Has Handwriting Become Obsolete? The Effect of Handwriting on Warmth Perceptions of Service Firms

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Abstract: This research explores how and when actual handwriting (vs. a typewritten font) increases perceived warmth of service firms. Five studies are conducted to clarify the questions. Study 1 demonstrates a basic effect of actual handwriting (vs. a typewritten font) on perceived warmth of the target in a non-consumption domain. Study 2 provides further demonstration by investigating consumer response to handwritten vs. typewritten message in a public service consumption context. Study 3 not only replicates study 2 with different writing styles but also delves into the dual mediating roles of perceived effort and psychological closeness. Study 4 adds the computerized handwritten font, and compares the effects of three writing styles (actual handwritten vs. computerized handwritten vs. computerized standard typewritten) on perceived warmth of service firms and the underlying mediating mechanisms. Lastly, Study 5 examines a boundary condition when handwriting has no impact on perceived warmth. The implications of this research for marketing practitioners and contributions to existing theories are discussed.

Keywords: handwritten, typewritten, warmth, perceived effort, psychological closeness

Our ancestors used the handwritten word as a primary means of communication. But technology has replaced almost all of it today. Simple communication of writing a letter or note is not something we do anymore. Is handwriting a dying art? Does it still have an irreplaceable value?

In business world, every business owner believes they have great customer service. In fact, no single owner says that their customer service is terrible. Good customer service simply isn’t enough anymore. Customers expect to be treated well. If they’re not, they will do business with someone who does treat them right. So, how do firms stand out from the crowd of good customer service? Caring communication be often described as the glue between consumers and service firms. Especially good written communication is essential in service settings as it is the convenient way to communicate with consumers, ensure they understand everything they may need to know and create good feelings about doing business with firms.

We have found handwritten or typewritten notes appear frequently in the service context almost all over the world, such as hotel, retailing, education and health care settings etc. By various online social networking tools, several consumers share their vivid experiences, for instance, “Special handwritten welcome note. Awesome Hotel! You will love this...” “Handwritten notes! It make me feel very warm. How can I don’t love it!” “A Handwritten reminder from the seller! It is so warm and touches me like a old friend’s care and love. I gave a very good evaluation and thank the seller form my heart.” It seems that service firms turn this seemingly simple customer service gesture into a real “wow” factor to impress consumers in practice.

However how handwritten (vs. typewritten) notes influence consumers in the service context has received virtually no scholarly attention. Two main sets of literature provide some initial insights. The marketing literature on fonts has identified the typeface of brands and logos on consumer perceptions of the firm (Hagtvedt 2011; Henderson, Giese and Cote 2004). Cognitive psychology and neuropsychological literature has focused predominantly on perceptual differences between reading handwritten and typed words and different brain responses (Corcoran...
and Rouse 1970; Forad and Banks 1977; Longcamp, Hlushchuk and Hari 2011; Wamain 2012).

The gap in the literature has generated a new call for research. Specifically, we investigate three questions: What does handwriting (vs. a typewritten font) influence consumers’ warmth perceptions of service firms? What are the influence processes? What is the boundary condition?

In answering these questions, our research makes several contributions to the literature. First, it demonstrates handwriting effect on warmth perceptions of service firms. Second, we investigate the source of the warmth. Third, by identifying a boundary condition, we show that handwriting has a positive relationship with perceived warmth when service firms’ competence is high compared with when it is low. Finally, our work has managerial implications, which we elaborate on in the “General Discussion.”

THEORETICAL FOUNDATION AND HYPOTHESES DEVELOPMENT

Warmth

Two main sets of literature provide some initial insights into warmth. Emotion literature defines warmth as a positive, mild, volatile emotion involving physiological arousal and precipitated by experiencing directly or vicariously a love, family, or friendship relationship (Aaker, Stayman, and Hagerty 1986). Such emotion is acute, specific, and reactive (Aaker, Stayman, and Hagerty 1986). Acute means warmth is short-lived, capable of being created or changed quickly. Specificity identifies that warmth is created by a specific target in the environment. Specificity also implies that warmth changes quickly in seconds or minutes as the perceived environment changes. Reactivity further expresses warmth as being created by a reaction to the environment rather than by a goal-directed behavior or response (Aaker, Stayman, and Hagerty 1986).

