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Tagger's delight? Disclosure and liking behaviour in Facebook: the effects of sharing photographs amongst multiple known social circles

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Discussion Paper Series



Title: Tagger's Delight? Disclosure and liking behaviour in Facebook: the effects of sharing photographs amongst multiple known social circles

Author: David Houghton, Adam Joinson, Nigel Caldwell and Ben Marder

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Running head: Effects of information sharing in Facebook on personal relationships.

TAGGER'S DELIGHT? DISCLOSURE AND LIKING IN FACEBOOK: THE EFFECTS OF
SHARING PHOTOGRAPHS AMONGST MULTIPLE KNOWN SOCIAL CIRCLES

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Abstract

The present work identifies the relationship between sharing photographs with different depictions in Facebook on relationship quality, which varies depending on the type of target sharing the photographs. With over 1 billion active users, disclosure on Facebook is frequent, considered a norm of online interaction, and actively encouraged by site providers. The extant academic literature identifies Facebook as an effective tool to connect with known and unknown others, and identifies the differences in sharing behaviour when users are aware of their audience. Operating within a lowest common denominator approach to disclosure on Facebook, the present work identifies the potential consequences to personal relationships when sharing day-to-day information. Results found from a sample of 508 Facebook users suggests individuals should actively adjust their privacy settings to ensure that even amongst flattened information – i.e. that deemed appropriate for release to all target types – disclosure does not harm current and potential relationships. Implications for, users, academic theory and disclosure practice are discussed.

Key words: Facebook, personal relationships, sharing behaviour

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1. Introduction

Social Network Sites (SNS) have been defined as, “web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system” (Boyd & Ellison, 2008, p. 211). SNS platforms allow simultaneous one-to-one, one-to-many, and many-to-many communication via text, photographs, IM, direct messages (akin to email) and videos (Boyd & Ellison, 2008). Communication can occur synchronously and asynchronously.

Millions of users interact via these platforms each day. Currently, Facebook is the most popular SNS with over 1 billion active users worldwide¹, and 2.5 billion pieces of information and more than 500 terabytes processed each day². Its users click ‘Like’ 2.7 billion times and share 300 million photographs per day². These figures show a dramatic contrast to the number of

¹ <http://newsroom.fb.com/content/default.aspx?NewsAreaId=22> accessed January, 2013.

² <http://techcrunch.com/2012/08/22/how-big-is-facebooks-data-2-5-billion-pieces-of-content-and-500-terabytes-ingested-every-day/> accessed August, 2012.

active Facebook users just four years ago, around 175 million³. As SNS are increasingly popular with millions of users connecting within and beyond the platform, it is important to understand the effects of SNS use to identify the potential benefits and costs to personal relationships.

SNSs such as Facebook require individuals to post information to provide site content and improve the overall user experience to ensure individuals remain engaged and committed to its future use (e.g. Bonneau & Preibusch, 2009; Burke, Marlow, & Lento, 2009; Vasalou, Joinson, & Courvoisier, 2010). As Ellison and colleagues note, “the primary function of these sites is to consume and distribute personal content about the self” (Ellison, Vitak, Steinfield, Gray, & Lampe, 2011, p. 19). Such a reliance on information provided by users led much of the early research on Facebook to address information sharing practices from the perspective of informational privacy, with disclosure often viewed negatively or by the potential harm it could cause when accessed by third parties (e.g. Acquisti & Gross, 2006, 2009; Catlett, 2007; Christofides, Muise, & Desmarais, 2009; Gross & Acquisti, 2005; Westlake, 2008; Wondracek, Holz, Kirda, & Kruegel, 2010). Other research to date has typically identified the uses of SNS to connect with known and unknown others (e.g. Joinson, 2008; Lampe, Ellison, & Steinfield, 2006; Lampe, Ellison, & Steinfield, 2007; Sheldon, 2008; Special & Li-Barber, 2012), the different social connections held within the platform and the potential for “leakage” across social boundaries of information that may be recognisably harmful to relationships (e.g. Binder, Howes, & Sutcliffe, 2009; DiMicco & Millen, 2007; Lampinen, Lehtinen, Lehmuskallio, & Tamminen, 2011; Marder, Joinson, & Shankar, 2012; Marwick & Boyd, 2011; Skeels & Grudin, 2009), the presentation of the self and identity development (e.g. Marder, et al., 2012; Zhao,

³ Facebook Press Room. <http://www.facebook.com/press.php#/press/info.php?statistics> accessed March, 2009.

Grasmuck, & Martin, 2008), and differences in user behaviour based on culture and site affordances (e.g. Kosinski, Stillwell, & Graepel, 2013; Vasalou, et al., 2010), amongst others.

Previous academic work has demonstrated that users can successfully fulfil the need to connect within SNS, and that SNS can facilitate the creation of offline connections, relationship development and relationship degradation generally (e.g. Binder, et al., 2009; Chen, 2011; Ellison, Steinfield, & Lampe, 2007; Joinson, 2008; Lampe, et al., 2006, 2007; Marwick & Boyd, 2011; Sibona & Walczak, 2011; Skeels & Grudin, 2009; Steinfield, Ellison, & Lampe, 2008). Significant factors of Facebook use are social connection, shared identities, friend functions, photographs, content, status updates, social network surfing and social investigations, use of the 'like' feature and the development and maintenance of social capital (Ellison, et al., 2007; Joinson, 2008; Kosinski, et al., 2013; Lampe, et al., 2007; Wilcox & Stephen, In Press). However, of specific relevance to this paper is the potential relational harm that may arise from sharing information across different social circles, i.e. across relationship types (e.g. Binder, et al., 2009).

