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Silicon sycophants: the effects of computers that flatter

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A laboratory experiment examines the claims that (1) humans are susceptible to flattery from computers and (2) the effects of flattery from computers are the same as the effects of flattery from humans. In a cooperative task with a computer, subjects ($N = 41$) received one of three types of feedback from a computer: "sincere praise", "flattery" (insincere praise) or "generic feedback". Compared to generic-feedback subjects, flattery subjects reported more positive affect, better performance, more positive evaluations of the interaction and more positive regard for the computer, even though subjects knew that the flattery from the computer was simply noncontingent feedback. Subjects in the sincere praise condition responded similarly to those in the flattery condition. The study concludes that the effects of flattery from a computer can produce the same general effects as flattery from humans, as described in the psychology literature. These findings may suggest significant implications for the design of interactive technologies.

1. Introduction

In the last two decades, computer feedback has changed dramatically. Today we are (for the most part) bidding farewell to the cryptic computer outputs and error messages of earlier days. Increasingly, the feedback from computers comes in more "user-friendly" forms. As a result, today's computer users can rely less on technical training and more on their natural language abilities and culturally determined scripts (Gaines, 1981; Ferrari, 1986; Cawsey, 1989; Nielsen, 1990).

While scholars and designers have investigated the impact of feedback from computers (e.g. Schurick, Williges & Maynard, 1985; Sellen, 1990; Pridemore & Klein, 1991), the research to date has assumed that the feedback was accurate (at least from the subject's point of view). No study has examined the effects of a duplicitous computer—one whose words do not necessarily match the situation. While this kind of duplicity is common in human–human interactions [people often say things they do not mean (Jones & Wortman, 1973)], no one knows what effects mismatched words and reality would have in human–computer interaction.

This study looks at one kind of mismatch between words and reality: flattery. Usually referred to in the literature as "other enhancement", flattery is defined as communicating positive things about another person without regard to that person's true qualities or abilities (for similar definitions, see Jones, 1964; Pandey & Singh, 1987; Kumar & Beyerlein, 1991). In other words, this study investigates the effects of computers that praise users regardless of their actual performance on a task. In doing so, this study posits two questions: can computers effectively flatter users? And if so, are the

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effects of flattery from a computer the same as the effects of flattery from another human being?

Why might anyone believe that individuals would be susceptible to flattery from computers? This prediction, and the associated method, is based on the "Computers Are Social Actors" or "CASA" paradigm (Nass, Steuer, Tauber & Reeder, 1993; Nass, Steuer & Tauber, 1994; Reeves & Nass, 1996). CASA studies demonstrate that the social rules and dynamics guiding human–human interaction apply equally well to human–computer interaction. For example, Nass, Moon and Carney (1995) found that people apply politeness norms to computers: individuals asked by a computer to evaluate its own performance tended to provide a more positive response, compared to when asked by a different computer. Similarly, research has demonstrated that people use the notion of "self" and "other" when evaluating computers (Nass, Steuer, Henriksen & Dryer, 1994), apply gender stereotypes to computers based on the voices used (Nass, Moon & Green, in press), and respond to computer personalities in the same way they respond to human personalities (Nass, Moon, Fogg, Reeves & Dryer, 1995). In sum, the CASA paradigm maintains that individuals can be induced to behave *as if* computers warranted human consideration, even though users *know* that the machines do not actually warrant this treatment, which is a process known as ethopoeia (Nass *et al*., 1993). In all these experiments, as in the present study, CASA draws on the experimental procedures and measures developed by psychologists studying human–human interaction and adapts them to the study of human–computer interaction.

If individuals are susceptible to flattery from computers, the CASA paradigm would suggest that the effects of flattery from computers should match the effects of flattery from humans, as documented in the literature from social psychology.

2. Effects of flattery

Most scholars who have examined flattery have investigated the concept from the position of the flatterer—who uses flattery, to whom, in what contexts and for what purposes. In contrast, relatively few (e.g. Jones, 1964; Pandey & Kakkar, 1982) have studied the effects of flattery on the receiver (known in the literature as the "target"). Of the research on flattery from the target's point of view, a few common findings emerge, as described below.

Targets tend to believe that flatterers speak the truth: targets of flattery tend to believe the content of flattering messages, even if they know the flatterer is insincere. As Cialdini (1993) puts it,

> "We are phenomenal suckers for flattery" (p. 145).

