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The Benefits of Synchronized Genuine Smiles in Face-to-Face Service Encounters

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Abstract

This paper examines the role of facial expressions in dyadic interactions between a banking service provider and customer. We conduct experiments in which service providers manipulate their facial expressions while interacting with customers in one of three conditions: In the neutral condition the banker tried to maintain a neutral facial expression; in the smiling condition the banker tried to smile throughout the interaction; in the empathetic condition the banker tried to respond with the same or complementary facial expressions. Results show that the customers (n=37) were more satisfied with the service provider interaction when they perceived the service provider was empathetic. More significantly, the service provider and customer shared synchronized genuine facial expressions with many prolonged smiles, when customers said the service provider was empathetic. According to the analysis based on what actually happens in the interaction, smiling banker without sharing smiles with customers was appraised worse than non-smiling banker.

1. Introduction and Related Work

During conversations people tend to mimic one another's facial and body gestures, such as smiling together, nodding their heads in unison, or each putting their hand on their chin. Research has shown that synchronized nonverbal cues can influence face-to-face communication in a positive manner (Kendon, 1970). Many aspects of mimicry behavior have been studied by social scientists. In Chartrand's work he demonstrated the *chameleon effect*, showing that those participants that interacted with a confederate who imitated the participant's behavior, compared with the case in which the confederate did not imitate the participant, felt the interaction was more pleasing (Chartrand & Bargh, 1999). Other research has also investigated the positive influence of mimicry behavior in varying situations. In student-teacher interaction, the rapport between student and teacher was stronger when the students were copying the teacher's behavior (LaFrance, 1982). In counselor-client conversation clients preferred those counselors who mimicked the clients' expressions to those who did not (Maurer & Tindall, 1983).

There are many arguments, and growing evidence, to account for human behavioral mimicry. According to the common-coding theory (Prinz, 1997; Knoblich & Flach, 2003), the representations of generated action are affected by the representations of perceived action and vice versa. Decety claims that people have similar representations of action (Decety J & Sommerville, 2003) and that people mimic the physical movements of one another because they are projecting the other person's situation to their own (Decety, 2004). Empathy produces this "kinesthetic" imitation (Lipps, 1903), which induces people to think that they are sharing similar affective states and experiences with their conversation partners (Decety, 2004). The result is that people feel as if they "connect" with others, which influences the building and sustaining of relationships with others (Chartrand, 2005). As a result people create positive social and emotional qualities including affiliation and rapport by unconsciously mimicking the physical movements and expressions of one another when they interact (Chartrand, 2005).

Mimicry behavior can also be advantageous in establishing successful business relationships. In a study of facial mimicry between a service provider and a customer, at a coffee shop, there was a positive correlation between mutually similar facial expressions and positive customer evaluation (Barger, 2006). Moreover, a waitress received higher tips when she mimicked the customers by repeating the order that she was told (Baaren, 2003). In service-oriented businesses that rely on face-to-face interaction, such as coffee shops, restaurants, banks or hotels, it is vital to establish and maintain good relationships with the customers. Although research in business management has shed light on the importance of employee-customer interactions, little has been done with respect to the analysis of dyadic interactions that focus on the behavior, and subsequent influences, of one person's actions on the other. Notable examples by Pugh and Tsai demonstrate that positive affect, smiling, and engaging eye contact can positively influence the customer's experience (Pugh 2001; Tsai 2001).

In this paper, we examine how nonverbal communication between a service provider and a customer affects the

customers' perceived satisfaction. Among nonverbal communication features such as facial expressions, eye contact, postures and body gestures, we primarily analyze the dynamics of facial expressions between people in face-to-face conversations. Previous studies have investigated behavioral mimicry in dyadic interaction by having human coders at the location of the experiment and check whether a certain behavior, such as smiling, happened over the entire interaction (Tsai, 2001). Other approaches have recorded the interactions and had human coders review the film and count the number of times a behavior occurred (Chartrand & Bargh, 1999; Barsade, 2002). We propose quantitatively more accurate ways of measuring mimicry behavior by measuring the number of times when it occurred and the percentage of time it takes up in the entire interaction.

