

# Text or Talk? Social Anxiety, Loneliness, and Divergent Preferences for Cell Phone Use

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## ABSTRACT

This paper investigates whether social anxiety and loneliness lead to contrasting beliefs and preferences among cell phone users towards texting and talking on their cell phones. Three hypotheses are examined: (1) that social anxiety and loneliness are differentially associated with generalized preferences either for texting or for talking on the cell phone, (2) that these preferences are linked to contrasting beliefs concerning the social functionality of the short message service (SMS), and (3) that these divergent beliefs mediate the effects of social anxiety and loneliness on cell phone users' generalized preferences for texting or talking. Results from an Internet questionnaire ( $N = 158$ ) showed that, whilst lonely participants preferred making voice calls and rated texting as a less intimate method of contact, anxious participants preferred to text, and rated it a superior medium for expressive and intimate contact. These divergent beliefs accounted for 36% and 16% of the variance in preference for texting and voice calls, respectively, and significantly attenuated the influence of loneliness and social anxiety when they were added to the regression equations for these measures. Results are discussed in terms of the hyperpersonal possibilities of mobile communications technologies.

## INTRODUCTION

THE GLOBAL CELLULAR PHONE MARKET now stands at approximately 1.8 billion subscribers, and is forecasted to reach 3 billion by the end of 2010, by which time nearly half of all human beings on the planet are expected to own and use a cell phone.<sup>1</sup> Although voice calls account at present for about 80% of cell phone revenue, the extraordinary success of the short message service (SMS), particularly among younger cell phone users, continues to surprise network operators: SMS is now expected to dominate mobile messaging in both traffic volume and revenue well into the last quarter of the present decade.<sup>2</sup> But in contrast to a voice call, sending an SMS message on a typical, second-generation mobile phone takes time and significant effort—the keypad is cramped and awkward to use, often re-

quiring several key taps to enter a single character, the handset display is small and poorly lit, and though editable, messages are limited to 160 simple text characters. Choosing to text rather than talk is clearly a significant decision point when using a cell phone to connect with another person.

Which method of contact is chosen will depend on the expectations and goals of the user, and the way these goals interact with the affordances of texting and talking. Compared with a voice call, an SMS message can be comparatively inexpensive, sent and received unobtrusively, used when other forms of contact are not possible, and can fill odd moments of unoccupied time.<sup>3</sup> However, frequent cell phone users—particularly teenagers and young adults, many of whom now prefer texting to talking on their cell phones for most forms of peer contact<sup>4</sup>—develop a deeper appreciation of the social

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functionality of SMS, and this may be reflected in their generalized patterns of cell phone use. Some prefer to text because it gives them time to think about the wording of their messages, allowing them to be more informal and candid, even with close friends.<sup>5</sup> A minority even develop an entirely separate, "brave SMS self," which contrasts with their more reticent real-life personality.<sup>6</sup>

These attitudes towards SMS echo two themes emerging from the recent debate concerning the Internet as a social medium. First, it is now understood that online contact can at times surpass direct face-to-face interaction in both intimacy and intensity, and support the development of enduring online and offline relationships.<sup>7</sup> In a similar vein, cell phone users demonstrate that even a rudimentary plain text medium such as SMS can be preferred to spoken interaction for achieving certain relationships goals.<sup>8</sup> Compared to a voice call, SMS enables the cell phone user to disengage from the multiple attentional demands of real-time social interaction and focus cognitive resources on the task of composing a message, even to analyze the smallest of cues to achieve important self-presentational goals.<sup>9</sup>

Secondly, evidence is mounting that online interaction may become the preferred mode of social contact for key groups of Internet users. Recent studies have shown that lonely, anxious, and depressed individuals gain positive benefit from online interaction.<sup>10,11</sup> Some evidence now suggests that this may in turn lead to problematic or excessive Internet use by this group.<sup>12</sup> A similar pattern may be evident among cell phone users: a recent online survey revealed that cell phone owners declaring a generalized preference for texting on their cell phones were both lonelier and more anxious than those who preferred talking.<sup>5</sup>

In this paper, we report on an Internet survey of cell phone users designed to address these questions. The survey sets out to evaluate three linked hypotheses: (1) that social anxiety and loneliness are differentially associated with generalized preferences either for texting or for talking on the cell phone, (2) that these preferences are linked to divergent beliefs concerning the social functionality of SMS, and (3) that these divergent beliefs mediate the effects of social anxiety and loneliness on cell phone users' generalized preferences for texting or talking.

#### *Social anxiety, loneliness, and texting*

Social anxiety is the combination of fear, apprehension and worry that people experience when

they anticipate being unable to make a positive impression on others, particularly in encounters with strangers in public settings.<sup>13</sup> Research now suggests that this anxiety is associated with a preoccupation with the "observer's perspective" on the self, leading to cognitive overload.<sup>14</sup> By delaying or eliminating the audience reactions that normally accompany real-time spoken interaction, SMS may offer anxious individuals a way of making social contact without fear of immediate disapproval or rejection, allowing attention to be refocused away from the observer's perspective and towards the composition of messages that more effectively achieve self-presentational goals.

The experience of loneliness, on the other hand, arises from the absence of social relationships capable of satisfying needs for attachment and belonging.<sup>15</sup> However, mere social contact does not cushion people against loneliness, and may even exacerbate it. Although the sheer number of social contacts matters to young people, it is the quality of these contacts—particularly the presence of a truly intimate friend or romantic partner—that is important to young and old alike. Loneliness is therefore more likely to arise from a lack of intimate contact than from a lack of contact per se.<sup>16</sup> Whilst an SMS exchange might ameliorate the experience of loneliness, we expect the intimacy needs of lonely people to be satisfied more directly by a vocally expressive, real-time voice call. Lonely cell phone users are less likely therefore to associate SMS with their sociability needs, and instead will show a generalized preference for talking over texting on their cell phones.

Now, loneliness and social anxiety are correlated states, and social withdrawal and isolation often occur as the result of acute social anxiety.<sup>17</sup> However, not every lonely person is anxious—for some, loneliness is a transitory condition occasioned by a change of location or employment, whilst for others social isolation may be an enduring feature of their circumstances. Equally, whilst shyness and disaffiliation may diminish their integration into networks of friends and social groups, some anxious people may nevertheless enjoy enduring one-to-one relationships that provide feelings of affection and security.<sup>15</sup> We therefore evaluate the diverging effects of loneliness and social anxiety by testing the association of each of these variables on preferences for texting and talking whilst statistically holding the other variable constant.

*H1a: With the effects of loneliness controlled, social anxiety will be positively correlated with a preference for texting on the cell phone.*

*H1b: With the effects of social anxiety controlled, loneliness will be positively correlated with a preference for talking on the cell phone.*

### *Outcome expectations as mediating variables*

Our approach to understanding cell phone users' attitudes to SMS has a close parallel to recent developments in uses and gratifications models of Internet use.<sup>18,19</sup> A key feature of these developments is the recognition that predictions of Internet use can be improved significantly by reframing peoples' beliefs about the Internet in terms of their expectations of achieving specific outcomes. We extend this reasoning to cell phone use in the present study by drawing upon uses and gratifications beliefs shown by Leung<sup>20</sup> to be particularly relevant to the conversational use of online chat services available on the Internet. Leung found that heavy users of online chat were motivated by the *intrinsic* goals of sociability and affection, whilst light users were *instrumentally* motivated, tending to chat online for entertainment or appearances sake. Our analysis of attitudes towards SMS suggests that anxious cell phone users—particularly those for whom circumstantial causes of loneliness are statistically controlled—will resemble Leung's heavy chat users, motivated by rewards intrinsic to SMS activity, such as self-presentation, sociable contact, intimacy, and so on. Lonely users—particularly those for whom social anxiety is statistically controlled—are more likely to view SMS as a means to an end, or as an inferior substitute for other more immediate forms of contact, particularly voice calls.

*H2a: With the effects of loneliness controlled, social anxiety will be positively associated with intrinsic outcomes and negatively associated with instrumental outcomes associated with SMS.*

*H2b: With the effects of social anxiety controlled, loneliness will be positively associated with instrumental outcomes and negatively associated with intrinsic outcomes associated with SMS.*

Finally, we set out to test whether beliefs concerning the social functionality of SMS provide a cognitive middle link in a causal chain connecting the dispositional orientations associated with anxiety and loneliness to preferences for texting or talking. We do this by applying Baron and Kenny's<sup>21,22</sup> causal step test for evaluating mediating variables, by determining whether the connections between loneliness and social anxiety and preferences for texting and talking are eliminated—or at least significantly reduced—when beliefs concerning the so-

cial functionality of SMS are included in the causal chain.

*H3: Outcome expectations concerning the relationship management possibilities of SMS will mediate the relationship between loneliness and social anxiety, and generalized preferences for talking or texting on the cell phone.*

## METHODS

### *Participants*

The participants were 158 visitors (127 females and 31 males) completing an online questionnaire made available on a secure research website over a four-month period in 2004. The questionnaire was advertised on a University of Plymouth mailing list and on Internet research websites. The majority of participants were residents of the United Kingdom (51.3%) and the United States (20.9%), and were aged between 16 and 55 years (median = 20.0). All participants owned at least one cell phone, and the majority (74.7%) reported using email "often" or "sometimes."

### *Variables and measures*

*Social anxiety.* The 15-item interaction anxiousness subscale of the Leary Social Anxiousness scale<sup>17</sup> was used to gauge the frequency and/or intensity with which participants experienced anxiety during or prior to social encounters. In this scale, respondents are asked to indicate the degree to which each of 11 positively and four negatively worded statements is characteristic or true of them by responding on a five-point scale (1 = *not at all characteristic*; 5 = *extremely characteristic*). An aggregate score, obtained by summing over items after first correcting item polarities, yielded a standardized reliability of  $\alpha = 0.89$ , identical to values reported by Leary and Kowalski<sup>23</sup> for college student samples.

*Loneliness.* The 10-item abbreviated version of the UCLA Loneliness Scale, version 3<sup>24</sup> was used to assess subjective feelings of loneliness, shyness, and social isolation. In this scale, respondents report on the quality of their interpersonal relationships by responding to five positively and five negatively worded statements on a four-point scale (1 = *never feel this way*; 4 = *always feel this way*). An aggregate score was obtained by summing over items after first correcting item polarities. This score showed satisfactory internal consistency, obtaining a stan-

dardized reliability of  $\alpha = 0.84$ , compared with the value of  $\alpha = 0.89$  reported by Russell<sup>24</sup> for an adult sample.

*Uses and gratifications of SMS.* As instant and mobile messaging are functionally similar technologies, items for the present study were drawn from previous research in these two domains. First, the 26 items of Leung's<sup>20</sup> online chat survey were included in the present questionnaire. These items tap into six primary motives for engaging in online chat—to express affection, for entertainment, for relaxation, to appear fashionable, to be sociable, and as a form of escapism. A further 19 supplementary items, generated from a previous survey of mobile messaging,<sup>5</sup> were combined with Leung's items to include uses and gratifications more closely related to mobile messaging, such as concerns for impression management, relationship maintenance, opportunities for contact, and ease of use. The 55 items in this enlarged pool were presented in random order as separate statements completing the sentence *I use text messaging to communicate with others*, and were each accompanied by a five-point Likert scale (1 = *strongly disagree*; 5 = *strongly agree*).