The present paper recognises that users operate under "context collapse" - whereby posts are created based on a lowest common denominator to avoid harms from sharing all information types across distinct social spheres who may consider particular information inappropriate (Binder, et al., 2009; Marwick & Boyd, 2011), especially if taken out of context. Furthermore, the assumption is made that the average user will have different types of "friend" connection in Facebook and will share different information with differing frequencies across the different social circles. That is, they will post ordinary, day-to-day information that is not deliberately or inadvertently extreme so as to cause offence or turbulence in a relationship, but typical of the norms of Facebook communication with different "friends".

Thus, the current work aims to address a shortfall in the academic literature by identifying *within* the norms of Facebook use, the relationship between information sharing by different relationship types and the relationship quality held with these different relationship partners, i.e. to determine if: -

Information Disclosure X Relationship Type = Relationship Quality differences.

2. Background

To fulfil the research aim, it is necessary to understand previous research findings on offline information disclosure and relationship development with different targets, and work identifying the outcomes of SNS use amongst different social circles. Therefore, the following research areas are addressed: First, a brief review of the properties of self-disclosure; Second, the effects of self-disclosure on relationship development in offline environments; Third, work relating to the use of interpersonal boundaries to control information flow to and from different types of relational target is reviewed; Fourth, research within SNS environments on the effects of disclosure more generally is identified; and Fifth, the features used within Facebook for different purposes are outlined to identify a focal use of Facebook to investigate within the current empirical work.

2.1 What is self-disclosure?

Since early research was conducted on self-disclosure there have been multiple definitions, each attributing a narrower focus and identifying specific scenarios, or conditions, for which the definition applies (Chelune, 1979b). An early definition of disclosure is provided

by Jourard & Lasakow - but is derived from a mental health and self-actualisation process (Chelune, 1979a; Rosenfeld, Civikly, & Herron, 1979) - as “the process of making the self known to other persons” (Jourard & Lasakow, 1958, p. 91). Their definition covers a broad perspective of disclosure, and Jourard later argued that it is only by disclosing to others about the self, that individual begins to understand their self through the process of reflection and verbalisation (Jourard, 1971). Later definitions of self-disclosure begin to provide a narrow focus of what constitutes a disclosure (e.g. Chelune, 1979a; Cozby, 1973; Derlega & Grzelak, 1979; Worthy, Gary, & Kahn, 1969), which may be indicative of the approach taken by the respective authors within their own research (Chelune, 1979b). However, such definitions begin to narrow the focus beyond a usable definition in the modern communication era by restricting the method by which information is disclosed. For example, Cozby defines self-disclosure as “any information about himself which Person A communicated verbally to Person B” (Cozby, 1973, p. 73). Cozby’s definition restricts disclosure to verbal occurrences, but disclosure may also occur through text, photo or video based mediums or from observation of online behaviour more generally. Therefore, for the purpose of the present paper, a new definition is developed drawing on these earlier definitions to provide a broader perspective and an understanding of the approach taken in this empirical research. Self-disclosure is defined as: *Information intentionally communicated about person A to any person(s) via any form of communication and interaction by person A.*

However, to understand the concept of self-disclosure it is necessary to understand further its properties to determine how to measure it appropriately. Self-disclosure can vary on its dimensionality. One approach is to treat self-disclosure as if it were unidimensional, such as

the process of revealing information while not considering other aspects such as recipient, time and scenario (Chelune, 1979a; Derlega & Grzelak, 1979; Wheelless, 1978). An alternative approach is to treat self-disclosure as multidimensional, consisting of both person and environment variables (Altman, 1975; Chelune, 1979a; Petronio, 2002).

Within the multi-dimensions of disclosure, it has been argued that there are two distinct properties, or continuums: breadth and depth (Collins & Miller, 1994; Joinson, 2001; Moon, 2000; Spiekermann, Grossklags, & Berendt, 2001; Tidwell & Walther, 2002). Breadth relates to the quantity of information disclosed (both frequency and category), and depth to the quality. Depth can range from surface information, such as demographic data, to more core values, such as sexual fantasies and desires (Altman & Taylor, 1973; Joinson & Paine, 2007). Choosing to disclose different information of varying depth and breadth is based on a number of factors including the environment or situation in which the individual finds themselves and their own personal characteristics (Altman, 1975; Altman & Taylor, 1973; Petronio, 2002; Taylor, De Soto, & Lieb, 1979). Within the environment, further variables can have an effect on a disclosure choice, such as the number of recipients (Petronio, 2002; Solano & Dunnam, 1985; Taylor, et al., 1979) or socially constructed norms of concealment or disclosure patterns (Altman, 1975; Berger & Bradac, 1982; Westin, 1967, 2003). Smaller audiences, or groups, are related to a greater willingness to disclose (Solano & Dunnam, 1985) and increased intimacy (Taylor, et al., 1979) - a variable often used to assess self-disclosure choices or successful self-disclosure (e.g. Altman & Taylor, 1973; Gilbert, 1976; Reiman, 1976; Worthy, et al., 1969). Norms of disclosure relate to what is expected to be disclosed based on the stage or type of relationship and personal idiosyncrasies, with the evaluation of a discloser derived from the relationship between the discloser and recipient as well as other variables such as message content (e.g. Altman & Taylor,

1973; Berger & Bradac, 1982; Burgoon, 1993; Burgoon & Hale, 1988; Burgoon, Newton, Walther, & Baesler, 1989).

2.2 Self-disclosure and others

Amongst the many other variables that determine the decision to disclose or the success or failure of a disclosure, the type of recipient is of interest to the current research. Different relational targets (targets, hereafter), i.e. mother, father, same-sex friend, opposite-sex friend, colleagues and strangers are disclosed to differently (Dindia, Fitzpatrick, & Kenny, 1997; Jourard, 1959; Jourard & Lasakow, 1958; Rosenfeld, et al., 1979). Recipients evaluate disclosure based on the discloser, message timing and content, the situation and circumstance of the discloser and merely being chosen as a recipient (Brock, 1968; Kleinke, 1979). Therefore, predispositions of recipients and their expectancies of disclosure within their relationships with others can impact on the way disclosures are interpreted and the effects this may have on the relationship itself.

