

# Contact Stratification and Deception: BlackBerry Messenger versus SMS Use among Students

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## ABSTRACT

The proliferation of communication technology has led to potential stratification of contacts across different media, which has important implications for interpersonal dynamics, such as deception. The present study examines how two text-based communication media, BBM and SMS, involve different kinds of social contact networks, and how these differences lead to changes in the frequency and nature of lies. The results reveal that BBM social contacts are relationally closer and include more friends but fewer family and acquaintances than SMS. More deception was also observed in BBM, which included more lies about managing social interactions. The results have important implications for the impact of design features, such as PIN exchange, in text messaging.

## Author Keywords

Computer-mediated communication, deception, SMS, BlackBerry, text messaging, relationship closeness.

## ACM Classification Keywords

H.5.3. Group and Organization Interfaces: Asynchronous interaction

## General Terms

Design, human factors

## INTRODUCTION AND BACKGROUND

The recent proliferation of communication media has resulted in a widespread sense of being overwhelmed by too many communication opportunities and distracting interruptions. This has led users of some media, such as instant messaging (IM), to abandon these technologies altogether and instead use media that give more control over who has access to them [2]. Many technologies, such as Facebook, allow users to stratify their contacts into

discrete groups, and restrict communication and information sharing with people in certain groups.

There are a variety of dimensions along which users might stratify contacts, such as relationship type (e.g., business vs. social) or relationship closeness. Boneva et al. [3], for example, found that teens' relationships with IM contacts were less close than with phone and face-to-face contacts.

One currently popular mobile device, the BlackBerry, provides a novel method for stratifying one's contacts. The BlackBerry allows users to exchange text-based messages in two ways: 1) traditional short message service (SMS) and 2) the proprietary BlackBerry Messenger (BBM). Both function similarly, except for two technical differences. One difference is that BBM requires users to exchange personal identification numbers (PINs) in addition to their phone numbers prior to exchanging messages. The second is that BBM alerts a sender that their message has been read by the recipient by displaying an "R" for read, whereas SMS provides no such notification.

The PIN feature represents an added barrier to communication in BBM relative to SMS. The PIN feature and BBM network more generally has been designed and advertised as system that can help protect users from unwanted interruptions from unfamiliar contacts. This design goal should create a more trusted communication network environment that can facilitate coordination with a close set of contacts.

In the present paper we examine the assumption that a design feature like the PIN exchange found in BBM leads to a stratification of social contacts. For instance, do people use BBM to stratify their contact list into a closer set of communication partners? Given our informal observations of BBM users and the fact that a PIN exchange increases the cost of initiating communication on BBM, we expect that people use BBM to limit their contacts to closer relationships than in SMS.

*H1: BBM contacts will be relationally closer than SMS contacts*

If contact stratification occurs as we expect, then what kind of impact will this stratification have on how people communicate socially using BBM relative to SMS? One communication dynamic involved in managing

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relationships that is especially relevant to BBM and its goal of a more trusted communication network is interpersonal deception. Interpersonal deception is any message that involves the purposeful misleading of another person [5].

How might the stratification of contacts affect deception? On one hand, some research [5] shows that people report telling fewer lies to those they are close to because lying in close relationships violates the authenticity and openness of the relationship. This result suggests that people should tell fewer lies to closer partners. If this is the case, and BBM users stratify social contacts by sharing PINs only with closer contacts, people should lie less often in their BBM communications than in SMS:

*H2A: Deception will occur less in BBM than in SMS*

On the other hand, research focusing more on the benefits of telling lies within relationships suggests that the most prominent reason for lying is to avoid hurting others' feelings [8]. Those who lied more in close relationships reported feeling more satisfied, close and committed to their partner. If deception is driven by concerns about managing relationships, and BBM involves closer contacts, then people should lie more often in BBM than in SMS:

*H2B: Deception will occur more in BBM than in SMS*

Given that BBM and SMS are critical for coordinating social activity and interactions, another important question concerns how deception operates across these two media for interpersonal coordination. This type of deception has been called butler lies, which have received interest in the CHI and CSCW communities [7, 1]. Butler lies are defined as lies used to manage the entry, exit, avoidance or arrangement of conversation. Their name is a reference to the function of a butler answering the door, serving in effect as a buffer between his employer and any visitors. In this role, the butler can easily tell a visitor the employer is busy, regardless of their actual status. Butler lies are a form of "white lie," which are often considered socially acceptable and tend to have few consequences for the recipient [4].

How might butler lies differ across BBM and SMS? Given that BBM is designed and advertised as a more trusted communication system between close contacts, it seems intuitive that there should be fewer butler lies relative to the more open communication network of SMS. However, butler lies are critically important for maintaining relationships by offering polite – albeit deceptive – explanations for potentially rude behavior related to managing social interactions (e.g., saying "I have to go eat dinner" to exit a long IM conversation).