A preliminary principal components factor analysis of the additional items indicated four factors with eigenvalues greater than 1, and 11 items with the highest differential loadings were identified to sample these factors. These were then combined with the items loading highest on Leung's<sup>20</sup> six instant messaging factors, and were subjected to a series of iterated exploratory factor analyses, using principal axis factoring with direct oblimin rotation.<sup>25</sup> Items failing to load significantly and/or differentially over factors were discarded on each iteration. After several iterations, a solution based on 18 items was accepted. Factors with eigenvalues greater than 1 were retained. Five factors were derived in this manner, explaining over 72% of the overall variance (with all factor loadings of  $>0.50$ , no cross-loadings, and acceptable construct reliabilities of  $\alpha = 0.68$ – $0.87$ ).

The resulting rotated factors (with percent variance explained in brackets) are shown in Table 1: (1) *Self-Presentation* (25.8%) combines one new item with three of Leung's Sociability items to reflect an emphasis on impression management concerns, particularly during the early stages in the formation of new relationships; (2) *Intimacy* (24.8%) combines two new items with three from Leung's Sociability and Affection factors, focusing on the expression of intimacy and the management of existing relationships; (3) *Appearances* (21.2%) and (4) *Escapism* (18.7%) reproduce similar factors in Leung's analy-

sis; and (5) *Last Resort* (9.5%) emerged as a new factor reflecting a view of mobile messaging as a dispreferred alternative to more direct forms of social contact. With the exception of the Appearances factor, which tended towards the disagreement pole of item rating scales, item averages fell within one standard deviation of the scale midpoint. The discriminant validity of this five-factor solution was then examined by inspecting the factor correlation matrix. Self-Presentation correlated strongly with Appearances ( $r = 0.46$ ), and Intimacy ( $r = 0.43$ ), suggesting a common relationship management theme underlying these three factors. Summary variables for each factor were created by averaging participants' ratings over the items loading significantly on each factor.

*Preferences for texting and talking on the cell phone.* Three questions were included to assess participants' generalized preferences for using their cell phones to make contact with other people. First, preferences for using cell phones for texting were assessed with the dichotomous question *Which do you prefer: talking or texting on your cell phone?* Participants were classified into those preferring to talk (scored as 1) and those preferring to text (scored as 2). Secondly, participants provided two ostensibly objective estimates which were expected to reflect biased judgments of preferred usage of their cell phones: an estimate of the number of cell phone text messages they sent in a typical month, and a similar estimate of the number of cell phone voice calls they made in the same month.

## RESULTS

### *Descriptive and correlational analyses*

Means, standard deviations, and zero-order correlation coefficients between variables and measures are shown in Table 2. As expected, scores on the loneliness and interaction anxiousness measures were significantly correlated,  $r = 0.48$ ,  $p < 0.01$ . Although mean interaction anxiousness scores in the present sample do not differ significantly from the mean obtained by Leary and Kowalski<sup>23</sup> for their larger validation sample,  $t(1777) = 1.45$ , *ns* (not significant), the mean loneliness score is significantly higher (by 1.7 points on the 28-point scale) than that observed by Russell<sup>24</sup> in his validation sample,  $t(467) = 3.39$ ,  $p < 0.001$ .

As Table 2 illustrates, the distributions of most uses and gratifications variables were centered within one point of the scale midpoint, although the



TABLE 1. FACTOR LOADINGS OF THE USES AND GRATIFICATIONS OF SMS ITEMS

| <i>"I use text messaging to communicate with others..."</i> | <i>M</i> | <i>SD</i> | <i>Factors</i> |           |           |           |           |
|---|----------|-----------|----------------|-----------|-----------|-----------|-----------|
|   |          |           | <i>1</i>       | <i>2</i>  | <i>3</i>  | <i>4</i>  | <i>5</i>  |
| 1. Self-presentation  |          |           |                |           |           |           |           |
| Because other people get a better impression of me          | 2.09     | 1.10      | <b>82</b>      | 37        | 45        | 34        | −03       |
| To be less inhibited chatting with strangers                | 2.51     | 1.20      | <b>77</b>      | 44        | 42        | 38        | −01       |
| To make new acquaintances                                   | 2.25     | 1.25      | <b>73</b>      | 48        | 29        | 33        | −22       |
| To make friends of the opposite sex                         | 2.30     | 1.14      | <b>72</b>      | 44        | 53        | 34        | 05        |
| 2. Intimacy   |          |           |                |           |           |           |           |
| To deepen my relationships                                  | 2.84     | 1.26      | 54             | <b>83</b> | 29        | 28        | −13       |
| To add extra dimensions to my relationships                 | 2.94     | 1.20      | 57             | <b>82</b> | 33        | 26        | −06       |
| To show encouragement to others                             | 3.06     | 1.18      | 46             | <b>72</b> | 28        | 27        | 03        |
| To let others know I care about their feelings              | 3.37     | 1.05      | 28             | <b>70</b> | 10        | 34        | −14       |
| To let others know I am thinking of them                    | 3.67     | 1.09      | 19             | <b>68</b> | 02        | 41        | −07       |
| 3. Appearances  |          |           |                |           |           |           |           |
| To look fashionable   | 1.94     | 1.01      | 43             | 22        | <b>93</b> | 29        | 15        |
| To look stylish   | 1.90     | 1.00      | 33             | 11        | <b>82</b> | 30        | 29        |
| To not look old fashioned                                   | 1.87     | 0.90      | 50             | 17        | <b>75</b> | 30        | 26        |
| 4. Escapism   |          |           |                |           |           |           |           |
| To put off something I should be doing                      | 2.74     | 1.23      | 39             | 28        | 33        | <b>86</b> | −04       |
| To get away from what I am doing                            | 2.85     | 1.17      | 47             | 43        | 31        | <b>79</b> | −08       |
| To kill time  | 3.28     | 1.20      | 21             | 32        | 31        | <b>69</b> | 03        |
| 5. Last resort  |          |           |                |           |           |           |           |
| Only when I cannot voice call that person                   | 3.08     | 1.37      | −22            | −16       | 14        | −04       | <b>70</b> |
| Only if it is the only method of communication available    | 2.80     | 1.31      | 04             | −17       | 21        | −01       | <b>68</b> |
| Only when I cannot see that person face-to-face             | 2.90     | 1.16      | 01             | 09        | 18        | −03       | <b>58</b> |
| Standardized alpha coefficient                              |          |           | 0.86           | 0.87      | 0.87      | 0.83      | 0.68      |

$n = 158$ . Five factors extracted using principal axis factoring, with direct oblimin rotation. Decimal points omitted from factor loadings. Significant loadings are shown in bold face.

SMS, short message service.

mean of the Appearances factor was closer to the disagreement pole of the scale. Nearly half (45.6%) of the participants preferred to use their cell phones for texting than talking. Table 2 also illustrates the relatively high text and talk rates estimated by participants in the present sample, averaging about seven messages and five voice calls each day. As expected, these estimates reflect perceived rather than actual usage: rates as high as this would place our participants among the heav-

iest cell phone users, even within teen and young adult age groups.<sup>4</sup>

We tested for age and gender effects on all variables and measures. No significant effects of gender were found. However, as shown in Table 2, age correlated negatively with interaction anxiousness ( $r = -0.17, p < 0.05$ ), self-presentation ( $r = -0.16, p < 0.05$ ), escapism ( $r = -0.28, p < 0.01$ ), and marginally with estimated texts sent per month ( $r = -0.14, p < 0.10$ ). In view of this, all hypothesis tests were

TABLE 2. ZERO-ORDER CORRELATIONS AND DESCRIPTIVE STATISTICS

| Variables  | 1       | 2       | 3        | 4       | 5       | 6       | 7       | 8        | 9                 | 10    | 11    |
|--|---------|---------|----------|---------|---------|---------|---------|----------|-------------------|-------|-------|
| 1. Loneliness                                    | —       |         |          |         |         |         |         |          |                   |       |       |
| 2. Interaction<br>anxiousness                    | 0.48*** | —       |          |         |         |         |         |          |                   |       |       |
| 3. Age   | 0.06    | -0.17** | —        |         |         |         |         |          |                   |       |       |
| 4. Self-presentation                             | 0.05    | 0.23*** | -0.16**  | —       |         |         |         |          |                   |       |       |
| 5. Intimacy                                      | -0.20** | 0.03    | 0.01     | 0.59*** | —       |         |         |          |                   |       |       |
| 6. Appearances                                   | 0.09    | 0.02    | -0.12    | 0.50*** | 0.26*** | —       |         |          |                   |       |       |
| 7. Escapism                                      | 0.02    | 0.21*** | -0.28*** | 0.50*** | 0.43*** | 0.39*** | —       |          |                   |       |       |
| 8. Last Resort                                   | 0.11    | -0.07   | -0.06    | -0.08   | -0.11   | 0.22*** | 0.04    | —        |                   |       |       |
| 9. Prefer texting to<br>voice calls <sup>a</sup> | -0.15*  | 0.03    | -0.01    | 0.28*** | 0.31*** | -0.04   | 0.20*** | -0.42*** | —                 |       |       |
| 10. Estimated texts<br>sent per month            | -0.02   | -0.06   | -0.14*   | 0.13    | 0.07    | 0.00    | 0.15*   | -0.14*   | 0.31***           | —     |       |
| 11. Estimated voice<br>calls made per<br>month   | 0.10    | -0.11   | -0.03    | 0.00    | 0.02    | 0.34*** | 0.09    | 0.17**   | -0.15*            | 0.09  | —     |
| Mean   | 20.9    | 40.4    | 22.9     | 2.3     | 3.2     | 1.9     | 3.0     | 2.9      | 45.6 <sup>b</sup> | 223.9 | 145.2 |
| SD   | 5.2     | 10.5    | 7.6      | 1.0     | 1.0     | 0.9     | 1.0     | 1.0      | —                 | 387.7 | 172.8 |

$n = 158$ .

<sup>a</sup>Scored as 1 = prefer voice calls, 2 = prefer texting.

<sup>b</sup>Percent preferring texting to voice calls.

\* $p < 0.10$ .

\*\* $p < 0.05$ .

\*\*\* $p < 0.01$ , two-tailed tests.

carried out using age as a statistically controlled covariate.

#### Testing the divergence hypotheses

H1 was tested by calculating partial correlation coefficients between loneliness and each preference measure. These coefficients provide an estimate of the unique amount of variation on each of these measures predicted by loneliness scores which cannot be explained by participants' age or interaction anxiousness scores. Similar partial correlation coefficients were calculated for interaction anxiousness, controlling for the effects of age and loneliness on each cell phone measure.

Partial correlations of the three preferences measures with loneliness and interaction anxiousness are shown in the upper panel of Table 3. It is clear from this table that loneliness and interaction anxiousness are associated with divergent preference patterns. Lonely participants prefer texting less than talking on their cell phones ( $r = -0.18$ ,  $p < 0.05$ ) and estimate making a high number voice calls made per month ( $r = 0.19$ ,  $p < 0.05$ ), although surprisingly do not estimate sending fewer text messages ( $r = 0.08$ , *ns*). Despite showing a weak preference for texting ( $r = 0.12$ ), anxious partici-

pants estimated sending fewer texts ( $r = -0.10$ ), although neither correlation was significant. However, they did show a significant tendency to make fewer voice calls on their cell phones ( $r = -0.19$ ,  $p < 0.05$ ).