One of the functions of disclosure with others is to help develop and maintain relationships and intimacy through the reciprocation of continually intimate (deeper) information (e.g. Altman & Taylor, 1973; Berger, 1979; Berger & Bradac, 1982; Derlega & Grzelak, 1979; Jourard, 1959). Self-disclosure falls within the regulation of social norms and personal idiosyncrasies, such that receiving too deep or too frequent information for a particular relationship stage or type can result in the discloser being seen as socially deviant, and negatively evaluated (Altman & Taylor, 1973; Berger & Bradac, 1982). Similar effects are found for those who don't disclose frequently enough or with sufficient depth (Altman & Taylor, 1973; Berger & Bradac, 1982). However, such behaviour has been found beneficial to manage information

disclosure and signal to recipients that a more intimate encounter or relationship is not desired. For example, a stranger discussing their personal life on a train can be reciprocated with similar levels of intimacy (depth) or be forced into an ‘acquaintance’ box through lack of reciprocity, reciprocity to a shallower depth, or through body language such as averting one’s gaze (Argyle & Dean, 1965; Derlega & Chaikin, 1976; Jourard & Friedman, 1970; Petronio, 2002; Worthy, et al., 1969).

To manage information flow to and from the self, the concept of personal boundaries has been applied. Altman (1975) likens interpersonal and self boundaries to a selectively permeable cell membrane. The permeability of the membrane can be adjusted to control the flow of information to and from the self, thus helping to obtain the desired level of privacy. Information is released from the ‘self’ boundary if the individual believes there is a closed boundary around the others. Derlega & Chaikin (1977) ascertain that the extent of control we have over this boundary contributes to the level of privacy we have. They further suggest that the state of these boundaries can determine the relationship we have with others in terms of what they may know about oneself, and thus determine the power balance.

2.3 Disclosure in SNS and impact on relationships

Previous academic work has demonstrated that users can successfully fulfil the need to connect within SNS, and that SNS can facilitate the creation of offline connections, relationship development and relationship degradation generally (e.g. Binder, et al., 2009; Chen, 2011; Ellison, et al., 2007; Joinson, 2008; Lampe, et al., 2006, 2007; Marwick & Boyd, 2011; Sibona & Walczak, 2011; Skeels & Grudin, 2009; Steinfield, et al., 2008). Disclosure to different others in SNS has received attention recently from the approaches of privacy and identity protection,

anxiety and social tension, and successful information control across boundaries (e.g. Acquisti & Gross, 2006, 2009; Acquisti, Gross, & Stutzman, 2011; Binder, et al., 2009; Marder, et al., 2012; Marwick & Boyd, 2011), amongst others.

In SNS naturally occurring boundaries merge into one large group of ‘friends’ (Binder, et al., 2009; Marwick & Boyd, 2011). Communication between dyads can also be viewed by other network connections and their connections (i.e. other friends and friends-of-friends) (Binder, et al., 2009; Boyd & Ellison, 2008), moving dyadic interaction into a group boundary. Furthermore, it is suggested that an increase in the numbers of kin in the collapsed ‘friend’ group in SNS is related to increased tension due to the potential for information to leak across boundaries (Binder, et al., 2009). It is the blurring of these otherwise distinct relationship boundaries that causes social tension and necessary alternative behaviour, such as flattening the intimacy or sensitivity of a post to make it suitable for most recipients (Binder, et al., 2009; DiMicco & Millen, 2007; Marwick & Boyd, 2011). The merging of two or more heterogeneous networks into one homogeneous environment is akin to stretching the self boundary over all of a person’s social connections allowing information to flow freely amongst everyone. Awareness of the conflicting demands of different social circles is disputed. Some authors claiming users are unaware of the potential audience (e.g. Acquisti & Gross, 2006), and more recent work suggesting that users are aware and alter their posts to become more mundane (e.g. Marwick & Boyd, 2011).

Wilcox & Stephen (In Press) found that while Facebook use increases self-esteem, the temporary effects of increased self-esteem when searching through the profiles and posting of close friends, also reduces self-control. A reduction in self-control may make users more vulnerable to posting information across boundaries that could be considered inappropriate. One

of the features of Facebook is the ability to tag other users in posts such as status updates, photographs and comments in general. The ability to tag others makes them identifiable to information that they have not decided to disclose themselves. Although Facebook now offers a function to review this information before it is made available, Walther and colleagues suggest that such information posting and identifying of others can result in their being evaluated by friends of friends in Facebook, with specific impact upon ratings of attractiveness and credibility of the data subject (Walther, Van Der Heide, Kim, Westerman, & Tong, 2008). However, the same authors noted that not all evaluations are negative.

Other work on the evaluation of disclosures by Facebook users on perceptions of liking and appropriateness found that intimate information was perceived negatively if posted in public channels compared to private channels, and recipients evaluated disclosures with greater intimacy if they were perceived to be personally attributed to them (Bazarova, 2012). A lack of anonymity in Facebook may act to enhance the effects found by Walther and colleagues and Bazarova, simply because individuals can be attributed to their own posts and posts about them.

Facebook has a strict 'real names' policy embedded within its Terms of Service (Facebook, 2012). Users are therefore no longer anonymous, which has often been discussed as one of the reasons interaction pairs become *hyperpersonal* in pre-SNS CMC environments (e.g. Joinson, 2001; Kraut et al., 1998; McKenna & Bargh, 1998). A lack of anonymity may act to reinforce control over what a user posts in SNS, as they know it is easily attributed to them. As such, relationships are argued to be 'anchored in reality' (Zhao, et al., 2008). However, with information attributed to known individuals there is the potential for positive and negative evaluations of Facebook users at all times of the day as network connections have the ability to browse profiles and view this information at any time.