2. Methods

2.1. Experimental Design



Figure 1. Setting where banker and customer interact

The general design of the experimental interaction is that of a professional banker interacting with a customer interested in learning about financial services (Figure 1). The banker provides two kinds of financial services, which are similar to real world services provided at a retail branch. The first service is to cash a \$5 voucher from the customer participant as compensation for participating in the study. This part is designed to simulate a cashing a check scenario. Actually the participant was told up front that they would get \$10 for compensation but the banker told them they would have to fill out more paperwork after the study to get the rest of the money they were owed and could only get \$5 now. This manipulation was made to instill a slightly negative state in the customer in order to approximate more accurately the situation where a customer might be going to a real bank assistant for help. After the experiment ended the participant received the rest of the money without additional paperwork. The second service is to explain one of the financial services that a customer chose to

learn more about: Home Equity Line of Credit (HELOC), Individual Retirement Arrangement (IRA), Certificate of Deposit (CD), mortgages, credit card, or student financial plans (529 plans & CDs). This part is to simulate the situation in which bank customers ask questions and receive information about the financial product they are interested in. There were two male bankers and one of them interacted with thirty participants, while the other interacted with seven participants. The experiment was conducted in a room equipped with a desk, two chairs, bank service advertising pamphlets and two cameras to make the appearance alike to a personal banking service section at banks (Figure 1). One camera was used to record the banker's facial expressions and the other was used to record the participant's facial expressions.

2.2. Hired Bankers

We hired two professional personal bankers, each with over two years of career experience as a personal banker, to do what they usually do at work - explain financial services. During the hiring, we asked them if they would be willing and able to manipulate the type of facial expressions displayed during interaction with the customer. Each banker agreed to alter his facial expressions in three different ways, following these exact instructions:

Manipulation 1 – Neutral facial expressions: Please try to sustain neutral facial expressions regardless of the changes in the customer's facial expressions over the entire interaction.

Manipulation 2 – Complementary facial expressions: Please try to understand the customer's feeling and respond to it appropriately by smiling when the customer seems to feel good, showing caring facial expressions when the customer expresses concern, showing neutral facial expressions when you need to express that you are listening to the customer sincerely and carefully, etc.

Manipulation 3 – Always smiling: Please try to keep smiling regardless of the changes in the customer's facial expressions over the entire interaction.

Throughout the experiment, the bankers interacted with the customer as they would normally do in a banking setting aside from the expression manipulation. This included greeting a customer, providing proper information, and thanking the customer for their time. The facial expressions of the bankers were unobtrusively videotaped and audio-recorded from the moment they met and greeted the customer to the end when the customer left the seat.

2.3. Participants

Twenty-four males and thirteen females (n=37) were recruited through flyers who were interested in receiving information about different financial services. Before the experiment started, they were told that their face and voice would be recorded as banks normally do for security reasons.

However, they were not told that their facial expressions would be analyzed. This was to prevent them being aware of the purpose of the study. Afterward, they were told about the expressions and helped to label them.

2.4. Procedure

Prior to the participant entering the room the banker was told which expression manipulation to conduct. The participant was then allowed into the experiment room where they would interact with the banker and learn about specific financial services. At the end of the experimental interaction both the banker and participant filled out 9-point Likert scale surveys evaluating the quality of the service based on the most comprehensive and popular instrument SERVQUAL (Parasuraman, 1985 & 1988) and the attitude of the banker. While the banker and participant completed the surveys the experimenter transferred the video recorded experimental session to DVDs. After the banker and participant were finished with surveys they were asked to label the video data for their facial expressions and emotions. After labeling their own video information they labeled the videos containing the person they interacted with.

2.5. Coding

In this study, the banker labeled his own video data and the participants also labeled their own data. Then, the banker labeled the participant's video data and the participants labeled the banker's video data. Lastly, human coders not involved in the study labeled both the bankers' and the participants' data. In the interface of the labeling software that the banker and the participant used, "VideoLAN-VLC media player" plays the DVD and the labeling software provides an entity to enter the time when a certain facial expression was observed and seven emotion labels to select (Figure 2). These seven labels are: smile, concerned, caring, confused, upset, sorry, and neutral. If there was no proper label to choose from, the user could press "Other" and enter another label that they think is appropriate for the expression. The labelers were instructed to stop playing the video and click on the label button when they saw a facial expression, and then to continue to play the video until they saw a change in the facial expression. On the right side of the user interface, there was a text box displaying the time and the labeling result and it was editable so that the user could annotate the reason for each facial expression, e.g. "smile – he made me laugh". By providing the space to type the comment, we could learn more about the intent behind the facial expressions, especially the smiles, where we would later categorize them into "Greeting Smile," "Social Smile," and "Genuine Smile." For example, when the annotation was "smiling to greet the customer", it was classified as "Greeting Smile" and when the annotation was "smiling to be polite to the customer", the smile was classified as "Social Smile". "Genuine Smile" can be annotated as "hearing about getting the cash", "glad to hear about tax deductions", "the banker told