Based on social perception literature, warmth and competence are the two universal dimensions of human social cognition, both at the individual level and at the group level (Fiske, Cuddy, and Glick 2007). People form evaluative impressions about others habitually and often without effort or specific intention (Wojciszke 2005). This logic builds on the evolutionary rationale that perceivers want to know others’ positive or negative intentions (i.e. warmth) and their ability to effectively realize the intentions (i.e. competence). The warmth dimension captures traits that are related to perceived intent, including friendliness, helpfulness, sincerity, trustworthiness and morality, whereas the competence dimension reflects traits that are related to perceived ability, including intelligence, skill, creativity and efficacy. In addition, Aaker, Vohs, and Mogilner (2010) found that judgments of firms are governed by the same dimensions along which judgments of other people are known to occur. Specifically, they demonstrate consumers perceive nonprofits as being warmer than for-profits but as less competent. Scott, Mende, and Bolton (2013) found that conspicuous consumption by a seller decreases warmth inferences toward the seller under the communal norm; conversely, it increases competence inferences under the exchange norm.

Psychological Closeness

Psychological closeness comes from the psychological distance literature and is the antonym of psychological distance. Psychological distance is the set of subjective experiences associated with being near or far from some person, place, event, or mental representation (Williams, Stein, and Galguera 2014). People perceive psychologically closer to friends compared to strangers
(social distance), to own hometown compared to foreign lands (spatial distance), to the present compared to the future (temporal distance), to reality compared to fictitious worlds (hypotheticality), and to highly probable compared to improbable events (probability) (Williams, Stein, and Galguera 2014). Kreilkamp (1984) also states that all relationships between consumers and organizations have some level of psychological distance.

Following Gino and Galinsky (2012), we define psychological closeness as feelings of attachment and perceived connection toward another subject. People feel close to others not only when they share a common group membership or identity, but also when they share subtler similarities. For instance, people experience a sense of psychological closeness to another person when they share common attributes, such as a similar name or the same birthday (Gino and Galinsky, 2012). Psychological closeness is a pervasive feature of consumers’ mental lives, meaningfully influencing consumer feelings, judgments and decisions (Williams, Stein, and Galguera 2014). We expect psychological closeness increases the feelings of warmth that underlie firm evaluations.

**Handwriting and Typewriting**

Cognitive psychology and neuropsychological literature have paid attention to perceptual differences between reading handwritten and typed words and different brain responses (Corcoran and Rouse 1970; Forad and Banks 1977; Wamain 2012). Neuropsychologists confirmed that the recognition of handwritten versus printed characters can be disturbed following a brain lesion. They suggest that the cognitive architecture for processing handwriting is different from that used to process machine-produced fonts (Grainger et al. 2008). Longcamp et al. (2011) used fMRI data to demonstrate that recognizing handwritten letters might rely on distinct processes, possibly related to motor knowledge. The marketing literature on fonts has mainly centers around the typeface of brands and logos on consumer perceptions of the firm (Hagtvedt 2011; Henderson, Giese and Cote 2004).

In addition, people have wondered if the appearance of one’s handwriting signals something beyond legibility and penmanship, such as personal identity or human expression over the years. Graphology experts suggest that how letters and words are crafted can be linked to one’s personality, personal tendencies, and predispositions. Handwriting is also regarded an extension of the self. It signals that a human being is behind the production of the words.

As is stated above, past discussion about handwriting and typewriting focuses on the use of handwriting as a tool that combines cognitive, kinesthetic, and perceptual-motor components (Feder and Majnemer 2007) or regards handwriting as one way that communicates and reveals our deepest thoughts and inner lives. Far less attention has been paid to how consumers respond to handwriting (vs. a typewritten font) as a stimulus in the service context.

**Handwriting (vs. Typewriting) to Perceived Warmth**

**Handwriting (vs. Typewriting) to Perceived Effort.** Longcamp et al. (2011) showed that supplementary motor area, an area that is involved in planning and control of voluntary actions, becomes more active when showed to handwriting than typewriting. They concluded that based on the brain activation patterns it is possible that handwriting activates the memory representations of the actual letter formation and might also engage the reader to simulate the hand actions associated with writing. When consumers simulate the writing actions, they can know handwriting
takes more time and physical exertion than typewriting. Moreover, based on our in-depth interviews, a handwritten note is perceived to be personal, while a typewritten note is unpleasantly impersonal and really does show a lack of effort. People feel the handwritten effort is directed at an individual consumer, while the typed effort is only generally directed. We therefore expect handwriting (vs. a typewritten font) causes consumers to perceive more (vs. less) effort of service firms.

Handwriting (vs. Typewriting) to Psychological Closeness. It is well accepted that a handwritten note symbolizes personal touch more than a typewritten one. Since handwriting is closely connected to being human and instinctually implies there is or was a person responsible for the production of the handwriting. In contrast, typewritten fonts always look impersonal and business-like. When people receive a handwritten note, it is easy to associate the interaction with persons. When people receive a typewritten note, they feel the target of interaction is a machine (i.e. computer). According to the Gestalt law of proximity, elements near each other tend to be seen as a unit. People feel close to subjects when they share a common group membership or identity, even subtler similarities (Gino and Galinsky 2012). Handwriting can psychologically bond us to others because of sharing the same human nature with people. Namely, the interaction with same unit (i.e. person) leads to more psychological closeness, whereas the interaction with different unit (i.e. machine) leads to less psychological closeness.

