

# The Role of Social Norm in User-engagement and Appreciation of the Web Interface Agent Bonzi Buddy

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## Abstract

*A small pilot experiment (N=14) investigated user-engagement (i.e. involvement and distance) and appreciation of the Web interface agent Bonzi Buddy, a monkey-like cartoon figure that assists in performing computer tasks and that claims to provide empathic functionality. The study focused on the effects of peer-group norms on individual judgments of anthropomorphic Web applications. The experiment was performed with master students of Computer Science at the Vrije Universiteit, Amsterdam, using a structured questionnaire. Preparatory activation of the norms of the peer group positively impacted the subjectively experienced level of involvement as well as of distance. Given the initial low personal involvement, this may be interpreted as a result of group conformity and regression to the average, but in view of the moderate level of estimated group distance, unexpectedly, as rebellion against such group restraints as well. The level of appreciation remained unaffected.*

## 1. Introduction

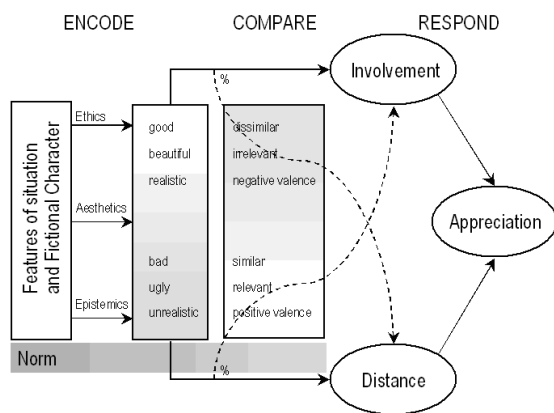
Intimacy at a distance [3], not only physically but also emotionally, is the key concept to understanding quasi-social behaviors with persons on television, in film, or digital media. Mediated persons, such as presenters, actors, or fictional characters in video games can provoke unidirectional relationships with the viewer. Recent developments in ICT, such as the Internet, have enabled the growth of virtual communities in which people can put up faked identities. Designers of computer systems and communication in-

terfaces develop empathic agents as the utmost user-friendly software application. For example, agents supposedly help performing tasks, help achieving (business) goals, and facilitate work processes in an emotionally appealing style. One of the most important functions of empathic agents is to emulate face-to-face multimodal communication between the system and the user. Personified multimodal communication would be richer and easier to comprehend than unimodal communication such as text. Personified interfaces can provide back-channel feedback to users in a more natural and less obtrusive manner than interface widgets such as dialog boxes (cf. [10, 11, 12, 13]). Although it is widely admitted that integrating human interpretation is paramount in interface design, yet agent theory mainly 'is concerned with the question of what an agent is, and the use of mathematical formalisms for representing and reasoning about the properties of agents' [18]. Although at the moment that may seem a bit of an overstatement [14, 9], there is still a need for creating 'quality interactive characters (or believable agents)' [15]. 'Two important aspects of such characters will be that they appear emotional and that they can engage in social interactions' [ibid].

Agents that evoke empathy are supposed to do so in an individual user. However, users are members of social groups (e.g., communities of practice or friendship networks), a fact that has considerable effect on the level of empathy that is experienced [16]. Whether or not an agent application is accepted or rejected is not only the effect of its empathic qualities but also of the assessment of empathy by the user as influenced by peer group norms. If a Computer Science student visits, for example, a Web site that advertises the Bonzi Buddy Web agent (Appendix 1), he or she will be prejudiced against the agent before even interacting with it and despite the empathic qualities it advertises (e.g., put a smile on your face, expressing emotions on your

behalf). One of the factors causing these effects is that Computer Science students reckon with the group norms of their peers, who forbid appreciating Microsoft applications in the first place, particularly user applications that may be judged childish.