me a funny joke", etc. There were four human coders not involved in the actual experiments. These labelers used an online video annotation program, VidL, developed by the experimenters to label the video data (Figure 3). The interface contains nine labeling buttons for facial expressions, which are composed of smile, concerned, caring, confused, upset, neutral, satisfied, surprised and other and four labels for gestures including head nod, headshake, chin on hand, open arms. The last three buttons are to record the points when the participant started filling out a survey asking about a demographic profile at the very beginning of the interaction and the last scene of the interaction since we could not observe the participants face during this period.

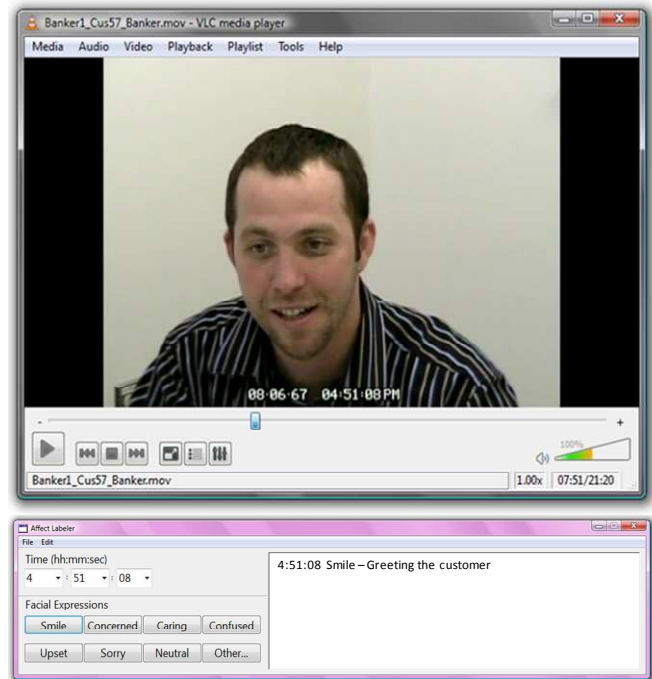


Figure 2. Labeling interface used by banker and customer



Figure 3. Labeling interface used by four outside coders

2.6. Measures

2.6.1. Percent synchrony time of the facial expressions. We measured the duration of each of the facial expressions studied for both the banker and participant. In total there are twenty-one facial expressions that can be assigned by the human coder (Table 1). Therefore, there are $21 \times 21 = 441$ possible pairs of synchronized facial expressions between a banker and participant and each synchrony is assigned a unique identification. For example, “Banker: Social Smile – Customer: Social Smile” is assigned to “Synchrony ID : 1” and “Banker: Concerned – Customer: Social Smile” is assigned to “Synchrony ID : 22”. In this context, synchronization means a pair of facial expressions between banker and customer that overlaps in time. The percent synchrony time of the facial expressions is defined as the percentage of the time each synchrony takes up in the entire interaction; the length of the synchrony is divided by the entire interaction time length.

ID	Facial Expressions	ID	Facial Expressions
1	Social Smile	12	Interested
2	Concerned	13	Bored
3	Caring	14	Enthusiastic
4	Confused	15	Persuasive
5	Upset	16	Annoyed
6	Sorry	17	Genuine Smile
7	Neutral	18	Greeting Smile
8	Other	19	Survey
9	Satisfied	20	The end
10	Surprised	21	Missing Label
11	Relieved		

Table 1. Twenty-one labels for the facial expressions

2.6.2. Number of the synchronized facial expressions. This measure is defined as the number of times synchronized facial expressions transitioned from a particular unique synchrony, from the 441 possible, to a different synchrony.

2.6.3. Interaction satisfaction. The participants answered the question, “How satisfied are you with the interaction overall?”, with a 9-point Likert scale rating.

