Chronemic Nonverbal Expectancy Violations in Written Computer Mediated Communication

Abstract

Time related (chronemic) cues are an important component of nonverbal communication. Do they also act as nonverbal cues in computer mediated communication? 55 participants were asked to rate a job candidate described in a vignette. Candidates varied in their valence (high valence, low valence) and in their response latency to an e-mail (normative one day latency, and nonnormative latencies of two weeks, and of total silence for a month). Candidates were identical in all other respects. The results show that the normative online response latency was more expected and resulted in more positive evaluations of the candidate. Complex interactions between response latency and candidate valence were observed. The importance of response latency as a nonverbal cue in computer mediated communication is discussed.

Introduction

Expectancy Violations Theory

Expectancy Violations Theory (EVT) (Burgoon, Buller, & Woodall, 1996) initially attempted to explain why some invasions of private space resulted in a negative reaction, while in other cases similar violations of proxemic norms resulted in positive reactions. Later, EVT was expanded to apply to other nonverbal behaviors and to involvement violations in general (Burgoon & Hale, 1988; Burgoon, Newton, Walther, & Baesler, 1989). The theory describes what happens when expectations about a communicator's nonverbal behavior are violated. It asserts that once such a violation occurs (for example, when a person we are comfortably conversing with significantly decreases conversational distance), our attention to this nonverbal aspect of the conversation is heightened, and we attempt to assign a valence to this violation: is it positively valenced (e.g. the other person's decreased conversational distance is a pleasant act of increased intimacy) or is it

negatively valenced (e.g. the decrease in distance is a threatening act). EVT research has shown that often the assignment of violation valence is a result not only of the type of violation, but is influenced by our assessment of the person who committed the violation. To take the above example, the decrease in the conversational distance by a high valence person who is attractive and appealing to us, is more likely to be judged as a positive violation than the same action by a low valence person whom we judge as unattractive or even as repulsive.

In a pivotal study of nonverbal expectancies, Burgoon and Walther (1990) set out to understand how expected or unexpected various nonverbal behaviors are, what evaluations are assigned to these behaviors, and how these evaluations are moderated by communicator valence, as well as by communicator gender. In that study, the authors asserted that "*...communication expectancies are cognitions about the anticipated communicative behavior of specific others, as embedded within and shaped by the social norms...*" (p. 236). They go on to make the distinction between "expectancy" for what is predicted to occur, rather than what is desired. By making that distinction, they separate *expectancies* from *evaluations*. The results of that study clearly demonstrate which nonverbal behaviors are more expected than others (i.e. normative), how various nonverbal behaviors are evaluated, and how they affect variables such as communicator credibility, attractiveness and relational message interpretation. Relational communication (Burgoon & Hale, 1987) resembles identity and impression management, though it follows a participant (rather than observer) perspective, it is directed to a specific target, it focuses on the dyadic interaction, and it focuses on meanings attached to nonverbal behavior (Walther & Parks, 2002). EVT reveals interesting interactions

between expectancies and communicator valence, as well as between evaluations and communicator valence. EVT has been applied to online communication and online expectancies too (Burgoon, Burgoon, Broneck, Alvaro, & Nunamaker Jr, 2002; Krikorian, Lee, Chock, & Harms, 2000).

Chronemics of email responsiveness and unresponsiveness

When people converse using CMC, they send messages as well as respond to the messages sent by the person they are communicating with. This exchange creates a rhythm, a rhythm common to traditional conversation (Brady, 1965; Cappella, 1979; Jaffe & Feldstein, 1970; Sacks, Schegloff, & Jefferson, 1978), and to CMC conversations. An in-depth analysis of the nature of this rhythm in asynchronous written CMC (Kalman, Ravid, Raban, & Rafaeli, 2006a) has shown a highly skewed pattern, in which most responses occur relatively quickly after the receipt of the message that elicits them. Nonetheless, some responses occur only after a very long time. A mathematical analysis of the distribution of these response latencies led the authors to define three zones that describe response latencies of users. The zones are defined by τ, the average response time at a given situation. The first zone, zone I, includes response latencies of a duration τ or less. Most (at least 70-80%) of the responses fall in this zone. Zone II includes response latencies greater than τ, but smaller than 10τ. A small minority of the responses fall in this zone. Zone III response latencies have been titled "long silence" and include rare responses (less than 3-4% of the responses) that take more than 10τ to be sent. These three zones describe the norms of response latencies. For example, if τ for email correspondence is in the vicinity of one day (Kalman & Rafaeli, 2005), then normative response latencies would be those that falls within zone I (for example 10

hours or one day), or within zone II (for example, 5 days), while a response that falls in

zone III (for example two or three weeks) would be considered nonnormative. These

empirically measured behavioral norms should be placed in the wider context of

chronemics, of "*how humans perceive, structure, and use time as communication*"

(Burgoon et al., 1996 p. 122). The chronemics of online communication have received

only little attention in the literature. An important exception is the work by Walther &

Tidwell (1995) who presented the importance of chronemics in conveying subtle

messages even in the apparently cue-impoverished medium of email.