In line with [16], we define prejudice as negative attitudes toward an agent to create a psychological distance towards the prejudiced agent, which may result in disliking the agent, before even using it and despite its empathic characteristics. Moreover, we consider empathy as one aspect of a broader concept of experiencing involvement with another (mediated) person [2]. Agents may not only invoke empathy but also friendliness, responsiveness, admiration, etc. Moreover, as in the case of prejudiced assessments of a mediated figure, empathy has its counterpart in antipathy, aversion, boredom, and irritation, in a word, in psychological distance. Next we provide an explanation of how involvement (with empathy as an important constituent) and distance transpire when people encounter fictional characters, such as agents.



**Figure 1. Model of perceiving and experiencing fictional characters [2]**

The model of Perceiving and Experiencing Fictional Characters (PEFiC) (Figure 1) [2] is an explanation of how humans engage with persons that are presented through media, such as TV, film, VR, and multimedia. In the encoding phase, people assess the ‘ethics’ of a character (e.g., was the agent created with a good intend or does it have spyware), its aesthetic appeal (beautiful-ugly) and degree of realism or ‘epistemics’ (e.g., realistic tutor or unrealistic cartoon). In the comparison phase, people evaluate the relevance of the character to their concerns (e.g., is the agent pertinent to my computer tasks). Users estimate the outcome expectancy or valence of using the agent (e.g., help

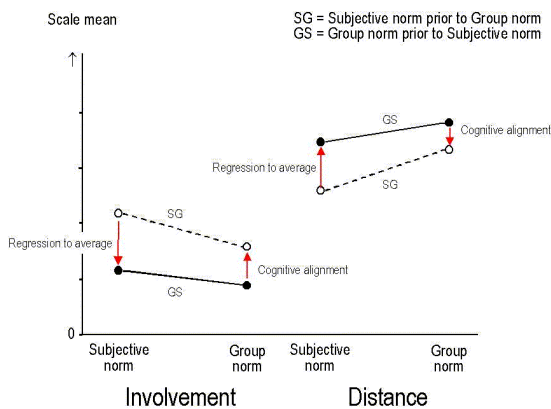
or annoyance), and how similar the agent and its behaviors are to the self, i.e. in the case of avatars acting on the user’s behalf. All these evaluations are input to the response phase, in which involvement with and distance towards the character predicate the appreciation of the character. The core assumption of the PEFiC model is that involvement and distance are simultaneously activated and together explain appreciation of a character or mediated person better than involvement or distance alone. The model is empirically tested, and to a large extent, corroborated by exposing real viewers to film characters [8] and news photos [7]. PEFiC predicts, among others, that the factor Social Norm (subjective norm vs. peer group norm) will have differentiating effects on the levels of involvement and distance, but less so on appreciation, which is a measure that usually regresses to an average judgment, such as ‘nice’ [8].

The present study focuses on the role of subjective and peer group norms in the response phase of the PEFiC model. Two general mechanisms are assumed to motivate the effects of Social Norm on engagement with personae in parasocial interaction. One is a well-evidenced mechanism of compliance with the group norm (conformity) (e.g., [4, 5]), which should be materialized in regression to the average for prejudiced judgments from a peer group’s perspective. If the peers take extreme positions, subjective judgments will be more prejudiced (i.e. extremely negative) in view of the group norms than without taking the group norms into account. However, [17] state that the degree of membership to a group is an ‘enduringly salient component of the person’s self-definition,’ and more important than the motivation to live up to the group’s expectations. Even when subjects do not comply with the (negative) group norms, they are happy to be identified with them. In this line, the second mechanism we will coin ‘cognitive alignment.’ If personal opinions are expressed without consciously taking into account the group’s opinions, the estimations of the group’s opinions will be adapted to the earlier expressed personal opinions so to justify in hindsight the personal opinions expressed earlier. If subjective judgments are mild, the extremity of the group’s opinions will be reduced so to align the estimated group average with the personal opinions.

The present pilot experiment is concerned with the effects of social norms of Computer Science students on the response phase (Figure 1) of engaging with fictional characters, i.e. the Web agent Bonzi Buddy. Participants were invited to judge the Bonzi Buddy figure, which offers computer task functionality (e.g., Web searches) as well as emotional functionality (e.g., telling jokes). Because Computer Science students in their Masters are expert users of Web applications, the somewhat silly and probably, to them, not so useful empathic agent probably will evoke more distance than involvement. However, due to the emotional function-

ality, which may have a universal appeal, these students may experience more involvement and less distance than they think they are allowed (prejudice) according to their expert peers.