2.6.4. Information satisfaction. The participants also evaluated information satisfaction with the question, “How satisfied are you with the financial information provided?”, using a 9-point Likert scale rating.

2.6.5. Empathy of the bankers. A survey was given to ascertain the customer’s interpretation of the service provider’s empathetic attitude. The survey was based on the most commonly used instrument SERVQUAL (Parasuraman, 1985 & 1988) that investigates five aspects of the service; “Tangibles, Reliability, Responsiveness, Assurance, Empathy.” The four items in the “Empathy” section of

SERVQUAL were adopted and the rating used a 9-point Likert scale.

2.6.6. Customer perception. The customers were asked to choose one of three attitudes for the banker: neutral, always smiling, and empathetic. We measured this to see whether customer perception did or did not agree with what the banker intended to convey.

2.7. Hypotheses

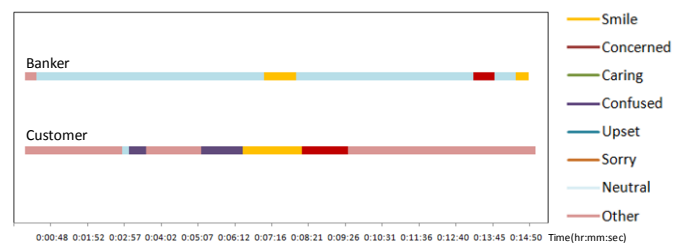
We hypothesized five statements as follows:

- H1. Customer perception is different from the banker’s intent.
- H2. The banker and the customer share genuine smiles for a longer period of time when the customer perceives the banker is empathetic.
- H3. The banker and the customer share genuine smiles more often when the customer perceives the banker is empathetic.
- H4. Customers are more satisfied with the interaction and the information when a customer feels the service provider is empathetic.
- H5. Customers give lower ratings on interaction satisfaction, information satisfaction and empathy of the service provider when a service provider always smiles regardless of the expression on the customer’s face.

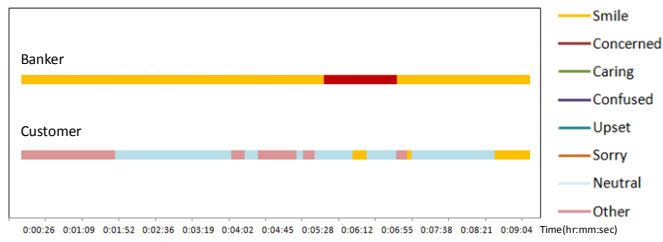
3. Results

3.1. Manipulation checks

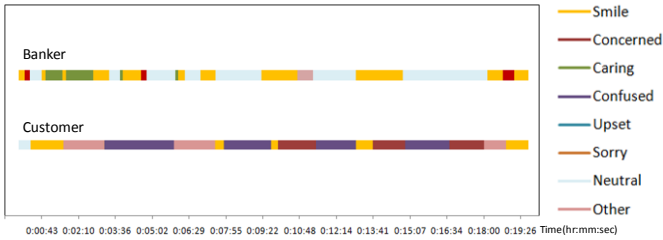
Figure 4 shows three labeled interactions illustrating interactions where the banker successfully performed the facial expressions for each condition. In Figure 4(a), “Neutral,” the banker is showing neutral facial expressions most of the time, visualized with light blue color, and other facial expressions such as smile and concerned are rarely observed. In Figure 4(b) “Always Smiling”, the banker is smiling throughout the interaction, which is visualized with orange bars. In Figure 4(c), “Complementary facial expressions”, we can see more dynamics in the banker’s facial expressions, i.e., transitions between different facial expressions, and we observe where the banker and customer are smiling together. Additionally we see that the banker was responding with “caring” facial expressions when the customer was expressing “confused” or “other”.



(a) Neutral manipulation



(b) Always Smiling manipulation



(c) Complementary facial expressions manipulation

Figure 4. Banker Manipulation Checks

Table 2. shows the quantitatively measured percentage of smile and neutral facial expressions for each manipulation on average. From this measurement, we can confirm there are three distinct forms of manipulations taking place.