Three strategies of control in Facebook have been identified: friending behaviours, change in disclosure practices - including message content - and the management of audiences through the manipulation of site privacy settings (Ellison, et al., 2011). Within the content category Marwick & Boyd (2011) found that, amongst Twitter users, individuals are aware of their audience and the potential conflicts of sharing information across these boundaries, and as such adopt a lowest common denominator approach to sharing, i.e. they flatten the content of their posts to be suitable for all social circles.

Regardless of awareness and the mechanisms used to control information, it is not currently understood how this mundane information sharing, *intended* for all network connections, may interfere with relationships of different types and when control should be operated to allow or prevent information sharing. For example, a user may *deliberately* share photographs of their pets, which may not necessarily be considered to be detrimental to their relationships. However, when received by different recipient types such photographs could have an impact because some contacts are expecting less mundane information, some contact types may not care about pets and other contact types may wish to see pets. Furthermore, depending on the stage of a relationship, different pieces of seemingly mundane information may be considered useful or dull.

2.3.1 SNS features and use

SNS incorporate a multitude of features for their users to connect, share and interact (Boyd & Ellison, 2008; Donath & Boyd, 2004). Previous research has identified the effects of using different SNS features, and using SNS in general, on social connections. The remainder of

this section outlines a few of these studies as key examples of such work and motivates the present research to identify one Facebook feature of interest for empirical investigation.

Students were found to use Facebook most likely to keep in touch with old friends or school friends, check the profile of somebody they met socially, somebody who lived in halls or other class-mates, and to find information about a party or event (Lampe, et al., 2006). Lampe and colleagues labelled the use of the SNS to find information out about somebody specific with whom the user already has an offline connection as *Social Searching*. The least likely uses of Facebook identified by Lampe et al. were to initiate a FtF encounter with somebody they met through Facebook, to find people to date, and to find casual sex partners. Such behaviour has been termed *Social Browsing* by the same authors.

Ellison and colleagues found that Facebook supports the development of new strong and weak network connections, as well as the maintenance of pre-existing offline relationships (Ellison, et al., 2007). However, students believed their primary audience would be those with whom they have an offline connection, and were more likely to use it to maintain existing connections than to seek new ones. Student users of Facebook are more likely to perform social searching than social browsing (Ellison, et al., 2007; Lampe, et al., 2006).

More generally, relationship maintenance has been identified as a key motivation for Facebook use, alongside passing time, entertainment, keeping up with old friends, staying connected with others, personal information sharing, practical information sharing (e.g. arranging events) and friendship functions more generally (Bumgarner, 2007; Joinson, 2008; Special & Li-Barber, 2012). Within Twitter a sample of 317 users showed that the longer a user had an active account and the more hours they spent per week using Twitter were related positively to the gratification of an informal need to connect with others (Chen, 2011).

Furthermore, Facebook use has been related to increased self-esteem (e.g. Gonzales & Hancock, 2011; Steinfield, et al., 2008; Wilcox & Stephen, In Press). Amongst the features available in Facebook, photographs have been identified as one of the most used (Joinson, 2008), with over 300 million photographs uploaded per day², and has previously been identified as the most used site for photograph sharing (Facebook, 2007, cited in Bumgarner, 2007).

Another popular feature of communication in Facebook is the 'Like'. Data available on a user's profile about the pages they 'like' can successfully predict an individual's personality traits and profile information with a high degree of accuracy (Kosinski, et al., 2013). Specifically, using a sample of over 58,000 participants, Kosinski and colleagues accurately identified a user's sexual orientation, ethnicity, religious and political views, personality traits, intelligence, happiness, use of addictive substances, parental separation (if it occurred before the subject reached 21 years of age), age and gender. The authors noted that as the number of available 'likes' on a user's profile increased, i.e. the more input data they have, the greater the accuracy of their profiling. However, they also found their predictions to be accurate with only 1 like. A similar method has been adopted to identify a US Facebook user's social security number in less than 1,000 attempts from information available on their Facebook profiles and the publicly available death master file that contains the social security numbers of deceased US citizens (Acquisti & Gross, 2009).

2.3.2 Summary and Research Questions

As outlined briefly above, there are many features available in SNS to interact with others. The present work uses Facebook as the interaction environment for empirical research as it is currently the most popular. Furthermore, as disclosure can vary depending on environmental

influences (e.g. Altman, 1975), selecting Facebook helps to control for environmental effects. Photographs are chosen as the information type to investigate as photographs are one of the most used Facebook features and offer the ability for users to alter message content and frequency of posting.

As Shklovski et al. note, “the precise role of mediated communication in relationship maintenance has been difficult to isolate” (Shklovski, Kraut, & Cummings, 2008, p. 1). The present work operates under the assumption that the ‘self’ boundary is lowered and information is disclosed to others within a larger group of differing Facebook contacts, and that the disclosures are predisposed to the lowest common denominator of sensitivity. That is, it operates by investigating the differences in disclosure practices, with privacy settings and friending behaviours considered relatively consistent. Specifically, the work identifies the effects of disclosure on relationship quality with different others *within* disclosure that can be expected to be sharing in Facebook in day-to-day activity. In support of the investigation of the disclosure of different targets, previous work in offline environments demonstrates differences in disclosure based on the person disclosed to (e.g. Dindia, et al., 1997; John, Acquisti, & Loewenstein, 2011; Jourard & Lasakow, 1958). The approach taken in the current research is that users *are* aware of their different audiences. While the sharing of potentially polarised or socially damaging information may cause tension amongst SNS users, little is known about the effects on relationships of sharing ‘everyday’, socially benign information.