In this light, Hypothesis 1 (H1) states that, because Computer Science students are expert users of Web applications, they will experience more distance than involvement. H1 should be corroborated by a significant main effect in which the level of distance is higher than of involvement. Hypothesis 2 (H2) claims compliance with group norms (prejudice) as based on the norms of peer experts who are assumed to experience considerable distance and little involvement. Regression to the average should become visible in substantial differences between the levels of involvement and distance for subjective judgments that follow active awareness of peer-group norms, subjectively experienced distance being at its highest and involvement at its lowest point. Hypothesis 3 (H3) posits that, free from the conscious presence of peer-group norms (i.e. being more unprejudiced), subjective involvement is higher and distance lower than estimated in view of the group norm. Cognitive alignment, however, will



**Figure 2. Predictions of the relationships among the scale means of involvement and distance in response to Social Norm and Order of judgment**

adjust the perceived group averages to the subjective judgments, in this case, making estimated group involvement less low and estimated group distance less high. Hypothesis 4 (H4) states that appreciation is insensitive to the effects of Social Norm, being a neutral statement that conceals actual emotional activity. H2, H3, and H4 should be observable in the interaction among engagement (involvement-distance) but not appreciation, social norm (subjective vs. group), and

order of judgment (subjective judgments prior to perceived group judgments vs. perceived group judgments prior to subjective judgments). The predicted relations among factors and factor levels are depicted by Figure 2.

## 2. Method

### 2.1. Participants and Design

University master students ( $N=14$ , age 21-27) in Computer Science, Multimedia and Culture, taking classes in Text Interface Design at the Vrije Universiteit of Amsterdam served as volunteers in a questionnaire experiment. Two versions of the questionnaire were filled out, one focusing on the respondent's subjective norms and one focusing on estimations of the group norms (i.e. of the other 13 respondents). Participants were randomly assigned to two experimental conditions ( $n=7$ ). They either filled out the group version of the questionnaire prior to the subjective version or vice versa. The full factorial design consisted of a 2 (Order: Subjective prior to group norm vs. Group prior to subjective norm) \* 2 (Sex: Male vs. Female) (between-subjects factors) \* 2 (Social norm: Subjective vs. Group) \* 3 (Scales: Involvement vs. Distance vs. Appreciation) as within-subjects factors, the dependent variable being agreement to the statements. Age served as a covariate in the analysis.

### 2.2. Stimuli

A screenshot of the Bonzi Buddy homepage (see Appendix 1) served as the stimulus<sup>1</sup>. It was printed in black and white on both versions of the paper questionnaires and was projected in color on a screen in front of the class. The screenshot featured a purple gorilla-like cartoon figure in eight different poses, smiling, writing, holding a globe in his hands, eating a banana, etc. Apart from functionality that is concerned with performing computer tasks (e.g., e-mailing, Internet searches, help and documentation), the Bonzi Buddy agent pretends to have empathic functionality as well (conversing, telling jokes, expressing emotions, being knowledgeable about life, etc.). In particular, the feature that the user should feed the monkey in time is supposed to actively trigger empathy and other aspects of user involvement.

### 2.3. Procedure

Participants were seated in a dimly lit classroom opposite (about 2-3 meter) of a projection screen. The Bonzi

<sup>1</sup> BonziBUDDY and BONZI are trademarks of BONZI Software, Inc. BonziBUDDY uses Microsoft Agent Technology.

Buddy screenshot was rendered in Microsoft PowerPoint 97 SR-2 on an Asus M1 300 Series laptop connected to a PHILIPS UGO X-Lite Impact video beamer (XGA resolution, 1000 ansi lumen). The size of the screenshot on the screen was about 1 m. by 2 m. Seven participants received the subjective version of the questionnaire first, followed by the version on the perception of peer group norms. The other seven participants received the reverse order, that is, the group version prior to the subjective version. Items of the scales Involvement, Distance, and Appreciation were pseudo-randomly mixed, following a different order for each version (see [1]).