Banker Manipulation \ Measurement	Neutral Manipulation	Always Smiling Manipulation	Complementary facial expressions Manipulation
The percent of smile	0.56%	87.12%	44.10%
The percent of neutral facial expressions	93.13%	5.27%	26.50%

Table 2. Banker smiled most of the time in the “Always Smiling” manipulation, which was 87.12% of the interaction time and showed neutral facial expressions for 93.13% of the interaction time in “Neutral” manipulation.

3.2. Customer Perception and Banker Manipulation

3.2.1. Customer perception is different from the banker’s intent (H1). Interestingly, despite the differences between the three facial manipulations acted by the banker (Table 2), a customer’s perception of the banker’s attitude did not always agree with a banker’s manipulation. Table 3 shows that when the banker tried to maintain a smile throughout the interaction, only five out of thirteen customers reported that they thought the banker was always smiling, while two of thirteen customers thought the banker’s attitude was neutral. Surprisingly, seven out of twelve customers in the neutral manipulation sessions reported that they perceived the bankers attitude as “Always Smiling”. This may be due to voice tone and the typical notion that bankers usually smile at their customers. Meanwhile, the probability that the customer would feel the banker was empathetic was highest when the banker was trying to always smile and the probability of the customer perception to be “Always Smiling” was highest

when the banker intended to display complementary facial expressions, which is the opposite of our expectation. Since a customer’s perception doesn’t match a banker’s intent, we needed something more objective for our analysis. We therefore conducted three kinds of analysis, classifying the data into three conditions, i.e., neutral, always smiling, empathetic (complementary facial expressions), according to three different measures: the cognitively reported customer perception, a banker’s intent, and the measured synchrony labeled using their facial expressions. We present these three analyses in Analysis1, Analysis2 and Analysis 3 sections below.

Banker Manipulation \ Customer Perception	Neutral	Always Smiling	Empathetic
Neutral	5/12 = 0.417	7/12 = 0.583	0/12 = 0.0
Always Smiling	2/13 = 0.154	5/13 = 0.385	6/13 = 0.461
Complementary Facial Expressions	2/12 = 0.166	6/12 = 0.5	4/12 = 0.333

Table 3. Banker manipulation vs. customer perception.

3.3. Analysis 1. Cognitively reported customer perception.

We collected thirty-seven sets of interaction data and in each pair the customer appraised whether the banker’s attitude was neutral, always smiling or empathetic. This section examines when the data are grouped into these three conditions based on using the customer’s perceptions of the banker.

3.3.1. The banker and the customer share genuine smiles for a longer period of time when the customer perceives the banker is empathetic (H2). Figure 5 illustrates the ten kinds of facial expression synchrony between the banker and the customer that took up the longest duration among 441 synchrony pairs in each group. The x-axis indicates the synchrony ID and the y-axis indicates the fraction of the synchronized facial expressions. The fraction of each synchrony is computed across the participants in each condition. In the perceived as “Neutral” condition, the “neutral-caring” pair (ID = 129) occurred most of the time, taking up 44.76% of the entire interaction time on average. In the “Always Smiling” condition, we found more than 50% of one-sided smiles from the banker i.e., 30.4% of the pair “social smile-neutral” (ID = 7) and 24.79% of the “social smile-concerned” (ID = 2). These smiles occur when the banker is smiling to pretend to be polite rather than enjoying the interaction or providing interesting information. At the same time, the customer was showing neutral facial expressions rather than smiling, which may be inferred as the customer not enjoying the interaction either. In contrast, in the perceived as “Empathetic” condition, the pairing “genuine smile-genuine smile”(ID = 353) was recorded as one of the ten longest synchrony pairs. The smile pairings are summarized in Figure

6, where the "genuine-genuine" pairing is seen to be most prominent in the "banker appears empathetic" condition.