In addressing the aim of this paper, a significant step is taken to apply early disclosure findings in offline environments to new, socially connected, online network platforms. While other work has addressed disclosure in CMC more generally (e.g. Andrade, Kaltcheva, & Weitz, 2002; Joinson, 2001; Moon, 2000; Ramirez, Walther, Burgoon, & Sunnafrank, 2002; Tidwell &

Walther, 2002), with the differences in platforms and underlying motives for connecting in social media, it is considered essential to address the findings of previous offline era research in these platforms to avoid the presumption that pre-SNS CMC work is the basis to understand this second era of online connectivity. As Joinson notes, “*Tools do not simply translate a behaviour to a new medium without some impact on psychological processes*” (Joinson, 2003, p. 18).

The following research questions are thus developed: -

Research Questions: -

1. *How does the disclosure of photographs in SNS affect the qualities of our relationships?*
2. *How does the disclosure of photographs in SNS affect our relationships with different types of recipient?*

3. Study 1 – Method & Results

A short questionnaire was conducted to identify the variations in the content of photographs normally shared via Facebook. Participants (25 males and 9 females (N=34) with an age of 30.79 ± 9.35 (mean \pm S.D.)) were asked to, ‘Think back to the last photo(s) you uploaded to Facebook. What and/or whom did it depict?’ Content analysis was then performed on the responses to determine the different categories of photograph typically shared on Facebook. Seven categories of photograph content were identified: *self, friend, event, family, scene, object, and animal*.

4. Study 2 – Method & Results

Study 2 determines the effects of different targets disclosing photographs in Facebook on the quality of the relationship between the discloser (the different targets in this study) and the recipient (the participant in this study). Participants (N=508, gender weighted to 50:50 with a mean age of 23.92 ± 8.33) were first allocated randomly to one of five groups. Each condition represented one of five target types: a *relative*, *partner*, *close friend*, *colleague* and a *general Facebook friend* (control group). An independent groups design was employed.

Participants reported scores of relationship quality for their relationship with the target type (group condition) to which they were assigned. Relationship quality was measured using two self-report scales (1-5, 5 = strongly agree), each comprising three items from the Network of Relationships Inventory (NRI). Furman & Buhrmester (1985) progressively developed the NRI using samples of children and adolescents (e.g. Furman & Buhrmester, 1992). The NRI measures relationship qualities including support, conflict, companionship, admiration, affection, intimacy and relative power, with different relational targets. Within the current research, relationship quality was measured using the NRI as it breaks relationships into components and provides a networked approach to measure overall relationship quality between the different types of network connection available. As the present research looks at subtle changes in relationship quality based on one broad category of information sharing, changes are easily identifiable in smaller sub-sections of overall relationship quality than in a broad measure of liking, e.g. Rubin's (1970) liking scales.

The two scales used within the present research are *Support*, to measure the extent that the participant considers themselves and the target provide one another with emotional support and advice, and *Intimacy*, to determine the closeness between the participant (recipient) and target

(discloser) from the recipient's perspective. Participants then completed scales measuring the frequency at which the target discloses each of the seven photograph types identified in Study 1 via Facebook (scale of 1-7, 7 = most frequent). Therefore, the results are presented from the recipient's perspective, to identify how frequently the target discloses each of the seven photograph types via Facebook, and to ascertain the quality of the relationship between the recipient and the discloser of these photographs.

Dummy variables of target type were created using *general Facebook Friend* as the control condition in order to produce standardised moderation variables of *Target X Frequency of Shared Photograph Type*. *Support* and *Intimacy* were entered as DVs in two separate multiple linear regressions to identify the effects of photograph sharing by different targets on the quality of their relationship held with the recipient. The IVs were entered in steps to control for Age and Gender at step 1, and investigate the Frequency of Shared Photograph Type at step 2, Target Type at step 3, and the standardised moderation variables at step 4.

For scores of the relationship quality *support* the model was significant at 4 steps ($F_{(41,466)}=4.427, p<.001$) and accounted for 21.7% of the variance observed (Adj. $R^2=.217$), with a significant F change for the moderation term ($\Delta F=2.054, p=.001$). The significant predictor variables were (standardised betas) Age ($t=-2.925, B=-.126, p=.004$), Gender ($t=-3.542, B=-.156, p<.001$), Photos of Self ($t=-3.474, B=-.526, p=.001$), Photos of Friends ($t=2.101, B=.325, p=.036$), Colleague vs. General Facebook Friend ($t=-5.002, B=-.333, p<.001$), Relative*Photos of Self ($t=2.123, B=.184, p=.034$), Relative*Photos of Family ($t=2.736, B=.196, p=.006$), Partner*Photos of Family ($t=3.113, B=.239, p=.002$), Partner*Photos of Friends ($t=-4.696, B=-.493, p<.001$), Partner*Photos of Events ($t=2.305, B=.225, p=.022$), Close Friend*Photos of Self

($t=2.582$, $B=.219$, $p=.010$), and Close Friend*Photos of Friends ($t=-2.220$, $B=-.224$, $p=.027$), see Figure 1 for a graphical representation.

