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Marketing managers and consumers who use the Web as a source of information often use input from strangers to make decisions or gain knowledge. The authors propose that in such contexts, the information provider's current and past behaviors, relative to those of other information providers, influence who the information seeker believes provides a valuable response and how valuable he or she judges the provider's information to be. The authors track information queries, information provider responses, and objective valuation of these responses by information seekers in a Web forum, in which responses to information queries come from multiple information providers with whom the information seeker has not met face-to-face and has had no prior interaction. Among other results, the authors show that a provider's response speed, the extent to which the provider's previous responses within the focal domain have been positively evaluated by others, and the breadth of the provider's previous responses across different domains of knowledge affect objective judgments of information value. Importantly, these effects are moderated by the information seeker's goal orientation. The information provider's experience in responding to questions in different domains of knowledge increases judgments of information value for information seekers with a decision-making orientation, whereas the information provider's reputation for providing valuable contributions within the focal domain increases judgments of information value for information seekers with a learning orientation.

Keywords: information value, information search, information exchange, goal orientation, learning, decision making

Listening to Strangers: Whose Responses Are Valuable, How Valuable Are They, and Why?

Marketing managers and consumers often use other managers and consumers as sources of information. Increasingly, such information exchanges occur in contexts in which information seekers and information providers have not met and have had no prior relationship. Examples include online forums that address finance, health care, and business issues; book recommendations at Amazon.com; or comments on service providers from Angieslist.com (e.g., Chevalier and Mayzlin 2006; Li 2005; Toder Alon 2005). In each of these contexts, information seekers must assess (1) whether a particular (often anonymous) person provides valuable information and (2) how much value they provide relative to that of other information providers.

This article suggests that in such settings, the information seeker uses the information provider's current and past behaviors, relative to those of other information providers, to make judgments about information value. Because information search is often goal directed, we also contend that judgments of the value of information are driven by the information seeker's goal. We focus on two goals: whether the information provider is trying to (1) make a decision or (2) learn something new.

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We test our hypotheses in a Web forum for marketing professionals, examining how relative information provider behavior affects the perceived value of responses to information requests. Our data provide unique insights by including novel, behavioral antecedents to judgments of information value, including the provider's response speed, length of response, the extent of back-and-forth dialogue with the seeker, and how valuable the provider's previous responses (behaviors) to other seekers have been judged to be.

Using an objective (versus a subjective or an inferred) measure of information value, we find (among other things) that responses from providers who respond more quickly than other providers to the seeker's query are judged to have greater value. We also find that judgments of information value depend on the information seeker's goal and the information provider's past behavior. Specifically, information seekers whose goal is to make a decision find greater value from providers who have greater breadth of experience responding to queries in multiple domains outside the focal domain. In contrast, those whose goal is to learn something new find greater value from providers who have demonstrated a strong reputation for providing useful information within the focal domain. By focusing on objective measures of information value and by identifying novel behaviors associated with the information provider that affect seekers' judgments of the provider's value, we add to the literature on information seeking, judgments of information value, and goal orientation in information search. Our results also offer pragmatic guidelines for marketing professionals who must respond to customers' information-seeking requests in a way that customers find valuable.

VALUING INFORMATION: MODEL AND HYPOTHESES

Prior research on information search has helped us understand when, whether, where, and from whom seekers get information, as well as how much information they get (e.g., Brucks 1985; Jaillet 2003; Klein and Ford 2003; Moorthy, Ratchford, and Talukdar 1997). However, our understanding of factors that affect people's judgments of the relative value of the information they receive is limited. This is unfortunate because those whose information is judged to be valuable are likely to have greater influence on behavior. Judgments of the value of information also affect the perceived costs and benefits of an information source and, thus, the likelihood that an information source will be used. Because marketers are themselves information providers, understanding what affects these issues is important.

Research is beginning to explore factors that affect judgments of information value (e.g., Moe and Fader 2004; Ratchford and Srinivasan 1993). One way to examine judgments of information value is to use surveys to ask consumers which sources they found to be most valuable. However, as Ratchford, Lee, and Talukdar (2006) note, such data suffer from problems of retrospective recall. An alternative method is to use behavioral data to infer information value. For example, the value of information can be inferred from the relative benefits of engaging in information search and using different information sources (Dellarocas, Zhang, and Awad 2007; Ratchford 1982; Ratchford, Lee, and Talukdar 2006; Ratchford and Srinivasan 1993; Srinivasan and Ratchford 1991; Zettelmeyer, Morton, and Silva-Risso 2006) and the amount of search people undertake (Johnson et al. 2004; Steckel et al. 2005), how buyers accumulate sufficient information to make a purchase (Moe and Fader 2004), how word of mouth affects ratings and sales (Chevalier and Mayzlin 2006; Godes and Mayzlin 2004), and the relative page rank of contributions to online communities (Dwyer 2007). Although each of these approaches is valid, a more objective assessment of the value of information from the perspective of the information seeker would add to the literature by providing an alternative operationalization of the value construct. Furthermore, prior research does not examine a central question we study here: Regardless of how much people search, how do they judge which source provides the greatest value?

