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# Psychosocial Outcomes Associated with Engagement with Online Chat Systems

Linda K. Kaye[a] and Sally Quinn[b]

[a]Department of Psychology, Edge Hill University, Ormskirk, Lancashire, UK; [b]Department of Psychology, University of York, York, UK

**ABSTRACT**

The psychosocial outcomes associated with online communication is hotly debated. We explored how WhatsApp engagement related to a number of psychosocial outcomes, and how key social factors were relevant here. WhatsApp users ($N$ = 200) completed an online questionnaire measuring WhatsApp use and motivations, online bonding, quality of relationships, group identity, and psychosocial outcomes. Findings showed that including mediator variables of online bonding, group identity and quality of relationships was important for understanding the relationship between WhatsApp use and well-being. Specifically, online bonding mediated the relationship between WhatsApp use and social competence, and self-esteem. Group identity had an effect on all outcomes except psychological well-being. Conversely, although minutes per day using WhatsApp was positively related to quality of relationships, this in turn, was not significantly related to any of the outcome variables. This highlights the pertinence of accounting for key mediators underpinning the link between technology use and well-being.

## 1. Introduction

The prevalence of online social interaction systems, such as WhatsApp, Snapchat and other messaging services often embedded within social networking sites (SNSs), presents many key opportunities for users to socialize with others (Ellison, Steinfield, & Lampe, 2007). These are largely text-based in nature, and often offer opportunities for the sharing of other media content, such as photos and videos. Indeed, these are highly useful tools for enabling social interactions between dyads or even groups of individuals, and provide a basis through which friendships may be maintained (Subrahmanyam, Reich, Waechter, & Espinoza, 2008). Of specific interest is the extent to which engagement in using online communication systems may relate to a number of theoretically relevant psychosocial outcomes (psychological well-being, self-esteem, social competence, and loneliness). Within this line of enquiry, it is also worth exploring the associated affordances these systems may proffer upon the aforementioned psychosocial outcomes. That is, regardless of how much or why individuals use such systems, if they do not provide meaningful social affordances, theoretically, we would not necessarily expect them to hold psychological benefits. Therefore, the current study also aimed to establish the relevance of key variables (online bonding capital, group identity, quality of relationships) and their relationships with these psychological outcomes. This was to form a better understanding of the conditions through which online chat engagement may promote aspects of well-being. From a theoretical perspective, this aims to contribute to the "stimulation hypothesis", suggesting how Internet-enabled activities may enrich social interactions and thus have positive impacts on well-being (Valkenburg & Peter, 2007, 2009b). It is worth noting here that for the purpose of the current study, there is a focus exclusively on "WhatsApp" as the online chat system of interest to restrict the likelihood of encountering any confounding factors relating to differences across online chat systems (e.g., functionality, types of media-sharing capabilities). WhatsApp is a text-based messaging app service which users can download onto their Smartphones. Whereas SMS (short message service) is adequate in allowing users to send and receive text messages, WhatsApp facilitates this as well as group chat functions. Additionally, it better supports multimedia functionality and therefore is often experienced more favorably by users, and has also been found to be related to users' perceptions of social support (Chan, 2018a). A review of the relevant literature in this area is presented in the following section.

## 2. Literature review

There is much debate about the extent to which online platforms may facilitate social interactions (Lee, 2009) and, in turn, be related to aspects of well-being (Valkenburg & Peter, 2009a). This debate comprises under two main competing hypotheses; the displacement hypothesis and the stimulation hypothesis. That is, the displacement hypothesis suggests that the Internet takes time away from more meaningful, quality "real world" interactions (Nie, Hillygus, & Erbring, 2002), and thus promotes negative psychological outcomes such as depression and loneliness (Kraut et al., 1998; van Den Eijnden, Meerkerk, Vermulst, Spijkerman, & Engels, 2008). However, the stimulation hypothesis instead posits that the Internet may enrich experiences with

**CONTACT** Linda K. Kaye Linda.Kaye@edgehill.ac.uk Department of Psychology, Edge Hill University, Ormskirk, Lancashire, UK.
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existing friends (Bryant, Sanders-Jackson, & Smallwood, 2006; Subrahmanyam et al., 2008), to promote these relationships and thus have a positive impact on well-being (Valkenburg & Peter, 2007, 2009b).