Because people have a basic desire to think of themselves favorably (Berscheid & Walster, 1978; Taylor & Brown, 1988), targets of flattery want to believe that the flatterer is following the implicit social contract of being sincere (Jones, 1964, 1990). Also, because targets of flattery are inclined to accept the messages as veridical, insincere praise and sincere praise may well induce the same effects.

Flattery creates positive affect in the target: another general finding from the flattery literature is that people feel good when others flatter them (Berscheid & Walster, 1978; Pandey & Kakkar, 1982; Pandey & Singh, 1987; Swann, Hixon, Stein-Seroussi &

Gilbert, 1990). Even if the targets of flattery judge the content to be inaccurate, the flattery still produces positive affect (Byrne, Rasche & Kelley, 1974). Related to positive affect is the increased power-feeling and importance that targets of flattery experience (Pandey & Singh, 1987).

Targets like those who flatter them: various studies show that people like people who flatter them (Jones, 1964; Jones & Wortman, 1973; Wortman & Linsenmeier, 1977; Berscheid & Walster, 1978). This effect seems to hold even if the flattery is excessive (Jones, 1964), except when an ulterior motive is clear (Berscheid & Walster, 1978).

Targets judge the performance of flatterers more favorably: flattery also enhances the perception of the flatterer's performance. For example, employees who flattered their bosses were rated higher on "competence" and "overall performance" (Wortman & Linsenmeier, 1977; Watt, 1993; see also Pandey & Kakkar, 1982). Not only does the target rate the flatterer's work performance more favorably, but the target also perceives the flatterer to be more intelligent (Pandey & Singh, 1987).

3. Relevance to human–computer interaction

The effects of flattery among humans are intriguing, but the idea that computer flattery will work similarly to human flattery might be farfetched. To a certain degree, human flattery may work because people believe the content of the flattering message (Jones, 1990). People simply expect other people to observe an implied social contract of sincerity in communication (Grice, 1975; Jones, 1990), so flattering messages may be unwittingly construed as veridical. However, the implied social contract that operates in human–human communication may not apply in human–computer interaction.

Other theories also suggest that flattery dynamics may not function in human–computer interaction. Reciprocation norms (Cialdini, 1993) and balance theory (Heider, 1958), for example, might explain certain effects of flattery. Both theories predict that if Susan praises John, then John would feel obligated to reciprocate Susan's sentiment in some way. In the human–computer realm, however, common sense would say that people would not feel obligated to return a compliment to a computer that praised them; humans simply have no social obligations to machines. Indeed, the concepts of reciprocation norms and balance theory have never been applied to human–computer relationships.

Despite these arguments against the potential efficacy of computer flattery, we find the possibility highly compelling, given the CASA paradigm. This experiment therefore attempts to determine (1) if humans are susceptible to flattery from computers and (2) if the effects of flattery in human–computer interaction are the same as those listed above for human–human interactions.

4. Method

4.1. PARTICIPANTS

Forty-one college undergraduates volunteered to participate in a computer experiment called the "Animal Game". All subjects were familiar with computers in general (i.e. they could use a mouse to navigate menus, they could word process, and they could manage an email account on UNIX). Gender was balanced across conditions.

4.2. DESIGN

This experiment had three conditions: (1) "sincere praise", (2) "flattery" (insincere praise) and (3) "generic feedback".

4.3. PROCEDURE

After arriving at the laboratory, subjects were told that they would be working with a computer to play a guessing game, which was something like the game called "20 Questions". After hearing a brief description of how the interaction would proceed, subject began working with the computer.

The interaction consisted of 12 rounds of the guessing game using a computer program written expressly for this experiment. In each round, the computer would first prompt the subject to think of an animal. The computer would then pose a series of yes/no questions about the animal, to which the subject would respond by using a keyboard or a mouse (the entire interaction was text-based). For example, the computer might pose the question, "Does the animal have feathers?" Subjects would then answer "yes" or "no", and the computer would continue asking questions. If the computer guessed the animal that the subject had in mind (a very rare occurrence), the computer would start a new round of the game. However, if the computer guessed incorrectly, the computer enlisted the subject's help to refine the game's algorithm by asking the subject to input a yes/no question to be used in later rounds of the game (e.g. the subject might type in "Does the animal have hooves?"). At this point, the computer would provide feedback to the subject (either sincere praise, flattery or generic feedback) and then begin another round of the game.

Once the subjects completed 12 rounds of the game, which took around 15 min in total, they completed a questionnaire. The subjects were then debriefed and thanked for their help.