Research on the diagnosticity of information on consumers' product judgments also provides some insight into factors that affect information value. For example, negative information tends to be weighted more heavily than positive information in consumers' product evaluations (Mizerski 1982; Skowronski and Carlston 1989), and information received through word of mouth has a greater impact on product judgments than printed information (Herr, Kardes, and Kim 1991). In addition, impression-inconsistent information tends to be weighted less heavily than consistent information (Hoch and Deighton 1989). Notably, though, this literature examines characteristics of information that create value instead of behaviors of information providers that generate value.

The judge–adviser and persuasion literature streams have studied how characteristics of the information provider affect judgments that may be related to information value (e.g., persuasion, use of advice and information diagnosticity). For example, research has examined factors such as the provider's similarity to the information seeker (Haas 1981; Simons, Berkowitz, and Moyer 1970; Woodside and Davenport 1974), the provider's professional status (Gershoff, Broniarczyk, and West 2001; West and Broniarczyk 1998), the provider's organizational affiliation (e.g., *Consumer Reports*), the provider's incentives (Sniezek, Schrah, and Dalal 2004), and the social setting (Wood 2000). Notably, this research does not examine judgments of value directly and does not consider contexts in which the information provider and seeker are strangers and, thus, contexts in which these variables might be difficult to assess.

More directly relevant to our research is a body of research that examines what affects consumers' choices of different information sources, the amount of time they spend on different sources, and how helpful they find these sources to be (at a given point in time or over time; Hauser, Urban, and Weinberg 1993; Ratchford, Lee, and Talukdar 2003, 2006). Although these studies are related to the topic of the value various information sources can provide, their goal is not to examine how people assess which sources create the most value.

Our research contributes to this body of knowledge in three ways: (1) We use an objective measure of the value of information, (2) we focus on novel aspects of the information provider's behavior as factors that drive the seekers' judgments of information value, and (3) we focus on the value people derive from one information provider versus another. We focus on relative assessments because our interests lie in contexts in which receivers get information

from multiple information providers. In these contexts, social comparison judgments are likely to occur, making relative assessments appropriate. Furthermore, substantial research suggests that most judgments involve a comparative process in which advice is judged relative to other available information (e.g., Adaval and Monroe 2002; Kirmani and Baumgartner 2000).

Information Providers' Current Behaviors and Judgments of Information Value

Research on interpersonal communications (e.g., Carlson and Zmud 1999; Daft and Lengel 1984, 1986) suggests that communication has two objectives: (1) uncertainty reduction and (2) equivocality reduction. Uncertainty reduction involves rectifying a lack of information, whereas equivocality reduction involves removing ambiguity about what questions to ask and how to structure problems (Daft and Lengel 1984, 1986). Uncertainty can be reduced through greater information, whereas equivocality can be reduced through communication mechanisms that allow rapid back-and-forth exchanges that foster consensus.

Although media richness theory (Daft and Lengel 1984, 1986) typically compares different types of media, it is possible to examine richness within the same medium. For example, the length and emotional content of communications are different for male and female e-mail users (Boneva, Kraut, and Frohlich 2001). Similarly, there may be important variations in the richness of communication by different users of the same medium. In addition, although Daft and Lengel (1984, 1986) conceptualize media richness as an overall measure, insights may be gained by examining particular behavioral elements that affect richness, particularly those that are under the control of information providers. These include (1) the speed with which users respond to queries, (2) the frequency of contact between the provider and the seeker, and (3) the amount of information the provider gives.

Speed and frequency are related to Daft and Lengel's (1984, 1986) idea of feedback and are elements designed to reduce ambiguity (equivocality). Speed refers to how quickly the information provider responds to the seeker's query compared with other providers who responded to the same query. Frequency refers to the number of contacts between the information seeker and the information provider compared with other providers who responded to the same query. The amount of information the provider gives is related to Daft and Lengel's idea of uncertainty reduction. The amount of information refers to the total quantity of information the information provider gives the seeker's query compared with other information providers. Subsequently, we articulate whether and when these three dimensions are likely to affect the information seeker's judgments of how much value the information provider gives.

Speed of response. It might be argued that slower responses should be judged to be more valuable because they reduce uncertainty. That is, by responding later, information providers can build on prior information, identify the true sense of the information query, and differentiate their response more clearly. However, we argue that in goal-directed contexts, rapid responses are judged to offer greater value because they reduce ambiguity (Daft and Lengel 1984). In particular, rapid responses allow the information provider to help the information seeker quickly structure the particular problem he or she faces and clarify goals. The same response delivered by a second information provider would not add value because ambiguity reduction has already occurred from the first provider's responses.

Frequency. The notion that relative speed of response should increase information value might lead to the conclusion that information developed through back-and-forth dialogue with the information provider will be perceived as less valuable. However, back-and-forth dialogue is also likely to make the information seeker believe that he or she has been given the opportunity to clarify questions and responses. Frequent responses allow the information seeker to dig deeper into the problem at hand by asking follow-up questions, thus reducing information ambiguity (equivocality; Daft and Lengel 1984, 1986). The greater an information provider's relative ability to reduce ambiguity, the more valuable the information should be judged to be.