Since "Internet use" can be multidimensional, debates in this area have moved on from this to consider how certain types of internet use, such as "social internet use" may relate to aspects of psychosocial well-being (Nowland, Necka, & Cacioppo, 2018). In relation to loneliness specifically, a recent review suggests that when the internet is used to enhance existing relationships and develop new ones, this can be useful for reducing loneliness (Nowland et al., 2018). However, if it is simply an escapism from the social world, loneliness may be increased (ibid). Additionally, in respect of active versus passive use of Facebook, it has been found that larger network sizes on this site are related to lower feelings of loneliness (Brown, Roberts, & Pollet, 2018). Recent research has gone further from understanding active versus passive use, and instead utilized latent profile analysis to identify four profiles of internet behavior: non-active internet user, active social media user, all-round active internet user and moderately active internet user (Ma, 2018). Indeed, this has revealed that type of profile has differential impacts on psychosocial outcomes such as depression and loneliness. Specifically, those with a profile of being an all-round active internet user, are more likely to be depressed, although with higher perceived social support (Ma, 2018). In addition, other research has highlighted that for instant messaging (IM), different types of social exchanges impact differentially upon well-being (Tsai et al., 2019). For example, insensitive IM messages have been found to be positively related to loneliness, depression and other aspects of well-being (ibid). However, other research has revealed that multimodal connectedness such as via digital communication, is positively related to psychological well-being, particularly through how this may accentuate positive feelings (Chan, 2018b). Therefore, understanding the network connections, social activities and affordances of internet use are key to fully understand how this relates to different aspects of psychosocial well-being.

As well as understanding the types of internet use, the quality of relationship with existing friends is a pivotal factor and thus, would appear to hold a key function for the extent to which online interactions are related to different psychological outcomes (Valkenburg & Peter, 2009b). Indeed, quality of friendships has previously been found to be influential in respect of well-being (Hartup & Stevens, 1997), and this is being considered as a key factor in the current study. Specifically, this is operationalized by exploring three key facets of quality of relationships: conflict, depth, and support garnered through relationships (Pierce, Sarason, & Sarason, 1991). Specifically, "conflict" refers to the extent to which a given relationship includes interpersonal disharmony which is considered to be important in individual's experiences of loneliness and personal adjustment (Pagel, Erdly, & Becker, 1987; Rook, 1984). "Depth" refers to one's perceptions of commitment and security in a relationship (Pierce et al., 1991). Finally, "Support" simply refers to one's perceptions of availability of support from a relationship (ibid). It may be expected, therefore, that if WhatsApp facilitates communications between individuals who have deeper, more supportive and less conflicted relationships, this will be related to positive well-being.

Alongside this, online social capital (i.e., social resources obtained through online experiences) is also conceivably important here (Bessiere, Kiesler, Kraut, & Boneva, 2008; Chan, 2018b), particularly if individuals experience feelings of connectedness with others (Collins & Freeman, 2013; Williams, 2006) and online engagements substantiate "real world" social relationships (Valkenburg & Peter, 2007, 2009b). Specifically, in line with the notion that online chat systems such as WhatsApp may stimulate these forms of social relations, social capital focuses on two similar, yet unrelated components of "bridging" and "bonding". Whilst "bridging" capital refers to those weaker ties, for example, with those whom may offer new experiences or perspectives, "bonding" capital refers to those strong and emotional ties with close friends or family (Putnam, 2000). It is the latter of these which will be the focus of the current research, given that WhatsApp engagement would tend to be between those who have existing "real world" friendships rather than with "online-only" others (Valkenburg & Peter, 2009b). The accumulation of social capital has been found to be associated with a range of positive outcomes including increased life satisfaction (Putnam, 2000), enhanced self-esteem, and general physical and psychological well-being (Helliwell, 2006; Helliwell & Putnam, 2004). Specifically for online chat, research has also found engagement in instant messaging to have a long-term impact upon the quality of friendships with chat partners (Valkenburg & Peter, 2009b). The relevance of social capital among chat users may be the potential from which engagement may foster "bonding" opportunities and thus promote favorable psychosocial outcomes (Bargh & McKenna, 2004; Chan, 2018b; Ellison et al., 2007; Helliwell & Putnam, 2004).

However, as well as bonding capital, it is also important to acknowledge the extent to which an individual feels a sense of group affiliation to his/her communication partners in WhatsApp. That is, a greater sense of belonging to others within a given group is likely to promote more positive well-being outcomes relative to lower affiliation. With this in mind, the current research draws on the principles of social identity theory (Tajfel, 1978, 1979; Tajfel & Turner, 1979) as a conceptual basis through which to explore its role. That is, social identity as a construct in defining one's self-concept in respect of one's belonging to a certain social group (Tajfel & Turner, 1979), would posit that enhanced group identification should be positively related to one's sense of self-esteem and psychological well-being (Crocker, Luhtanen, Blaine, & Broadnax, 1994). Indeed, previous research has identified that group identity derived through online groups is positively related to outcomes such as self-esteem, social competence and negatively related to loneliness (Kaye, Kowert, & Quinn, 2017). Thus, a sense of group identity which may be derived through social engagement in online chat social interactions may therefore also be related to these specific outcomes.