These partial correlations provide evidence of the divergent preferences predicted by H1a and H1b, though not all measures showed this in equal strength. Nevertheless, broad support for the divergence hypothesis is provided by *t* test contrasts on the magnitude of differences between partial correlations, also shown in the upper panel of Table 3. In fact, all contrasts were significant and in the predicted direction, even those between the nonsignificant but opposite signed correlations for estimated texts sent per month,  $t(155) = 2.24$ ,  $p < 0.05$ .

Similar tests were carried out on the second hypothesis. As shown in the lower panel of Table 3, H2a was broadly supported: anxious participants did not simply use text messaging when other forms of contact were unavailable (Last Resort;  $r = -0.16$ ,  $p < 0.05$ ), but valued it for its self-presentational (Self-presentation;  $r = 0.21$ ,  $p < 0.01$ ) and intimacy opportunities (Intimacy;  $r = 0.15$ ,  $p < 0.05$ ), as well as a diversion from other activities (Escapism;  $r = 0.18$ ,  $p < 0.05$ ). In line with H2b, lonely participants were more likely to think of texting as a channel of

TABLE 3. PARTIAL CORRELATION COEFFICIENTS

| <i>Variables</i>                                     | <i>Loneliness</i> | <i>Interaction<br/>anxiousness</i> | <i>t (155)</i> |
|--|-------------------|------------------------------------|----------------|
| Preferences for texting or talking on the cell phone |                   |                                    |                |
| Prefer texting to voice calls                        | -0.18*            | 0.12                               | -3.83**        |
| Estimated texts sent per month                       | 0.08              | -0.10                              | 2.24*          |
| Estimated voice calls made per month                 | 0.19*             | -0.19*                             | 5.06*          |
| Uses and gratifications of text messaging            |                   |                                    |                |
| Self-presentation                                    | -0.05             | 0.21**                             | -3.29**        |
| Intimacy   | -0.25**           | 0.15*                              | -5.32**        |
| Appearances  | 0.11              | -0.05                              | 1.98*          |
| Escapism   | -0.05             | 0.18*                              | -2.89**        |
| Last Resort  | 0.18*             | -0.16*                             | 4.40**         |

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

Partial correlations with loneliness control for interaction anxiousness and age, those with interaction anxious control for loneliness and age.

last resort (Last Resort;  $r = 0.18$ ,  $p < 0.05$ ) and not as a means of intimate contact (Intimacy;  $r = -0.25$ ,  $p < 0.01$ ). Once again, the strength of the divergence between social anxiety and loneliness varied over uses and gratification factors. However, all contrast tests on partial correlations were significant and in the predicted direction, even those between the non-significant but oppositely signed correlations for the Appearances factor ( $t(155) = 1.98$ ,  $p < 0.05$ ).

#### *Testing the mediation hypothesis*

A series of hierarchical regression analyses was carried out to evaluate the four conditions necessary for a robust test of H3: (1) that loneliness and interaction anxiousness separately predict significant variation in preferences for texting or talking; (2) that these predictor variables also separately account for significant variation in beliefs concerning the uses and gratifications of SMS; (3) that these beliefs in turn account for significant variation in preferences for texting or talking; and (4) that associations between predictor and preference variables are eliminated (or at least significantly attenuated) when beliefs concerning the uses and gratifications of SMS are included in the regression equations.

The results shown in Table 3 already provide the evidence necessary to evaluate Condition 1. Of the three preference measures, two show divergence sufficiently strongly to test for mediation: as neither partial correlation for estimates of texts sent reached significance, this variable will be omitted from this stage of the analysis. Table 3 also provides evidence

for Condition 2 (i.e., the association between of loneliness and interaction anxiousness on SMS outcome expectations).

Tables 4 and 5 present the regression analyses necessary to evaluate H3 for the two remaining preference measures. These tables depict the results of three regression models, carried out in sequence. In the first model, the three predictor variables (i.e., loneliness, interaction anxiousness, and age) are entered together to determine their independent influence on the texting preference measures, and to provide further confirmation of Condition 1. In the second model, the uses and gratification factors are entered as a group in order separately to determine their independent effects on preferences measures and provide the evidence needed to test Condition 3.

Condition 4 is tested by combining the predictor variables and the uses and gratification factors in a third model, and comparing the fit of this and the preceding models. Three pieces of evidence are relevant to this. First, should Model 3 prove a significantly better fit than Model 1, this will confirm the additional causal influence of uses and gratifications beliefs on texting preferences, over and above that of the predictor variables (Condition 3). Second, if the regression coefficients for the predictor variables decline in Model 3, then the mediating role of uses and gratifications beliefs will be confirmed (Condition 4), either as partial mediators if these coefficients remain significant, or full mediators if they do not.<sup>22</sup> Finally, if Model 3 fails to provide a better overall fit than Model 2, this will provide fur-

TABLE 4. HIERARCHICAL LOGISTIC REGRESSION MODELS PREDICTING PREFERENCE FOR TEXTING OVER VOICE CALLS

| <i>Variables entered</i>                | <i>B<sub>exp</sub></i> | <i>Effect <math>\chi^2</math></i> | <i>R<sup>2</sup></i> | <i>Model <math>\chi^2</math></i> | <i>df</i> |
|---|------------------------|-----------------------------------|----------------------|----------------------------------|-----------|
| Model 1                                 |                        |                                   |                      |                                  |           |
| Loneliness                              | 0.92                   | 5.18*                             | 0.05                 | 5.57                             | 3         |
| Interaction anxiousness                 | 1.03                   | 2.12                              |                      |                                  |           |
| Age                                     | 1.01                   | <1                                |                      |                                  |           |
| Model 2                                 |                        |                                   |                      |                                  |           |
| Self-presentation                       | 1.70                   | 3.49                              | 0.36                 | 48.94**                          | 5         |
| Intimacy                                | 1.60                   | 3.39                              |                      |                                  |           |
| Appearances                             | 0.66                   | 2.02                              |                      |                                  |           |
| Escapism                                | 1.21                   | <1                                |                      |                                  |           |
| Last Resort                             | 0.39                   | 19.20**                           |                      |                                  |           |
| Model 3                                 |                        |                                   |                      |                                  |           |
| Loneliness                              | 0.97                   | <1                                | 0.36                 | 49.90**                          | 8         |
| Interaction anxiousness                 | 1.00                   | <1                                |                      |                                  |           |
| Age                                     | 1.00                   | <1                                |                      |                                  |           |
| Self-presentation                       | 1.77                   | 3.78                              |                      |                                  |           |
| Intimacy                                | 1.49                   | 2.05                              |                      |                                  |           |
| Appearances                             | 0.67                   | 1.92                              |                      |                                  |           |
| Escapism                                | 1.24                   | <1                                |                      |                                  |           |
| Last Resort                             | 0.39                   | 18.30**                           |                      |                                  |           |
| Differences between model 1 and model 3 |                        |                                   | 0.31                 | 44.33**                          | 5         |
| Differences between model 2 and model 3 |                        |                                   | 0.00                 | <1                               | 3         |

\* $p < 0.05$ .

\*\* $p < 0.01$ .

$n = 158$ . Table shows exponentiated logistic regression coefficients,  $B_{exp}$ , representing the odds of an increase (odds  $> 1$ ) or decrease (odds  $< 1$ ) in the preference for texting per unit increase in the predictor variable. For each model, all variables are entered simultaneously.

ther evidence for the causal irrelevance of the predictors variables when entered alongside the uses and gratifications variables (Condition 4).

#### *Mediating preferences for texting versus talking*

Table 4 shows these results for the first of the two preference measures—the preference for texting over voice calls—and as it is dichotomous, logistic regression is used throughout. A comparison of the models in this table supports H3 for this variable. Although Model 1 fails to reach significance,  $\chi^2 (3, N = 158) = 5.57, p = 0.13$ , the exponentiated regression coefficient for loneliness was significant ( $B_{exp} = 0.92, p < 0.05$ ), confirming the partial correlation shown in Table 3, and implying that a one-point increase in loneliness is associated with an 8% increase in the likelihood of participants preferring to use their cell phone for talking rather than texting.

Model 2 reveals that, taken together, the uses and gratifications variables exert significant influence,  $\chi^2 (5, N = 158) = 48.94, p < 0.01$ , explaining 36% of this texting measure, due mainly to the near-significant positive influence of the Self-Presentation ( $B_{exp} = 1.70, p = 0.06$ ) and Intimacy factors ( $B_{exp} = 1.60, p = 0.07$ ), and the strongly negative influence of the Last Resort factor ( $B_{exp} = 0.39, p < 0.01$ ). These results illustrate the pattern of outcome expectations lying behind the preference for using the cell phone for texting rather than for voice calls, and confirm Condition 3.

When the influence of these mediating variables is added to the predictor variables (Model 3), a significant increment in explanatory power ( $R^2_{diff} = 0.31$ ) over the predictor variables alone (Model 1) is obtained,  $\chi^2_{diff} (5) = 44.33, p < 0.01$ . Furthermore, the previously significant regression coefficient for loneliness is no longer so, and the  $\chi^2$  values for all



TABLE 5. HIERARCHICAL LINEAR REGRESSION MODELS PREDICTING ESTIMATED NUMBER OF VOICE CALLS MADE PER MONTH

| <i>Variables entered</i>                | $\beta$ | <i>Effect t</i> | $R^2$ | <i>Model F</i> | <i>df</i> |
|---|---------|-----------------|-------|----------------|-----------|
| <b>Model 1</b>                          |         |                 |       |                |           |
| Loneliness                              | 0.21    | 2.36*           | 0.05  | 2.63           | 3,154     |
| Interaction anxiousness                 | -0.23   | -2.46*          |       |                |           |
| Age                                     | -0.09   | <1              |       |                |           |
| <b>Model 2</b>                          |         |                 |       |                |           |
| Self-presentation                       | -0.26   | -2.41*          | 0.16  | 5.71**         | 5,152     |
| Intimacy                                | 0.05    | <1              |       |                |           |
| Appearances                             | 0.42    | 4.59**          |       |                |           |
| Escapism                                | 0.04    | <1              |       |                |           |
| Last Resort                             | 0.07    | <1              |       |                |           |
| <b>Model 3</b>                          |         |                 |       |                |           |
| Loneliness                              | 0.17    | 1.83            | 0.18  | 4.13**         | 8,149     |
| Interaction anxiousness                 | -0.16   | -1.73           |       |                |           |
| Age                                     | -0.04   | <1              |       |                |           |
| Self-presentation                       | -0.25   | -2.23*          |       |                |           |
| Intimacy                                | 0.08    | <1              |       |                |           |
| Appearances                             | 0.40    | 4.22**          |       |                |           |
| Escapism                                | 0.04    | <1              |       |                |           |
| Last Resort                             | 0.04    | <1              |       |                |           |
| Differences between model 1 and model 3 |         |                 | 0.13  | 4.83**         | 5,149     |
| Differences between model 2 and model 3 |         |                 | 0.02  | 1.41           | 3,149     |

\* $p < 0.05$ .\*\* $p < 0.01$ .

For each model, all variables are entered simultaneously.

three predictors have declined to less than 1. Finally, adding the predictor variables back into a model alongside the mediator variables does nothing to improve the prediction of the texting preference variable: the difference between Models 2 and 3 is negligible,  $\chi^2_{\text{diff}}(3) < 1$ . Taken together, these results confirm Condition 4, and provide strong support for H3 on this measure.