Amount of information. Consistent with Daft and Lengle's (1984, 1986) notion of uncertainty reduction, we also anticipate that information seekers will judge responses as more valuable when the provider gives relatively more information than other providers who respond to their query. In particular, information seekers may believe that larger amounts of information remove more uncertainty. These beliefs should enhance judgments of information value.

H_1: The more the information provider (a) responds to the information seeker's query quickly, (b) engages the seeker in frequent dialogue, and (c) offers a greater amount of information than other information providers, the more valuable seekers judge the information to be.

Impact of Information Providers' Past Behavior

Research on reputation (e.g., Axelrod 1984; Melnik and Alm 2005; Raub and Weesie 1990; Weiss, Anderson, and MacInnis 1999; Wilson 1985) and source effects (e.g., Petty, Cacioppo, and Goldman 1981) in persuasion suggests that in addition to using current information provider behavior to guide judgments of information value, information seekers may use demonstrated past behavior to guide judgments of information value. We examine two dimensions of the information provider's past behavior. The first is the extent to which others have positively evaluated an information provider's past behavior in the focal domain; the second is the extent to which the information provider has previously participated in information exchange in multiple domains. For ease of exposition, we call the former "domain depth" and the latter "domain breadth."

Past effectiveness within the focal domain (domain depth). The information provider's past effectiveness in giving valuable information to other information seekers within the focal domain (depth) may be communicated informally through word of mouth or, as in the context studied here, through public postings. In the Web forum we study, an information provider is recognized for his or her domain depth by being awarded points based on responses to queries by other information seekers. In much the same way that the persuasion literature has shown that source expertise is used as a heuristic cue to affect persuasion (Petty, Cacioppo, and Goldman 1981), the information

provider's demonstrated effectiveness within the focal domain may affect the perceived value of his or her current contributions. Specifically, information seekers may infer that the more effective the information provider has been in answering others' information requests within the domain, the better able he or she is to (1) categorize the question, (2) determine what the information seeker really needs to know, and (3) provide a response that maps well onto the seeker's specific question. In addition, the information seeker may believe that the more the information provider has previously demonstrated effectiveness in addressing questions within the focal domain, the more he or she is likely to provide information that is (4) clearer, (5) less confusing, (6) more credible, and (7) more valuable.

H_{2a}: The greater an information provider's domain depth (relative to that of providers who respond to the same query), the more valuable seekers judge the information to be.

Tendency to respond across multiple domains (domain breadth). We define domain breadth as the extent to which an information provider has given information in multiple domains beyond the focal domain. The more domains in which the information provider has given responses, the greater is his or her domain breadth. In other words, those who have answered questions in only a single domain have the lowest breadth, whereas those who have answered questions in all domains have the largest domain breadth.

Theoretically, an information provider can be effective not only in the focal domain but in other domains as well. Thus, domain depth and domain breadth are conceptually independent. However, we hypothesize that seekers may perceive domain depth and domain breadth as inversely related. In other words, they may perceive that an information provider who has a tendency to give responses in multiple domains is not as knowledgeable about the focal domain (Hirschfeld and Gelman 1994; Mitchell and Dacin 1996). In particular, because the information provider has responded in multiple domains, the seeker may infer that he or she knows less about a specific domain. This may be true even if the provider has a history of communicating valuable information in the domain in question. In essence, someone who has a history of providing information in multiple domains may be perceived as a dilettante whose knowledge is sufficiently diffuse so as to make the information provided less credible. Thus, the more domains in which the information provider has responded to information queries (the greater the domain breadth), the less valuable seekers may judge the information to be.

Other research is consistent with this idea. Lewis and colleagues (2000) find that generalists are less well respected than specialists (see also Gregorian 2004). Some research finds that being a generalist is negatively related to success in academics and the likelihood of making meaningful contributions to a field (Jervis 2002). In light of the foregoing discussion, we posit the following:

H_{2b}: When we control for an information provider's domain depth, the more domain breadth the information provider shows (relative to providers who respond to the same query), the less valuable seekers judge the information to be.

In addition to its direct and negative effect on judgments of information value (H_{2b}), domain breadth may moderate the impact of domain depth on judgments of information value. That is, perceptions of the information provider as a dilettante may cause the seeker to cast doubt on the veridicality of the provider's knowledge in the focal domain. Therefore, greater breadth may attenuate the effects of past domain depth on judgments of information value.

H_3: The relationship between the information provider's domain depth and the judged value of his or her current information (H_{2a}) is weakened by the information provider's demonstrated domain breadth.