The way in which online chat systems can afford interpersonal interactions means they are often suited to providing social support and this, in turn, may promote a range of

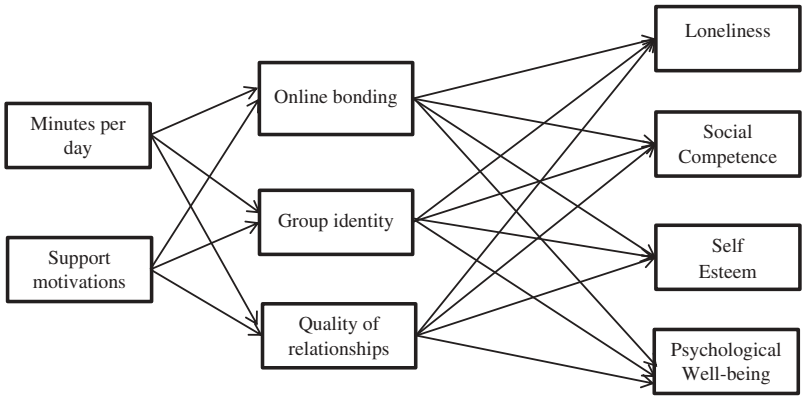



**Figure 1.** Hypothesized model showing online bonding, group identity, and quality of relationships as mediators between WhatsApp use (minutes per day and support motivations) and psychosocial outcomes.

positive psychosocial impacts. That is, the benefits of social support are well documented (Cohen & Willis, 1985; Langford, Bowsher, Maloney, & Lilllis, 1997). Specifically, social support is said to consist four distinct components; emotional, informational, instrumental and appraisal (Langford et al., 1997) and therefore different social networks may be better suited to encouraging certain types of social support over others, which may have differential impacts on psychosocial outcomes (Cohen & Willis, 1985). In respect of WhatsApp and indeed other online chat systems, it is not fully understood on the extent to which users may be motivated to use these systems as a form of social support, and how the various components of support may contribute to aspects of well-being. Research has initially established that children and adolescents are motivated to use the Internet for mood management and social compensation when experiencing stressful life events, and that high social support diminishes the negative impacts of this stress (Leung, 2007). However, less is understood about how each of the various forms of support motivations may be relevant here, particularly for specific forms of Internet-enabled communication, and whether this applies to an adult sample. Although much research exists on online social support and how this corresponds with various outcomes, this tends to focus around specific communities or user-groups, such as those with particular health concerns (Coulson, 2005; Coulson, Buchanan, & Aubeeluck, 2007; Wright, 2002). Establishing the more generic social support motivations garnered through WhatsApp for non-specified communities and how these impact upon well-being presents a pertinent area of enquiry. The platform of WhatsApp specifically was selected because it is conceivably a platform which is used to supplement existing friendships rather than a setting whereby online-only friends interact. As such, this provides a lens through which to explore how existing friendships may be enriched (or otherwise) through this system. This can provide some specificity to debates surrounding displacement versus stimulation hypotheses, whereby there is a more exclusive focus on this platform as a supplementary mechanism for existing friends to interact rather than conflating various types of platforms under an umbrella term of "internet or online communication" (which arguably afford a variety of mechanisms for different types of "friends" to connect and interact). The specific contribution here can be to identify how social support motivations may drive online engagement with existing friends, and importantly how this stimulates social affordances which can be supported through this platform. As such, it draws together the literature on (online) social support as well as the literature on the stimulation hypothesis, whereby additional insight into the motivations for engagement (not just engagement per se) is accounted for in these debates.

In summary, based on the existing literature, the current research aimed to assess the how WhatsApp engagement, operationalized by reported usage (minutes per day and support motivations) was related to a number of key psychosocial outcomes (loneliness, self-esteem, social competence, and psychological well-being), through the mediators online bonding, group identity and quality of relationships with WhatsApp partners (see Figure 1 for hypothesised model). As such, the hypotheses were:

H1. Support motivations and minutes per day will be positively related to the mediators online bonding, group identity and quality of relationships

H2. Online bonding, group identity and quality of relationships will each be positively related to the outcome variables social competence, self-esteem and psychological wellbeing, and will each be negatively related to the outcome variable loneliness.