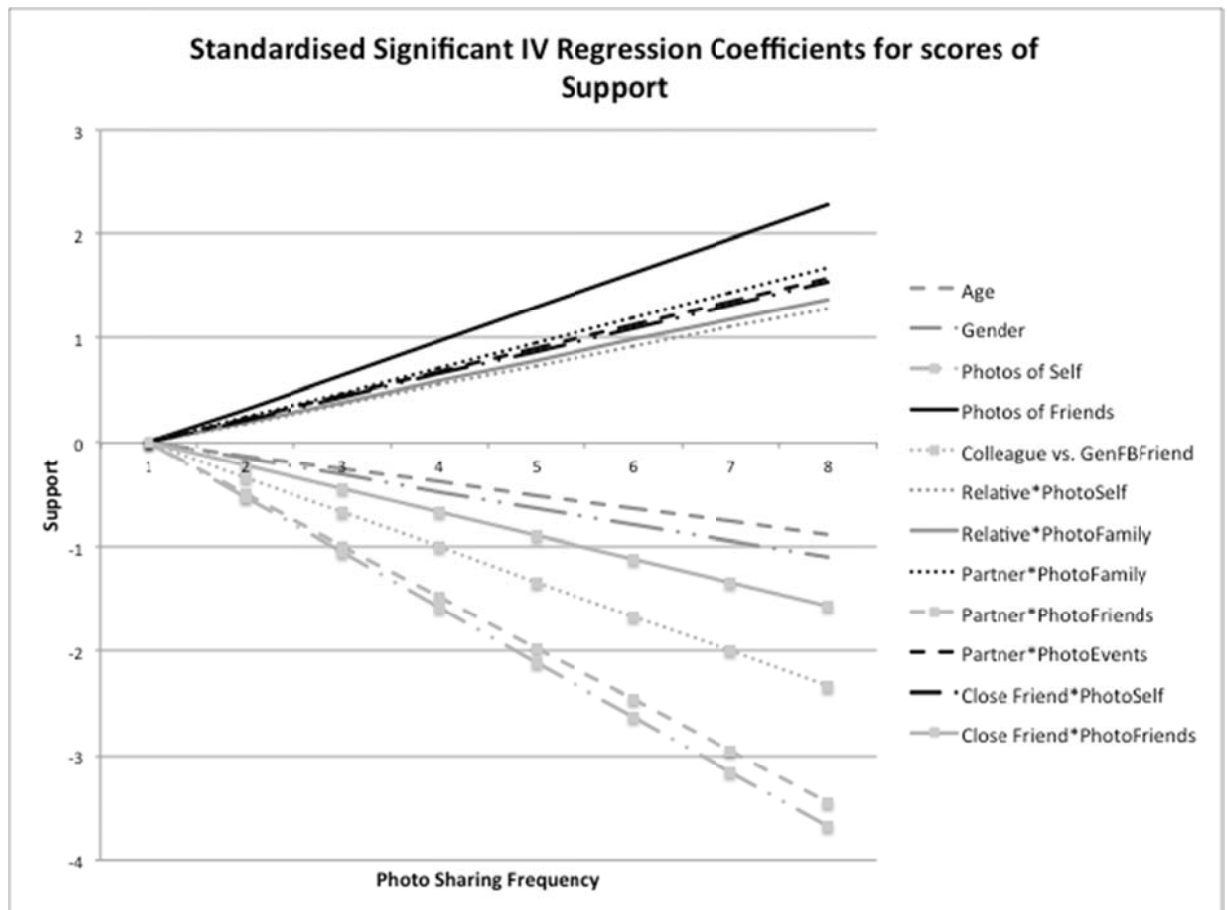


Figure 1: Standardised regression results for scores of Target X Photo Type on Support.

For scores of the relationship quality *intimacy* the model was significant at 4 steps ($F_{(41,466)}=3.855$, $p<.001$) and accounted for 18.8% of the variance observed ($\text{Adj. } R^2=.188$), with a significant F change for the moderation term ($\Delta F=1.760$, $p=.010$). The significant predictor variables were (standardised betas) Age ($t=-2.483$, $B=-.109$, $p=.013$), Photos of Self ($t=-2.603$, $B=-.402$, $p=.010$), Colleague vs. General Facebook Friend ($t=-4.521$, $B=-.307$, $p<.001$), Partner*Photos of Friends ($t=-3.295$, $B=-.352$, $p=.001$), Partner*Photos of Events ($t=2.204$,

$B=.219, p=.028$), Close Friend*Photos of Self ($t=2.545, B=.220, p=.011$), and Close Friend*Photos of Friends ($t=-2.330, B=-.240, p=.020$), see Figure 2 for a graphical representation.