In addition, handwriting is made by persons and people can do it by effort. But the typewritten font is made by computers and it is difficult for people to generate the completely same words even they make much effort.

Finally, the handwriting gives the feeling of flexible informal relationship like with friends, while the typewritten font gives the feeling of stiff formal relationship like with exchange partners.

To sum up, we infer consumers feel psychologically closer to handwriting compared to a typewritten font.

Perceived Effort to Warmth. Warmth judgments typically involve perceptions of generosity, kindness, honesty, sincerity, helpfulness, trustworthiness, and thoughtfulness (Aaker, Vohs, and Mogilner 2010). Firm effort is the resources expended to market a product or service (Morales, 2005).

When service firms expend considerable effort, the real effort is felt by people’s hearts and observed by people’s eyes. The actual evidence is regarded as sincere, honest, and without fraud. Low effort is regarded to be somewhat insincere and perfunctory. Prior research has shown that effort in a consumer context improves the perceived quality of the products and services when actual quality is ambiguous. Consumers reward firms for extra effort and extra effort can change evaluations and choices (Morales, 2005).

Moreover, effort to be other-focused is in line with moral codes (Aaker, Vohs, and Mogilner 2010). The amount of effort service firms typically put into in the operational activities influences intention inference. When consumers observe that firms are expending effort to try to help or service them, they infer that the firm should be sincere. People value sincerity. It creates trust and good feelings about doing business with service firms. Therefore, we anticipate the more effort service firms invest to consumers—whether in the form of time, physical exertion, pain, or money—the more positively they evaluate warmth of service firms.

Psychological Closeness to Warmth. Aron and Aron’s (1986) self-expansion theory argues
that people’s sense of self can be broadened to include others, and that this is likely to occur when these others are people we feel close to (Aron et al. 1991). When people feel psychologically close to one subject, they are unlikely to suspect the motive. When they feel psychologically close to rather than distant from the subject, they consider the subject to be benevolent and friendly, and at least the subject don’t do harm to oneself. We expect psychological closeness increases warmth perception of service firms.

All in all, we expect that handwriting (vs. a typewritten font) will generate warmth perceptions of service firms and this effect will be mediated by the degree of perceived effort and psychological closeness. Accordingly, we summarize the specific hypotheses as below:

H1: Handwriting (vs. a typewritten font) causes consumers to perceive service firms as more (vs. less) warm.

H2: This influence is mediated simultaneously by the perceived effort of service firms and psychological closeness to service firms.

Besides actual handwriting, computerized handwritten fonts are also utilized in our lives. In the current research, we conceptualize handwritten font as a natural font that mimics cursive human-generated writing. These handwriting fonts on word processing programs have become popular. With the use of the handwriting font, the writer may convey a personalized meaning while still utilizing the time-saving software programs that one has at their disposal these days. Computerized handwritten font possesses human-like qualities, approaching a more actual handwritten, cursive style compared with many plain standard fonts. Meanwhile, it saves time and effort compared with actual handwriting. Such cursive fonts may convey a softer and more appreciative feel than standard fonts. Although these fonts are extensively used, the difference effects of using them versus typical typewritten fonts (those that do not mimic human-generated writing) and actual handwriting are yet unknown. We expect the specific hypotheses as follows:

H3: Actual handwriting (vs. a computerized handwritten font and a computerized standard font) causes consumers to perceive service firms as warmest. Perceived effort mediates the effect of actual handwriting (vs. a computerized handwritten font) on perceived warmth.

The Moderating Role of Service Firms’ Competence

Generally, the primary nature of relationships between consumers and service firms is the typical exchange relationship. When consumers and firms engage in ongoing exchanges, perceptions of relative rewards and costs are crucial. Both sides assume that a benefit is given with the expectation of receiving a comparable benefit in return. That is to say, in such exchange relationship, it is reasonable that people provide benefits to receive compensation, and both parties are concerned with how much they receive for what they give (Aggarwal 2004). The exchange relationship makes consumers concentrate on the link between their own self-interest and their dependence on service firms’ competence (Scott, Mende, and Bolton 2013). We define competence as core task performance of service firms in the current research.