## 3. Method

### 3.1. Design/procedure

An online questionnaire built in SurveyGizmo was advertised to WhatsApp users via a number of social media channels (e.g., Twitter) and via a university participation scheme. No specific-targeted users or groups were approached but inclusion criteria stipulated that participants should be "WhatsApp users". The questionnaire contained established measures of group identity (Doosje, Ellmers, & Spears, 1995), online social

capital (Bonding Sub-scale of Social Capital Scale: Williams, 2006), quality of relationships (Quality of Relationships Inventory: Pierce et al., 1991), self-esteem (Self Esteem Scale: Rosenberg, 1965), loneliness (UCLA loneliness scale: Russell, Peplau, & Ferguson, 1978), social competence (CPI:SY sub-scale of the IPIP Scale: Gough & Bradley, 1996), and psychological well-being (Short Version of Oxford Happiness Questionnaire: Hill & Argyle, 2002). Additionally, questions on participants' demographics, online chat habits and motivations were obtained (e.g., type of chat used, frequency of usage, support motivations for use). Specifically for online chat motivation, this was measured in respect of the extent to which users engaged for social support, characterized through four dimensions of emotional, instrumental, informational and appraisal motivations (developed based on Langford et al., 1997). Ethical assurances were adhered to at all times in line with the British Psychological Society's (BPS) Code of Ethics and Conduct (BPS, 2009), Code of Human Research Ethics (BPS, 2014), as well as their Ethical Guidelines for Internet-mediated Research (BPS, 2017).

## 3.2. Participants

The sample ($N$ = 200) consisted 41 males and 158 females, with an average age of 23.55 (SD = 14.24). Among the sample, the average daily usage of WhatsApp was reported as 55.07 min/day (SD = 75.11), and the majority reported they used this "most of the time" (33.0%), with the remainder reporting they used it "regularly" (30.5%), "occasionally" (30.0%) or "very rarely" (6.00%). When asked to identify the different reasons they used WhatsApp, 76.5% of the sample indicated it was because "my friends use it", 72% because of its functionality for group chat (rather than for one-to-one chat), 30% because of its media-sharing capabilities, 72% because it was good value for money, and 52.5% because it is "fairly synchronous".

## 3.3. Materials

### 3.3.1. Online chat engagement

Two key indicators were obtained in respect of online chat engagement: minutes per day spent communicating to friends on WhatsApp and motivations for using WhatsApp. Specifically, the latter-measured motivations for social support, characterized through the four dimensions identified by Langford et al. (1997). These are: emotional ("I use WhatsApp as a way of obtaining emotional support from my friends"), instrumental ("I use WhatsApp to access or obtain tangible services, goods or assistance"), informational ("I use WhatsApp to gain practical information or knowledge to help me maintain control and/or reduce my uncertainty in my life"), and appraisal motivations ("I use WhatsApp obtain information which is useful for helping me understand myself in my current life"). Participants were asked to indicate how important each of these four statements were on a 5-point scale (1 = not at all important, 5 = extremely important).

### 3.3.2. Group identity

The Group Identification Scale (Doosje et al., 1995) was used to assess participants' strength of identification with their friendship groups on WhatsApp. Participants were asked to endorse their agreement with a series of four statements on a 7-point scale (1 = strongly disagree, 7 = strongly agree) from which a mean score was calculated. Items included: "I identify with my friends". This measure has been found to be adequately reliable in previous studies (Kowert & Oldmeadow, 2015), as well as the current study (α = .93), indicating its suitability for the current study.

### 3.3.3. Online bonding capital

To garner participants' reports of online bonding capital through WhatsApp, the Bonding sub-scale of the Internet Social Capital Scale was used (ISCS: Williams, 2006). Although the full 40-item version includes two sub-scales of bridging capital and bonding capital, only the latter of these was used. More specifically, this was obtained in respect of online bonding only (the full version also includes offline bonding and bridging sub-scales). Examples of the 10 items include: "There is someone through WhatsApp I can turn to for advice about making very important decisions". Items were rated on a 5-point scale (1 = not characteristic of me, 5 = extremely characteristic of me), from which a total score was calculated. Reliability analysis revealed this scale to be adequately reliable (α = .84).