The above studies are related to cases where a response has, eventually, been created and

sent. Nevertheless, what about situations of total online silence: situations where no

response at all was received? Silence is a subject that received a lot of attention in

traditional research (Tannen & Saville-Troike, 1985), and recently increasing attention in

the context of CMC and CMC chronemics: Work by Williams and his colleagues

(Eisenberger, Lieberman, & Williams, 2003; Smith & Williams, 2004; K D Williams,

2005; K.D. Williams, Cheung, & Choi, 2000; K.D. Williams et al., 2002; Zadro,

Richardson, & Williams, 2004) has demonstrated the significant emotional consequences

of online silence or "cyberostracism"; Work by Cramton (2001) has shown the severe

effects of online unresponsiveness on the work of distributed groups; Work on the

importance of "lurkers" in online communities (Nonneeke & Preeee, 2000; Rafaeli,

Ravid, & Soroka, 2004; Soroka & Rafaeli, 2006; Takahashi, Fujimoto, & Yamasaki,

2002) also emphasizes the unique role of unresponsiveness in online communication;

Work on customer satisfaction following the filing of an online complaint, (e.g. Mattila &

Mount, 2003) demonstrated the ever decreasing satisfaction as response times increase, and the strong customer dissatisfaction resulting from an unanswered complaint email.

Response latency as a chronemic cue

Expectancy Violations Theory, in conjunction with findings on online silence and on the chronemic profiles of online response latencies, enabled us to hypothesize about online response latency as a nonverbal chronemic cue. This research looks at the way different email response latencies affect the impressions created by a job applicant (for details see the Method section below). Three response latency levels were used: a normative response latency, a nonnormative response latency, and total silence. The three latency levels were chosen based both on empirical results (Kalman & Rafaeli, 2005; Kalman et al., 2006a) as well as on more qualitative studies such as that of Tyler & Tang (2003). The zone I **one-day** response latency was chosen as a typical normative latency, in the vicinity of τ; the zone III response latency of **two-weeks** was chosen as a typical nonnormative long pause, above 10τ; and, the third point was **never**, continued silence of a month, deep into zone III and well beyond 20τ.

Hypotheses

The hypotheses were based on the assumption that norms of behavior that were mathematically deduced from empirical measures of response latencies in study 1, will also be reflected in the expectations of communicators. The assumption was that experienced e-mail users will perceive a normative response latency as more expected than nonnormative response latencies. Thus:

$H^2 1$: *Normative (one day) latency is more expected than (a) long latency (two weeks) and (b) "never".*

Having no a-priori reasons to assume otherwise, and based on the results of Burgoon &

Walther (1990), it was assumed that expectancy violations will result in a lower

assessment of the communicator by the recipient of the cues, for all variables measured,

and thus:

$H^2 2$: (a) evaluation, (b) social attraction, (c) task attraction, (d) immediacy/affection, (e) similarity/depth, (f) receptivity/trust, and (g) credibility, will be more favorable when latency is normative (one day) than when it is (I) long (two weeks) or (II) "never".

A nonnormative response latency that would lower the evaluation and attraction of a job

candidate is also likely to lower the likelihood of recommending hiring that candidate

(Burgoon, Manusov, Mineo, & Hale, 1985), and thus:

$H^2 3$: Likelihood of recommending hiring will be higher when latency is normative (one day) than when it is (a) long (two weeks) or (b) "never".

EVT teaches us that in cases of ambiguous nonverbal cues, when there is more than one

interpretation for a violation, the valence of the communicator might influence the way

the violation is interpreted, and thus:

H4: The main effect of response latency on (a) expectedness (b) evaluation (c) social attraction, (d) task attraction, (e) immediacy/affection (f) similarity/depth (g) receptivity/trust and (h) credibility will be moderated by applicant valence

And, this fourth hypotheses leads to a final research question:

RQ1: If H4 is supported, how will the main effect of response latency on expectations, evaluation, credibility, attractiveness and relational message interpretation, be moderated by candidate valence?

Method
A short paper-based vignette was handed out to each of the participants. Vignettes have

been used in diverse ways in questionnaires and interviews. A typical vignette is based on

a relatively short description of a concrete situation, followed by questions that elicit a

judgment or a decision from the responder (Alexander & Becker, 1978). In the methodology employed in this study, different responders receive vignettes which differ only in the parameters under investigation, the independent variables. All other elements of the situation are held constant. This allows the researchers to examine the effect of the independent variables on the respondent's judgment of the situation. This technique is especially effective in evaluating normative judgments, as well as beliefs and values (Alexander & Becker, 1978; Finch, 1987). The use of vignettes is often an effective alternative to experiments and to observational techniques, but is also limited by the fact that no vignette can fully reproduce the complexity of real life situations (Hughes & Huby, 2002).

The fact that the vignette method is an effective tool for measuring norms and attitudes made it an appropriate method to explore the sensitivity of e-mail users to chronemic norms. The methodology allowed holding constant all factors other than response latency and candidate valence. Moreover, this experiment was in line with previous work on online chronemics (Walther & Tidwell, 1995).