Information Seeker Goal Orientation

Importantly, the impact of information providers' current and past behaviors on judgments of information value may depend on whether the information seeker has a learning or decision-making orientation (DeShon and Gillespie 2005; Elliot and Church 1997; Sujan, Weitz, and Kumar 1994). A learning orientation involves the goal of personal growth and task mastery (DeShon and Gillespie 2005; Sujan, Weitz, and Kumar 1994). It motivates a search for information so as to improve and develop capabilities (Elliot and Church 1997; Kohli, Shervani, and Challagalla 1998). A decision-making orientation involves the goal of making optimal decisions. Similar to a performance orientation (DeShon and Gillespie 2005; Kohli, Shervani, and Challagalla 1998; Sujan, Weitz, and Kumar 1994), it motivates a search for advice that helps a person narrow, support, and justify a specific course of action.

Information providers' current behavior. Because their goal orientation is one of action, we anticipate that information seekers with a decision-making orientation will place more weight on a provider's relative speed of response and assign less value to the relative amount of information he or she shares than seekers with a learning orientation. Information seekers with a decision-making orientation are more interested in formulating a decision. Rapid responses are consistent with this action-oriented objective. However, seekers with a learning orientation may place greater value on the relative frequency and amount of information the provider gives because they may believe that relatively more information and back-and-forth dialogue help them resolve knowledge gaps. Thus, the effects of the information provider's current response behavior on judgments of information value are moderated by the seeker's goal orientation.

H_4: (a) Information seekers with a decision-making orientation find more value in information that is delivered relatively quickly, whereas those with a learning orientation place a higher value on (b) the relative amount of information provided and (c) the relative frequency of dialogue between the information seeker and the information provider.

Information providers' past behavior. We also hypothesize that goal orientation moderates the effects of H_{2a}. Specifically, we anticipate that demonstrated depth in the focal domain is more important for information seekers with a learning orientation than for those with a decision-making orientation. Seekers with a learning orientation may infer that an information provider's past effectiveness in providing useful information in the focal domain demonstrates his or her understanding of that domain (Alba and Hutchinson 1987; Loken and Ward 1990; Rosch et al. 1976). Information seekers with a decision-making orientation may believe that depth in the focal domain is less criti-

cal because their goals do not dictate learning about the issue at hand but rather obtaining input on factors to consider when making a decision. Such information may not be domain specific (Reuber 1997). Therefore, we expect the following:

H_{5a}: The relationship between an information provider's relative past effectiveness in providing valuable information in the focal domain and judgments of information value is stronger for information seekers with a learning orientation than for those with a decision-making orientation.

Finally, we anticipate that goal orientation moderates the relationship between domain breadth and perceived information value (H_{2b}). Although domain breadth may hurt value judgments for people with a learning orientation, it may have the reverse effect on those with a decision-making orientation. Prior research has shown that experience in a diverse set versus a single context helps people think about how to structure problems, think creatively, and handle new situations (Perkins and Rao 1990; Reuber 1997; Simon 1960). If people with a decision-making orientation share this view, they may infer that an information provider with greater domain breadth is better equipped to advise and provide them with creative solutions. They may also believe that the greater the provider's domain breadth, the more he or she can anticipate potential contexts that might be relevant to a decision, identify critical attributes for the decision at hand, and foresee outcomes that might be associated with the decision (Alba and Hutchinson 1987; Ratneshwar, Pechmann, and Shocker 1996). Thus:

H_{5b}: The relationship between the provider's relative domain breadth and judgments of information value is more positive for information seekers with a decision-making orientation than for those with a learning orientation.

METHOD

Empirical Context

The data used to test the hypotheses come from an online discussion forum for marketing professionals who use the forum to (1) learn about some aspect of marketing or (2) make a marketing decision. (The Appendix illustrates these question [goal] types.) Each new forum member is awarded an initial set of 250 points, all or a subset of which can be used to make one or more information requests. When an information query is posted, any number of information providers may respond. When the information seeker believes that the question has been addressed, he or she "closes" the question by distributing the allocated points to the question among those who provide the best (e.g., the most valuable) information. Thus, point allocations indicate judgments of information value. Information seekers can give all the points to a single information provider or distribute them among a subset or the entire set of information providers. For example, although five people may respond to a request for information, only two may be perceived as providing valuable information, and the information seeker will distribute points only to those two (rather than all five) providers.

Every member has a profile that is easily accessed from any query or response posted on the forum. The profile contains information about the member, including the total number of points he or she has been awarded in the focal domain in the past. In this way, information seekers can learn about a given information provider's past effectiveness at responding to questions within the focal domain (domain depth). The profile also lists all queries to which the provider has given a response. Clicking on a query reveals the query category and the member's response. In this way, information seekers can learn about the number of different domains in which the provider has previously responded (domain breadth).

Data for this study include a random sample of closed queries and associated responses from information providers made in the forum over an 18-month period. We eliminated queries that were answered by only one information provider because this provider would receive 100% of the available points regardless of the value of his or her response, as well as queries that were closed by the forum's moderator (rather than the information seeker). The resultant data set includes 776 requests for information (from 668 different information seekers) and 17,628 responses. Each request and associated responses includes the time and date of each post and response (from which we calculate relative speed of response), the length of the response (from which we calculate the relative amount of information provided), the relative number of times the seeker and provider engaged in a response, and the number of points the information seeker awarded to each information provider (our indicator of the value of information). Table 1 shows the question categories, the number of questions in each category, the number of responses, and the average number of responses to which points were allocated for questions in the various categories.