### 3.3.4. Quality of relationships

The Quality of Relationships Inventory (QRI: Pierce et al., 1991) was used to gain reports of the quality of relationship participants had with those in their WhatsApp friendship group. Participants were firstly asked: "Can you identify one WhatsApp friend?" from which 91.5% of the sample reported "Yes". Those who reported "No" did not complete the QRI and instead moved onto the next part of the questionnaire. The QRI included the three sub-scales of support, conflict and depth, in which participants rated the extent of their agreement on a 4-point scale (1 = not at all, 4 = very much) to the 25 statements, from which mean scores were calculated. Items include: "How significant is this relationship in your life?" (depth), "To what extent could you turn to this person for advice about problems?" (support), and "How often do you need to work hard to avoid conflict with this person?" (conflict). Previous evidence highlights this measure to be adequately reliable, with sub-scale alpha coefficients ranging from .83 to .91 (Pierce et al., 1991). Similarly, the current study found acceptable internal consistency for the individual sub-scales. Namely, .85 for "Support", .82 for "Conflict" and .86 for "Depth".

### 3.3.5. Self-esteem

The Self Esteem Scale (Rosenberg, 1965) was used to measure participants' self-esteem. Participants were asked to endorse their agreement with 10 statements on a 4-point scale (1 = strongly disagree, 4 = strongly agree), from which a total score was obtained. Items include: "I take a positive attitude towards myself". This measure was been found to be suitable

(Fleming & Courtney, 1984; Hagborg, 2006), consistent with the internal consistency analysis of the current study, revealing an alpha coefficient of .91.

#### 3.3.6. Loneliness

The UCLA loneliness scale (Russell et al., 1978) was used to assess loneliness in which participants rated two statements: "I feel alone most of the time" and "I often feel let down". A 5-point scale was used (1 = not characteristic of me, 5 = extremely characteristic of me), and a total score was obtained. Previous research has demonstrated this to be adequately reliable (Kowert, Vogelgesang, Festl, & Quandt, 2015), which was supported by the current study (α = .81).

#### 3.3.7. Social competence

To garner participants' reports of their social competence, the CPI:SY subscale of the International Personality Item Pool Scale was used (Gough & Bradley, 1996). This asked participants to rate the two items: "I get on very well with others" and "I can handle social situations very well". These were rated on a 5-point scale (1 = not characteristic of me, 5 = extremely characteristic of me), and a total score was obtained. This has been previously found to be a reliable measure, supported by the current study's analysis (α = .82).

#### 3.3.8. Psychological well-being

The Short Form of the Oxford Happiness Questionnaire (Hill & Argyle, 2002) was used as a measure of psychological well-being. This consists one global statement ("I am well satisfied about everything in my life") which participants rate on a 6-point scale (1 = strongly disagree, 6 = strongly agree).

## 4. Analytic strategy

Firstly, descriptive analysis was conducted to establish the means and standard deviations of the study variables. This was followed by correlation analysis (Pearson correlation), to ascertain the level of association between variables which would be entered subsequently into the hypothesized model. Next, Path Analysis was undertaken in which WhatsApp use (mins per day) and Support Motivations were entered as exogenous variables. The four psychosocial outcomes; loneliness, social competence, self-esteem, and psychological well-being were entered as endogenous variables. Finally, variables of online bonding, group identity and quality of relationships were entered as mediators into the model.

**Table 1.** Descriptive analysis of all variables in the model.

| Observed Variables | *M* | *SD* |
|---|---|---|
| Mins per day on WhatsApp (before transformation) | 55.07 | 74.92 |
| Support motivations (before transformation) | 2.03 | 0.85 |
| Online Bonding | 36.19 | 7.27 |
| Group identity | 6.03 | 1.18 |
| Quality of relationships | 2.64 | 0.49 |
| Loneliness | 4.80 | 2.32 |
| Social Competence | 7.29 | 1.99 |
| Self-esteem | 27.19 | 5.82 |
| Psychological Well-being | 4.08 | 0.99 |

## 5. Results

Some participants did not complete all items for every measure and so for those with missing data, their data were imputed with their predicted values based on linear trends for each datapoint. Additionally, the variables 'Minutes per day' and 'Support Motivations' were positively skewed and so before any analyses, the variables were transformed using a log transformation.

Descriptive analysis was conducted for all variables in the hypothesized model (see Table 1). Mean scores for group identity were relatively high ($M$ = 6.03, $SD$ = 1.18), suggesting participants experienced close affiliation to their WhatsApp friends. Loneliness (mean score based on total score of two items) was relatively low ($M$ = 4.80, $SD$ = 2.32), suggesting loneliness was not especially prominent in the current sample.

Correlation analyses were conducted on all variables in the hypothesized model, and are shown in Table 2. These analyses suggest significant relationships for many of the pathways in the hypothesized model.