The vignette was followed by a set of identical questions, and a brief demographic questionnaire. The versions of the vignette were physically mixed, and unanswered or partially filled questionnaires were collected and discarded.

Participants
Participants were 55 graduate students enrolled in an MBA program at an Israeli university. Average age was 36 years (s.d.=6.8), 31% were female. All participants use e-mail at least a few times a week. The students were asked to volunteer and dedicate 10-15

minutes between classes to complete the questionnaire. No compensation or class credit

was offered. The questionnaires were collected during, and immediately after class.

The Vignette

The vignette (described in detail in the Appendix) was inspired by a similar face to face

EVT experiment described in Burgoon et al. (1985). In the vignette, the participants read

about a job candidate, were asked to form an impression of the candidate, and then

respond to a questionnaire about the candidate. Each respondent received one version out

of a total of six (2x3) versions of the vignette. The vignettes varied by the candidate's

valence (high valence and low valence) and by the candidate's email response time (one

day, two weeks, no response at all for a month). After reading the vignette, the

participants were asked to respond to a set of questions that measured their impression of

the candidate's attributes (see "dependent variables" below), and of the likelihood that

they will recommend the candidate for the position.

Dependent Variables

The dependent variables were based on adaptations of existing scales commonly used in

EVT research. The adaptation was two-fold: a translation from English into Hebrew, and

an adjustment of the scales that were used for face-to-face situations, for the

measurement of impressions from online behavior. The adaptation resulted in a set of

eight scales with acceptably high standardized Cronbach alpha reliabilities: *expectedness*

and *evaluation* (Burgoon & Walther, 1990) were 0.81 and 0.86 respectively, *social*

attraction and *task attraction* (McCroskey & McCain, 1974) were 0.85 and 0.87

respectively, *immediacy/affection*, *similarity/depth* and *receptivity/trust* (Burgoon &

Hale, 1987) were 0.72, 0.75 and 0.75 respectively, and *credibility* (McCroskey & Young,

1981) was 0.76. *Likelihood to recommend* was based on a single question taken from Burgoon et al. (1985). All responses were on a seven-interval Likert-format scales. A high score denotes a more positive evaluation. These eight scales allowed us to measure expectedness, evaluation, attraction (social & task), three relational message interpretations (immediacy/affection, similarity/depth and receptivity/trust) and credibility.

Results

Manipulation checks

Manipulation checks were performed to confirm that the valence manipulation was perceived by the respondents. A t-test comparing two independent samples was performed to compare evaluation of high and low valence candidates. As expected, evaluation differed significantly $t(53)= - 2.99$, $p=0.0042$. In addition, a chi-square analysis of the likelihood that the candidate will be recommended for the job (described below) showed strong dependency ($p=0.0005$) between high candidate valence and the likelihood of being recommended.

Hypotheses and research question

Note that the research question stems from hypothesis 4.

Two-way ANOVA was performed to identify main effects of response latency and of valence, as well as interactions between latency and valence. The ANOVA was followed by a post-hoc test, Duncan's multiple range test, to see which effects of response latencies are statistically significant ($p<.05$). In order to gain a deeper understanding of interactions between valence and response latency, a one-way ANOVA was performed separately for each of the two valence levels, measuring the main effect of response latency at each

valence. This test too was followed by Duncan's multiple range test, as described above.

The main effects are summarized in table 1, the means by latency are summarized in

table 2, and the means by latency split by valence are summarized in table 3 and in Figure

1. A t-test revealed no significant differences between the responses of males and of

females for any of the independent variables.

Hypotheses

H1: Main effect on expectedness
The two way ANOVA showed a significant main effect for latency on expectedness,

$F(49,2)=4.90$, $p=0.0115$. The expectedness for a one-day latency was significantly higher

(M=4.51) than for two-weeks (M=3.67) or for never (3.26). H1 was supported.

H2: Main effects on evaluation, attraction, relational message interpretation, and credibility

Evaluation
The two way ANOVA showed a significant main effect for latency on evaluation,

$F(49,2)=4.74$, $p=0.0131$. The evaluation for a one-day latency was significantly higher

(M=4.39) than for never (M=3.08). However, it was not significantly higher than for a

two-week latency (M=3.59). H2aI was not supported, and H2aII was supported.

Attraction
The two way ANOVA did not show a significant main effect for latency on social

attraction, $F(49,2)=2.13$, $p=0.1294$. However, an interaction was detected between

valence and latency, as presented below (H4). H2b was not supported.

A two way ANOVA did not show a significant main effect for latency on task attraction,

$F(49,2)=1.60$, $p=0.2125$.

H2c was not supported.

Relational message interpretation

The two way ANOVA showed a significant main effect for latency on immediacy/affection, $F(49,2)=5.92$, $p=0.0050$. The immediacy/affection for a one-day latency was significantly higher (M=4.92) than for two-weeks (M=3.98) or for never (M=3.43). H2d was supported.

The two way ANOVA showed a significant main effect for latency on similarity/depth, $F(49,2)=18.05$, $p<0.0001$. The similarity/depth for a one-day latency was significantly higher (M=5.24) than for two-weeks (M=4.21) or for never (M=2.93). H2e was supported.