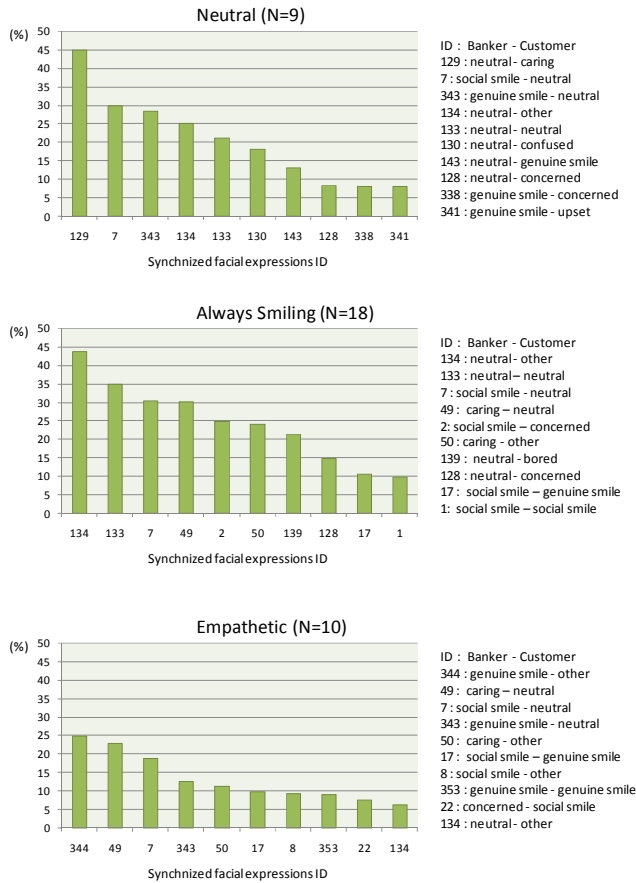


Figure 5. Ten Synchronized Facial Expressions that take up largest percent in the entire interaction in each group

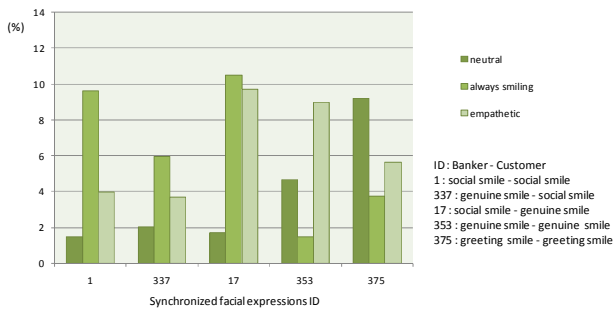


Figure 6. Percent synchrony time of each smile pair in each group

3.3.2. The banker and the customer share genuine smiles more often when the customer perceives the banker is empathetic (H3). The most frequently occurring synchrony pairs are shown in Figure 7. The x-axis indicates the synchrony ID and the y-axis indicates the number of the synchronized facial expressions. In the "Neutral" group, the banker was expressing neutral facial expressions most of the time, regardless of the customer's facial expressions. In "Always Smiling" group, "social smile-social smile" pair (ID = 1) was

highest and "genuine smile-genuine smile" did not appear among the ten most frequent pairs. In "Empathetic", smile pairs such as "social smile-genuine smile" and "genuine smile-genuine smile" were among the five most frequent pairs and both of these pairs recorded the highest in comparison with other two groups (Figure 8). Therefore, we can conclude that when the customer perceived the banker is empathetic, they smiled together genuinely more often and longer.