In the service setting, the core task performance of the service delivery relies on the expertise or competence (Grandey et al. 2005). The ways that enhance impressions of competence include accuracy and efficiency (Parasuraman et al. 1985). The effect of handwriting must be tested while taking these other important predictors of service quality into account. As an extra-role aspect of service firms, handwriting is anticipated to only induce warmth perception of competent firms. This is consistent with research demonstrating that organizational citizenship behaviors (extra-role,
voluntary behaviors) have the greatest effect on job performance ratings when the employee is performing in-role tasks effectively (e.g., Rotundo and Sackett 2002; Grandey et al. 2005). When the service transaction is performed inefficiently and mistakes are made, the handwriting should be unlikely to elicit the perceived warmth because the core requirements of the firm were not met. After all, both the technical and interpersonal skills are critical (Parasuraman et al. 1985). We expect the specific hypotheses as follows:

H4: Handwriting (vs. a typewritten font) has a positive relationship with perceived warmth when service firms’ competence is high compared with when it is low. Namely, if service firms’ competence is low, the handwritten will not influence perceived warmth.

OVERVIEW OF STUDIES

To test these hypotheses we present five studies. Study 1 begins by demonstrating a basic effect of actual handwriting (vs. a typewritten font) on perceived warmth of the target in a non-consumption domain. Study 2 provides further demonstration by investigating consumer response to handwritten vs. typewritten message in a public service consumption context. Study 3 not only replicates study 2 with different writing styles but also delves into the underlying dual mediating mechanisms of handwriting effect on perceived warmth. Study 4 adds the computerized handwritten font, and compares the effects of three writing styles (actual handwritten vs. computerized handwritten vs. computerized standard typewritten) on perceived warmth of service firms and the underlying mediating mechanisms. Lastly, Study 5 examines a boundary condition when fonts have no impact on perceived warmth. Together, these studies provide systematic demonstration how and when actual handwriting (vs. a typewritten font) increases perceived warmth of service firms.

Hotel settings were selected as study 2-5 context for three reasons, (1) both handwritten and typewritten messages have been identified as prevalent in this context, (2) providing quality service and creating good feeling toward firms are critical to retain customer loyalty and market share for the hotel industry, and (3) the hotel industry is a key economic player in the service sector (Grandey et al., 2005). To reduce the ceiling effect, on the basis of the in-depth interviews with 2 hotel managers, 2 relevant academic experts, and 10 students, we develop frequently provided free services by many hotels and utilize these services to design following experimental scenarios.

STUDY 1

The goal of study 1 was to provide an initial test of handwriting effect in a non-consumption domain.

Method

Participants (N=60, 38% female, mean age=23) from a large public university completed the study. To recruit participants, we set up a research station at the university student cafeteria. This location was particularly desirable, as it was frequented by many students. The students who passed the station were approached by our research assistants. Participants were asked if they would help out with a research survey and receive a soft drink as a gift. We instructed “At graduation, graduates often send and receive personal greetings among classmates. Now you
receive one postcard from a classmate.” They were randomly exposed to one of two (handwritten vs. typewritten) real postcards including the following message:

As I look back at the four-year university days, you leap before my eyes. It is fortunate for me to meet you in our best time. Even if we’re not any younger, you are my most precious memory forever. Happiness and peace to you!

All information was held constant except for the handwritten vs. typewritten manipulation. Participants were then asked, “To what extent do you feel this classmate is?” on three traits to comprise the warmth index (warm, kind, generous; α=.963; Aaker, Vohs, and Mogilner 2010). Trait assessments were reported on Likert scales anchored by 1 (not at all) and 7 (very much). Participants were then thanked and dismissed.

Results

Analysis of variance revealed participants perceived handwritten to be warmer than typewritten (M_handwritten=6.444, SD=.718 vs. M_typewritten=4.222, SD=.770; F(1,58) =133.641, p=.000). This supported our prediction, demonstrating that handwriting increases perceived warmth of the target compared to a typewritten font.

STUDY 2

Study 2 extended study 1’s finding to a public service consumption context, provided casual evidence for H1. Moreover, it examined if perceived warmth of service firms drives consumers’ behavioral intentions. We relied on a two-level single factor design.

Method

Participants were 53 undergraduate students from a large public university who were enrolled in a marketing course. They were 21 years old, on average, and 48% were women. We asked them to imagine they stay in one hotel for the travel and receive the following message from the hotel clerk for themselves on the room desk. They were then presented randomly with a picture of actual handwritten or typewritten note made by a hotel.

Dear guest,

I’m very glad to serve you as the room attendant. The hotel’s restaurant provides 24-hour free room service. Hope it can bring the convenience to you. Wish you a pleasant stay here!