A two way ANOVA showed a significant main effect for latency on receptivity/trust, $F(49,2)=8.24$, $p=0.0008$. The receptivity/trust for a one-day latency was significantly higher (M=5.15) than for never (M=3.63) but not significantly higher than for two-weeks (M=4.52). H2fI was not supported, and H2fII was supported.

Credibility

The two way ANOVA showed a significant main effect for latency on credibility, $F(49,2)=4.22$, $p=0.0204$. The credibility for a one-day latency was significantly higher (M=4.83) than for two-weeks (M=3.97) or for never (M=3.86). H2g was supported.

H3: Likelihood of hiring

A chi-square analysis of the effect of latency (normative versus nonnormative) on likelihood of recommendation resulted in too many cells and a low average number of measures per cell. Thus, the possible answers were dichotomized by removing the equivocal responses ("my opinion is balanced between yes and no"), and grouping in one

group all those who said they will recommend the applicant (in 3 various likelihoods), and in the second group all those who said that they will not recommend the candidate (also, in 3 various likelihoods). The resultant chi-square analysis yielded a less than significant result that did not support H3a: $\chi^2=3.2143$ p=0.0730, and a significant result that supported H3b: $\chi^2=5.4106$ p=0.0200.

H4: Interactions between latency and valence

Expectedness
The two way ANOVA revealed an interaction between latency and valence on expectedness $F(49,2)=4.35$, p=0.0183. The expectedness of high valence candidates was significantly higher for a one-day latency (M=5.39) than for two weeks (M=3.47) or never (M=3.31). However, the expectedness of low valence applicants was the same, regardless of response latency (one-day: M=3.53, two-week M=3.87, never M=3.23). H4a was supported.

Evaluation
The two way ANOVA did not reveal a significant interaction between latency and valence on evaluation $F(49,2)=1.79$, p=0.1779. However, there is some evidence for such an interaction, since the evaluation of high valence applicants who responded within one day was significantly higher (M=5.27) than for those who responded within two weeks or not at all (M=3.81, M=3.44, respectively), while the evaluation of low valence applicants was the same regardless of response latency (one-day: M=3.41, two-week M=3.37, never M=2.83 respectively). H4b was partially supported.

Attraction

The two way ANOVA revealed an interaction between latency and valence on social attraction $F_{(49,2)}=4.50$, p=0.0160. The social attractiveness of high valence candidates was significantly higher when they responded within one day (M=5.00) than when they responded within two weeks (M=3.12). However, there was no significant difference between the social attractiveness of low valence applicants regardless of response latency (one-day: M=2.21, two-week M=2.58, never M=2.56). H4c was supported.

The two way ANOVA did not reveal a significant interaction between latency and valence on task attraction $F_{(49,2)}=0.67$, p=0.5169. H4d was rejected.

Relational message interpretation
The two way ANOVA did not reveal a significant interaction between latency and valence on immediacy/affection $F_{(49,2)}=1.49$, p=0.2359. However, there is some evidence for such an interaction, since the immediacy/affection of high valence applicants who responded within one day was higher (M=5.30) than for those who responded within two weeks or not at all (M=3.71, M=3.85, respectively), while the immediacy/affection of low valence applicants was not significantly higher when they responded within one day (M=4.5) or within two weeks (M=4.25), and was significantly lower only if they did not respond at all (M=3.14). H4e was partially supported.

The two way ANOVA did not reveal a significant interaction between latency and valence on similarity/depth $F_{(49,2)}=1.33$, p=0.2736. H4f was rejected.

The two way ANOVA did not reveal a significant interaction between latency and valence on receptivity/trust $F_{(49,2)}=1.45$, p=0.2443. However, there is some evidence for such an interaction, since the receptivity/trust of high valence applicants who responded within one day was significantly higher (M=5.35) than of those who responded within

two weeks or not at all (M=4.23, M=4.00, respectively), while the receptivity/trust of low valence applicants was the same when they responded within one day (M=4.93) or within two weeks (M=4.80), and were significantly lower only if they did not respond at all (M=3.37). H4g was partially supported.

Credibility

The two way ANOVA did not reveal a significant interaction between latency and valence on credibility $F(49,2)=1.09$, $p=0.3448$. However, there is some evidence for such an interaction, since the credibility of high valence applicants who responded within one day was significantly higher (M=5.41) than of those who responded within two weeks or not at all (M=4.06, M=4.30, respectively), while the credibility of low valence applicants was the same regardless of response latency (one-day: M=4.19, two-week M=3.88, never M=3.55). H4h was partially supported.

RQ1: how does valence moderate the main effect of response latency on expectedness, evaluation, attraction, relational message interpretation, and credibility

Evidence for a significant interaction between valence and the main effect of response latency was found in expectedness, and in social attraction; some evidence for this interaction was found in evaluation, immediacy/attraction, receptivity/trust, and credibility; no evidence at all for such an interaction was found in task attraction, and similarity/depth. Due to the complexity of the interactions, a detailed discussion of these interactions will be presented in the Discussion section. One generalization that can be made about all of the cases where at least some significant interaction was detected is that in these cases, the absolute differences between the score for the normative behavior, and the score for the nonnormative behaviors, was greater in the case of high valence

candidates than in the case of low valence candidates. Or, in other words, the effect of response latency on the assessment of the candidate for these variables is a greater effect in the case of high valence candidates, than in the case of low valence candidates.