Correlations revealed that WhatsApp usage (as measured by minutes per day) was positively related with online bonding capital ($r$ = .27, $p$ < .01), as well as with quality of relationship with WhatsApp partners ($r$ = .20, $p$ < .01). Similarly, support motivations were also positively related to both online bonding ($r$ = .27, $p$ < .01) and quality of relationships ($r$ = .17, $p$ < .05).

When exploring the quality of relationships, this was positively related to social competence ($r$ = .16, $p$ < .05), and negatively with loneliness ($r$ = −.18, $p$ < .01). Online bonding through WhatsApp was related favorably to all psychosocial outcomes. Namely, it was positively related to self-esteem ($r$ = .24, $p$ < .01), social competence ($r$ = .31, $p$ < .01), and psychological well-being ($r$ = .16, $p$ < .05), and negatively related to loneliness ($r$ = −.21, $p$ < .01). Similarly, group identity to WhatsApp groups was also related to these outcomes in the equivalent way Table 3. Namely, positively related to self-

**Table 2.** Correlational analysis of all study variables.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Mins per day | 1.00 | .25** | .27** | .07 | .20** | −.11 | .15* | .12 | .06 |
| 2. Support motivations | | 1.00 | .27** | .01 | .17* | .12 | .05 | −.07 | −.04 |
| 3. Online Bonding | | | 1.00 | .43** | .49** | −.21** | .31** | .24** | .16* |
| 4. Group identity | | | | 1.00 | .27** | −.32** | .26** | .27** | .14* |
| 5. Quality of relationships | | | | | 1.00 | −.18** | .16* | .10 | .04 |
| 6. Loneliness | | | | | | 1.00 | −.45** | −.62** | −.45** |
| 7. Social competence | | | | | | | 1.00 | .56** | .35** |
| 8. Self-esteem | | | | | | | | 1.00 | .56** |
| 9. Psychological Well-being | | | | | | | | | 1.00 |

** $p$ < .01 * $p$ < .05

**Table 3.** Standardized beta coefficients from the path analysis of variables in the hypothesized model.

| Pathway | β | *p* |
|---|---|---|
| Mins/Day → Online Bonding | .25 | <.001 |
| Mins/Day → Group Identity | .07 | >.05 |
| Mins/Day → Quality of Relationships | .26 | <.001 |
| Support Motivations → Online Bonding | .20 | <.01 |
| Support Motivations → Group Identity | −.03 | >.05 |
| Support Motivations → Quality of Relationships | .08 | >.05 |
| Online Bonding → Self-esteem | .17 | <.05 |
| Online Bonding → Loneliness | −.05 | >.05 |
| Online Bonding → Social Competence | .25 | <.01 |
| Online Bonding → Psychological Well-being | .15 | >.05 |
| Group Identity → Self-esteem | .21 | <.01 |
| Group Identity → Loneliness | −.28 | <.001 |
| Group Identity → Social Competence | .15 | <.05 |
| Group Identity → Psychological Well-being | .09 | >.05 |
| Quality of Relationships → Self-esteem | −.04 | >.05 |
| Quality of Relationships → Loneliness | −.09 | >.05 |
| Quality of Relationships → Social Competence | −.004 | >.05 |
| Quality of Relationships → Psychological Well-being | −.06 | >.05 |

esteem ($r = .27$, $p < .01$), social competence ($r = .26$, $p < .01$) and psychological well-being ($r = .14$, $p < .05$), and negatively with loneliness ($r = -.32$, $p < .01$).