If butler lies are indeed used as a polite way to maintain relationships in the face of difficult interpersonal coordination problems then people should use more butler lies with closer contacts. Given our prediction that BBM will involve relationally closer contacts, we should therefore observe more butler lies in BBM:

*H3: Butler lies will be more frequent in BBM than in SMS*

Finally, the "received" indicator in BBM should also affect the use of butler lies relative to SMS. By indicating that a contact has read a message, this feature may affect response time expectations and also makes it more difficult to tell a butler lie excusing late reply to a message (e.g., "sorry; just saw your message"). In BBM, we expect receivers not wishing to immediately respond to messages to alter their behavior. One such alteration that would preserve the ability to delay response to a message would be delaying the opening of a message until one is ready to respond.

*H4: Participants will report more delaying in opening messages in BBM than in SMS*

## RESEARCH METHODS

*Participants:* 137 students (105 female) from a large US university who all have both SMS and BBM took part in this study. Participants were 18 to 23 years old, had used SMS for an average of 60 months and BBM for an average of 12 months. All received course credit for participation.

*Procedure:* Participants completed an online questionnaire accessed via a link emailed from our university's online participant recruitment system. The questionnaire included demographics (age, gender, SMS/BBM experience) and questions about the people with whom they often exchange messages (e.g., "Who do you talk to most using SMS?").

Participants then entered each of the last 5 outgoing messages from their last 5 conversations using both BBM and SMS, for a total of 50 messages (not all reported this many). For each message, participants answered questions about their relationship with the recipient on a 5-point scale anchored by "not close at all" (1) and "very close" (5) and the status of their relationship ("family" "acquaintance/classmate" "friend" "significant other"), and whether the message was deceptive. Participants were told that deceptive messages were those intending to mislead the recipient. If a message was rated as deceptive, participants were asked to explain why and to rate the degree of deceptiveness on a 5-point scale anchored by "slightly deceptive" (1) and "extremely deceptive" (5).

*Message Coding:* Participants provided 2517 BBM messages, of which 322 were self-reported as deceptive; and 2239 SMS messages, of which 256 were deceptive.

The messages were coded for deception and butler lies on coding schemes from prior studies ([1], [7]). Messages were coded in four phases:

First, messages were rated as jocular if they were clearly not intended to create a false belief in the recipient (e.g., the message "Aight lol" was not technically true because the participant was not actually laughing out loud, but was not likely intended to mislead the recipient). Inter-rater reliability for jocular was acceptable (Kappa= .83). There were 86 BBM and 66 SMS messages that were coded as jocular and not used in subsequent analyses.

Second, messages were coded as butler lies if they were rated as deceptive and contained butler content that pertained to managing the entry, exit, or arranging of communication. Examples include avoiding entering a conversation “i just got those bbms my phone is f\*cked up,” exiting conversations “i have to go study now ttyl okay bye xo,” and arranging future communication “I’m gonna leave in 20 minutes if you want a ride.” (see Table 1). Interrater reliability for butler content was acceptable (Kappa = .72). There were 174 butler lies coded in the dataset.

Type of Lie	Example	Explanation
Butler Entry	“Just saw your Facebook chat”	Saw it last night
Butler Exit	“I’m really tired will text you later	No intention of texting later
Butler Arranging	“Can’t wait to see yah and show you around! :)”	Didn’t want to see them or show them around
General lie	“Hahahah I forgot to answer her!! Wooooops”	Intentionally ignored them
General lie	“I’m getting C’s, it’s fine”	Don’t believe it’s fine
General lie	“one out of two isn’t horrible”	Thought that was pretty horrible
General lie	“what I voted for you”	Didn’t actually vote for them
General lie	“yeah sounds good”	Didn’t actually like the plan

Table 1. Examples of lies from the present study.

## RESULTS

Our first question of interest is whether BBM stratifies relationships into closer contacts relative to SMS. To test this question and our following hypotheses, a linear mixed model was constructed with contact and message nested within participant and medium (BBM vs. SMS) as the predictor variable. Note that the denominator degrees of freedom in these models are estimated using a Satterthwaite’s approximation, which can yield non-integer degrees of freedom [9]. The model revealed higher levels of relationship closeness with BBM partners ( $M=4.08$ ,  $SE=0.04$ ) than SMS partners ( $M=3.82$ ,  $SE=.04$ ),  $F[1, 4317.49]= 144.09$ ,  $p<.001$ . This result supports our stratification prediction (H1) and indicates that features of BBM, such as the exchanging of pin numbers, leads to a closer set of communication partners for BBM than SMS.

The breakdown of relationship categories reveals that BBM contacts included more friends but fewer family members and acquaintances than SMS,  $\chi^2(3)=17.63$ ,  $p<.001$  (Table 2). That family represented fewer BBM contacts suggest that the relational closeness effect above does not simply reflect more intimate contacts. Instead, these data suggest

that relational closeness reflects contacts with which users interact with on a frequent basis. This observation, in addition to fewer acquaintances in BBM than SMS, suggest that users do indeed use BBM to stratify their contact network as expected into closer, more frequent contacts.