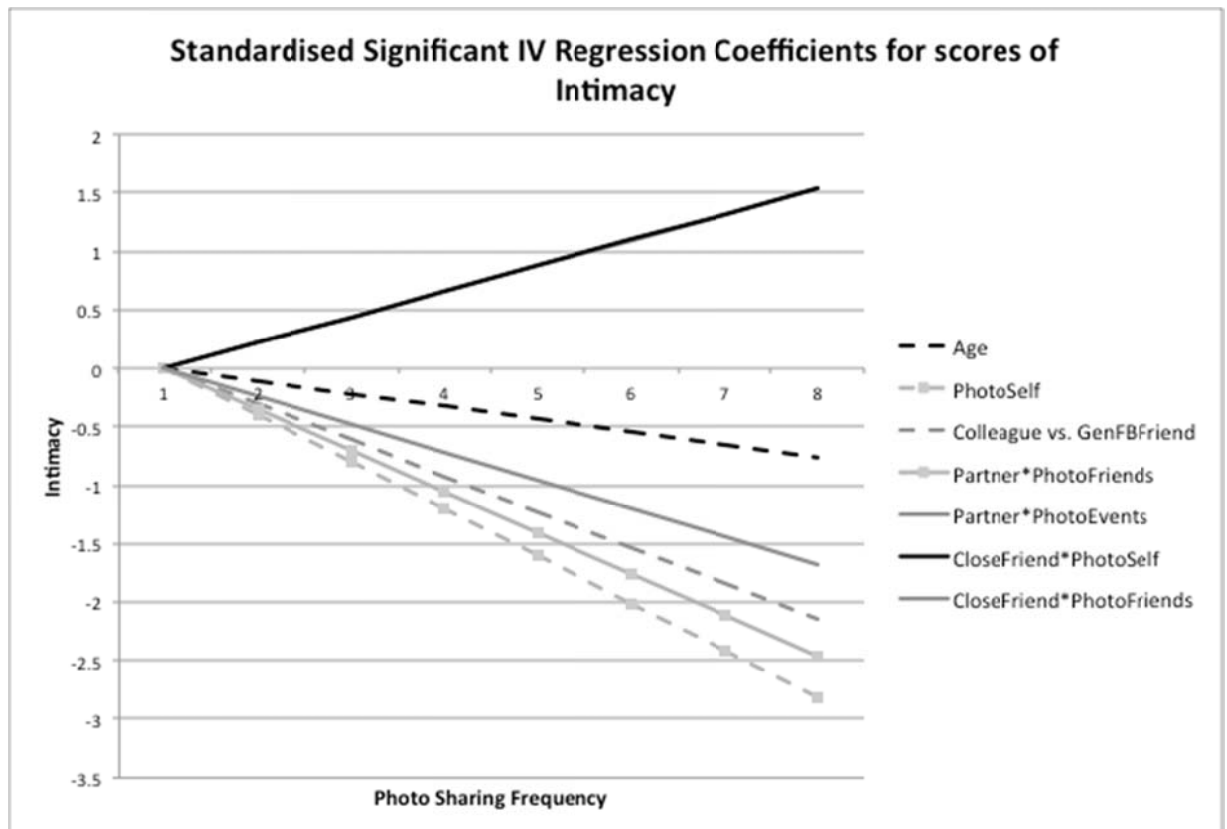


Figure 2: Standardised regression results for scores of Target X Photo Type on Intimacy.

5. Discussion and Implications

The results of study 1 separate the photograph category of Facebook into seven distinct photograph types comparable to broader photograph types identified by Jones & O'Neill (2011): *self, friend, event, family, scene, object, and animal*. These photograph types were then used in study 2 to address the frequency, scored 1-7, with which the participant can identify their relational target shares each of the photograph types on Facebook. Using the photograph types

and five targets, relative, partner, close friend, colleague and general Facebook friend, the relationship with the relationship qualities support and intimacy were investigated using multiple linear regressions.

In study 2, the results for support show that that older participants have lower scores for support than younger participants across all target types. Males have lower scores of support than females overall. Colleagues have significantly lower scores of support than a General Facebook Friend. Furthermore, significant predictor variables suggest that increased sharing of photos of the self is related to decreased scores of support, whereas more frequent sharing of photos of friends is related to increased scores of support, regardless of the type of target sharing the photograph. Increased frequency of sharing photographs of the self and of family by a relative was related to an increase in support. A partner sharing more photographs depicting family or events was related to increased scores of support, whereas a partner sharing more photographs of friends was related to a decreased score of support. Close friends sharing more photographs of the self was related to increased scores of support whilst close friends sharing more photos of friends was related to decreased scores of support.

The results for the scores of intimacy suggest that older participants have lower scores of intimacy with a target regardless of target type or frequency of sharing photographs on Facebook. Colleagues are scored significantly lower for intimacy than a General Facebook Friend. Increased frequency of sharing photographs of the self, regardless of the type of target sharing the photographs, is related to a decrease in intimacy. Increased frequency of sharing by a partner of photographs of friends is related to a decrease in scores of intimacy, whereas an increased sharing of photographs of events by a partner is related to an increase in intimacy. Close friends sharing an increasing number of photographs of the self is related to increased

scores of intimacy, whereas Close Friends sharing photographs of friends is related to decreased scores in intimacy. The finding of Close Friends sharing photos of the self relating to increased intimacy scores shows the impact of the moderation term, as sharing photographs of the self across relationship targets is negatively related to intimacy.

Overall, the results of these two studies show that within normal, day-to-day Facebook sharing the frequency with which recipients receive photographs interacts with the type of photograph and the target posting them to significantly predict scores of support and intimacy. That is, research questions one and two are addressed and the following relationship is found: *Information Disclosure X Relationship Type = Relationship Quality differences*. Across all targets, photograph sharing frequency can impact the levels of support and intimacy. In addition, the type of relationship the recipient holds with the discloser, in comparison to the control group general Facebook friend, is related to different levels of relationship quality. For example, colleagues were scored less positively for both intimacy and support than a general Facebook friend. When photograph type frequency was combined with the target type, specific photograph types for different targets were found to impact on the scores of intimacy and support. Across the two variables of relationship quality, photographs when shared by particular others showed both a positive and negative effect in comparison to a general Facebook friend. For example, partners sharing more photographs of family is positively related to support, whereas partners sharing more photographs of friends is related negatively to intimacy.

This finding suggests that subtle differences in the depictions and frequency of sharing photographs can relate both positively and negatively to relationship quality. Therefore, support is found for the benefits and costs of using Facebook on social connections held with others, but critical to this research is that within standard information sharing in Facebook, across different

social circles, similar information can have positive and negative outcomes. Thus, it is concluded that even with audiences aware of their network connections and operating a flattened communication structure across social boundaries can have detrimental effects, supporting work that identified social tension across social circles when sharing information to all network types (e.g. Binder, et al., 2009; DiMicco & Millen, 2007; Marder, et al., 2012). In addition, the present work adds support for detrimental and positive effects of others evaluating information posted to Facebook (e.g. Bazarova, 2012; Walther, et al., 2008).

The present work implicates the use of boundary negotiation, as found in offline environments (e.g. Altman, 1975; Derlega & Chaikin, 1976; Petronio, 1991, 2002), to be critical to managing personal relationship in SNS environments. Knowing that different photograph content depending on the frequency with which it is shared can cause positive and negative outcomes motivates the use of site privacy settings to a fine degree to manage the recipients of different information. As Ellison et al. (2011) find, there are three strategies of information control in SNS: managing content, managing site settings and adopting selective friending behaviour. The present work supports the need to be strategic about content, by managing the different photograph depictions one posts to Facebook, managing friending behaviour, for example limiting the connections made with relatives to ensure detrimental outcomes can be negated, or by managing the privacy settings to a fine degree to ensure that information, even if relatively broad and mundane in nature, does not leak across boundaries. However, to ensure that friending can remain flexible and content varied and interesting, it is perhaps useful to continue to share this information for others to see, but control precisely who sees it to encourage continued sharing and site stickiness for users and their network connections.