4.4. MANIPULATION

All three conditions were identical except for the type of feedback the subjects received after making a contribution to the game. According to condition, the subjects would receive either "sincere praise", "flattery" or "generic feedback".

The "sincere praise" and the "flattery" conditions were identical in every respect except for what the subjects were told before interacting with the computer. Subjects in the "sincere praise" condition were led to believe that the feedback from the computer was contingent on their input. (However, to avoid problems of implying intentionality to the computer, we never used the word "sincere" in the experimental procedure.) Specifically, these subjects were told that the computer would evaluate their work by comparing it with the work of hundreds of other previous participants in the game.

In contrast, subjects in the "flattery" condition were told that although the computer would present evaluations on the screen, these evaluations would be noncontingent; they would have nothing to do with their actual performance. To be clear, "flattery" subjects were explicitly told various times that the evaluations from the computer had nothing to do with their input.

In reality, for both the "sincere praise" and "flattery" conditions, the evaluations from the computer were pre-programmed and identical. Subjects under both conditions received mostly positive feedback after they contributed a new question to the program. The computer would display text similar to the following examples: "Your question makes an interesting and useful distinction. Great job!" or "You seem to have an uncommon ability to structure data logically". In total, "sincere praise" and "flattery" subjects saw 10 evaluations that were strongly positive and two evaluations that were somewhat negative (e.g. "Be careful. Your last question may steer the game in the wrong direction".). The moderately negative responses were added to give the positive evaluations more credibility, a common strategy (Jones, 1964; Wortman & Linsenmeier, 1977; Pandey & Kakkar, 1982; Pandey & Singh, 1987).

In the "generic feedback" condition, subjects interacted with the computer in the same way as in the "sincere praise" and "flattery" conditions. However, instead of receiving praise for their work, subjects in the "generic feedback" condition simply saw a message that said, "Begin next round". This message was designed to have neither positive nor negative valence and to be typical of feedback messages on current computing systems.

4.5. DEPENDENT MEASURES

After interacting with the computer, subjects completed a four-page questionnaire. The questionnaire presented a series of adjectives with 10-point Likert scales that were anchored by "Describes Very Poorly" and "Describes Very Well". The questionnaire measured three areas: (1) the subject's feelings during the interaction (adapted from Pandey & Singh, 1987), (2) the subject's perception of the interaction and (3) the subject's perception of the computer. For "sincere praise" and "flattery" subjects, the questionnaire ended with an item designed to verify if subjects remembered the contingency manipulation.

4.6. ANALYSIS

We used theory and factor analysis to construct six indices. All the indices were very reliable (Cronbach's alpha of 0.77 or greater). In addition, the indices were relatively independent, with all correlations among indices no larger than 0.60.

Two indices assessed subjects' feelings about themselves during the interaction. *Positive affect on the user* was an index of three items: "good", "happy" and "relaxed" (Cronbach's $\alpha = 0.77$). *Power-feeling of the user* was an index that consisted of three items: "important", "powerful" and "dominant" ($\alpha = 0.85$).

User's perception of their own performance was an index made up of four items: how well subjects felt they performed, how satisfied subjects were with their performance, how efficient their game framework was and how favorably subjects would rate their performance compared to other subjects ($\alpha = 0.87$).

Two indices assessed user's response to the interaction. *Enjoyment of the interaction* was an index consisting of three items describing the interaction: "fun", "creative" and "rewarding" ($\alpha = 0.84$). *User's willingness to continue working* consisted of two items: how willing to continue working with computer and how willing to continue creating questions ($r = 0.86$).

Evaluation of the computer's performance was an index consisting of three items that referred to the computer: "helpful", "intelligent" and "insightful" ($\alpha = 0.89$).

5. Results

The manipulation check at the end of the questionnaire (a single item asking whether the praise was contingent or noncontingent) showed that all subjects in the flattery and sincere praise conditions correctly indicated whether the praise from the computer was (ostensibly) contingent on their work or not.

We predicted that both the flattery condition and the sincere praise condition would be significantly different from the generic feedback condition. To control for the experimentwise error rate, we compared the flattery and sincere praise conditions to the generic feedback condition using Dunnett's t. If people are truly as susceptible to flattery as the social science literature maintains, then this experiment should find little difference between the sincere praise and flattery conditions. To provide the most rigorous challenge to this expectation of nonsignificance, we compared these two conditions using a simple two-tailed t-test. Table 1 summarizes the results of these analyses.