Table 1
RESPONDENT WEB QUERY CATEGORIES

Category	*Number of Questions Asked*	*Average Number of Responses to Each Question*	*Average Number of Responses for Which Points Were Awarded*
Advertising/public relations	170	7.4	3.7
Branding	96	7.3	3.5
Career/training	63	6.7	3.5
Copywriting	21	9.0	3.9
Customer behavior	56	8.1	4.0
E-marketing	66	6.4	3.3
Research/metrics	57	6.3	2.8
Strategy	193	7.8	3.5
Taglines/names	39	13.1	3.2
Web site critique	15	11.4	5.7

Measures

Speed of response. We calculated response speed as one less the difference (in minutes) between the time the seeker posted a request and the provider's response divided by the average response speed of all providers for that request. Higher numbers indicate faster speed.

Frequency. Response frequency is a tally of the number of times the information provider responded to the information seeker's request divided by the total frequency of responses from all information providers to that request.

Amount of information. We calculated amount of information as the total number of characters in all a provider's responses to the seeker divided by the total number of characters in all providers' responses to that query. Amount of information varies independently from frequency. For example, two providers might each provide 1000 characters of information, but one might do so in one response, and another might do so in five responses.

Past effectiveness in providing information in the focal domain (domain depth). We calculated depth in the domain as the number of points the information provider previously accumulated within the focal domain (i.e., category) at the time the information seeker posted the information request (but before the seeker awarded points) divided by the total number of points that all providers who answered the question previously accumulated in the focal domain.

Past tendency to respond in multiple domains (domain breadth). We measured domain breadth as the entropy of provider participation in the forum's various categories;[1] more formally,

$$(1) \qquad I(C) = -\sum_{i=1}^{m} p(c_i)\log_2 p(c_i),$$

where c_i (c_1, c_2, ..., c_m) are the different categories (domains) of queries in the forum and $p(c_i)$ is the proportion of queries previously answered in a category divided by the entropy of participation of all respondents to that query. This information-theoretic measure (Garner 1962; Shannon and Weaver 1949) is an appealing way to assess an information provider's domain breadth because it accounts for the number and proportion of categories in which the information provider responded. Unlike a count of the categories in which the information provider has participated, it distinguishes between information providers who, despite participating in multiple categories, provide information primarily in a single category and those who have been more uniform in providing information. This entropy measure has been used extensively in psychology and economics as a measure of information as perceived by human decision makers (for reviews, see Dawes 1970; Garner 1962). In marketing, it has been used to predict brand switching (Herniter 1973), estimate consideration sets (Gensch and Soofi 1995), and measure consumer variety seeking (Kahn 1995) and preferences (Glazer 1984). It has also been used to manipulate the informativeness of feedback (West 1996) and has proved to be a more valid predictor of information overload than simple counts of alternatives and attributes (Lurie 2004).

[1]Similar results were obtained using a simple count measure.

Goal orientation. Goal orientation was judged by two coders, who read each query and determined whether the information seeker's response was driven by a learning orientation or a decision-making orientation (see the Appendix). Intercoder agreement was 88%; one of the authors resolved disagreements. The final measure is a dummy variable (decision orientation), which is coded as 0 for learning and as 1 for decision making.

Value of information. We measured the dependent variable, judgments of the value of information, as the percentage of available points awarded to an information provider for his or her response to the seeker's query. Because each question can have different point values, we did not use an absolute measure; one provider might receive more points than another who answers a different question, not because the former provided a more valuable response but because the questions have different point values. Thus, the proportion measure controls for different question values. Note that not all information providers receive points; points are awarded only to providers who the seeker judges to have given valuable responses. Thus, the value of information is the relative worth of the information provider's response as judged by the information seeker.

It might be argued that points allocated to an information provider are based on reciprocity rather than value. To address this possibility, we asked a separate sample of 100 information seekers to complete a short online survey immediately after they allocated points to the information providers. We measured value by averaging information seekers' responses to two seven-point Likert scales (r = .96): "I allocated points to people who gave the most valuable responses," and "I allocated points to people who gave the most useful responses." We measured reciprocity by averaging two seven-point Likert-scaled items (r = .74): "I allocated points to people I felt I owed points to, even though their responses weren't that great," and "I allocated points to people I wanted to compensate even if their responses weren't that useful."

The mean response on the value items was 5.61 (1 = "strongly disagree," and 7 = "strongly agree"), suggesting that the value of information is an important determinant of point allocations. The mean response to the reciprocity scale was 2.56 (1 = "strongly disagree," and 7 = "strongly agree"), suggesting that information seekers are not awarding points purely on the basis of reciprocity. The difference between the value (5.61) and the reciprocity (2.56) scales was significant ($t = 17.9$, $p < .01$). Thus, although reciprocity may play a small role in determining who is awarded points, points appear to be awarded mainly for information judged to be most valuable.

Number of respondents. The number of respondents may influence the nature of how points are allocated. Accordingly, we included the number of responses to an information request as a control variable in our statistical tests.