#### *Mediating estimates of voice calls made*

A similar linear regression analysis carried out on the voice calls measure also supports H3. Table 5, Model 1 explains a small ( $R^2 = 0.05$ ) but near-significant proportion of variance on the voice calls measure,  $F(3,154) = 2.63$ ,  $p < 0.06$ , resulting mainly from the diverging effects for loneliness ( $\beta = 0.21$ ,  $p < 0.05$ ) and interaction anxiousness ( $\beta = -0.23$ ,  $p < 0.05$ ) already identified in Table 3. This model therefore confirms Condition 1 for the voice calls measure.

Model 2 shows that beliefs concerning SMS outcome expectations separately account for a significant proportion of the variance in the voice calls measure,  $F(5,152) = 5.71$ ,  $p < 0.01$ ,  $R^2 = 0.16$ , but that this is due to the divergent effects of just two uses and gratifications factors, Self-Presentation ( $\beta = -0.26$ ,  $p < 0.05$ ) and Appearances ( $\beta = 0.42$ ,  $p < 0.01$ ). These results provide the evidence needed to support Condition 3.

Adding the influence of these mediating variables to the predictor variables (Model 3) produced a significant increment in explanatory power ( $R^2_{\text{diff}} = 0.13$ ) over the predictor variables alone (Model 1),  $F(5, 149) = 4.83$ ,  $p < 0.001$ . Further to this, the previously significant regression coefficients for loneliness and interaction anxiousness are now nonsignificant ( $\beta = 0.17$  and  $-0.16$ , respectively). Finally, adding the predictor variables back into a model that includes the mediators (i.e., the difference between Models 2 and 3) produces a negligible increase ( $R^2 = 0.02$ ) in the variance ex-

plained,  $F(3,149) = 1.41$ , *ns*. Again, these results confirm Condition 4, and support a full mediation version of H3 for the voice calls variable.

## DISCUSSION

These results support all three hypotheses. After controlling for extraneous influences, outcome expectations and cell phone preferences of lonely and social anxious participants clearly diverged: lonely participants preferred making voice calls and rated texting as a less intimate method of contact to be used only as a last resort, whilst anxious participants estimated making fewer voice calls and preferred to text, achieving expressive and intimate contact using this medium. Anxious participants also used texting as a diversion, to kill time or avoid some other activity. In short, texting has intrinsic appeal to anxious cell phone users, but is *dispreferred* by lonely users, except for instrumental purposes. Voice calls show the reverse pattern. The results also point to the mediating role played by divergent beliefs concerning the uses and gratifications of mobile messaging. Collectively, these beliefs accounted respectively for 36% and 16% of the variance in preference for texting and estimated voice calls per month, and significantly attenuated the influence of loneliness and social anxiety when they were added to the regression equations for these measures.

However, our results also suggest two important qualifications to these conclusions. First, whilst they diverged, beliefs and preferences associated with social anxiety and loneliness did not produce an entirely consistent picture. Clear-cut divergences were observed for four of the five uses and gratification factors: Self-Presentation, Intimacy, Escapism, and Last Resort. However, only three of these (Self-Presentation, Intimacy, and Last Resort) turned out to be significant mediators of texting preferences in their own right, and only one (Self-Presentation) was a significant mediator of estimated voice calls per month. Furthermore, the one factor that did not obtain clear-cut partial correlations with interaction anxiousness and loneliness (Appearances) appeared to play a significant part in mediating the voice calls measure. Although the uses and gratifications identified in the present study collectively mediated the effects of anxiety and loneliness on cell phone usage, the role of individual factors is far less clear from our data.

Secondly—and despite the differentiation of text and talk by our measures—the results revealed a

positive but nonsignificant correlation ( $r = 0.09$ ) between estimates of text and talk rates. The implication is that text and talk may not be perceived as mutually exclusive methods of social contact, but as interchangeable for some purposes. For example, texting is often used when a voice call fails to connect.<sup>26</sup> Furthermore, individual differences in base rates of social contact are likely to be reflected in our judgment measures: although they estimate making fewer voice calls per month, socially anxious participants did not simply report sending more texts, as might be expected from our analysis of the self-presentational goals associated with their use of the cell phone. In fact, the more anxious they were, the less these participants perceived themselves making *any* kind of contact, whether by voice or text, presumably reflecting the disaffiliative consequences of high levels of social anxiety.<sup>13</sup> Similarly, loneliness was positively, though weakly, correlated with estimates of text messaging, even though lonely participants viewed texting as a medium of last resort. These results suggest overlap as well as differentiation between the responses of anxious and lonely cell phone users, and complex variations in texting or talking preferences associated with different relationship goals.

In addition to these qualifications, several important limitations to the present study must be noted. First, potential sampling biases present an obvious threat to the generality of our findings. In particular, the slightly elevated level of loneliness may signal a potential preference bias in favor of asynchronous discourse in the present sample, comparable to that observed among lonely Internet users.<sup>10,12</sup> Furthermore, the predominance of female participants (over 80%) would also lead us to expect a higher levels of texting and a generally positive attitude towards texting in the present sample.<sup>3</sup> Despite this, *differential* effects of loneliness and social anxiety on texting and talking preferences were still detectable in our data. We believe it reasonable to assume that a more systematic and representative sample of cell phone users would actually reveal these effects with even greater force.

Next, shortcomings in the design of the present study and the operationalization of measures need to be recognized. We used participants' estimates of their cell phone use as an indirect measure of their preferences for texting and talking, but these need to be supplemented by objective measures of actual rates of usage of these two communications channels. The uses and gratifications factors used in the present study obtained reasonable levels of discriminant validity, and although we obtained mod-

est evidence for their convergent validity as first-order factors, further testing on other samples will be necessary to establish their stability. Furthermore, determining the causal priority of technology beliefs in relation to choice behavior is problematic in a one-shot, self-report study such as ours.<sup>27</sup> A definitive test of the mediating role of uses and gratifications beliefs awaits more systematic and, ideally, longitudinal studies of cell phone usage.

The present study does suggest that preferences for cell phone use mirror those for social interaction via the Internet in several respects. However, there are also some important differences. Firstly, we have shown that it is the self-presentational concerns associated with social anxiety—rather than the experience of social isolation that most closely defines loneliness—that best predicts the generalized preference for texting. These results are more consistent with a self-presentational approach to online interaction<sup>11</sup> than one based on generalized states of loneliness and disaffiliation.<sup>10</sup> Secondly, differences between SMS and the Internet bring the unique appeal of mobile messaging to anxious individuals into sharp focus. On the Internet, it is quite possible to remain anonymous and unidentifiable, browse postings in a newsgroup or chat room, yet gain some benefit from social involvement without actively participating in online interaction. In contrast, most cell phone texts are person-to-person messages received from and sent to known individuals with whom the sender is already acquainted, however fleetingly. SMS is a one-to-one, personalized, and individuating social medium. Thus the appeal of texting observed in the present study is difficult to reconcile with the emphasis on anonymity and depersonalization at the heart of the social identity-deindividuation<sup>28</sup> or focus-of-attention<sup>29</sup> models of online communication.

On the other hand, both the Internet and SMS allow users to disengage from the demands of immediate interactive involvement, releasing time and attentional resources to compose and edit messages. For anxious individuals in particular, the Internet and SMS are interchangeable in this respect. Both provide a non-threatening and controllable environment in which to articulate aspects of self too fragile to be expressed even to close acquaintances in normal, embodied interactions, a process more compatible with Walther's<sup>7,30</sup> "hyperpersonal" perspective on mediated interaction. According to this perspective, individuals learn to capitalize on the affordances of interactive media to individuate themselves and their communication partners, and achieve levels of intimate contact they could not

achieve in other interactional settings. By revealing why lonely and anxious individuals differ in their preferences for texting and talking on their cell phones, the present study points towards the hyperpersonal possibilities of new mobile communications technologies.

## REFERENCES

1. Merry, P., Domlija, D., Mackenzie, N., et al. (2005). *Global mobile forecasts to 2010*, 5th ed. London: Informa Telecoms & Media.
2. Crabtree, J., Nathan, M., & Roberts, S. (2003). *MobileUK: mobile phones and everyday life*. London: The Work Foundation.
3. Ling, R. (2004). *The mobile connection: the cell phone's impact on society*. San Francisco: Morgan Kaufmann.
4. Haste, H. (2005). *Joined up texting: the role of mobile phones in young peoples' lives*. Croydon, UK: Nestle Trust.
5. Reid, D.J., & Reid, F.J.M. (2005). Textmates and text circles: Insights into the social ecology of SMS text messaging. In: Hamill, L., Lasen, A. (eds.), *Mobile world: past, present and future*. London: Springer-Verlag, pp. 105–118.
6. Kasesniemi, E.L., & Rautiainen, P. (2002). Mobile culture of children and teenagers in Finland. In: Katz, J.E., Aakhus, M. (eds.), *Perpetual contact: mobile communication, private talk, and public performance*. Cambridge, UK: Cambridge University Press, pp. 170–192.
7. Walther, J.B., & Parks, M.R. (2002). Cues filtered in, cues filtered out: computer-mediated communication and relationships. In: Knapp, M.L., Daly, J.A. (eds.), *Handbook of interpersonal communication*, 3rd ed. Thousand Oaks, CA: Sage, pp. 529–563.
8. Byrne, R., & Findlay, B. (2004). Preference for SMS versus telephone calls in initiating romantic relationships. *Australian Journal of Emerging Technologies and Society* 2:2–14.
9. Ellison, N., Heino, R., & Gibbs, E. (2006). Managing impressions online: self-presentation processes in the online dating environment. *Journal of Computer-Mediated Communication* 11:415–441.
10. Morahan-Martin, J., & Schumacher, P. (2003). Loneliness and social uses of the Internet. *Computers in Human Behavior* 19:659–671.
11. Stritzke, W.G.K., Nguyen, A., & Durkin, K. (2004). Shyness and computer-mediated communication: a self-presentational theory perspective. *Media Psychology* 6:1–22.
12. Caplan, S.E. (2003). Preference for online social interaction: a theory of problematic internet use and psychosocial well-being. *Communication Research* 30:625–648.
13. Schlenker, B.R., & Leary, M.R. (1982). Social anxiety and self-presentation: a conceptualization and a model. *Psychological Bulletin* 92:641–669.