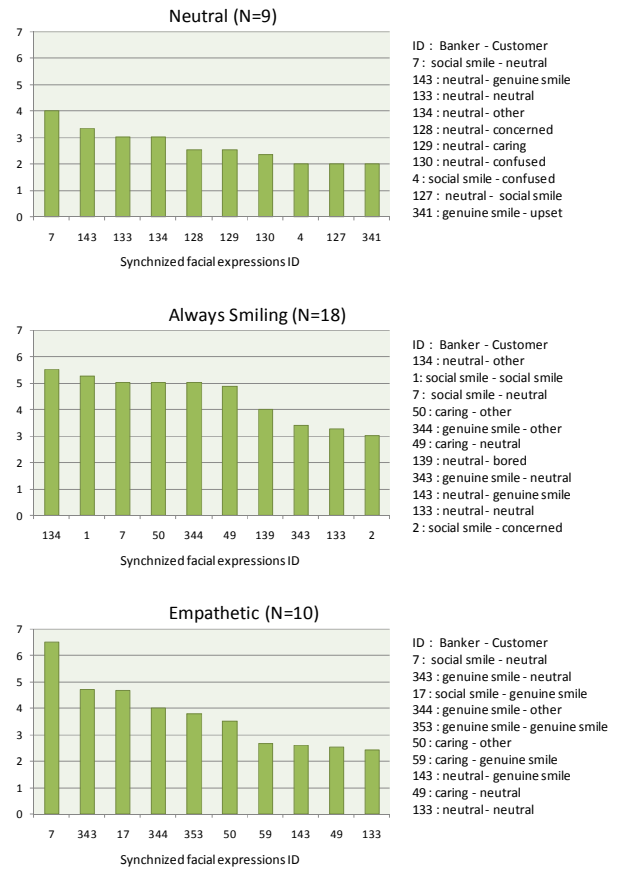


Figure 7. Ten most frequent synchronized facial expressions in each group

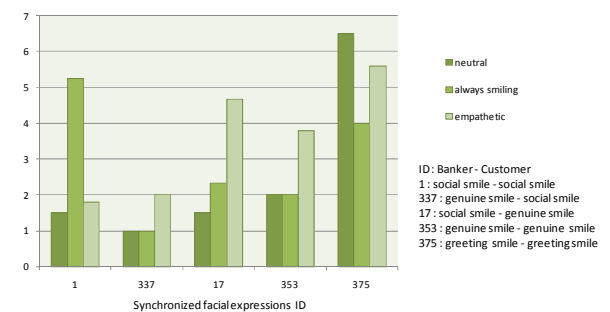


Figure 8. Number of each smile pair in each group

3.3.3. Customers are more satisfied with the interaction and the information when they say that the service provider is empathetic (H4). Interaction satisfaction, information satisfaction and empathy score of a service provider measured

with a survey were highest in the "Empathetic" group and second highest in the "Always Smiling" group and lowest in the "Neutral" group (Figure 9). In ANOVA, "Interaction Satisfaction" ($F = 5.584, p = 0.007$) and "Empathy Score" ($F = 7.267, p = 0.002$) were significantly higher in the "Empathetic" group than in the other two. Meanwhile, the "Interaction Satisfaction" ($F = 2.054, p = 0.143$) in the "Empathetic" group was not significant, although the mean trended higher than in the other two groups.

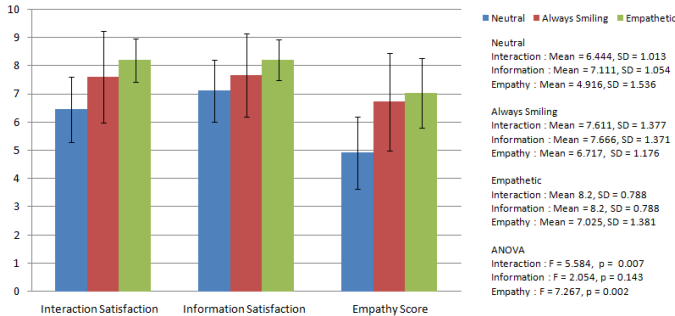


Figure 9. Interaction satisfaction, Information satisfaction and Empathy score

3.4. Analysis 2. Banker Manipulation

While there are obvious differences among the three measures i.e., Interaction Satisfaction, Information Satisfaction, and Empathy Score, when the data is classified according to customer perception, these measures are similar when we classify the data according to the banker's manipulation. As it is shown in Figure 10, Interaction Satisfaction and Information Satisfaction scored highest in "Always Smiling" group and Empathy Score scored highest in "Complementary Facial Expressions" group. However, all of the *P-values*, $p(\text{Interaction, Information, Empathy Score}) = (0.274, 0.826, 0.845)$, are higher than 0.05 in ANOVA, which indicates that the difference is not highly significant.

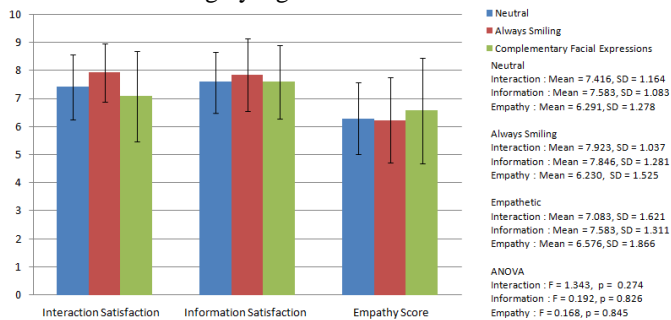


Figure 10. Interaction satisfaction, Information satisfaction, Empathy score

3.5. Analysis 3. Affectively Measured Synchronized Facial Expressions

We classified the data into three groups by directly measuring the synchronized facial expressions: if the data includes more than 5% of shared smiles (ID = 1: social smile-