RESULTS

Table 2 presents summary statistics, and Table 3 presents a correlation matrix of the variables used to test the hypotheses. The analysis we describe here relies on standardized data.

We based our choice of statistical model to test our hypotheses on the following considerations: First, our

dependent variable (value of information) is represented as the percentage of points allocated to each information provider and thus is a continuous measure bounded by 0 and 1. Logit analysis is inappropriate because our dependent variable is neither binomial nor multinomial, and standard least squares estimates under these conditions would yield biased results (Green 2000). Second, because the value of a respondent's information occurs within a question, the observations are clustered by questions (17,628 observations clustered by 776 questions). Within-cluster correlation is likely because value (measured as a percentage) is sum-constrained to 1 in each cluster. Because the number of clusters is large compared with the average cluster size, a random effects specification in the model will correct for cluster correlation (Wooldridge 2002). This specification has been used in prior research in similarly constant-sum-constrained contexts, such as the estimation of market shares for firms within various industries (e.g., Gatignon, Weitz, and Bansal 1990). Third, because only a set of respondents for a given question are awarded points, our dependent variable is 0 for a significant fraction of the observations. Finally, because points can be awarded to only one of several respondents, our dependent variable is 1 for a significant fraction of the observations.

Thus, we consider the data censored and estimate a double-limit Tobit model with random effects (Misra, Coughlan, and Narasimhan 2005). We denote y_{ij} as the observed percentage of points allocated to person i for question j, and k indexes the independent variables. Then,

(2) $$y_{ij} = 0 \text{ if } y_{ij}^* \le 0,$$
$$y_{ij} = y_{ij}^* \text{ if } 0 < y_{ij}^* < 1,$$
$$y_{ij} = 1 \text{ if } y_{ij}^* \ge 1.$$

The model we estimate is as follows:

(3) $$y_{ij} = B_0 + \Sigma B_k X_{ik} + e_{ij} + u_j,$$

where e_{ij} is the idiosyncratic error and u_j is the random cluster effect. The estimation uses a Gauss-Hermite procedure, a technique used in similar limited-dependent-variable contexts with random effects (e.g., Honore 1992). In summary, our estimation framework accounts for the double-limit Tobit nature of our dependent variable and allows for cluster correlation. Table 4 shows estimated coefficients, standard errors, and t-values.[2]

H_1 was supported. Specifically, the more quickly a provider responded (H_{1a}), the more the information provider engaged the seeker in frequent dialogue than other information providers (H_{1b}), and the more information the provider gave (H_{1c}), the more his or her information was judged to be valuable. Therefore, an information provider's current response behavior has a positive impact on judgments of information value.

H_2 was also supported. In particular, an information provider's past effectiveness at providing valuable information in the focal domain (domain depth) was positively related to information value, in support of H_{2a}. A provider's demonstrated tendency to respond to many different domains in the past was negatively related to value, in support of H_{2b}.

H_3 was also supported. The interaction between depth in the focal domain and breadth across domains was significant and negative. The form of the interaction revealed that the impact of an information provider's relative depth in the focal domain on judgments of the value of the information he or she provided was attenuated by his or her relative breadth across domains. Thus, the positive effect of demonstrated effectiveness at providing information in the focal domain in the past on judged value is reduced by providers' demonstrated tendency to respond to questions in many different domains.

H_4 predicted that the effects of the information provider's current response behavior on judgments of information value would be moderated by the seeker's goal orientation. H_{4b} was supported. Compared with information seekers with a decision-making orientation, those with a learning

Table 2
SUMMARY STATISTICS

Variable	*M*	*SD*
Information value	.146	.156
Domain depth	.147	.192
Domain breadth	.131	.104
Response frequency	.184	.118
Response speed	.861	1.98
Response elaboration	.133	.166
Decision orientation (0 = learning; 1 = decision making)	.648	.478
Number of responses per question	8.724	4.378

Notes: All variables, except goal orientation and number of responses, are in percentage units. For example, domain depth is the number of expert points the information provider has accumulated within the focal domain (i.e., category) divided by the sum of expert points of all information providers who responded to that question.

[2]The Web Appendix provides results using alternative model specifications (see http://www.marketingpower.com/jmraug08).

Table 3
CORRELATION MATRIX

	Information Value	*Domain Depth*	*Domain Breadth*	*Frequency*	*Speed*	*Elaboration*
Information value	1.0000					
Domain depth	.2481	1.0000				
Domain breadth	.3703	.5908	1.0000			
Frequency	.5088	.4079	.7142	1.0000		
Speed	–.0763	–.0200	–.2058	–.3261	1.0000	
Elaboration	.4967	.2648	.4729	.6091	–.2305	1.0000

Table 4
DETERMINANTS OF INFORMATION VALUE

	Coefficient	*SE*	*t-Value*
Constant	.148*	.00597	24.82
Domain depth	.017*	.00287	5.85
Domain breadth	–.022*	.00314	–7.02
Domain depth × domain breadth	–.004*	.00121	–2.92
Frequency	.063*	.00364	17.25
Speed	.030*	.00217	13.49
Elaboration	.065*	.00242	26.91
Decision orientation (0 = learning; 1 = decision making)	–.004	.00395	–1.00
Decision orientation × domain depth	–.009*	.00362	–2.41
Decision orientation × domain breadth	.019*	.00417	4.51
Decision orientation × domain depth × domain breadth	.002	.00161	1.12
Decision orientation × frequency	–.002	.00436	–.42
Decision orientation × speed	.002	.00284	.74
Decision orientation × elaboration	–.009*	.00317	–2.97
Number of responses	–.003*	.00060	–6.07
Rho	.032	.00419	7.63
Log-likelihood	–1361.555		

*$p < .01$.