## 2.4. Measurements

Based on the three theoretical factors of the PEFiC-model, (Engagement (involvement-distance), and Appreciation), 2 unipolar scales for Engagement and one bipolar scale for Appreciation were constructed in a 64 items questionnaire (32 items per version) (for details, see [1]). For Appreciation, 12 items were formulated (which in case of bipolarity could be considered 6 indicative and 6 contra-indicative items) and involvement and distance each had 10 items. Items were statements, followed by a 6-point rating scale (0 = I fully disagree; 5 = I fully agree). For details on the complete questionnaire and its theoretical account, see [8].

*Engagement.* To cover the subjectively assessed and felt tendency to (psychologically) approach or avoid the Web agent as affective processes called involvement and distance, two 10-item scales were constructed. Items reflected general positive/negative affect and approach/avoidance tendencies toward Bonzi Buddy, such as ‘I have friendly feelings for Bonzi Buddy’, ‘I want Bonzi Buddy on my screen’, ‘I prefer to stay away from Bonzi Buddy’, ‘Bonzi Buddy leaves me with cold feelings’. Items in the group-norm version were the same, except that they were focusing on the fellow students (‘My fellow students prefer to stay away from Bonzi Buddy’, etc.).

*Appreciation.* The general evaluation in terms of (dis)liking the Bonzi Buddy figure was formulated in simple evaluative statements such as ‘Bonzi Buddy is fun’ and ‘Bonzi Buddy is boring’.

## 3. Results

The items that were contra-indications of Appreciation were recoded and analyzed together with the indicative items as one scale of 12 items. Together with Appreciation, the 10-item scales of Involvement and Distance were analyzed for psychometric quality. The complete analysis and all results are tabulated in [1] and summarized in Ta-

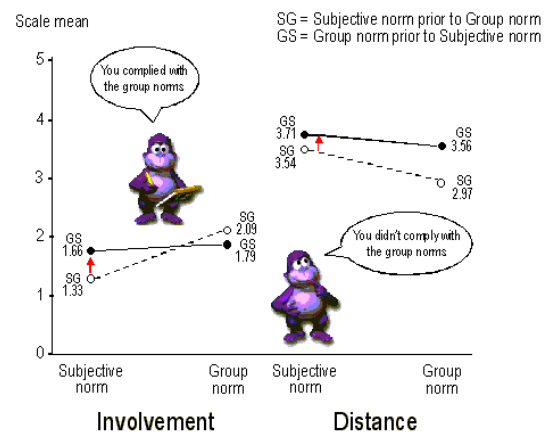
Involvement		Distance		Appreciation	
Subjective	Group	Subj	Group	Subj	Group
.92	.91	.86	.90	.92	.85

Note: Involvement: 10 items (unipolar). Distance: 10 items (unipolar). Appreciation: 12 items (bipolar).

**Table 1. Scale reliabilities (Cronbach’s  $\alpha$ ) for the engagement (involvement-distance) with and appreciation of Bonzi Buddy according to subjective and group norm (N=14).**

ble 1, which shows that scale reliabilities are excellent (.93 > Cronbach’s  $\alpha$  > .84).

A 2\*2\*2\*3 MANOVA was run for Order (between-subjects) by Sex (between-subjects) by Norm (within-subjects) by Scale (within-subjects) on the level of agreement to questionnaire statements about involvement with, distance towards, and appreciation of the Bonzi Buddy agent with Age as a covariate. The complete procedure and all results are presented in Hoorn (2003). The mean agreement to statements about involvement, distance, and appreciation are shown in Table 2. Figure 3 graphically depicts the scale means of Involvement and Distance alone as related to Order and Norm.



**Figure 3. Scale means of Involvement and Distance, underlying the significant third-order interaction among Order, Norm, and Scale**

Significant effects were established for the main effects of Scale (Pillai’s Trace = .65,  $F(2,10) = 9.34$ ,  $p = .005$ ).