### 5.1. Path analysis

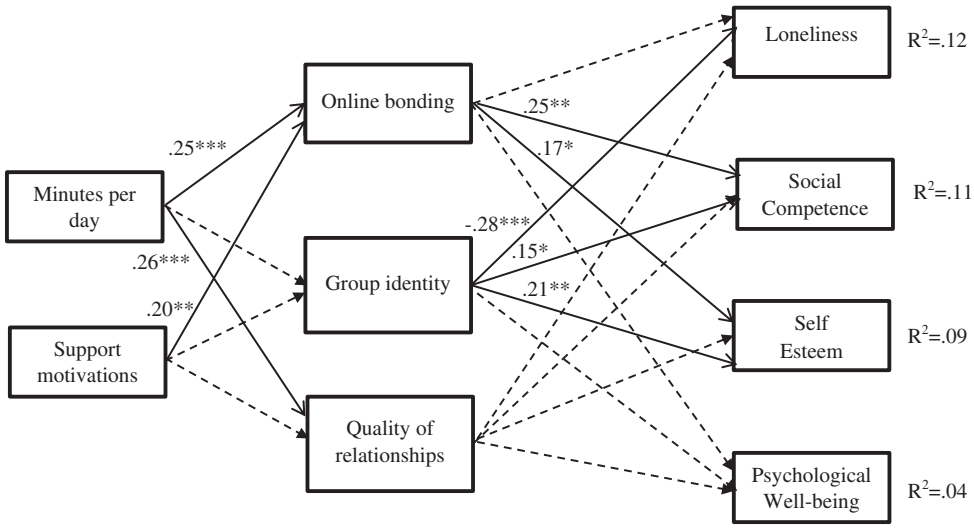
The hypothesized model was tested using path analysis in AMOS 25.0. The error terms of bonding, group identity, quality of relationships were allowed to co-vary, as were the error terms of loneliness, social competence, self-esteem, and psychological wellbeing. Four model fit indices were used to test the model: the chi-square test, the relative chi-square ($\chi^2$/df ratio), the root-mean-square error of approximation (RMSEA) and the comparative fit index (CFI). Typically, a good model fit is expressed by a non-significant Chi-square test result, a relative chi-square <3.00, an RMSEA value <.06 and a CFI value >.95 (Byrne, 2001; Kline, 2011). The model fit was deemed good, $\chi^2$ (8) = 9.14, $p = .331$, $\chi^2$/df = 1.14, RMSEA = .027, CFI = .997. Figure 2 shows the coefficients of each predicted relationship and shows that only online bonding acted as a mediator, which in turn predicted social competence and self-esteem. Group identity was directly related to all outcomes other than psychological well-being. Conversely, although minutes per day using WhatsApp was positively related to quality of relationships, quality of friendships was not significantly related to any of the outcome variables.

## 6. Discussion

The current study established how WhatsApp usage was related to a number of key psychosocial outcomes and the extent to which group identity, quality of relationships and online bonding capital derived through this engagement were relevant mediators. The path analysis findings highlighted that the inclusion of mediator variables was important for understanding the relationship between WhatsApp use and psychosocial well-being. That is, online bonding garnered through WhatsApp partners was a significant mediator between WhatsApp engagement and self-esteem, as well as social competence. As such, this highlights why including social factors as mediators in understanding psychosocial impacts of technology is highly pertinent. Specific findings and implications are discussed in the following sections. (sec-sections 6.1 to 6.4).

### 6.1. Affordances associated with WhatsApp usage

WhatsApp usage, as measured by minutes per day spent on the platform showed positive relationships with online bonding capital and quality of relationships with WhatsApp partners. Similarity, the support motivations for use also positively




*** $p < .001$; ** $p < .01$; * $p < .05$

**Figure 2.** Path analysis showing the significant relationships in solid lines, and non-significant relationships in dotted lines. Standardized coefficients for the significant pathways are shown. See Table 3 for all values.

*** $p < .001$; ** $p < .01$; * $p < .05$

related to online bonding. This corresponds with previous research on Instant Messaging, showing how this can have a positive impact on quality of friendships with chat partners (Valkenburg & Peter, 2009b). However, the findings relating to social capital contribute additional evidence here and the extent to which WhatsApp specifically as a platform may facilitate online bonding capital to enrich the social resources garnered through existing relationships. As such, this suggests that exploring pathways such as the quality of friendships and bonding opportunities within online platforms is theoretically important in this area of enquiry. Therefore, future research would benefit from including variables such as these rather than just solely measuring outcomes of technology engagement. This may go some way to explain the contradictory research findings in this area given that many studies do not account for the role of these factors (e.g., van Den Eijnden et al., 2008). As such, it is not clear how or why engagement in Internet-enabled technologies may be related to the measured outcomes of such studies. This suggests that greater nuance is required when conducting research of this nature to establish how different types of friendship dyads or groups may mediate these relationships. That is, it cannot be assumed that spending time interacting online will have equivalent psychological outcomes if this is substituting rather than supplementing existing friendships for example. The current study focused exclusively on existing friendships and the potential for online messaging systems for these dyads or groups to promote positive outcomes. However, observed findings cannot necessarily be generalized to other forms of friendships such as those which occur exclusively online. As such, these may be more representative of online bridging capital and thus may hold differential relationships to the psychosocial outcomes measured in the current study. Indeed, previous research with online gamers has revealed online bridging versus bonding capital to have opposite relationships with loneliness, specifically that bonding capital is related to reduced loneliness in this sample relative to bridging that has a positive relationship with this outcome (Kaye et al., 2017). The findings, therefore, should be considered with caution when drawing claims about the psychological impacts associated with WhatsApp engagement.