Overall, the data in Table 1 demonstrate the beneficial effect of praise, regardless of contingency. Praise from the computer—both contingent (sincere praise) and noncontingent (flattery)—had a remarkable impact on how users felt about themselves, the interaction and the computer. Figure 1 presents graphically the means of how users responded to flattery, sincere praise and generic feedback in this experiment.

5.1. FLATTERY VS. GENERIC FEEDBACK

The fourth column of Table 1 compares flattery subjects to generic feedback subjects. The data show that the effects of flattery from the computer were strong and pervasive. First of all, flattery had a clear effect on how users viewed themselves. Compared to generic feedback subjects, subjects who received flattery from the computer reported a higher level of positive affect—a result that is consistent with flattery studies on human–human interaction. In addition, users who received flattering comments from a computer reported a higher level of power feeling than did users who received generic feedback. Finally, despite the fact that flattery subjects knew the computer's evaluations were not relevant to their actual work, users who received flattery from a computer rated themselves as performing better than did subjects who received generic feedback.

While the above findings might not be remarkable for sincere praise in human–human interactions (in fact, these are the findings one would expect), the fact that users reported such positive responses to *flattery* from a *computer* makes these findings striking. This demonstrates that computers—even ones that flatter—can have large effects on how people feel about themselves and their performance.

Table 1 also shows that the flattering computer affected how users assessed the interaction. Users who received flattery from a computer thought the interaction was more enjoyable than did users who received generic feedback. Furthermore, compared to generic feedback users, those who received flattery from the computer were also significantly more willing to continue working with the computer.

TABLE 1
Statistical comparisons of the three conditions

Index	Flattery means	Generic feedback means	Sincere praise means	Flattery vs. generic feedback $t(27)$	Sincere praise vs. generic feedback $t(26)$	Flattery vs. sincere praise $t(23)$
Positive affect of user	8.1	6.3	7.5	3.20**	2.10*	1.2
Power feeling of user	6.8	5.2	7.4	2.50**	3.97***	0.9
User's perception of own performance	6.8	5.2	6.7	2.59*	2.26*	0.1
User enjoyment of interaction	6.8	4.7	6.8	2.74**	2.75**	0.8
User's willingness to continue working	5.8	3.9	5.6	2.27*	2.32*	0.2
Evaluation of computer's performance	4.4	2.5	4.4	2.40*	2.14*	0.0

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

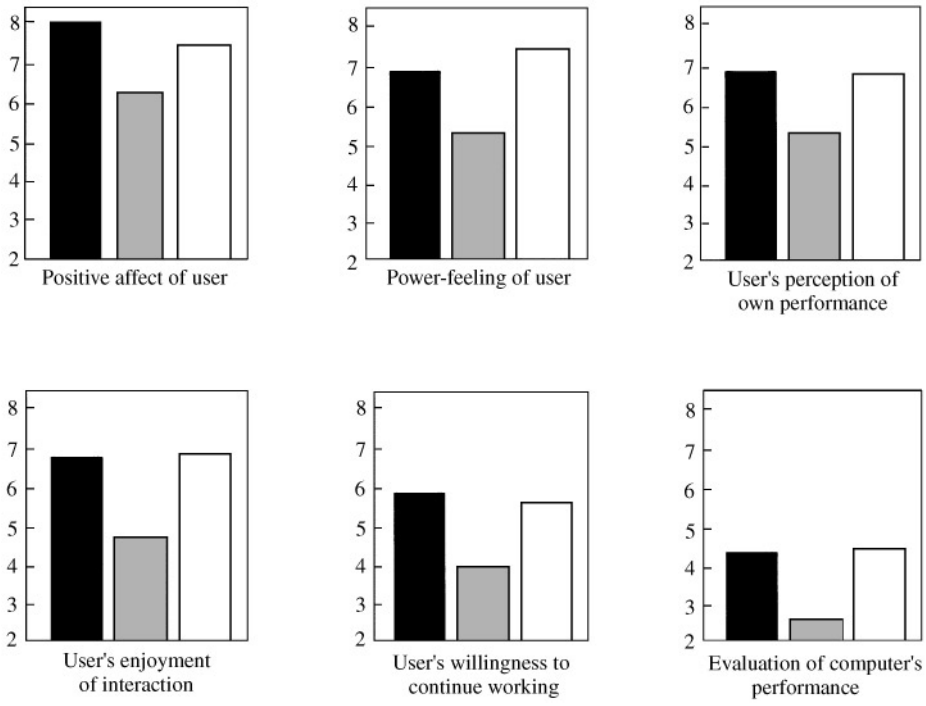

FIGURE 1. Mean response by condition. (■) "flattery"; (▒) "generic feedback"; (□) "true praise".