	Involvement (a)				Distance (a)				Appreciation (b)			
	Subjective		Group		Subjective		Group		Subjective		Group	
Order:	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Subjective-Group (b)	1.33	.94	2.09	.96	3.54	.92	2.97	.53	2.31	.50	2.97	.46
Group-Subjective (b)	1.66	.77	1.79	.71	3.71	.91	3.56	.77	2.07	.82	3.55	.53

Note: For *Subjective*,  $n = 7$ . For *Group*,  $n = 7$ . (a) indicates that differences were significant for Engagement; (b) indicates no significant effects.

**Table 2. Means and SDs for the engagement (involvement-distance) with and appreciation of Bonzi Buddy according to subjective and group norm (N=14).**

Parameter estimates for the contrast between Involvement and Distance showed a significant effect with a moderate to large effect size (Coefficient: -3.41,  $t = -3.56$ ,  $p = .004$ ,  $\eta_p^2 = .56$ ). Parameter estimates for the contrast between Involvement and Appreciation also showed a significant effect with a moderate to large size (Coefficient: -1.31,  $t = -3.80$ ,  $p = .003$ ,  $\eta_p^2 = .59$ ). Parameter estimates for the contrast between Distance and Appreciation were doubtful (Coefficient: 2.10,  $t = 2.32$ ,  $p = .041$ ,  $\eta_p^2 = .35$ ), particularly if the rejection area is corrected according to Bonferroni (then,  $\alpha = .05/3 = .017$ ). More importantly, however, these effects were partly embedded in a significant third-order interaction of Order\*Norm\*Scale (Pillai's Trace = .47,  $F(2,10) = 4.43$ ,  $p = .042$ ). Parameter estimates for the contrast between Involvement and Distance showed a significant effect of a moderate size (Coefficient: .57,  $t = 3.05$ ,  $p = .011$ ,  $\eta_p^2 = .48$ ). Parameter estimates for the contrast between Involvement and Appreciation, however, showed an insignificant effect ( $p = .112$ ). The same occurred for the contrast between Distance and Appreciation ( $p = .153$ ).

#### 4. Conclusions/Discussion

H1 was corroborated by the significant main effect of Scale, suggesting that, overall (Table 2), the level of distance ( $M = 3.45$ ) towards the Bonzi Buddy Web agent was substantially higher than the level of involvement ( $M = 1.71$ ). Appreciation took a middle position ( $M = 2.30$ ), being significantly higher than involvement, and as a trend, lower than distance. H4, then, was corroborated in that appreciation seems to be a neutral judgment of "I find it so-so," whereas the real differentiation in emotional behavior lies in engagement, that is, in the case of Bonzi Buddy, the difference between feeling a bit involved while keeping a great distance.

In particular engagement (involvement - distance) was also sensitive to the social factors of Order and Norm. As predicted, the third-order interaction among Order, Norm, and Scale (involvement vs. distance, but not appreciation) was significant, but H2 and H3 were but partly supported. Table 2 and Figure 3 reveal that the estimated involvement

for the group ( $M = 2.09$ ) was higher than subjective involvement ( $M = 1.33$ ) if subjective judgments preceded judgments about the group norm (condition SG). In the condition where judgments about the group norm preceded subjective judgments (condition GS), regression to the average took place in that subjective involvement ( $M = 1.66$ ) was higher than in the SG condition, and, in the same vein, the level of group involvement ( $M = 1.79$ ) was estimated lower in GS than in SG conditions ( $M = 2.09$ ). Probably, conscious activation of the group norm prior to subjective judgments on involvement led to conformity with a group position that was assumed to be moderate (Figure 3, red arrow left). Judgments were more extreme, however, when the respondents made their subjective evaluations without first taking into account the norms of their peers (condition SG). It seems that these Computer Science students guessed that their private evaluations of the Bonzi Buddy figure were (far) less friendly than those of their peers. That regression to the average took place so that subjective judgments became more conform the perceived group judgments is in support of H2. However, that the subjective norms rendered more extreme results than the perceived group norms was unexpected by H2.