Notes: Number of observations = 17,628; number of groups = 776. All coefficients and t-values are standardized. Speed, frequency, elaboration, domain depth, and domain breadth reflect the level of each variable for a given information provider relative to that of other information providers who responded to the same query.

orientation judged information to be more valuable as the relative amount of information the provider gave increased. However, in contrast to predictions in H_{4a} and H_{4c}, the effects of relative speed and frequency of response did not depended on the information seeker's goal orientation. Regardless of their goal orientation, seekers consistently judged information as more valuable the more quickly it was delivered and the more frequently the provider engaged the seeker in dialogue than other information providers.

We also found support for H_5. The impact of information providers' past behaviors on judgments of information depended on the seeker's goal orientation. In support of H_{5a}, the relationship between depth in the focal domain and judgments of information value was stronger for seekers with a learning orientation than for those with a decision-making orientation. In support of H_{5b}, the relationship between breadth across domains and judgments of information value was stronger for seekers with a decision-making orientation than for those with a learning orientation.

DISCUSSION

Summary and Theoretical Implications

Consumers and marketing managers who seek information often make judgments about the value of information they receive from people they have not met and do not know personally. Such contexts are increasingly prevalent as consumers and managers turn to the Web. How do people judge (1) who provides valuable information and (2) how valuable this information is relative to that provided by others? Although prior research sheds light on other issues associated with information search and the value of information, emphasis has focused on the characteristics of the information seeker, the characteristics of the information, and the characteristics of the information provider as factors that determine judgments of information value. No research has explicitly examined the role of current and past information provider behaviors in judgments of information value. Prior research has also focused on subjective or inferred measures of information value rather than objective measures of information value, such as the point allocations used here.

We argue that an information provider's current and past behavior may be used to assess information value in contexts such as those we described previously. Using an objective measure of judgments of information value, we find that the more rapid the provider's response, the more information he or she provides, and the more he or she engages the seeker in frequent dialogue (compared with other providers who answer the same query), the more valuable the information is judged to be. Theoretically, each dimension of the information provider's current behavior is important because each contributes independently to judgments of information value. Equally important, each dimension is actionable for marketing managers who must provide information to current or prospective customers.

In addition, information seekers' goal orientations moderate the effects of information providers' current behavior on judgments of information value. The relative amount of information the providers give appears to be particularly important for seekers with a learning orientation (versus a decision-making orientation) because more elaborate responses may facilitate the development of new knowledge structures. Although we anticipated that rapid and frequent responses would have a greater effect on judgments of information value for people with a decision-making orientation, we observed that both were positively associated with judgments of value regardless of the information seeker's goal orientation. In retrospect, this is perhaps not surprising. Although learners and decision makers have different goals, both may want to achieve their goals as quickly as possible. Similarly, frequent responses may also help those with a learning orientation and those with a decision-making orientation, but in different ways. Fre-

quent responses may help those with a learning orientation clarify what they learn, and frequent responses may help those with a decision-making orientation ensure that decision-making risks are minimized by asking and having answers to follow-up questions.

In terms of information providers' past behavior, our results show that a demonstrated past effectiveness at providing information in the focal domain (domain depth) and a demonstrated past tendency to respond to many different domains (domain breadth) can have different effects on judgments of the value of information. For most queries, information from someone with greater relative domain depth is associated with judgments of better information value, whereas relative domain breadth has a negative impact on value judgments. Notably, although relative domain breadth can attenuate the impact of relative domain depth, the effect of these two dimensions of prior behavior depends on goal orientation. Domain depth is more important for those with a learning orientation, whereas domain breadth is more important for those with a decision-making orientation. These differing effects underscore the importance of articulating these two dimensions of information providers' past behavior and understanding how they are related to information seekers' goal orientations.

Managerial Implications

Our results suggest that it is critical for marketers (as providers of information) to discern whether potential customers have a learning or a decision-making goal. Although the three dimensions of current response behavior are each associated with positive information value, our results suggest that there are varying impacts of each on value judgments. For example, large amounts of information are more important for seekers with a learning orientation than for those with a decision-making orientation. Similarly, although domain breadth is relevant for seekers with a decision-making orientation, it may have less influence among seekers with a learning orientation. For example, a client with a learning goal who seeks advice on sales force automation may actually judge the information as less valuable if the consulting firm also discloses that it is experienced in shop floor design. Alternatively, a chief executive officer with a decision-making orientation who seeks information to decide between different sales force automation packages may prefer information from a consulting firm with a wide range of clients over information from a more specialized firm. These results imply that marketers may first want to identify whether the information seeker's goal orientation is learning or decision making before deploying information providers.