Participants were then asked, “To what extent do you feel this hotel is?” on three traits to comprise the warmth index (α=.917; Aaker, Vohs, and Mogilner 2010). They indicated their behavioral intentions (Cronin, Brady, and Hult, 2000; α=.854) toward the hotel, including visiting the hotel again, and recommending the hotel to own friends etc. They also answered a number of additional questions, such as (1) clear extent of the writing(M_handwritten=5.59, SD=.931 vs. M_typewritten=5.31, SD=1.379; F(1, 51) =.783, p=.380), (2) comfortable extent of the writing(M_handwritten=5.52, SD=.975 vs. M_typewritten=4.50, SD=1.631; F(1, 51) =7.680, p=.008), (3) satisfaction with the provided service(M=5.02, SD=1.135) on a seven-point scale. We also checked if they identified the note’s writing in the picture was handwritten or typewritten. Finally, demographic information was collected and participants were debriefed.

Results

The results from study 2 provided initial support for hypothesis 1. Analysis of covariance revealed participants perceived handwritten to be warmer than typewritten (M_handwritten=5.41, SD=1.010, vs. M_typewritten=4.62, SD=1.416; F(1, 51) =5.527, p=.023).
Behavioral intention was regressed on perceived warmth (β=.663, t=6.320, p=.000). As we predicted, perceived warmth of service firms did increase consumers' behavioral intentions in the service context.

**STUDY 3**

In study 3, we sought to replicate the main effect by changing the type of handwritten and typewritten note. A second goal was to clarify the double mediating mechanisms of perceived effort and psychological closeness.

**Method**

Participants (N=341, 71% female, mean age=21) from a large public university completed the studies for partial course credit. They were randomly assigned to one of our two experimental conditions. Participants were presented with scenario descriptions, “You stay in one hotel for your travel. You see the following message from the hotel clerk for you on the room desk.” They were presented with a picture of actual handwritten or typewritten note made by a hotel.

Dear guest,
Hope it can bring the convenience to your trip. Wish you a pleasant stay here!

We developed instruments and measured perceived effort (Morales 2005; α=.860) and psychological closeness (Gino and Galinsky 2012; α=.899) using three items respectively. Participants also responded to a set of questions, such as (1) clear extent of the writing (M\_handwritten=5.53, SD=.970, vs. M\_typewritten=5.38, SD=.846; F(1, 343) =2.399, p=.122), (2) comfortable extent of the writing (M\_handwritten=5.21, SD=1.169, vs. M\_typewritten=4.52, SD=1.348; F(1, 343) =25.290, p=.000), (3) satisfaction with the provided service on a seven-point scale (M=4.70, SD=1.273). We checked if they identified the note’s writing in the picture was handwritten or typewritten.

In addition, participants were asked to do an exercise, “Match the words in column A with the pictures in column B. Please draw a clear line from the word to the suitable picture.” We assigned four sets of tasks. Each set consisted of two words and two pictures. The first set included two words (sly, arrogant) and two pictures (fox, peacock). The second set included two words (time, angry) and two pictures (fire, dollar). The third set included two words (paper, glass) and two pictures (wood, sand). The fourth set included two words (typewritten “wish you happiness”, handwritten “wish you happiness”) and two pictures (person, computer). All of participants linked sly with fox, arrogant with peacock, time with dollar, angry with fire, paper with wood, glass with sand, typewritten “wish you happiness” with computer, and handwritten “wish you happiness” with person. From the reasonable matched results, we clarified that handwriting does signal that a human being is behind the production of the words. Finally, demographic information was collected and participants were debriefed.

**Results and Discussion**

Analysis of covariance revealed participants perceived handwritten to be warmer than typewritten (M\_handwritten=5.643, SD=0.915, vs. M\_typewritten=5.232, SD=1.062; F(1,339) =14.604, p=.000).

A dual mediation analysis showed that warmth was mediated by both perceived effort and psychological closeness. In accordance with Zhao, Lynch, and Chen (2010) and Preacher and
Hayes (2008), we used a bootstrapping procedure that generated a sample size of 5,000 to assess the regression models. The totality of all the estimated indirect effects permitted the construction of a 95% confidence interval for the effect size of each indirect effect. All the intervals we describe were bias-corrected intervals. The results of this analysis indicated that the total indirect effect for all two mediators assessed simultaneously was significant (.1741, .4952), and the effect size was .3291. The confidence interval for the indirect paths for perceived effort(.0616 to .2282) and psychological closeness(.0939 to .3208) did not include zero, and the effect sizes were .1298 and .1993 respectively, indicating that they were significant mediators. To determine the relative value of the mediators, we conducted bias-corrected comparisons between all the mediators. The 95% confidence intervals for contrasts of perceived effort with psychological closeness included zero (-.1967 to .0405), indicating that two mediating effects had no significant difference (see figure 1).

FIGURE 1
STUDY 3 RESULT: PERCEIVED EFFORT AND PSYCHOLOGICAL CLOSENES AS DUAL MEDIATORS

These results further clarified that handwriting (vs. typewritten) enhances perceived warmth and demonstrated such influence is rooted to two underlying processes: perceived effort and psychological closeness.