social smile, 353: genuine smile-genuine, 337: genuine smile-social smile, 17: social smile-genuine smile) or more than 1% complementary facial expressions (ID = 47: caring-upset) in the entire interaction, the interaction was classified into the "Empathetic" group; if the data included more than 6% of one-side neutral pairs (ID = 127: neutral-social smile, 130: neutral-confused, 133: neutral-neutral, 134: neutral-other, 143: neutral-genuine smile) and fewer than 5% of shared smiles, then the data were classified into the "Neutral" group. The data that included more than 8% of "smile-neutral" pairs (ID = 7: social smile-neutral, 343: genuine smile-neutral) and fewer than 5% of shared smiles, were classified into the "Always Smiling" group. As is the case in Analysis 1, the "Empathetic" group also scored highest in this analysis.

3.5.1. Customers give lower ratings on interaction satisfaction, information satisfaction and empathy of the service provider when a service provider always smiles regardless of the expression on the customer's face (H5). The major difference between Analysis 1 and Analysis 3 is that the "Always Smiling" group scored lowest in all the measures, which implies that the interaction lacking synchronized smiles was less likeable than the interaction without any smile.

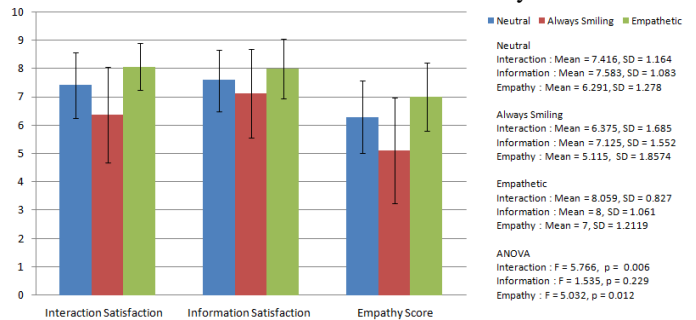


Figure 11. Interaction satisfaction, Information satisfaction and Empathy score

4. Discussion

"Service with a smile" (Pugh, 2001 & Grandey, 2005) is a common motto in the service provider industries. It is assumed that a smiling employee is the best representative for customer interaction. We examined the affects that service provider facial expression manipulation during customer interaction had on customer satisfaction. We measured interaction satisfaction, information satisfaction, and the perceived empathetic attitude of the service provider, to estimate customer satisfaction. The results show that customer satisfaction was not significantly affected by the banker's intent to portray a particular quality of interaction. Rather, customer satisfaction was dependent on how the customer perceived the service provider's attitude. When the customer perceived the service provider as empathetic, customer satisfaction was greater than the cases in which the customer thought the service provider was neutral or always smiling. We looked more specifically at the data when the customer felt the service provider was empathetic, and measured that they shared genuine smiles together more often

and for a longer time. In contrast to the common notion of “Service with a Smile”, the “Always Smiling” attitude of the service provider was not effective in making the service provider or experience more enjoyable. Based on measuring smiles, the important aspect of smiles in service appears to be when conditions are such that both the service provider and the customer smile, together, and genuinely. This principle also applies to other complementary facial expressions. We obtained this result using the facial expression labels provided by the experimental participants. However, the labeling depends on the labeler’s perspective. To improve the reliability of the data labeling, we could compare the three different labelings done by the participants themselves, their interaction partners and four independent outside coders.

5. Conclusion and Future Work

Dyadic analysis of 37 face-to-face customer service encounters reveals that affective social signals through facial expressions have a significant influence on how customers perceive the service. The current state of computer vision technology suggests that computers can be trained to recognize a number of human facial expressions automatically (el Kaliouby, 2005 & Zaman, 2006). We visualized the dyadic pattern of facial expressions between a service provider and a customer by assigning each facial expression to a specific color. A future application might provide real-time feedback (e.g., Kim et al., 2008) about affective information during a service interaction. With regard to data analysis, other measures such as the duration of each facial expression and the number of transitions of between expressions, may be useful. In addition, for more complete understanding, voice analysis can be combined with facial analysis to explain such topics as why a customer perceives a service provider was smiling even when the service provider intended to be neutral. While sharing genuine smiles appears to be very important to interaction, the way to best achieve this sharing is more challenging than simply asking the banker to act empathetically.

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