14. Spurr, J.M., & Stopa, L. (2003). The observer perspective: effects on social anxiety and performance. *Behaviour Research and Therapy* 41:1028–1266.
15. Weiss, R. (1973). *Loneliness: the experience of emotional and social isolation*. Cambridge, MA: MIT Press.
16. Green, L.R., Richardson, D.S., Lago, T., et al. (2001). Network correlates of social and emotional loneliness in young and older adults. *Personality and Social Psychology Bulletin* 27:281–288.
17. Leary, M.R. (1983). Social anxiousness: the construct and its measurement. *Journal of Personality Assessment* 47:66–75.
18. Eastin, M.S. (2005). Teen Internet use: relating social perceptions and cognitive models to behavior. *CyberPsychology & Behavior* 8:62–75.
19. LaRose, R., Mastro, D., & Eastin, M.S. (2001). Understanding Internet usage: a social-cognitive approach to uses and gratifications. *Social Science Computer Review* 19:395–413.
20. Leung, L. (2001). College student motives for chatting on ICQ. *New Media & Society* 3:483–500.
21. Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 51:1173–1182.
22. Holbert, R.L., & Stephenson, M.T. (2003). The importance of indirect effects in media effects research: testing for mediation in structural equation modeling. *Journal of Broadcasting & Electronic Media* 47:556–572.
23. Leary, M.R., & Kowalski, R.M. (1993). The Interaction Anxiousness Scale: construct and criterion-related validity. *Journal of Personality Assessment* 61:136–146.
24. Russell, D.W. (1996). UCLA Loneliness Scale (version 3): reliability, validity, and factor structure. *Journal of Personality Assessment* 66:20–40.
25. Costello, A.B., & Osborne, J.W. (2005). Best practices in exploratory factor analysis: four recommendations for getting the most from your analysis. *Practical Assessment, Research & Evaluation* 10:1–9.
26. Ling, R., & Yttri, B. (2002). Hyper-coordination via mobile phones in Norway. In: Katz, J.E., Aakhus, M. (eds.), *Perpetual contact: mobile communication, private talk, public performance*. Cambridge, UK: Cambridge University Press, pp. 139–169.
27. MacCallum, R.C., & Austin, J.T. (2000). Applications of structural equation modeling in psychological research. *Annual Review of Psychology* 51:201–226.
28. Spears, R., Postmes, T., Lea, M., et al. (2002). When are net effects gross products? The power of influence and the influence of power in computer-mediated communication. *Journal of Social Issues* 58:91–107.
29. Joinson, A.N. (1998). Causes and implications of disinhibited behavior on the Internet. In: Gackebach, J. (eds.), *Psychology and the Internet*. San Diego: Academic Press, pp. 43–60.
30. Walther, J.B. (1996). Computer-mediated communication: impersonal, interpersonal, and hyperpersonal communication. *Communication Research* 23:3–43.

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3. Genavee Brown, Ruth Medcalf-Bell. 2022. Phoning It in: Social Anxiety, Intolerance of Uncertainty, and Anxiety Reduction Motivations Predict Phone Use in Social Situations. *Human Behavior and Emerging Technologies* **2022**, 1-8. [[Crossref](#)]
4. Sinan Aslan. 2022. 'Investigation of the relationship between smartphone addiction and social loneliness in high school students'. *Vulnerable Children and Youth Studies* **3**, 1-11. [[Crossref](#)]
5. Bilal Ahmad, Sajid Iqbal, Mahnoor Hai, Shahid Latif. 2022. The interplay of personal values, relational mobile usage and organizational citizenship behavior. *Interactive Technology and Smart Education* **19**:2, 260-280. [[Crossref](#)]
6. Dong Woo Ko, Ji-yeon Lee, Hyesuk Kim. 2022. Loneliness, Implicit-Self and Digital Literacy. *Frontiers in Psychology* **13**. . [[Crossref](#)]
7. Li Zhong, Vincent Huang, Steve Guo. 2022. Mobile phone paradox: A two-path model connecting mobile phone use and feeling of loneliness for Filipino domestic workers in Hong Kong. *Mobile Media & Communication* **7**, 205015792210775. [[Crossref](#)]
8. Erol ESEN, Melda Meliha ERBAŞ. 2022. Mesajlaşma Motivasyonları Ölçeğinin (MMÖ) Türkçe'ye Uyarlanması: Geçerlik ve Güvenirlilik Çalışması. *Dokuz Eylül Üniversitesi Buca Eğitim Fakültesi Dergisi* . [[Crossref](#)]
9. Enrico Ciavolino, Lucrezia Ferrante, Giovanna Alessia Sternativo, Jun-Hwa Cheah, Simone Rollo, Tiziana Marinaci, Claudia Venuleo. 2022. A confirmatory composite analysis for the Italian validation of the interactions anxiousness scale: a higher-order version. *Behaviormetrika* **49**:1, 23-46. [[Crossref](#)]
10. Snigdha Mohapatra, Manit Mishra. Insights: Indian Adolescents' Social Media Usage and Life Satisfaction 121-134. [[Crossref](#)]
11. Komal Nagar, Gurmeet Singh, Rabinder Singh. 2021. Mediating Effect of WhatsApp Addiction Between Social Loneliness and Preference for Online Social Interaction: A Cross-cultural Study. *Global Business Review* **20**, 097215092110556. [[Crossref](#)]
12. Aneta Przepiorka, Agata Błachnio, Andrzej Cudo, Paweł Kot. 2021. Social anxiety and social skills via problematic smartphone use for predicting somatic symptoms and academic performance at primary school. *Computers & Education* **173**, 104286. [[Crossref](#)]
13. Philippa L. Howard, Felicity Sedgewick. 2021. 'Anything but the phone!': Communication mode preferences in the autism community. *Autism* **25**:8, 2265-2278. [[Crossref](#)]
14. Anja Stevic, Jörg Matthes. 2021. A vicious circle between children's non-communicative smartphone use and loneliness: Parents cannot do much about it. *Telematics and Informatics* **64**, 101677. [[Crossref](#)]
15. Roni Oren-Yagoda, Idan M. Aderka. 2021. The Medium is the Message: Effects of Mediums of Communication on Perceptions and Emotions in Social Anxiety Disorder. *Journal of Anxiety Disorders* **83**, 102458. [[Crossref](#)]
16. Yun Zhang, Hongyan Wang, Chuan Luo, Siyu Chen. 2021. Ephemerality in Social Media: Unpacking the Personal and Social Characteristics of Time Limit Users on WeChat Moments. *Frontiers in Psychology* **12**. . [[Crossref](#)]
17. Seth Wynes, John Kotcher, Simon D. Donner. 2021. Can citizen pressure influence politicians' communication about climate change? Results from a field experiment. *Climatic Change* **168**:1-2. . [[Crossref](#)]
18. Y. S. G. Hoffman, E. S. Grossman, Y. S. Bergman, E. Bodner. 2021. The link between social anxiety and intimate loneliness is stronger for older adults than for younger adults. *Aging & Mental Health* **25**:7, 1246-1253. [[Crossref](#)]
19. Bumin Çağatay AKSU, Altan DOĞAN. 2021. Çalışanların Nomofobi Düzeylerinin Demografik Değişkenler Açısından İncelenmesi Ve Bir Araştırma. *ODÜ Sosyal Bilimler Araştırmaları Dergisi (ODÜSOBLAD)* . [[Crossref](#)]
20. Hui-Ling Zhou, Huai-Bin Jiang, Bin Zhang, Han-Yu Liang. 2021. Social anxiety, maladaptive cognition, mobile phone addiction, and perceived social support: A moderated mediation model. *Journal of Psychology in Africa* **31**:3, 248-253. [[Crossref](#)]
21. Ehsan Namaziandost, Mohammad Hasan Razmi, Ronald M. Hernández, Yolvi Ocaña-Fernández, Masoud Khabir. 2021. Synchronous CMC text chat versus synchronous CMC voice chat: impacts on EFL learners' oral proficiency and anxiety. *Journal of Research on Technology in Education* **4**, 1-18. [[Crossref](#)]
22. Anna Maria Annoni, Serena Petrocchi, Anne-Linda Camerini, Laura Marciano. 2021. The Relationship between Social Anxiety, Smartphone Use, Dispositional Trust, and Problematic Smartphone Use: A Moderated Mediation Model. *International Journal of Environmental Research and Public Health* **18**:5, 2452. [[Crossref](#)]



23. Jennifer Mbanu. 2021. Understanding how patients with psychosis would prefer to be contacted about research. *Psychosis* 13:1, 71-77. [[Crossref](#)]
24. Sanjana Mendu, Anna Baglione, Sonia Bae, Congyu Wu, Brandon Ng, Adi Shaked, Gerald Clore, Mehdi Boukhechba, Laura Barnes. 2020. A Framework for Understanding the Relationship between Social Media Discourse and Mental Health. *Proceedings of the ACM on Human-Computer Interaction* 4:CSCW2, 1-23. [[Crossref](#)]
25. Philip Jefferies, Michael Ungar. 2020. Social anxiety in young people: A prevalence study in seven countries. *PLOS ONE* 15:9, e0239133. [[Crossref](#)]
26. Tayana Panova, Xavier Carbonell, Andres Chamarro, Diana Ximena Puerta-Cortés. 2020. Specific smartphone uses and how they relate to anxiety and depression in university students: a cross-cultural perspective. *Behaviour & Information Technology* 39:9, 944-956. [[Crossref](#)]
27. Abby C. King, Ines Campero, Jylana L. Sheats, Cynthia M. Castro Sweet, Patricia Rodriguez Espinosa, Dulce Garcia, Michelle Hauser, Monica Done, Michele L. Patel, Nina M. Parikh, Cecilia Corral, David K. Ahn. 2020. Testing the effectiveness of physical activity advice delivered via text messaging vs. human phone advisors in a Latino population: The On The Move randomized controlled trial design and methods. *Contemporary Clinical Trials* 95, 106084. [[Crossref](#)]
28. Jeanette Villanueva, Andrea H. Meyer, Marcel Miché, Hanna Wersebe, Thorsten Mikoteit, Jürgen Hoyer, Christian Imboden, Klaus Bader, Martin Hatzinger, Roselind Lieb, Andrew T. Gloster. 2020. Social Interaction in Major Depressive Disorder, Social Phobia, and Controls: the Importance of Affect. *Journal of Technology in Behavioral Science* 5:2, 139-148. [[Crossref](#)]
29. L. Berdot-Talmier, F. Koliouli, C. Zaouche Gaudron. 2020. Impact de la téléphonie mobile et de l'adaptation intériorisée sur la satisfaction de vie des enfants âgés de 9 à 12 ans. *Psychologie Française* 65:2, 121-139. [[Crossref](#)]
30. Xiaoxin Mao, Xi Zhao, Yuanyuan Liu. 2020. mHealth App recommendation based on the prediction of suitable behavior change techniques. *Decision Support Systems* 132, 113248. [[Crossref](#)]
31. Kaveri Subrahmanyam, Eline Frison, Minas Michikyan. 2020. The relation between face-to-face and digital interactions and self-esteem: A daily diary study. *Human Behavior and Emerging Technologies* 2:2, 116-127. [[Crossref](#)]
32. Simon Rice, Bridget O'Bree, Michael Wilson, Carla McEnery, Michelle H. Lim, Matthew Hamilton, John Gleeson, Sarah Bendall, Simon D'Alfonso, Penni Russon, Lee Valentine, Daniela Cagliarini, Simmone Howell, Christopher Miles, Marc Pearson, Laura Nicholls, Nicola Garland, Edward Mullen, Patrick D. McGorry, Mario Alvarez-Jimenez. 2020. Leveraging the social network for treatment of social anxiety: Pilot study of a youth-specific digital intervention with a focus on engagement of young men. *Internet Interventions* 20, 100323. [[Crossref](#)]
33. Lara L. Jones, Lee H. Wurm, Gregory A. Norville, Kate L. Mullins. 2020. Sex differences in emoji use, familiarity, and valence. *Computers in Human Behavior* 106305. [[Crossref](#)]
34. Leora Trub, Baptiste Barbot. 2020. Great Escape or Path to Self-Expression?: Development and Validation of a Scale of Motivations for Text Messaging. *Measurement and Evaluation in Counseling and Development* 53:1, 44-61. [[Crossref](#)]
35. Kathryn D. Coduto, Roselyn J. Lee-Won, Young Min Baek. 2020. Swiping for trouble: Problematic dating application use among psychosocially distraught individuals and the paths to negative outcomes. *Journal of Social and Personal Relationships* 37:1, 212-232. [[Crossref](#)]
36. Nicholas C Jacobson, Berta Summers, Sabine Wilhelm. 2020. Digital Biomarkers of Social Anxiety Severity: Digital Phenotyping Using Passive Smartphone Sensors. *Journal of Medical Internet Research* 22:5, e16875. [[Crossref](#)]
37. ## #. 2020. The Research Progress and Prospects of Overuse of Social Network—Based on the I-PACE Model Perspective. *Advances in Psychology* 10:07, 976-988. [[Crossref](#)]
38. Hannah R. Marston, Kelly Niles-Yokum, Sarah Earle, Barbara Gomez, David M. Lee. 2020. OK Cupid, Stop Bumbling around and Match Me Tinder: Using Dating Apps Across the Life Course. *Gerontology and Geriatric Medicine* 6, 233372142094749. [[Crossref](#)]
39. Song-yi Youn. 2019. Connecting through Technology: Smartphone Users' Social Cognitive and Emotional Motivations. *Social Sciences* 8:12, 326. [[Crossref](#)]
40. Liana DesHarnais Bruce, Joshua S. Wu, Stuart L. Lustig, Daniel W. Russell, Douglas A. Nemecek. 2019. Loneliness in the United States: A 2018 National Panel Survey of Demographic, Structural, Cognitive, and Behavioral Characteristics. *American Journal of Health Promotion* 33:8, 1123-1133. [[Crossref](#)]
41. Jiaqi Gong, Yu Huang, Philip I. Chow, Karl Fua, Matthew S. Gerber, Bethany A. Teachman, Laura E. Barnes. 2019. Understanding behavioral dynamics of social anxiety among college students through smartphone sensors. *Information Fusion* 49, 57-68. [[Crossref](#)]