Discussion

Response latency as a nonverbal cue in CMC
The results of this study allow us to assert that response latency acts as a nonverbal cue in CMC. The study extends the findings of Kalman et al. (2006a) who analyzed the chronemic behavior of large numbers of CMC users, and who identified normative and nonnormative response latency zones. The study demonstrates that CMC users are sensitive to these response latency zones: they expect other users to stay within the normative zones, and react when these expectations are violated. The existence of chronemic cues in CMC has already been convincingly demonstrated in the past (Walther & Tidwell, 1995), and this study strengthens and extends those early findings. It also strengthens the evidence against the claim that CMC media, especially asynchronous written CMC, are poor media (Daft & Lengel, 1986; Daft, Lengel, & Trevino, 1987) devoid of the richness afforded by non verbal cues used in spoken communication.

The effects of response latency on expectedness, evaluation, attraction, relational message interpretation, and credibility
The results presented in table 1 show that on average, respondents presented with normative response latency consistently judged the candidate more positively than those presented with a nonnormative response latency. Thus, as a generalization, we have evidence that longer than normative response latencies, as well as total unresponsiveness, are interpreted as negative violations. These results are in line with the findings on reticence in face-to-face situations (Burgoon & Koper, 1984). These results come as no

surprise, since long latencies in email slow down communication and make it less efficient, and total silence results in a loss of interactivity. A rapid response to an email signals immediacy, care and presence (Aragon, 2003; Danchak, Walther, & Swan, 2001; Feldman & March, 1981; Goodwin, 2002; Walther & Tidwell, 1995), and failure to respond creates negativity and hostility, as already presented above. It is also evident that in the case of high valence applicants, for all of the variables, the mean for one-day latency was always higher than that for the other two latencies. This difference was not always statistically significant, but since the direction was the same in all cases, i.e. that the one-day latency was more positively rated than the other, nonnormative latencies, it is possible that the lack of significance is due to an insufficient sample size. Future studies could use this observation about directionality to test directional hypotheses, effectively increasing the power of the analysis in comparison with the non-directional ANOVA employed in this exploratory study.

Below is a discussion of the effect of response latency on each of the dependent variables, by candidate valence (Table 3).

Expectedness

In the case of high valence candidates, one can see that a one-day response was significantly more expected than a two-week latency or a never latency. On the other hand, when the candidate's valence was low, the three response latencies had the same level of expectedness. This difference is surprising, and begs an explanation. One possible explanation is that the negative first impression that is created by the vignette has a primacy effect that increases the salience of the negative impression and overshadows the effect of response latency on expectedness. A similar, but alternative

explanation is based on the fact that the information about valence was obtained, according to the vignette, based mainly upon a face-to-face interview. It is possible that a negative face-to-face impression has an overwhelmingly strong influence on future computer mediated interactions. Lastly, it is possible that the weight and importance of the interview, which is the formal selection tool, overcomes that of the less important minor e-mail follow-up. These three explanations are not mutually exclusive, and the data at hand do not allow ruling out one or more of these explanations.

Evaluation

In the case of high valence candidates, a one-day response was significantly more highly evaluated than a two-week latency or a never latency. On the other hand, when the candidate's valence was low, the evaluations did not differ significantly. This finding is similar to the behavior on expectedness from the previous section, and reflects the strong correlation between expectedness and evaluation (the Pearson correlation coefficient in this study was 0.77, $p < 0.0001$), which expresses the strong link between normative behavior and positive evaluation. Such a high correlation has already been reported by Burgoon & Walther (1990).

The drop in evaluation of a candidate who violates expectations is explained well by EVT. Nevertheless, the lack of sensitivity to latency in the case of a low valence candidate is as surprising in this case as it is for expectedness, and the same three possible and non-mutually exclusive explanations mentioned for expectedness might apply in this case too.

Social attraction

In the case of high valence candidates, the one-day latency was significantly more socially attractive than the two-week latency. Nevertheless, this difference was not significant in the case of candidates who did not respond at all. This surprising result, that the damage to one's social attractiveness is more significant when one reacts after two weeks than if one does not react at all, is not easy to explain. It might be a result of insufficient statistical power due to small sample size. It might also be a result of the role played by uncertainty in cases of silence. The centrality of uncertainty in "traditional" silence has been long established (Bruneau, 1973; Jaworski, 1999; Tannen & Saville-Troike, 1985), and, if at all, is only increased in CMC. Possibly, if no response at all is received, the drop in social attraction is not as great, since there are possible alternative explanations which are face-saving, such as that the candidate did not receive the e-mail due to some technical fault, or another, independent factor. Nevertheless, if an answer is received after a very long time, after two weeks, it might be more apparent that the reason for the delay is in the hands of the candidate, and not of a third party, and the negative attribution follows. On the other hand, when the candidate's valence was low, the three response latencies were evaluated at the same level, reflecting the same phenomenon already discussed in our discussion of the effect of latency on expectedness and evaluation in low valence candidates.