STUDY 4

The study consisted of a three-condition between-subjects design that manipulated the type of writing (actual handwritten vs. computerized handwritten vs. computerized standard typewritten). We aimed to test three writing styles’ different effects on warmth perceptions of the service firms and compared the different underlying mechanisms.

Method

Undergraduate students (N=81, 59% female, mean age=20) from a large public university volunteered for the experiment and received bonus course credit for their participation. We asked participants to imagine “You stay in one hotel for your travel. You see the following message from the hotel clerk for you on the room desk.” They were randomly assigned to one of the three experimental conditions.

Dear guest,

I’m very glad to serve you as the room attendant. It is the rainy season recently. We prepared
an umbrella in the wardrobe. Hope it can bring the convenience to your trip. Wish you a pleasant stay here!

All information was held constant except for the writing manipulation. Participants rated the warmth (α=.937), perceived effort (α=.921), and psychological closeness (α=.834) as study 3. After that, participants responded to a number of additional questions, such as (1) clear extent of the writing (M_{actual handwritten}=5.88, SD=.881, vs. M_{typewritten}=5.60, SD=1.003, vs. M_{computerized handwritten}=5.42, SD=.902; F(2, 78)=1.546, p=.220), (2) comfortable extent of the writing (M_{actual handwritten}=6.00, SD=.866, vs. M_{typewritten}=5.00, SD=1.339, vs. M_{computerized handwritten}=4.73, SD=1.538; F(2, 78)=6.912, p=.002), (3) satisfaction with the provided service (M=5.02, SD=1.204) on a seven-point scale. We also checked if they identified the note’s writing in the picture was actual handwritten or computerized handwritten or computerized standard typewritten. Finally, demographic information was collected and participants were debriefed.

Results and Discussion

Analysis of covariance revealed a significant effect of writing on perceived warmth, F(2,78)=5.331, p=.007. Average warmth in the actual handwritten condition (M=6.387, SD=.718) were significantly greater than in both the computerized standard font condition (M=5.744, SD=.834), p=.009, and the computerized handwritten font condition (M=5.808, SD=.784), p=.027. The computerized standard font and computerized handwritten font conditions were not different from one another, p=.951, see figure 2.

FIGURE 2

STUDY 4 RESULT: EFFECT OF THERE TYPES OF WRITING ON WARMTH

We followed Hayes and Preacher’s mediation script to calculate direct and indirect effects using a multicategorical predictor. We created two dummy codes to examine the relative effects of being in one group (computerized standard font condition or computerized handwritten font condition, coded 1) relative to a reference group (actual handwritten condition, coded 0). We found that both perceived effort and psychological closeness exerted significant indirect effects in the computerized standard font condition relative to the actual handwritten condition (indirect effect = -.2371 and -.2244; 95% bootstrapped confidence interval, CI: [-.4764, -.0348] and [-.4761, -.0233]), with results suggesting full mediation (see figure 3). Only perceived effort exerted
significant indirect effects in the computerized handwritten font condition relative to the actual handwritten condition (indirect effect = -0.2271; 95% bootstrapped confidence interval, CI: [-0.4290, -0.0678]), with results suggesting full mediation (see figure 4).

**FIGURE 3**

**STUDY 4 RESULT a: PERCEIVED EFFORT AND PSYCHOLOGICAL CLOSENESNESS AS DUAL MEDIATORS**

![Diagram of Study 4 Result a: Perceived Effort and Psychological Closeness as Dual Mediators]

**FIGURE 4**

**STUDY 4 RESULT b: PERCEIVED EFFORT AS A MEDIATOR**

![Diagram of Study 4 Result b: Perceived Effort as a Mediator]

These results demonstrated actual handwritten (vs. computerized handwritten and computerized standard typewritten) note caused consumers to perceive service firms as warmest. Perceived effort of service firms and psychological closeness to service firms together mediated the actual handwriting (vs. a computerized standard font) on perceived warmth. Obviously, handwriting signals that a human being is behind the production of the note. Thus, consumer can spontaneously feel handwriting takes more time and physical exertion than computerized standard font. It makes service firms real, personable and trustworthy, thus warming consumers.

Only perceived effort mediates the effect of actual handwriting (vs. a computerized handwritten font) on perceived warmth. Although computerized handwriting owns human-like qualities, but consumers appear to think that it shows a lack of effort compared with actual handwriting, which in turn causes consumers to perceive less warmth.

**STUDY 5**

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We now turn to a boundary condition under which the presence of actual handwriting may not affect perceived warmth. The idea is that the presence of handwriting in certain circumstances may fail to provide a strong signal to consumers about a firm’s warmth.