42. Zejun Hao, Liangyi Jin, Yan Li, Hafiza Rabia Akram, Muhammad Farhan Saeed, Jun Ma, Haibo Ma, Jinzi Huang. 2019. Alexithymia and mobile phone addiction in Chinese undergraduate students: The roles of mobile phone use patterns. *Computers in Human Behavior* **97**, 51-59. [[Crossref](#)]
43. Jim Oxtoby, Ronald Schroeter, Daniel Johnson, Sherrie-Anne Kaye. 2019. Using boredom proneness to predict young adults' mobile phone use in the car and risky driving. *Transportation Research Part F: Traffic Psychology and Behaviour* **65**, 457-468. [[Crossref](#)]
44. Sarah M. Coyne, Laura Stockdale, Kjersti Summers. 2019. Problematic cell phone use, depression, anxiety, and self-regulation: Evidence from a three year longitudinal study from adolescence to emerging adulthood. *Computers in Human Behavior* **96**, 78-84. [[Crossref](#)]
45. Apaolaza Vanessa, Hartmann Patrick, D'Souza Clare, Gilsanz Ainhize. 2019. Mindfulness, Compulsive Mobile Social Media Use, and Derived Stress: The Mediating Roles of Self-Esteem and Social Anxiety. *Cyberpsychology, Behavior, and Social Networking* **22:6**, 388-396. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
46. . References 167-201. [[Crossref](#)]
47. Sindy R Sumter, Laura Vandenbosch. 2019. Dating gone mobile: Demographic and personality-based correlates of using smartphone-based dating applications among emerging adults. *New Media & Society* **21:3**, 655-673. [[Crossref](#)]
48. Afolayan Oluyinka Titilope. Socio-Psychological Dimensions of Mobile Phone Addiction and Usage Patterns Amongst Teenagers in Higher Institutions of Learning in Kwara State 307-320. [[Crossref](#)]
49. Enitan T Marcelle, Laura Nolting, Stephen P Hinshaw, Adrian Aguilera. 2019. Effectiveness of a Multimodal Digital Psychotherapy Platform for Adult Depression: A Naturalistic Feasibility Study. *JMIR mHealth and uHealth* **7:1**, e10948. [[Crossref](#)]
50. Zhiqi You, Yingru Zhang, Lu Zhang, Yu Xu, Xuelian Chen. 2019. How does self-esteem affect mobile phone addiction? The mediating role of social anxiety and interpersonal sensitivity. *Psychiatry Research* **271**, 526-531. [[Crossref](#)]
51. ## #. 2019. The Association between Attachment Type, Mobile Phone Dependence, and Social Support among College Students. *Advances in Psychology* **09:02**, 379-388. [[Crossref](#)]
52. Vinitaa Agarwala, Shikha Panwar. 2019. Enlighten the Effect of Smartphone Usage on Employee Engagement and Employee Performance in Higher Educational Institutions. *SSRN Electronic Journal* . [[Crossref](#)]
53. Bianca Fox. Loneliness and Social Media: A Qualitative Investigation of Young People's Motivations for Use, and Perceptions of Social Networking Sites 309-331. [[Crossref](#)]
54. Sanjana Mendu, Mehdi Boukhechba, Anna Baglione, Sonia Bae, Congyu Wu, Laura Barnes. SocialText: A Framework for Understanding the Relationship Between Digital Communication Patterns and Mental Health 428-433. [[Crossref](#)]
55. Shah Jahan Khattak, Bakhtair Khan. 2018. A Novel Study to Predict Trends and Policies for Mobile Communication in Multienvironment Regions. *Wireless Communications and Mobile Computing* **2018**, 1-11. [[Crossref](#)]
56. Lucas F. Carvalho, Catarina P. Sette, Bárbara Letícia Ferrari. 2018. Problematic smartphone use relationship with pathological personality traits: Systematic review and meta-analysis. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace* **12:3**. . [[Crossref](#)]
57. Sara Thomée. 2018. Mobile Phone Use and Mental Health. A Review of the Research That Takes a Psychological Perspective on Exposure. *International Journal of Environmental Research and Public Health* **15:12**, 2692. [[Crossref](#)]
58. Mehdi Boukhechba, Alexander R. Daros, Karl Fua, Philip I. Chow, Bethany A. Teachman, Laura E. Barnes. 2018. DemonicSalmon: Monitoring mental health and social interactions of college students using smartphones. *Smart Health* **9-10**, 192-203. [[Crossref](#)]
59. Sarah Tulane, J. Mitchell Vaterlaus, Troy E. Beckert. 2018. A mixed methods examination of adolescents' reasons for pretending to text. *Journal of Adolescence* **69:1**, 175-179. [[Crossref](#)]
60. Oscar Oviedo-Trespalacios, Md. Mazharul Haque, Mark King, Simon Washington. 2018. Should I Text or Call Here? A Situation-Based Analysis of Drivers' Perceived Likelihood of Engaging in Mobile Phone Multitasking. *Risk Analysis* **38:10**, 2144-2160. [[Crossref](#)]
61. Michael Chan. 2018. Mobile-mediated multimodal communications, relationship quality and subjective well-being: An analysis of smartphone use from a life course perspective. *Computers in Human Behavior* **87**, 254-262. [[Crossref](#)]
62. Daria J. Kuss, Eiman Kanjo, Mark Crook-Rumsey, Fraenze Kibowski, Grace Y. Wang, Alex Sumich. 2018. Problematic Mobile Phone Use and Addiction Across Generations: the Roles of Psychopathological Symptoms and Smartphone Use. *Journal of Technology in Behavioral Science* **3:3**, 141-149. [[Crossref](#)]
63. Zahra Vahedi, Alyssa Saiphoo. 2018. The association between smartphone use, stress, and anxiety: A meta-analytic review. *Stress and Health* **34:3**, 347-358. [[Crossref](#)]

64. Shogo Kato, Yuuki Kato, Yasuyuki Ozawa. 2018. Perceived Usefulness of Emoticons, Emojis, and Stickers in Text Messaging. *International Journal of Cyber Behavior, Psychology and Learning* 8:3, 9-23. [[Crossref](#)]
65. Andy V. Pham, Anisa N. Goforth, Natasha Segool, Silvana Newman. 2018. Challenges of Emerging Technology: Social Networking and Texting in Pediatric Neuropsychology Practice. *Journal of Pediatric Neuropsychology* 4:1-2, 16-26. [[Crossref](#)]
66. Tyler Hatchel, Sonya Negri, Kaveri Subrahmanyam. 2018. The relation between media multitasking, intensity of use, and well-being in a sample of ethnically diverse emerging adults. *Computers in Human Behavior* 81, 115-123. [[Crossref](#)]
67. Mehdi Boukhechba, Philip Chow, Karl Fua, Bethany Teachman, Laura Barnes. 2018. Predicting Social Anxiety from GPS Traces of College Students (Preprint). *JMIR Mental Health* . [[Crossref](#)]
68. Yu-Kang Lee, Chun-Tuan Chang, Zhao-Hong Cheng, You Lin. 2018. How Social Anxiety and Reduced Self-Efficacy Induce Smartphone Addiction in Materialistic People. *Social Science Computer Review* 36:1, 36-56. [[Crossref](#)]
69. Erin K Ruppel, Tricia J Burke, Maura R Cherney, Dana R Dinsmore. 2018. Social Compensation and Enhancement via Mediated Communication in the Transition to College. *Human Communication Research* 44:1, 58-79. [[Crossref](#)]
70. #. 2018. Middle School Students' Mobile Phone Dependence and Its Grade Differences. *Advances in Psychology* 08:06, 820. [[Crossref](#)]
71. Salvador Alvidrez, José Luis Rojas-Solís. 2017. Los amantes en la época del smartphone: aspectos comunicativos y psicológicos relativos al inicio y mantenimiento de la relación romántica. *Global Media Journal México* 14:27. . [[Crossref](#)]
72. Piper Liping Liu, Louis Leung. 2017. Migrant Parenting and Mobile Phone Use: Building Quality Relationships between Chinese Migrant Workers and their Left-behind Children. *Applied Research in Quality of Life* 12:4, 925-946. [[Crossref](#)]
73. Noa Aharony. 2017. Factors affecting LIS Israeli students' mobile phone use: an exploratory study. *The Electronic Library* 35:6, 1098-1121. [[Crossref](#)]
74. Torsten J. Gerpott, Sebastian May, Gokhan Nas. 2017. The impact of mobile Internet on mobile voice usage: A two-level analysis of mobile communications customers in a GCC country. *Information & Management* 54:7, 958-970. [[Crossref](#)]
75. Saba Khashe, Gale Lucas, Burcin Becerik-Gerber, Jonathan Gratch. 2017. Buildings with persona: Towards effective building-occupant communication. *Computers in Human Behavior* 75, 607-618. [[Crossref](#)]
76. Shu-Sha Angie Guan, Jessica J. Chiang, Lauren E. Sherman, Jessy Nguyen, Yuling Tsui, Theodore F. Robles. 2017. Culture moderates the effect of social support across communication contexts in young adult women in the United States. *Computers in Human Behavior* 75, 775-784. [[Crossref](#)]
77. Yuuki Kato, Shogo Kato, Yasuyuki Ozawa. 2017. Nobody Read or Reply Your Messages. *International Journal of Cyber Behavior, Psychology and Learning* 7:4, 1-11. [[Crossref](#)]
78. Sarah Myruski, Olga Gulyayeva, Samantha Birk, Koraly Pérez-Edgar, Kristin A. Buss, Tracy A. Dennis-Tiwary. 2017. Digital disruption? Maternal mobile device use is related to infant social-emotional functioning. *Developmental Science* 57, e12610. [[Crossref](#)]
79. Bradford L. Schroeder, Shannon K. T. Bailey, Daphne E. Whitmer, Valerie K. Sims. 2017. Measurement of Technology Behaviors: A Look at Texting Scales. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 61:1, 1208-1212. [[Crossref](#)]
80. Shu-Sha Angie Guan, Tom Anh Bui, Wan Ho. 2017. Considering Cultural Factors in Emerging Adult Use of Communication Technologies. *International Journal of Information Communication Technologies and Human Development* 9:3, 14-28. [[Crossref](#)]
81. José De-Sola, Hernán Talledo, Gabriel Rubio, Fernando Rodríguez de Fonseca. 2017. Development of a Mobile Phone Addiction Craving Scale and Its Validation in a Spanish Adult Population. *Frontiers in Psychiatry* 8. . [[Crossref](#)]
82. Dawn Y. Brinkley, Robert A. Ackerman, Samuel E. Ehrenreich, Marion K. Underwood. 2017. Sending and receiving text messages with sexual content: Relations with early sexual activity and borderline personality features in late adolescence. *Computers in Human Behavior* 70, 119-130. [[Crossref](#)]
83. ###. 2017. Interpersonal Rejection Sensitivity and Mobile Instant Messaging: Intensity, Usefulness, Stress, and Sex differences. *Ewha Journal of Social Sciences* 33:1, 263-296. [[Crossref](#)]
84. Kumi Ishii, Tyler S. Rife, Naomi Kagawa. 2017. Technology-driven gratifications sought through text-messaging among college students in the U.S. and Japan. *Computers in Human Behavior* 69, 396-404. [[Crossref](#)]
85. Krystelle Shaughnessy, Miranda Fudge, E. Sandra Byers. 2017. An exploration of prevalence, variety, and frequency data to quantify online sexual activity experience. *The Canadian Journal of Human Sexuality* 26:1, 60-75. [[Crossref](#)]
86. José De-Sola, Hernán Talledo, Gabriel Rubio, Fernando Rodríguez de Fonseca. 2017. Psychological Factors and Alcohol Use in Problematic Mobile Phone Use in the Spanish Population. *Frontiers in Psychiatry* 8. . [[Crossref](#)]