## Deception and BBM

Given that BBM involved closer contacts and more friends than SMS, our next question was whether this difference across media led to a difference in lying frequency across the media. To test the contrasting hypotheses we compared the overall rate of deception across BBM and SMS. More lies were told using BBM (8.3% of messages) than SMS (6.7% of messages),  $F[1, 4672.084]=6.59$ ,  $p=.01$ . In support of H1B, but perhaps in contrast to the notion that BBM creates a more trusted communication environment, this outcome reveals that more lies are sent in BBM than in SMS as a proportion of total messages.

Given that more lies were observed in BBM, we also checked if there was any difference in the size of the lies. Recall that participants rated how deceptive their lies were. No difference was observed across the two media,  $F[1, 333.21]< 1$ , suggesting that the more frequent lies in BBM were not considered bigger lies than those told in SMS.

While BBM increased overall rates of deception but not deception magnitude, were butler lies also observed more often in BBM than in SMS? To test H3, we examined the percentage of butler lies across the two media. BBM (3.9% of messages) had significantly more butler lies than SMS (3.0% of messages),  $F[1, 5128.02]= 3.145$ ,  $p<.05$ . This confirms our prediction that this specific kind of deception that focuses on coordinating interaction was observed more frequently in BBM, highlighting the importance of managing social interactions with close contacts in BBM.

Relationship	Media Type				
	BBM		SMS		Total
Category	Freq	%	Freq	%	
Family	57	11.3%	73	15.5%	130
Acquaintances	42	8.3%	72	15.3%	114
Friends	381	75.4%	304	64.7%	685
Sign. Other	25	5.0%	21	4.5%	46

Table 2. Stratification of relationships by medium.

## Delays in Opening Messages

Finally, we were interested in whether the “read message” design feature in BBM affected how users responded to messages. We predicted that individuals would intentionally delay opening some messages in order to not change the status indicator from “delivered” to “read”. Participants reported intentionally delaying the opening of a message more while using BBM (2.6% of all messages) than using SMS (1.0%),  $F[1, 5127.81] = 22.86$ ,  $p<.001$ . These data suggest that in BBM users frequently delayed

opening a message, presumably a response to BBM's "read message" feature that allowed users to maintain some ambiguity about when the message had actually been read.

## DISCUSSION

We set out to examine how participants use BBM and SMS to stratify their contacts, and to determine how this stratification affected users' deception behaviors. Our results are relatively straightforward, although somewhat surprising in their implications.

First, as we expected, our participants used BBM to stratify their contacts by closeness and type. Compared to SMS, which used the same physical device as BBM (a Blackberry phone) but did not require a PIN exchange, BBM contacts were rated as closer. They were also much more likely to be friends than to be family or acquaintances. This pattern of contacts is consistent with the stated design goals of BBM to create a closer, trusted network of friends than SMS, and to avoid "contact overload" [2].

Our second major finding was that lies were more frequently produced in BBM than in SMS. Indeed, BBM involved 24% more lies than SMS, a substantial difference given that the same device was used for both media. The fact that more lies were observed in BBM with its closer contacts supports the notion that deception in this context is driven primarily by relational needs and the desire to avoid hurting valued others' feelings [5, 8].

While the observation that BBM involved more lies seems to contradict the notion of BBM as a more trusted network, these data may instead suggest that BBM messages can be trusted to be more relationally positive rather than factually trustworthy. That is, BBM messages may be more deceptive, but they are more oriented to avoiding hurtful, if truthful, messages. Additional research is required to confirm this speculation, but the fact that butler lies were also observed more often in BBM supports the notion that BBM deceptions were relationally-oriented. Butler lies function to politely manage the coordination of social interactions [1, 7]. Deceptively indicating that one can't meet a friend because of work demands is more relationally positive than saying something more truthful, such as not wanting to see the person at all.

Finally, the "read message" design feature of BBM also altered participants' communication behavior. Users more frequently avoided opening messages, presumably to maintain the sender's belief that they had not yet read the message. This behavior fits nicely with previous work emphasizing the importance of ambiguity generated by communication technology, and represents another example of how users adapt social conventions to maintain ambiguity in accounting for their interpersonal behavior [7].

## Limitations

The survey method used in the present study relies on self-reported assessments of deception. The accuracy of self-

reported behavior is an issue for most studies on deception. However, the present method of having participants record their actual messages and explain why they were deceptive has many advantages over previous methods. Unlike diary methods, for example, which require participants to remember lies, text messages leave a record and do not rely on the participant's memory of what was said.

Lastly, like many studies drawing on university samples, we had many more women participate than men. Although we did not observe any gender effects in the present study, some caution is required in interpreting this result given that 80% of our sample were female. Furthermore, the college-aged students in this study may use BBM differently than those who use it primarily for business.

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