Task attraction

Task attraction was not significantly influenced by latency, neither in low valence nor in high valence applicants. Possibly, task attraction is not influenced by latency. Alternatively, as already discussed above, this result might be a consequence of insufficient sample size and of a non-directional hypothesis.

Immediacy/affection

In the case of high valence candidates, the one-day response was evaluated significantly higher than the two-week latency or the never latency. On the other hand, when the candidate's valence was low, only the never latency resulted in a significant drop in immediacy/affection, while the two-week latency did not. It seems like in the low valence case, the delay in response did not matter, as long as some response was received, while only total silence sent a message of decreased immediacy/affection.

Similarity/depth

Both in the case of high valence and in the case of low valence candidates, one sees a significant drop in similarity/depth following a never latency, and a weaker, not statistically significant, drop in the case of the two-week latency. It is possible that with a larger sample or a directional hypothesis, the two-week drop too would be significant.

Receptivity/trust

In the case of high valence candidates, one can see that a one-day latency was significantly more highly evaluated than a two-week latency or a never latency. On the other hand, when the candidate's valence was low, only the never latency resulted in a significant drop in receptivity/trust, while the two-week latency did not. It seems like in the low valence case, the delay in response did not matter, as long as some response was received, while only total silence sent a message of decreased receptivity/trust. The behavior of this variable is very similar to that of immediacy/affection, which is not surprising, since both of these variables reflect aspects of intimacy.

Credibility

In the case of high valence candidates, one can see that a one-day response elicited significantly more credibility than a two-week latency or a never latency. On the other

hand, when the candidate's valence was low, the three response latencies elicited the

same level of credibility. This phenomenon reflects the behavior of the expectedness and

evaluation variables, and the same speculations about the reasons for this behavior can be

made in this case too.

Implications for EVT

EVT provided the general framework for this study, and the main effects detected support

its main tenets (Burgoon et al., 1996): people hold expectancies about response latencies

in email communication, and these expectations are both predictive and prescriptive.

They are predictive in the sense of reflecting typical behavior (as described by Kalman et

al's three chronemic latency zones), and they are prescriptive in the sense of reflecting

what is appropriate: we expect people to respond to email queries, and we expect the

response to be within the normative zones. Expectancies and evaluations are closely

correlated. Nevertheless, our results are not easily explained by EVT when we compare

the reaction to expectancy violations by high valence applicants, versus low valence

applicants. As predicted by the theory, there was at least some evidence for interaction

between valence and the means of all of the dependent variables, except task attraction

and similarity/depth. Nevertheless, it seems like the reaction to valence was different than

expected, and that the difference between high valence and low valence candidates is that

the response latency of the former is noticed and influences the evaluation of the

candidate, while the response latency of the latter seems to have only a minor effect on

the evaluation of the candidate. We believe this result does not weaken EVT, but rather

strengthens it, emphasizes its success in identifying the key parameters that affect

evaluations, and in identifying violator valence as a key parameter that interacts with those evaluations.

Implications for nonverbal cues in text-based CMC

The results of this study, as well as previous research (e.g. Walther & Tidwell, 1995) confirm that chronemic cues are an influential category of nonverbal cues in text-based CMC. On the other hand, several theories point to the apparent lack of nonverbal cues in text-based computer mediated communication (CMC), and suggest that this lack of cues is a key reason why text-based CMC is inferior to face-to-face communication. "Cues-filtered-out" (Culnan & Markus, 1987) and "Lack of Social Context Cues" (Sproull & Kiesler, 1986) claim that the lack of these cues leads to reduced social presence. Media richness theory (Daft & Lengel, 1986) categorizes text-based CMC like e-mail low on the media richness scale, consequently labeling it as inappropriate for the communication of highly equivocal information. These theories emerged in the early days of CMC, when the general public was only starting to adopt this form of mediated communication. These theories are based on the claim that text-based CMC is devoid, or almost devoid, of nonverbal cues. The findings reported here beg the question whether chronemics is the exception to the rule, or whether text-based CMC has turned out to be richer than assumed by theories that were developed two decades ago?

Research that shows that text-based CMC is desired and is used extensively to accomplish complex social tasks, sometimes more successfully than purportedly "cue rich" media such as face-to-face conversation (Herring, 1999; Walther, 1996; Walther & Tidwell, 1995), as well as work that shows that CMC can be an effective tool to convey emotion (Derks, Fischer, & Bos, in press), as well as our findings, lead us to assert that

text-based CMC might be rich in nonverbal cues. There is evidence that such cues are actually quite prevalent (e.g. Byron & Baldridge, 2007; Masterson, 1996; Panteli, 2002; Walther & D'Addario, 2001; Walther & Tidwell, 1995; Zviran, Te'eni, & Gross, 2006). Moreover, it is possible that the early hypotheses and theories that deterministically labeled some technologies as inferior and poor, led to a delay in the exploration of a significant portion of the communication taking place during computer mediated communication.