When connecting with new friends, it is potentially detrimental to have an empty profile with restricted information sharing as the new friend has little information to establish what the profile holder is like, who they are and whether a continued relationship is desired. For example, as outlined in offline accounts of self-disclosure, in early relationships it is not expected to share deep information about oneself but build the content and frequency of sharing gradually as the relationship progresses (Altman & Taylor, 1973; Berger & Bradac, 1982). Therefore, different information content and disclosure availability in profiles could have mixed effects for relationship progression. However, further work is needed to investigate the general profile effects at different relationship stages with connections held in Facebook.

Further implications of the present work are the indications given by the effects of sharing photographs on Facebook to the expectancies held by targets of different relationship types. For example, when partners share more photographs of events it is related to a decrease in intimacy. This relationship could indicate that between partners, sharing photographs of events more frequently violates what is expected to be shared between partners and so is related to lower scores of intimacy. However, to fully identify this effect it is necessary to conduct further research investigating expectancies and subsequent violations, drawing on expectancy violation theory (e.g. Burgoon & Hale, 1988), including addressing other variables such as personal idiosyncrasies between communication dyads.

A surprising result is observed in the findings of the current research. For both support and intimacy, a close friend sharing more photographs of friends is negatively related to relationship quality. It is expected that close friends sharing more photographs of friends would result in increases of intimacy and support. However, the use of the control group within the dummy variable for target type may indicate differences in expected photo sharing between close

friends and general Facebook friends. It can be argued that close friends have developed a high level of intimacy and support with one another in comparison to a general Facebook friend, and newer friends, such as the control group, may expect photographs of friends to be visible to identify how one another fit into their wider social networks. For example, when commencing a relationship information is sought to get to know one another, and photographs of friends may indicate other mutual friends of interest. Therefore, in comparison to a close friend, photos of friends may be more essential or positive for generic friends than close friends, explaining the negative relationship found.

Other variables that were shown to impact on the relationship quality were age and gender. Previous research suggests varying effects of gender for self-disclosure. Females have been suggested to disclose more to males, and males disclose more to females (Brooks, 1974). In a review of self-disclosure literature it has also been suggested that females disclose more to females and disclose more generally (Collins & Miller, 1994). Kleinke's (1979) review suggests that there are no gender effects of the recipient of a disclosure, and Dindia and Allen (1992) argue there are too many inconsistencies in the effects of gender on self-disclosure, but these may be explained by additional variables. In more technological based studies of disclosure, Boneva et al. (2001) found that women spent more time online communicating with friends and family, which would suit SNS platforms, but found no gender effect for general browsing behaviour. The results presented herein demonstrate differences in recipient gender for scores of support, therefore suggesting that the outcome of gender on relationship quality differs. To calculate gender differences in disclosure it would have been necessary to include gender in the manipulation variable, however, doing so would produce another 28 independent variables and complicate the findings due to the number of terms combined within each manipulation.

Therefore, gender was controlled for at step 1, but conclusions about gender effects on disclosure cannot be drawn.

Age of the participant was also controlled for at step one of the regressions and results indicate a negative relationship between age and both support and intimacy. As with gender age could not be practically included in the manipulation term and so conclusions regarding the effects of recipient age on disclosure cannot be drawn. However, the indications from the results suggest as participants get older, their levels of support and intimacy with one another gradually decline. It could be that as individuals age, their overall levels of relationship quality flatten compared to their younger peers. However, that is not to suggest that intimacy and support are not present between older individuals, merely that less extreme values are observed.

The present research poses implications for individuals communicating via Facebook and for marketing campaigns more generally. For individuals communicating via Facebook it is necessary to understand the need to utilise some form of information control regarding photograph sharing, either through content, friending behaviours generally, or more appropriately through changing site privacy settings and creating groups that have differing access to photograph albums. By using such an approach it will be possible to ensure that only photographs with no significant effect or with positive outcomes are shared with certain others, thus avoiding degradation of a relationship through photograph sharing.

Within marketing it should be understood that campaigns that entice users to post photographs to brand pages within Facebook, may have detrimental effects on the relationships their 'fans' hold with others. Therefore, while benefitting brand awareness and critical mass of a Facebook fan page for a brand, organisation or cause, sharing photographs may be harmful to those asked to participate. It should be carefully considered what information brands are asking

their Facebook fans to share, taking care to avoid users sharing such information more widely than with the brand page itself. However, the new features of Facebook with regard to likes and advertising often disclose what users have posted to brand fan pages for their networks to see, thus enhancing the need to understand the effects of sharing day-to-day, mundane information. For example, in November 2011 Skoda ran a “Me and My Skoda” campaign via their Facebook page asking consumers to post photographs of themselves with their Skoda cars. By doing so, it is possible that the wider networks of the consumers posting photographs will be able to see these photographs and potentially cause relationship degradation based on the frequency of sharing, content of the photograph and the relationship type held with their network connections.

To conclude, research questions one and two are both supported by the results of this empirical investigation. Disclosure of photographs depicting different content, shared at different frequencies with different targets relates positively and negatively to relationship quality. In addition, the present work supports prior research identifying the need to manage boundaries offline and in SNS depending on the relationship type held, but specifically contributes by highlighting the potential outcomes of one of the most used features of Facebook, photograph sharing. As relationship qualities were measured regardless of sharing in Facebook, photo use can be said to directly relate to outcomes in real relationships, i.e. the sharing *in* Facebook can impact the relationships held *outside* of Facebook.

However, to fully understand the processes underlying the relationship between photograph sharing and relationship quality, further research is required that may consider the device used to view the photographs – e.g. viewing from a mobile phone in any environment and receiving photographs may be more intrusional than viewing photographs whilst sat at a desktop PC – the stage of relationship development, or the longevity of the effects. For instance, the

relationship identified in the present work may be momentary rather than long-lasting, similar to the effect of temporary diminished self-control from increased self-esteem observed by Wilcox & Stephen (In Press).

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