther, J.K. Burgoon and M. Sunnafrank (2002) 'Information-seeking Strategies, Uncertainty and Computer-mediated Communication', *Human Communication Research* 28(2): 213–28.

Resnick, P. and R. Zeckhauser (2002) 'Trust among Strangers in Internet Transactions: Empirical Analysis of eBay's Reputation System', in M.R. Baye (ed.) *The Economics of the Internet and e-Commerce*, URL (consulted 31 January 2007): http://www.si.umich.edu/ ~presnick/papers/ebayNBER/index.html

Resnick, P., R. Zeckhauser, E. Friedman and K. Kuwabara (2000) 'Reputation Systems', *Communications of the ACM* 43(12): 45–8.

Roselius, T. (1971) 'Consumer Rankings of Risk Reduction Methods', *Journal of Marketing* 35(1): 56–61.

Shimp, T.A. and W.O. Bearden (1982) 'Warranty and Other Extrinsic Cue Efforts on Consumers' Risk Perceptions', *Journal of Consumer Research* 9(1): 38–46.

Spears, R. and M. Lea (1992) 'Social Influence and the Influence of the "Social" in Computer-mediated Communication', in M. Lea (ed.) *Contexts of Computer-mediated Communication*, pp. 30–65. London: Harvester Wheatsheaf.

Spears, R. and M. Lea (1994) 'Panacea or Panopticon? The Hidden Power in Computer-mediated Communication', *Communication Research* 21(4): 427–59.

Standifird, S.S. (2001) 'Reputation and e-Commerce: eBay Auctions and the Asymmetrical Impact of Positive and Negative Ratings', *Journal of Management* 27(3): 279–95.

Sunnafrank, M. (1986a) 'Predicted Outcome Value during Initial Interactions: a Reformulation of Uncertainty Reduction Theory', *Human Communication Research* 13(1): 3–33.

Sunnafrank, M. (1986b) 'Predicted Outcome Values: Just Now and Then?', *Human Communication Research* 13(1): 39–40.

Sunnafrank, M. (1990) 'Predicted Outcome Value and Uncertainty Reduction Theories: a Test of Competing Perspectives', *Human Communication Research* 17(1): 76–103.

Tan, S.J. (1999) 'Strategies for Reducing Consumers' Risk Aversion in Internet Shopping', *Journal of Consumer Marketing* 16(2): 163–78.

Tidwell, L.C. and J.B. Walther (2002) 'Computer-mediated Communication Effects on Disclosure, Impressions and Interpersonal Evaluations: Getting to Know One Another a Bit at a Time', *Human Communication Research* 28(3): 317–48.

Vishwanath, A. (2003) 'Comparing Online Information Effects: a Cross-cultural Comparison of Online information and Uncertainty Avoidance', *Communication Research* 30(6): 579–98.

Vishwanath, A. (2004) 'Manifestations of Interpersonal Trust in Online Interaction', *New Media & Society* 6(2): 219–34.

Vishwanath, A. and G.A. Barnett (2001) 'Reserve Price information and Online Auctions', paper presented at the Annual Meeting of the International Communication Association, Washington, DC, May.

Walther, J.B. (1992) 'Interpersonal Effects in Computer-mediated Interaction: a Relational Perspective', *Communication Research* 19(1): 52–90.

Walther, J.B. (1996) Computer-mediated Communication: Impersonal, Interpersonal and Hyperpersonal Interaction', *Communication Research* 23(1): 3–43.

Yokoo, M. and S. Fujita (2001) 'Trends of Internet Auctions and Agent-mediated Web Commerce', *New Generation Computing* 19(4): 369–88.

ANDREW FLANAGIN is an associate professor in the Department of Communication at the University of California at Santa Barbara. His research focuses on the ways in which ICTs structure and extend human interaction, with particular emphasis on the processes of organizing and information evaluation and sharing.

Address: Department of Communication, University of California, Santa Barbara, Santa Barbara, CA 93106, USA. [email: flanagin@comm.ucsb.edu]