**Design and Participants**

The study was a 2 (competence: high vs. low) X 2 (writing: actual handwritten vs. typewritten) between-subjects design. Participants (N=112, 79% female, mean age=20) were undergraduate students of a large public university who took part in the study in exchange for course credit.

We define competence as core task performance in this research. It is well accepted for hotel contexts, competence involves task performance of consumers’ sleeping, shower, and eating etc. We manipulated competence with scenarios. Participants were randomly assigned to read one of two scenarios.

In the low competence condition, participants were showed with the following information:

*You booked a hotel with good online reputation for travelling. After your stay, you found the sound insulation effect was poor. The shower water sometimes was hot and sometimes was cold. The breakfast was bad and the internet access was slow.*

High competence was manipulated by informing participants:

*You booked a hotel with good online reputation for travelling. After your stay, you found the sound insulation effect was good. It provides modern bathroom facilities, nutritious breakfast, and fast internet access.*

We asked participants to imagine “*After a day’s trip, you see the following message from the hotel clerk for you on the room desk.*” After that, they were presented randomly with a picture of actual handwritten or typewritten note made by a hotel.

*Dear guest,*

*I'm very glad to serve you as the room attendant. The gym at the 3rd floor is open freely for 24 hours. You're welcome to use it. Wish you a pleasant stay here!*

After reading the note, participants rated the warmth (α=.948), perceived effort (α=.893), and psychological closeness (α=.941). They responded to a manipulation check rating the competence using a seven-point Likert-type scoring format, ranging from “poor” to “excellent”, “inferior” to “superior”, and “low standards” to “high standards”. After that, participants responded to a number of additional questions, such as (1) clear extent of the writing (M\text{handwritten}=5.60, SD=1.050, vs. M\text{typewritten}=5.35, SD=.645; F(1,110)=2.306, p=.132), (2) comfortable extent of the writing (M\text{handwritten}=5.49, SD=1.088, vs. M\text{typewritten}=4.04, SD=1.247; F(1,110)=43.398, p=.000), (3) satisfaction with the provided service (M=4.97, SD=1.291) on a seven-point scale. We also checked if they identified the note’s writing in the picture was handwritten or typewritten. Finally, demographic information was collected and participants were debriefed.

**Results and Discussion**

Manipulation checks. Results showed that our competence manipulation was successful. Participants in the high-competence condition rated the hotel had considerably more competence than those in the low-competence condition (M=5.582, SD=.765, vs. M=3.766, SD=.994), F(1,110)=116.775, p=.000).

Analysis of covariance revealed an interaction between writing and competence on warmth (F(3,108) = 4.105, p=.045). For the high-competence condition, warmth was higher for the handwritten than for the typewritten (F(1, 53) = 14.062, p=.000). For the low-competence
condition, there was no difference in the two conditions, F(1, 55)< 1(see figure 5). Sample sizes, means, and standard deviations for warmth are shown in table 1.

**FIGURE 5**
STUDY 5 RESULTS: EFFECT OF WRITING AND COMPETENCE ON WARMTH

![Graph showing the effect of writing and competence on warmth](image)

**TABLE 1**
STUDY 5 RESULTS: WARMTH AND CONDITION

<table>
<thead>
<tr>
<th>condition</th>
<th>mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-competence, handwritten(n=28)</td>
<td>4.095</td>
<td>0.981</td>
</tr>
<tr>
<td>Low-competence, typewritten(n=29)</td>
<td>3.840</td>
<td>1.153</td>
</tr>
<tr>
<td>High-competence, handwritten(n=29)</td>
<td>6.253</td>
<td>0.524</td>
</tr>
<tr>
<td>High-competence, typewritten(n=26)</td>
<td>5.180</td>
<td>1.440</td>
</tr>
</tbody>
</table>

A bootstrapping procedure that generated a sample size of 5,000 was used to assess the regression models in the high competence condition. The totality of all the estimated indirect effects permitted the construction of a 95% confidence interval for the effect size of each indirect effect. All the described intervals were bias-corrected intervals. The confidence interval for the indirect paths for perceived effort(-.5931 to -.0188) and psychological closeness(-.8588 to -.0457) did not include zero, and the effect sizes were -.2080 and -.3767 respectively, indicating that they were significant mediators. The 95% confidence intervals for contrasts of perceived effort with psychological closeness included zero (-.1272 to .6381), indicating that two mediating effects had no significant difference.

Study 5 supported H4 and provided evidence that consumer response to handwriting depends on the firm's competence.

**GENERAL DISCUSSION**

In the service industry, written communication with consumers occurs in many everyday situations. Yet, despite the pervasiveness of handwritten or typewritten messages in human consumption life, prior research has provided little insight into the phenomenon.