87. Shuman Tao, Xiaoyan Wu, Yukun Zhang, Shichen Zhang, Shilu Tong, Fangbiao Tao. 2017. Effects of Sleep Quality on the Association between Problematic Mobile Phone Use and Mental Health Symptoms in Chinese College Students. *International Journal of Environmental Research and Public Health* **14**:2, 185. [[Crossref](#)]
88. Trub Leora, Starks Tyrel J.. 2017. Texting Under the Influence: Emotional Regulation as a Moderator of the Association Between Binge Drinking and Drunk Texting. *Cyberpsychology, Behavior, and Social Networking* **20**:1, 3-9. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
89. Ji-Won Chun, Jihye Choi, Jin-Young Kim, Hyun Cho, Kook-Jin Ahn, Jong-Ho Nam, Jung-Seok Choi, Dai-Jin Kim. 2017. Altered brain activity and the effect of personality traits in excessive smartphone use during facial emotion processing. *Scientific Reports* **7**:1. . [[Crossref](#)]
90. Christabel Owens, Nigel Charles. 2016. Implementation of a text-messaging intervention for adolescents who self-harm (TeenTEXT): a feasibility study using normalisation process theory. *Child and Adolescent Psychiatry and Mental Health* **10**:1. . [[Crossref](#)]
91. Torsten J. Gerpott, Phil Meinert. 2016. Correlates of using the billing system of a mobile network operator to pay for digital goods and services. *Information Systems Frontiers* **18**:6, 1265-1283. [[Crossref](#)]
92. Xiabing Zheng, Matthew K.O. Lee. 2016. Excessive use of mobile social networking sites: Negative consequences on individuals. *Computers in Human Behavior* **65**, 65-76. [[Crossref](#)]
93. Leora Trub, Baptiste Barbot. 2016. The paradox of phone attachment: Development and validation of the Young Adult Attachment to Phone Scale (YAPS). *Computers in Human Behavior* **64**, 663-672. [[Crossref](#)]
94. Joshua R. Novak, Jonathan G. Sandberg, Aaron J. Jeffrey, Stephanie Young-Davis. 2016. The Impact of Texting on Perceptions of Face-to-Face Communication in Couples in Different Relationship Stages. *Journal of Couple & Relationship Therapy* **15**:4, 274-294. [[Crossref](#)]
95. Matthew Pittman, Brandon Reich. 2016. Social media and loneliness: Why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior* **62**, 155-167. [[Crossref](#)]
96. Namkee Park, Seungyoon Lee, Jae Eun Chung. 2016. Uses of cellphone texting: An integration of motivations, usage patterns, and psychological outcomes. *Computers in Human Behavior* **62**, 712-719. [[Crossref](#)]
97. Bradford L. Schroeder, Daphne E. Whitmer, Shannon K. T. Bailey, Valerie K. Sims. 2016. Individual Differences in Middle School and College Students' Texting. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* **60**:1, 1215-1219. [[Crossref](#)]
98. Asli Enez Darcin, Samet Kose, Cemal Onur Noyan, Serdar Nurmedov, Onat Yılmaz, Nesrin Dilbaz. 2016. Smartphone addiction and its relationship with social anxiety and loneliness. *Behaviour & Information Technology* **35**:7, 520-525. [[Crossref](#)]
99. A. Kordecka, C. ?ukaszuk, M. Kraszy?ski, B. Kraszy?ska, E. Krajewska-Ku?ak. 2016. Mobile phone owners' health behaviors. *Progress in Health Sciences* **6**:1, 0-0. [[Crossref](#)]
100. Matteo Migheli. 2016. The sibling effect on the consumption of phone services. *International Journal of Consumer Studies* **40**:3, 319-326. [[Crossref](#)]
101. Nam C. Nguyen, Ockie J. H. Bosch, Fung Yen Ong, Jin Shan Seah, Athena Succu, Thanh V. Nguyen, Kwamina E. Banson. 2016. A Systemic Approach to Understand Smartphone Usage in Singapore. *Systems Research and Behavioral Science* **33**:3, 360-380. [[Crossref](#)]
102. Tayana Panova, Alejandro Lleras. 2016. Avoidance or boredom: Negative mental health outcomes associated with use of Information and Communication Technologies depend on users' motivations. *Computers in Human Behavior* **58**, 249-258. [[Crossref](#)]
103. Catherine Coccia, Carol A. Darling. 2016. Having the Time of Their Life: College Student Stress, Dating and Satisfaction with Life. *Stress and Health* **32**:1, 28-35. [[Crossref](#)]
104. Torsten J. Gerpott, Phil Meinert. 2016. The impact of mobile Internet usage on mobile voice calling behavior: A two-level analysis of residential mobile communications customers in Germany. *Telecommunications Policy* **40**:1, 62-76. [[Crossref](#)]
105. Yusong Gao, Ang Li, Tingshao Zhu, Xiaoqian Liu, Xingyun Liu. 2016. How smartphone usage correlates with social anxiety and loneliness. *PeerJ* **4**, e2197. [[Crossref](#)]
106. V. K. Kool, Rita Agrawal. Behavior in the Virtual Environment 187-251. [[Crossref](#)]
107. Torsten J. Gerpott. SMS Use Intensity Changes in the Age of Ubiquitous Mobile Internet Access 1473-1489. [[Crossref](#)]
108. Kuo-Lun Hsiao, Chun-Hsiung Lee, Hsiu-Sen Chiang, Ju-Yun Wang. Exploring the Antecedents of Technostress and Compulsive Mobile Application Usage: Personality Perspectives 320-328. [[Crossref](#)]



109. Leah M. Omilion-Hodges, Katie L. McClain. 2016. University use of social media and the crisis lifecycle: Organizational messages, first information responders' reactions, reframed messages and dissemination patterns. *Computers in Human Behavior* **54**, 630-638. [[Crossref](#)]
110. Brenda L. Lundy, Michelle Drouin. 2016. From social anxiety to interpersonal connectedness: Relationship building within face-to-face, phone and instant messaging mediums. *Computers in Human Behavior* **54**, 271-277. [[Crossref](#)]
111. Christian Montag, Christopher Kannen, Bernd Lachmann, Rayna Sariyska, Éilish Duke, Martin Reuter, Alexander Markowetz. 2015. The importance of analogue zeitgebers to reduce digital addictive tendencies in the 21st century. *Addictive Behaviors Reports* **2**, 23-27. [[Crossref](#)]
112. David Anstiss, Amber Davies. 2015. 'Reach Out, Rise Up': The efficacy of text messaging in an intervention package for anxiety and depression severity in young people. *Children and Youth Services Review* **58**, 99-103. [[Crossref](#)]
113. Torsten J. Gerpott. 2015. SMS use intensity changes in the age of ubiquitous mobile Internet access – A two-level investigation of residential mobile communications customers in Germany. *Telematics and Informatics* **32**:4, 809-822. [[Crossref](#)]
114. Peter Le, Jaejin Hwang, Sarah Grawe, Jing Li, Alison Snyder, Christina Lee, William S. Marras. 2015. Biomechanical patterns of text-message distraction. *Ergonomics* **58**:10, 1690-1700. [[Crossref](#)]
115. Lucia F. O'Sullivan. 2015. High texting rates mediate oral sex and intercourse experience in a longitudinal study of high school students. *Computers in Human Behavior* **49**, 526-531. [[Crossref](#)]
116. Torsten J. Gerpott. 2015. Who (Dis)Continues to use SMS in the Age of Ubiquitous Mobile Internet Access?. *International Journal of E-Business Research* **11**:3, 31-53. [[Crossref](#)]
117. James A. Roberts, Chris Pullig, Chris Manolis. 2015. I need my smartphone: A hierarchical model of personality and cell-phone addiction. *Personality and Individual Differences* **79**, 13-19. [[Crossref](#)]
118. Marissa A. Harrison, Christine E. Bealing, Jessica M. Salley. 2015. 2 TXT or not 2 TXT: College students' reports of when text messaging is social breach. *The Social Science Journal* **52**:2, 188-194. [[Crossref](#)]
119. Bethany L. Blair, Anne C. Fletcher, Erin R. Gaskin. 2015. Cell Phone Decision Making. *Youth & Society* **47**:3, 395-411. [[Crossref](#)]
120. Jonathan G. Shalom, Hagggar Israeli, Omer Markovitzky, Joshua D. Lipsitz. 2015. Social anxiety and physiological arousal during computer mediated vs. face to face communication. *Computers in Human Behavior* **44**, 202-208. [[Crossref](#)]
121. Marion K. Underwood, Samuel E. Ehrenreich, David More, Jerome S. Solis, Dawn Y. Brinkley. 2015. The BlackBerry Project: The Hidden World of Adolescents' Text Messaging and Relations With Internalizing Symptoms. *Journal of Research on Adolescence* **25**:1, 101-117. [[Crossref](#)]
122. Milena Foerster, Katharina Roser, Anna Schoeni, Martin Rösli. 2015. Problematic mobile phone use in adolescents: derivation of a short scale MPPUS-10. *International Journal of Public Health* **60**:2, 277-286. [[Crossref](#)]
123. Erin K. Ruppel, Tricia J. Burke. 2015. Complementary Channel Use and the Role of Social Competence. *Journal of Computer-Mediated Communication* **20**:1, 37-51. [[Crossref](#)]
124. Kaung-Hwa Chen, Kuo-Jung Hsieh, Feng-Hsiang Chang, Nai-Chia Chen. 2015. The Customer Citizenship Behaviors of Food Blog Users. *Sustainability* **7**:9, 12502. [[Crossref](#)]
125. Samuel E. Ehrenreich, Joanna K. Gentsch, Lisa H. Rosen, Marion K. Underwood. Text Messaging as a Forum for Negative and Antisocial Communication 1003-1010. [[Crossref](#)]
126. J. Mitchell Vaterlaus, Randall M. Jones. Adolescent Text Messaging 1399-1408. [[Crossref](#)]
127. Theodosia Prodromou, Maria Meletiou-Mavrotheris, Andreas O. Kyriakides. Students' Kinaesthetic Interactions with a Touch-Enabled Virtual Mapping Tool 1-23. [[Crossref](#)]
128. Michael Chan. 2015. Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being. *New Media & Society* **17**:1, 96-113. [[Crossref](#)]
129. Suyinn Lee, Cai Lian Tam, Qiu Ting Chie. 2014. Mobile Phone Usage Preferences: The Contributing Factors of Personality, Social Anxiety and Loneliness. *Social Indicators Research* **118**:3, 1205-1228. [[Crossref](#)]
130. Nancy A. Cheever, Larry D. Rosen, L. Mark Carrier, Amber Chavez. 2014. Out of sight is not out of mind: The impact of restricting wireless mobile device use on anxiety levels among low, moderate and high users. *Computers in Human Behavior* **37**, 290-297. [[Crossref](#)]
131. Chang Sup Park, Kavita Karan. 2014. Unraveling the relationships between smartphone use, exposure to heterogeneity, political efficacy, and political participation: a mediation model approach. *Asian Journal of Communication* **24**:4, 370-389. [[Crossref](#)]