Not only did subjects view themselves, their performance and the interaction more positively when they were flattered by the computer, they also viewed the computer in a more positive light. Table 1 shows that the computer that flattered users was perceived to have performed better in the interaction than the computer that gave generic feedback. Like other findings above, this finding is consistent with those from human–human studies on flattery.

5.2. SINCERE PRAISE VS. GENERIC FEEDBACK

The fifth column of Table 1 compares the sincere praise condition with the generic feedback subjects. Each index shows a significant difference between the two conditions, which is not particularly surprising. The data show subjects who received "sincere praise" from the computer reported a higher level of positive affect and felt more powerful than did subjects who received generic feedback. Also, sincere praise subjects thought they performed better than did generic feedback subjects. In addition, sincere praise subjects enjoyed the interaction more and were more willing to continue working with the computer. Finally, sincere praise subjects felt that the computer performed significantly better than did generic feedback subjects.

5.3. FLATTERY VS. SINCERE PRAISE

The final column of Table 1 compares the flattery condition with the sincere praise condition. As predicted, none of the six comparisons is significant. In examining the cause of the nonsignificance, we can rule out lack of power for three reasons. First, the largest *t*-value is 1.2, with all the other *t*-values below 1.0. Second, all the measures reached significance when compared to the generic feedback condition. Finally, all the measures were highly reliable. Hence, the data provide compelling evidence that flattery from a computer is as effective as sincere praise in generating certain positive responses from users.

6. Discussion

Perhaps the most important finding from this study is that praise from a computer is extremely powerful. Praise makes people feel better about themselves, their performance, the interaction and the computer offering the evaluations. Surprisingly, these beneficial effects occur even when users know that the computer's positive feedback has no bearing on their actual work; as this study shows, the beneficial effects of sincere praise and flattery from a computer were identical.

This study also shows that flattery from a computer can produce the same general effects as flattery from humans. Because the results of this study parallel the results of flattery studies among humans, this experiment provides additional support for the Computers Are Social Actors paradigm. Specifically, both computers that flatter and humans that flatter evoke similar responses in their targets, suggesting that at some psychological level a computer is not just another machine; it is a social actor.

What do these results mean for those who design media? If our results generalize to other people in other interactions with computers, we find important implications for design. Simply put, computers should praise people frequently—even when there may be little basis for the evaluation. In fact, to generate the highly beneficial effects discussed in this study, media designers do not necessarily need to create computer systems that provide contingent praise. Flattery works as well as sincere praise, probably because positive feedback (unlike negative feedback) is usually accepted without scrutiny. In fact, a compelling follow-up study could examine how people respond to contingent and noncontingent criticism from a computer. Findings in social psychology (Fiske & Taylor, 1984; Kunda, 1987; Swann & Schroeder, 1995) lead us to hypothesize that users receiving noncontingent criticism would respond less negatively than users receiving contingent criticism.

Because current computer applications are so heavily geared toward critical messages rather than praising ones, our study shows that a significant opportunity exists for enhancing the user experience. For example, adding either sincere praise or flattery to training and tutorial software may well increase user enjoyment, task persistance and self-efficacy. Because these three components are important in learning, generous positive feedback would ultimately make both the user and the software more successful.

Applications that allow users to generate text or graphics may also benefit from incorporating sincere praise or flattery. The positive messages in these applications could address user efforts ("Your careful work on this drawing is impressive."), user strategies

("Setting up a style sheet is a smart way to work. Good thinking!"), or the final product ("Congratulations on a job well done.").

In addition, if these results generalize, then applications that help users perform arduous or distasteful tasks seem ideal candidates for using copious positive feedback. For example, various computer programs exist to help people pay taxes, lose weight and balance a checkbook—all of which tend to be aversive tasks. The findings in this study suggest that if such programs praised or flattered users, these tasks would become less aversive, with the user feeling happier and more powerful as a result of using the computer application.

In sum, all the above design implications result from two key findings of this study: (1) praise has multiple beneficial effects on user perceptions and (2) flattery from computers generates the same effects as sincere praise. The other significant finding—that humans are susceptible to flattery from computers in the same way that humans are susceptible to flattery from other humans—contributes to theory by providing evidence for the Computers Are Social Actors paradigm. Thus, this study not only sheds light on the interesting dynamics of flattery and its potential use in today's software applications, but it also furthers our understanding of how humans interact with computing technologies.

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