Limitations of the study

Participants in this study were drawn from students in an MBA class at a single university. On the one hand, this was an advantage: a typical student in such a class is a full-time employed professional who studies part-time. The demographics of the group show that this is a relatively heterogeneous group of students, with diverse backgrounds and life experiences. However, participants were still recruited as a convenience sample from one segment of the population, and further research should explore additional segments of the e-mail using public.

The vignette described a single, clearly defined relational hierarchy: a job applicant and a potential recruiter. This fact limits the ability to generalize from this specific example, to other situations in which a host of other relational hierarchies may exist.

Only three of the relational message interpretations were incorporated, out of eight possible interpretations suggested by Burgoon and Hale (1987). That means that the analysis was less comprehensive. This was a result of two challenges: the first was to keep the number of questions in the vignette as low as possible in order to allow it to be administered to an academic class under a tight schedule. The second was a challenge in

translating the existing scales from one language to another. For example, where English has two synonyms, "casual" and "informal", Hebrew does not have a synonym. Consequently, the richness of the "formality" scale was diminished, and the scale was not useable in our study.

The ambiguity of some nonverbal cues is central to EVT, and the "never" latency chosen for this study was supposed to represent this ambiguity. When no response is received to an e-mail, there are plenty of possible explanations, some of which reflect badly on the intended recipient, the addressee of the e-mail, while some do not. For example, it is not possible to know if the addressee actually received the e-mail message. Nevertheless, it is possible that the ambiguous status of the "never" latency was not salient enough in this vignette, and no manipulation check that can verify if it was perceived as ambiguous or not, was employed.

The vignette versions that had the "never" latency included less information about the candidate (one less e-mail) than the other versions. No manipulation check was designed to assess the impact of this added information. We have no reason to assume this had a major impact, since in many cases the evaluations of the never latency and two-week latency (which does have that extra e-mail) were not significantly different. Nevertheless, without a manipulation check this remains a potential obstacle.

Lastly, the vignettes methodology is limited. On the one hand, it offers a very noise-free background against which to test hypotheses and modify variables (e.g. Alexander & Becker, 1978; Alves & Rossi, 1978; Denk, Benson, Fletcher, & Reigel, 1997; Finch, 1987; Ganong & Coleman, 2005; Hughes & Huby, 2002; Kosic, Mannetti, & Lackland Sam, 2005; Miller et al., 1997). It is also an efficient alternative to lengthy experiments.

For example, carrying out an experiment in which participants would be asked to evaluate candidates with whom they actually correspond over e-mail, would have been much more resource demanding than the present vignette. On the other hand, the vignette is a tool that requires the participants to imagine a situation, and imagine the way they would react to that situation. Real behavior might be different from imagined behavior. For example, we know that individuals who experience social exclusion experience the passage of time as slower (Twenge, Catanese, & Baumeister, 2003). Such an effect could not be reproduced in individuals reading a vignette about online silence.

Future directions

An obvious extension of this study is to increase the sample size, in a manner that will allow additional manipulations such as investigating more points on the continuum of response latencies, as well as assessing the impact of other intervening factors, such as, for example, a two-week latency accompanied by an apology for the delay. Such apologies seem to be common in responses beyond 10τ (Kalman, Ravid, Raban, & Rafaeli, 2006b). In addition, it would now be possible to make directional hypotheses based on these initial results, as well as on the results of classical EVT. These directional hypotheses can then be explored using a more sensitive tool such as contrast analysis (Rosenthal & Rosnow, 1985).

The success of the vignette methodology in exposing expectations and evaluations related to online communication opens the door to investigating additional nonverbal cues in computer mediated communication, and thus enriching our understanding of the way impressions are formed and interpreted in the online world.

An additional interesting direction would be to explore the role of response latencies in other social contexts. It is possible, for example, that a delayed response from a high valence addressee who is being courted by the sender will be interpreted as a positive expectancy violation, possibly even more positive than a quick response.

Summary

This study confirms that users of email are sensitive to response latencies, are aware of response latency norms, have expectations about response latencies, and incorporate response latencies as cues in their assessment of their fellow communicators. These cues influence a broad range of variables, and can affect impressions, as well as actions such as a recommendation to recruit or not recruit a job candidate. The study emphasizes the powerful negative influence of online silence.

Acknowledgement

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Appendix

Below is a detailed description of the vignettes. The translation from Hebrew is mostly literal, and some of the sentences might sound awkward in English. The texts used here were piloted on several native Hebrew speakers, and reflect a typical "business casual" linguistic style.

The email texts were presented in a different font type, and within a thin frame that delineated the text.

The vignette described to the participants a sequence of events in which:
1) The participants are asked to assess a candidate whose name is Rafi (a typical male Israeli name) for the position of sales team leader.
2) The candidate sent an application email. The text of the email was presented verbatim:

> Hello,
>
> I wish to apply for the advertised position of sales manager. I have over 6 years of sales experience, and believe that my qualifications meet the advertised requirements.