132. Afolayan Oluyinka Titilope. 2014. Socio-Psychological Dimensions of Mobile Phone Addiction and Usage Patterns amongst Teenagers in Higher Institutions of Learning in Kwara State. *International Journal of Information and Communication Technology Education* 10:2, 1-13. [[Crossref](#)]
133. Abdullah J. Sultan. 2014. Addiction to mobile text messaging applications is nothing to “lol” about. *The Social Science Journal* 51:1, 57-69. [[Crossref](#)]
134. Jennifer M. Crosswhite, Denise Rice, Sylvia M. Asay. 2014. Texting among United States young adults: An exploratory study on texting and its use within families. *The Social Science Journal* 51:1, 70-78. [[Crossref](#)]
135. E. Bun Lee. 2014. Facebook Use and Texting Among African American and Hispanic Teenagers. *Journal of Black Studies* 45:2, 83-101. [[Crossref](#)]
136. Deborah Kirby Forgays, Ira Hyman, Jessie Schreiber. 2014. Texting everywhere for everything: Gender and age differences in cell phone etiquette and use. *Computers in Human Behavior* 31, 314-321. [[Crossref](#)]
137. Yu-Kang Lee, Chun-Tuan Chang, You Lin, Zhao-Hong Cheng. 2014. The dark side of smartphone usage: Psychological traits, compulsive behavior and technostress. *Computers in Human Behavior* 31, 373-383. [[Crossref](#)]
138. Benjamin R. Garner. 2014. iPod use and the perception of social introversion. *Leisure Studies* 33:1, 22-31. [[Crossref](#)]
139. Eric D. Wesselmann, Kipling D. Williams, Dongning Ren, Andrew H. Hales. Ostracism and Solitude 224-241. [[Crossref](#)]
140. Katya C. Fernandez, Matthew R. Johnson, Thomas L. Rodebaugh. 2013. TeleMA: a low-cost and user-friendly telephone assessment platform. *Behavior Research Methods* 45:4, 1279-1291. [[Crossref](#)]
141. Thomas Holtgraves, Korey Paul. 2013. Texting versus talking: An exploration in telecommunication language. *Telematics and Informatics* 30:4, 289-295. [[Crossref](#)]
142. Çetin Tan, Mustafa Pamuk, Ayşenur Dönder. 2013. Loneliness and Mobile Phone. *Procedia - Social and Behavioral Sciences* 103, 606-611. [[Crossref](#)]
143. Bora Jin, Namkee Park. 2013. Mobile voice communication and loneliness: Cell phone use and the social skills deficit hypothesis. *New Media & Society* 15:7, 1094-1111. [[Crossref](#)]
144. Deborah Gordon-Messer, Jose Arturo Bauermeister, Alison Grodzinski, Marc Zimmerman. 2013. Sexting Among Young Adults. *Journal of Adolescent Health* 52:3, 301-306. [[Crossref](#)]
145. Mark W. Becker, Reem Alzahabi, Christopher J. Hopwood. 2013. Media Multitasking Is Associated with Symptoms of Depression and Social Anxiety. *Cyberpsychology, Behavior, and Social Networking* 16:2, 132-135. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
146. Xavier Carbonell, Ursula Oberst, Marta Beranuy. The Cell Phone in the Twenty-First Century 901-909. [[Crossref](#)]
147. Matthew P. Kassner, Eric D. Wesselmann, Alvin Ty Law, Kipling D. Williams. 2012. Virtually Ostracized: Studying Ostracism in Immersive Virtual Environments. *Cyberpsychology, Behavior, and Social Networking* 15:8, 399-403. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
148. Williams E. Nwagwu. 2012. Short messaging services and educational information sharing by students in Nigerian universities. *World Journal of Science, Technology and Sustainable Development* 9:3, 235-253. [[Crossref](#)]
149. Svein Bergvik, Rolf Wynn. 2012. The use of short message service (SMS) among hospitalized coronary patients. *General Hospital Psychiatry* 34:4, 390-397. [[Crossref](#)]
150. Dorothy Skierkowski, Rebecca M. Wood. 2012. To text or not to text? The importance of text messaging among college-aged youth. *Computers in Human Behavior* 28:2, 744-756. [[Crossref](#)]
151. Eric D. Wesselmann, Kipling D. Williams. Ostracism in cyberspace 127-144. [[Crossref](#)]
152. Christabel Owens, Paul Farrand, Ruth Darvill, Tobit Emmens, Elaine Hewis, Peter Aitken. 2011. Involving service users in intervention design: a participatory approach to developing a text-messaging intervention to reduce repetition of self-harm. *Health Expectations* 14:3, 285-295. [[Crossref](#)]
153. Xi Lu, Junko Watanabe, Qingbo Liu, Masayo Uji, Masahiro Shono, Toshinori Kitamura. 2011. Internet and mobile phone text-messaging dependency: Factor structure and correlation with dysphoric mood among Japanese adults. *Computers in Human Behavior* 27:5, 1702-1709. [[Crossref](#)]
154. Theodore S. Smith, Matthew I. Isaak, Christian G. Senette, Brenton G. Abadie. 2011. Effects of Cell-Phone and Text-Message Distractions on True and False Recognition. *Cyberpsychology, Behavior, and Social Networking* 14:6, 351-358. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
155. Dieter Rhode. 2011. Personal(ized) Health Monitoring, Personalization, and Personality. *Journal of Technology in Human Services* 29:2, 83-100. [[Crossref](#)]

156. Thomas Holtgraves. 2011. Text messaging, personality, and the social context. *Journal of Research in Personality* 45:1, 92-99. [[Crossref](#)]
157. Amy L. Gentzler, Ann M. Oberhauser, David Westerman, Danielle K. Nadorff. 2011. College Students' Use of Electronic Communication with Parents: Links to Loneliness, Attachment, and Relationship Quality. *Cyberpsychology, Behavior, and Social Networking* 14:1-2, 71-74. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
158. Linda A. Jackson, Alexander von Eye, Hiram E. Fitzgerald, Edward A. Witt, Yong Zhao. 2011. Internet use, videogame playing and cell phone use as predictors of children's body mass index (BMI), body weight, academic performance, and social and overall self-esteem. *Computers in Human Behavior* 27:1, 599-604. [[Crossref](#)]
159. Bong-Won Park, Kun Chang Lee. The Effect of Users' Characteristics and Experiential Factors on the Compulsive Usage of the Smartphone 438-446. [[Crossref](#)]
160. Bora Jin, Namkee Park. 2010. In-Person Contact Begets Calling and Texting: Interpersonal Motives for Cell Phone Use, Face-to-Face Interaction, and Loneliness. *Cyberpsychology, Behavior, and Social Networking* 13:6, 611-618. [[Abstract](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)]
161. C. Albert Bardi, Michael F. Brady. 2010. Why shy people use instant messaging: Loneliness and other motives. *Computers in Human Behavior* 26:6, 1722-1726. [[Crossref](#)]
162. Linda Jackson, Edward A. Witt, Alex von Eye, Hiram E. Fitzgerald, Yong Zhao. Children's Information Technology (IT) Use and Their Physical, Cognitive, Social and Psychological Well-Being 198-203. [[Crossref](#)]
163. 2010. Les sextos : Assurer la sécurité et la responsabilité des adolescents dans un monde adepte de technologie. *Paediatrics & Child Health* 15:1, 43-45. [[Crossref](#)]
164. DK Katzman. 2010. Sexting: Keeping teens safe and responsible in a technologically savvy world. *Paediatrics & Child Health* 15:1, 41-42. [[Crossref](#)]
165. Ruth Rettie. 2009. SMS: EXPLOITING THE INTERACTIONAL CHARACTERISTICS OF NEAR-SYNCHRONY. *Information, Communication & Society* 12:8, 1131-1148. [[Crossref](#)]
166. Motoharu Takao, Susumu Takahashi, Masayoshi Kitamura. 2009. Addictive Personality and Problematic Mobile Phone Use. *CyberPsychology & Behavior* 12:5, 501-507. [[Abstract](#)] [[PDF](#)] [[PDF Plus](#)]
167. Mercedes Sánchez-Martínez, Angel Otero. 2009. Factors Associated with Cell Phone Use in Adolescents in the Community of Madrid (Spain). *CyberPsychology & Behavior* 12:2, 131-137. [[Abstract](#)] [[PDF](#)] [[PDF Plus](#)]
168. Ray Jones, Maged N. Kamel Boulos, Inocencio Maramba, Heather Skirton, Jennifer Freeman. Patient Preferences for Online Person-Person Support 52-74. [[Crossref](#)]
169. Beverly Plester, Clare Wood, Victoria Bell. 2008. Txt msg n school literacy: does texting and knowledge of text abbreviations adversely affect children's literacy attainment?. *Literacy* 42:3, 137-144. [[Crossref](#)]
170. Theodosia Prodromou, Maria Meletiou-Mavrotheris, Andreas O. Kyriakides. Students' Kinaesthetic Interactions with a Touch-Enabled Virtual Mapping Tool 1701-1722. [[Crossref](#)]