Although the overall level of distance was higher than of involvement, the third-order interaction also discloses that (Table 2, Figure 3) subjective distance was at its peak ( $M = 3.71$ ), surprisingly, in the condition where awareness to peer-group norms was activated first (GS). This level of distance was higher than in the SG condition, in which subjectively experienced distance ( $M = 3.54$ ) was established without prior activation of the group norms, in other words, without the moderating group influence. Taken into account that the estimated level of distance according to the group norms were decreased compared to subjective distance in both GS ( $M = 3.56$ ) and SG ( $M = 2.97$ ) conditions, it seems that against conformity (Figure 3, red arrow right), these Computer Science students judged themselves more reserved towards Bonzi Buddy than their peers. H3, then, on cognitive alignment of norms, should be rejected. H3 expected that perceived group norms would be harmonized when they followed judgments according to subject-

tive norms. Yet, that subjectively experienced distance was at its highest when estimated after conscious activation of group norms (condition GS) is completely at odds with H3. It also seems from these results, that these Computer Science students were not prejudiced against Bonzi Buddy based on the peer group norms. If there was any prejudice at all, it probably was positive because the group was estimated as friendlier than the students judged themselves.

In sum, the overall level of distance these Computer Science students experienced towards the Bonzi Buddy Web interface agent was higher than the level of involvement (H1) but this was not based on negative social prejudice. In addition, involvement estimated for the group was higher than personal involvement (against H2), while distance estimated for the group was lower than the personally experienced distance (against H2). In experiencing involvement with Bonzi Buddy, however, conscious activation of the peer-group norms led these students to comply with a more moderate degree of involvement than their private norms would have allowed (H2), according to which they experienced little involvement. With regard to the experience of distance, however, these Computer Science students were less flexible with the Bonzi Buddy figure, even before interacting with it and despite its empathic characteristics. Here, they rebelled against or conformed less to the perceived group norms (against H3) by enhancing the more moderate level of distance that was assumed for their peers up to the highest degree of distance that was measured in this experiment. The most interesting finding, however, is perhaps that appreciation was insensitive to these involvement-distance conflicts (H4), which occurred in response to the conscious presence or absence of the norms of significant others. Probably, the mild appreciation these students had of Bonzi Buddy (taking a middle position between high distance and low involvement) was put up merely to express a harmless judgment that shielded of what was actually felt inside (i.e. less involvement and more distance than probably allowed); so to 'keep your nose clean' as it were. With regard to the PEFiC-model (Figure 1, then, Social Norm as a factor in engaging with fictional characters and mediated people seems to have a complex socio-emotional impact on parasocial behavior. Preparatory activation of the norms of the peer group had a positive effect on the subjectively experienced level of involvement as well as of distance. Given the initial low personal involvement, this may be interpreted as a result of group conformity and regression to the average, but in view of the moderate level of estimated group distance, unexpectedly, as rebellion against such group restraints and prejudices as well.

Yet, the level of appreciation remained unaffected. If one looks at appreciation alone, one could think that the social group is so homogeneous that no differences can be detected between group norm and subjective norm in paraso-

cial behavior with fictitious others. However, in the light of the observed interactions between subjectively experienced engagement and social norm, this is not the case.

As to future research, understanding empathy, engagement, and interaction with agents has to include a more sophisticated approach including in depth qualitative approaches in intensive interactive situations. The students did not actually interact with the agent but only saw the Web page. This is a limited way of evaluating such an agent and whatever the results it is hard to know what they will experience during interaction. This first impressions approach should come to the point where the response to and effect on the individual during interaction is what we are searching for. Moreover, further experimentation is needed with more stimuli and larger groups of participants to draw somewhat firmer conclusions, which will be done in a follow-up [6] on this small-scale exploration.

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## Appendix 1

Screenshot of the Web agent Bonzi Buddy and the description of his (emotional) functionality. The first part of the questionnaire focused on the subjective norms, the second on the perception of group norms. Order of filling out the two questionnaire versions was counterbalanced. The questionnaire (in Dutch) can be found in [1].