### 6.2. Social support motivations

A noteworthy contribution of the current research includes an exploration of social support motivations in respect of using WhatsApp. Correlational analysis found that using WhatsApp for social support was particularly important for quality of relationships and online bonding, the latter of these also being corresponded by the path analysis. This contributes new evidence to the literature in respect of social support motivations and how they relate to using online communicational technologies. In this sense, this helps draw together the literature on online social support with that which contributes to the stimulate debate. Specifically, this is presented in the context of everyday communication and not in specific support-seeking user groups or communities as is more typical in the existing literature (Coulson, 2005; Coulson et al., 2007; Wright, 2002). Clearly this highlights that gaining information on users' motivations for using certain everyday communication technologies is important and aligns with the principles of the Uses and Gratifications (U&G) perspective (LaRose, Lin, & Eastin, 2003; Larose, Mastro, & Eastin, 2001), which seeks to explain Internet or media behaviours by understanding their specific functions and how they gratify users' needs. It is recommended that future research in this area garners data of this sort when assessing technology engagement given that measuring usage per se may overshadow specific nuances when exploring users' psychological experiences.

### 6.3. Quality of relationships and psychosocial outcomes

The correlational analysis found a significant positive association between quality of relationships with WhatsApp partners and social competence, and a negative association with loneliness, although the path analysis did not substantiate these pathways. To some extent, this highlights the value of taking account of relationship types when exploring the impacts of online engagement on psychological outcomes, given these may reveal specific nuances within these links. There is some correspondence here with the existing literature in respect of how quality of relationships relate to aspects of well-being (Hartup & Stevens, 1997), and specific to online communication, how this may enrich these experiences (Bryant et al., 2006; Subrahmanyam et al., 2008), and have a positive impact on well-being (Valkenburg & Peter, 2007, 2009b). However, the current study is the first of its kind to study multiple facets of quality of relationships here and further, how they relate to a range of psychosocial outcomes relevant to well-being.

### 6.4. Online bonding, group identity, and psychosocial outcomes

Online bonding through WhatsApp was negatively related to loneliness, and positively with psychological well-being, self-esteem and social competence (the latter two of these substantiated by the path analysis findings). Group identity to WhatsApp groups was also related to these outcomes in the hypothesized way, with the exception that psychological well-being was not found to be significantly effected in the path analysis. There is much to be said about the importance of measuring specific social affordances which particular communicational technologies can provide to help build a theoretical basis for how online engagement is related to psychological outcomes. From a theoretical perspective, this makes sense given the previous work demonstrating the positive psychosocial outcomes associated with positive group identity (Crocker et al., 1994; Kaye et al., 2017). However, it also suggests the importance of establishing what the processes are for promoting group identity beyond the online platform itself, and how a more defined account of the interactions between online and offline networks is needed when understanding how group identity develops. That is, existing "real world" friendships may promote social identification and categorization processes of group identity, but having additional discrete online groups may foster aspects of the group comparison process (i.e., We are all members of this WhatsApp group and they are not included in this so

do not share our group identity). More work is needed to establish how the various facets of social identity theory apply across these largely inter-related contexts.

### 6.5. Limitations

The generalisability of the current findings could be questioned due to the nature of the current sample, particularly given the majority were emerging or young adults, with few in other age demographic groups. Having said that, ages 25–34 years, closely followed by 18–24 years are the majority user-groups of this platform according to recent demographic data (Statista, 2018), so it could be argued the current study provided an account which was based largely on a representative sample.

The current study focused exclusively upon WhatsApp as a specific platform of interest. Although this restricted the potential for confounding factors to interfere with the study data (e.g., platform differences), it cannot be established whether the observed findings are relevant for other online chat systems or other communication technologies more generally. Again, this may explain some variation of findings from previous studies which have been more generic in their approach at understanding engagement on the Internet per se (e.g., Bessiere et al., 2008), and its relationship to psychological outcomes. From a theoretical perspective, it makes sense to avoid conflating Internet technologies under one generic category as these vary considerably in their communicative and social functionalities. As such, research which is more exclusively focused on specific forms of Internet-based communication may be better at establishing their efficacy in promoting certain social interactions with specific types of users and thus provide greater nuance on their impact on psychological outcomes.

## 7. Conclusion

Overall, the current findings contribute to ongoing debates in this area and contribute specific evidence of the role of social factors, along with including social support motivations for communication technology use, to substantiate the literature in this regard. Specifically, the current findings highlight that including these factors as mediators (specifically those relating to social bonding capital) is highly pertinent within this field as a way of understanding how technology usage relates to psychosocial well-being. In this regard, it gives rise to the notion that communicational technology such as WhatsApp may stimulate existing relationships and communicational opportunities, whereby this enhances aspects of users' positive well-being.

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