Then the participants were told that the candidate was subsequently interviewed by them at the company's offices. "Rafi is a 29 old salesperson. You were very [un]impressed by his presentation and his professionalism. It seems to you that his sales experience is exactly that [not the experience] required for the job. Personally, you felt very [un]comfortable with him." Square brackets describe the low valence version of the vignette.

Following that, the participants were informed that they realized that their interview notes contained something unclear. Following that they sent Rafi the following email (provided verbatim):

> Hello Rafi.
>
> Thanks for your visit at our offices. I reviewed my interview notes and realized that something is not clear to me. Was your 2002-2004 position purely a sales position, or did you also have some managerial responsibility?

A month has passed, and you received no response from Rafi (never latency)/After one day/two weeks you received the following response:

> Hello,
>
> it was a pleasure meeting you. I certainly hope to come and work in your organization! I was very impressed by the positive atmosphere in the office, and feel that I will be able to easily fit in.
> As for your question, my role in 2002-2004 was pivotal to the company, and required a high level of responsibility, but it was purely a sales position, with no managerial responsibility.

Following this part, the participants were asked to respond to the questions. Participants were allowed to review the story as they responded.

Tables and figure

Table 1: Main effects of valence and latency, and interactions, on expectedness, evaluation, attraction (two variables), relational message interpretation (three variables), and credibility following two way ANOVA. n=55

	F value: Model	F value: Valence	F value: Latency	F value: Valence*Latency
Expectedness	F(5,49)=4.41**	2.49	4.90*	4.35*
Evaluation	F(5,49)=4.72**	8.75**	4.74*	1.79
Social attraction	F(5,49)=9.43**	31.96**	2.13	4.5*
Task Attraction	F(5,49)=7.62**	30.85**	1.60	0.67
Immediacy/affection	F(5,49)=3.53**	0.87	5.92**	1.49
Similarity/depth	F(5,49)=8.29**	0.00	18.05**	1.33
Receptivity/trust	F(5,49)=4.38**	0.28	8.24**	1.45
Credibility	F(5,49)=3.89**	6.80*	4.22*	1.09

$* p<0.05$
$** p<0.01$

Table 2: Main effect means and standard deviations for the effect of normative (1-day) vs. non-normative (two weeks or never) latencies on expectedness, evaluation, attraction (two variables), relational message interpretation (three variables), and credibility. n=55

	Normative response latency		Non-normative response latencies			
	1-day	s.d.	2-weeks	s.d.	never	s.d.
Expectedness	4.51	1.45	3.67*	1.08	3.26*	1.24
Evaluation	4.39	1.6	3.59	1.34	3.08*	0.98
Social attraction	3.69	1.83	2.85*	1.26	3.24	1.16
Task Attraction	4.38	1.53	3.71	1.51	3.62	1.13
Immediacy/affection	4.92	1.11	3.98*	1.63	3.43*	1.09
Similarity/depth	5.24	0.82	4.21*	1.45	2.93*	1.13
Receptivity/trust	5.15	0.97	4.52	1.19	3.63*	1.15
Credibility	4.83	1.12	3.97*	1.20	3.86*	0.90

* Significantly different ($p < 0.05$) from mean for one-day latency, based on Duncan's multiple range test.

Table 3: Main effect means and standard deviations, by valence, for the effect of normative (1-day) vs. non-normative (two weeks or never) latencies on expectedness, evaluation, attraction (two variables), relational message interpretation (three variables), and credibility. n=55

	Normative response latency		Non-normative response latencies			
High Valence	1-day	s.d.	2-weeks	s.d.	never	s.d.
Expectedness	5.39	1.21	3.47*	1.01	3.31*	1.53
Evaluation	5.27	1.17	3.81*	1.44	3.44*	1.05
Social attraction	5	1.19	3.12*	1.37	4.22	0.83
Task Attraction	5.37	1.12	4.32	1.53	4.6	0.73
Immediacy/affection	5.3	1.11	3.71*	1.85	3.85*	1.02
Similarity/depth	5.07	0.97	4.04	1.44	3.35*	1.08
Receptivity/trust	5.35	0.87	4.23*	1.33	4*	0.95
Credibility	5.41	0.98	4.06*	1.30	4.3*	0.45
Low Valence						
Expectedness	3.53	1.01	3.87	1.17	3.23	1.06
Evaluation	3.41	1.48	3.37	1.30	2.83	0.89
Social attraction	2.21	1.14	2.58	1.18	2.56	0.81
Task Attraction	3.26	1.11	3.1	1.29	2.94	0.80
Immediacy/affection	4.5	1.01	4.25	1.44	3.14*	1.08
Similarity/depth	5.42	0.64	4.37	1.54	2.64*	1.11
Receptivity/trust	4.93	1.09	4.8	1.05	3.37*	1.25
Credibility	4.19	0.94	3.88	1.17	3.55	1.03

* Significantly different (*p* < 0.05) from mean for one-day latency, based on Duncan's multiple range test.

Figure 1: Means for three latencies, of expectedness, evaluation, attraction (two variables), relational message interpretation (three variables) and credibility, by candidate valence