Five studies strongly support our predictions handwriting can stimulate perceived warmth
than mechanical typewriting fonts. Perceived effort and psychological closeness to the target play dual mediating roles of such effect. Actual handwriting (vs. a computerized handwritten font and a computerized typewritten font) note causes consumers to perceive service firms as warmest. Perceived effort mediates the effect of actual handwriting (vs. a computerized handwritten font) on perceived warmth. We also demonstrate a boundary condition when handwriting has no impact on perceived warmth in the service context. Namely, handwriting (vs. typewriting) has a positive impact on perceived warmth of service firms for high-competence compared with for low-competence.

**Theoretical Contributions and Managerial Implications**

The current research makes important contributions to the literatures. First, we contribute to the literature on the marketing communication literature. Previous research suggest a focus on various facets of communication, including frequency, direction, modality, and content (Mohr and Nevin 1990). Furthermore, these four facets have been studied extensively by empirical researchers in organizational communication. This research goes a step further in written communication, divides it into handwritten and typewritten types, and examines their effects.

Second, we contribute to the literature on the cognitive psychology of handwriting by illuminating a novel, yet very human, deep-rooted response to handwriting. Handwriting reinforces the idea that “real people are behind the content, people who have put thought and effort into the note to make it usable and trustworthy”. It is conceivable that consumers who receive handwritten notes, perceive service firms to be consumer-friendly and easier to approach compared to perfectly illustrated typewriting that might be more detailed and clearer, but sterile, technical and unapproachable.

Third, we also contribute to the literature on social perception and emotion by clarifying where warmth comes from. When the service firms expend considerable consumer-focused effort, the real effort is felt by people’s hearts and observed by people’s eyes. The actual evidence is regarded as sincere, honest, and without fraud. In addition, when people feel psychologically close to service firms, they are unlikely to suspect their motives. They consider firms to be benevolent and friendly, and at least firms don’t do harm to themselves. Both perceived effort and psychological closeness elicit warmth perception.

Finally, we find that handwriting effect exists only when the essential precondition is met. Handwriting only increases perceived warmth when it is present in an already competent service firm. If perceptions of a firm’s competence are low, no amount of handwriting compensates in terms of perceived warmth. Competence refers to core task performance of service firms in the current research. This finding again underscores the importance of competence.

Following this line of reasoning, our present findings have important managerial implications.

First, In a digital world, the role of handwritten communication shouldn’t be overlooked. Today technology has changed our communication. With the advent of computers, some people question whether handwriting has taken a backseat and has become a lost art. This research suggest handwriting still matters. Emily Roy said, “99% of people will open a handwritten card, making it much more effective than traditional direct mail or even email.” Service firms can write a reminder note, letter or some other personal way by hand on the right occasion and send unspoken messages to consumers, “You matter to me, I thought of you, I took trouble on your behalf, here’s who I am”. Some businesses have thousands of customers. It may not be practical to
send a handwritten note to every person who does business with firms. But that doesn’t mean firms shouldn’t do it for anyone. Start with key customers. Handwriting will speak volumes about your firm. The care service firms take over consumers could be powerful tools in the arsenal of customer service and marketing assets.

Second, be sure to keep in mind that delivering a high-quality offering (i.e. good task performance) is fundamental and the bottom line as service firms. Handwriting is especially effective for high-competence service firms. When tasks are performed poorly, a boundary condition occurs whereby the handwriting becomes uninformative to the consumer for his or her cognition. In short, the effect of handwriting is the icing on the cake for service firms.

Third, If service firms hope to build up warmful impressions to consumers gradually, they can show extra consumer-focused effort and create a sense of psychological closeness. Although computerized handwriting own human-like qualities, but consumers appear to think that it shows a lack of effort compared with actual handwriting, which in turn causes consumers to perceive less warmth in the service context. Consumers are very sensitive and know whether or not service firms really care about them. People value sincerity. It creates good feelings about doing business with reliable firms. For service firms, when you warm and touch your customers sincerely, they not only help you grow by continuing to do business with you, but recommend you to friends and associates in real life.

Limitations and Future Directions

The present work suggests several directions for future research. First, although our results highlight the robustness of handwriting effect. It would be worth examining how handwriting within a service consumption context affects real attitude and behavior by field study to ensure external validity. Second, our experimental context was limited to hotel settings. Further research should examine the generalizability of our results in different service contexts, such as retailing, banking, airlines, telecommunications, education and health care etc. Third, additional insight could be gained by further classifying the service types (i.e. standardized and personalized) and investigating which service type matches with which writing style. It will be important and meaningful to help managers select appropriate writing styles that affect strategically valued perceptions.

REFERENCES


Including Other in the Self,” *Journal of Personality and Social Psychology*, 60(2), 241-253.


Marketing Research, 50(3), 334-347.