Importantly, these results suggest that information provider behavior should be viewed as an important component of an interactive communication strategy that involves decisions not only about information content and media but also about how to respond to individual customers. Making strategic choices about how to respond to customer inquiries and who such responses should come from is particularly relevant to current marketing environments in which communication is customer initiated (Achrol and Kotler 1999). These results also have implications for marketers who use the anonymity of the Web to engage in "promotional chat" by disguising their identities in online forums (Mayzlin 2006) and the resultant consumer welfare implications of such practices.

Limitations and Directions for Further Research

Our empirical context involved a discussion forum that used points. Although the use of points is clearly not characteristic of many information-seeking contexts, the use of points here was opportune because it enabled an objective measure of judgments of information value. It might be argued that points incentivize information providers and thus increase the speed, elaboration, and frequency of responses. However, because these incentives were present for all information providers in this study, the presence of points should not systematically bias the results.

It might also be argued that the public nature of feedback on the value of information is not typical of information-seeking contexts. Although some information-seeking contexts provide public feedback (e.g., Amazon.com's posting of the number of seekers who found a particular review helpful), it is possible that these results do not generalize to nonpublic contexts. Although it is not immediately clear how nonpublic contexts would lead to different results, the issue is an empirical one worthy of further research. Another limitation is that the particular context we investigate uses nonmonetary rewards (points) versus monetary rewards. The use of monetary awards to incentive information providers may alter the results observed here.

Although our data set avoids problems such as retrospective biases linked to alternative approaches, such as surveys, it has other limitations. In particular, our naturalistic setting does not allow us to disentangle the behavior of the information provider from the information content he or she provides. Thus, it is difficult to know whether judgments of information value are affected by current and past behaviors alone or by some combination of these factors with the actual quality of information provided. Disentangling information quality from current and past behavior could be addressed in further research by controlling for or manipulating information quality independently of provider behavior, perhaps experimentally. In addition, our data do not indicate whether information judged to be valuable was actually used (i.e., whether information seekers were actually influenced by the advice they received). However, a posttest conducted on 251 respondents indicated a significant relationship between information value and intentions to use this information ($r = .58$, $p < .001$).

In addition, our analysis focused on the behavioral cues available in our data set. Although we show that information providers' current and past behaviors affect perceived information value, it is likely that nonbehavioral cues are also used to judge information value. To the extent that cues such as information provider trust (Smith 2002), credibility (Mayzlin 2006), motivation for participation (Hennig-Thurau et al. 2004), similarity, personality (Toder Alon 2005), or passion (Chevalier and Mayzlin 2006) can be assessed either directly through online profiles or indirectly through their communication, they are likely to be used along with the behavioral cues examined here in assessments of information value. Further research could examine the relative importance of behavioral and nonbehavioral cues in online and traditional environments.

The impact of current and past behaviors on value judgments may also depend on a host of moderating factors we do not examine here. Although we examine one characteristic of the information seekers (their goal orientation), the impact of provider behavior on value judgments may depend on whether seekers (1) have considerable versus limited confidence, (2) are high versus low in attention to social comparison information, (3) are high versus low in risk aversion, or (4) need information on an urgent versus nonurgent basis. Other factors that affect the credibility of information providers include their trustworthiness and likeability (Petty, Cacioppo, and Goldman 1981; White 2005) and whether the information is provided by a marketer rather than an unbiased third-party information provider (Mayzlin 2006). Moreover, although we examined the value of information in terms of its usefulness, it is undoubtedly a broad construct with several dimensions, such as veracity, scarcity, and synchronicity, all of which could be investigated in further research.

Appendix

SAMPLE QUERIES

	Question	*Goal Orientation*
1	Our client has created an acronym for this new service process that sounds like a man's name (e.g., think of United Airlines new low-cost division, TED). Our client wants to personify their new service (i.e., we'll brand to this name and promote the acronym as if it is a real person). Think of this as if United created a TED character who would serve as spokesperson for the airline or who would be the "universal pilot".... Is personifying a service process a smart strategy? My concern is that it may be too "cutesy" for senior-level executives to whom the promotional messages will be targeted. Then again, it may be more memorable. I'd look forward to your suggestions. Feel free to rip the strategy to pieces!—David	Decision making
2	Being inexperienced I would like to have step-by-step guidance on how to perform a profitability analysis. I would like to understand the elements of profitability analysis and how to calculate profitability for service network of a two-wheeler company.	Learning
3	Recently, I was assigned to market lab tests in the area of genetics (premarried tests, chromosomal disconfigurations); there was no growth in lab sales since it is founded four years ago. Marketing budget is limited; sales forecast is less than it should be. The concept is new, so what is your advice and strategies to be adapted?	Decision making
4	I need to know the difference between sales and marketing—the main component of them.	Learning

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