

Social Media and Relationship Development:

The Effect of Valence and Intimacy of Posts

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SOCIAL MEDIA AND RELATIONSHIP DEVELOPMENT

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Highlights
- 2
  - Both intimacy and valence of read online posts affect relationship development.
- 3
  - More intimate or negative posts decrease relationship strength.
- 4
  - The receiver’s perception of the posts mediates this effect.
- 5
  - Post perception also influences perceived homophily, which affects relationship
- 6
  - change.
- 7
  - Previous studies of offline communication found a similar pathway of mediation.

Abstract

26% of the world's population are monthly Facebook users (Facebook Newsroom, 2016). This development is supporting new interaction methods, some of which are neither directed nor reciprocated. For example, social media users can read online 'posts' (self-disclosures) of their friends without interacting with these friends. This is vastly different to traditional face-to-face communication. Our study investigated how reading online 'posts' affects relationship development. Using a longitudinal design sampling 243 participants, we focused on the effect of the posts' valence and intimacy. We found that high intimacy posts or negative posts decreased the social attractiveness of the self-discloser. The perception of the posts and the receiver's feelings of homophily to the self-discloser mediated this relationship. Studies of offline interpersonal interaction have found similar results. In offline communication, self-disclosure perception and homophily also mediate relationship outcomes. This suggests that reading posts on social media and interacting in real life triggers similar or identical relationship formation pathways. These results support the argument that passive consumption is a new method of interaction that does not fundamentally change human psychology. While novel, passive consumption is still based on the same principles as offline communication.

*Keywords:* friendship, self-disclosure, social media, psychology, relationship, contact

*Tweet, unlike, hashtag, unfriend.* Over the last five years these terms have been introduced into the Oxford English Dictionary. They are now an acknowledged part of the English language, and arguably a part of human life. Some have suggested that social media is actively reconfiguring the way people socialise. Many communication researchers stress, however, that social media is not “replacing, revolutionizing or reversing” traditional communication (Baym, Zhang, Kunkel, Ledbetter, & Lin, 2007). Instead, they think that social media adopts a supplementary role. There is therefore still debate about the change social media is causing to people's sociality. This poses a challenge to social media research. It is unclear how social media affects relationship development. Does it utilise the same processes used during offline communication, and therefore adopt a more supplementary role? Or does it affect relationship development via a completely new pathway?

Answering these questions is challenging. Some forms of social media interaction are very different to offline communication. For example, offline communication is characterised as directed and reciprocal self-disclosure (Altman & Taylor, 1973; Collins & Miller, 1994; Cozby, 1973; Greene, Derlega, & Matthews, 2006). Yet, social media users do not always take part in directed and reciprocated interaction online. Instead, they passively consume social information made available to them by these media (Burke, Kraut, & Marlow, 2011; Delia, O’Keefe, & O’Keefe, 1982; Wise, Alhabash, & Park, 2010). Passive consumption is when a person examines the social media posts of another user without interacting with them. This has become a common part of life online (Burke & Kraut, 2014; Lampe, Ellison, & Steinfield, 2006; Meenagh, 2015; Pempek, Yermolayeva, & Calvert, 2009; Utz & Beukeboom, 2011; Wise et al., 2010). However, research examining passive consumption is still sparse. Especially research about whether passive consumption and offline communication influence relationship formation differently. If we understood these possible differences, we could use previous research to understand the potential effects of social media. For example, we could then apply knowledge of offline communication to understand passive consumption. It would then be easier to outline how passive consumption affects social processes.

This study uses a new longitudinal design to mimic passive consumption. We do this to examine how passive consumption influences relationship development. Particularly, we look at the

effect of two self-disclosure characteristics: intimacy and valence. These characteristics have been shown to influence the effects of offline communication. Homophily with the self-discloser and the perception of the offline self-disclosures mediate this influence.

Are intimacy and valence also important during passive consumption? If yes, is their effect also mediated by homophily and self-disclosure perception? By answering these questions, we will gain insights into whether offline communication and passive consumption influence relationship development via similar pathways, and hence some understanding of whether social media is revolutionising or supplementing human communication. We also add significant value to the literature because of our longitudinal design. Previous research has only investigated these questions using retrospective (Lin & Utz, 2015; Rains & Brunner, 2015; Utz, 2015) or cross-sectional experimental designs (Baruh & Cemalcılar, 2015; Bazarova, 2012; Lin & Utz, 2015; Rains & Brunner, 2015).

### **Theoretical Background**

#### **Intimacy and relationship development**

Offline self-disclosure intimacy (mutual confiding) affects relationship change (Granovetter, 1973). Offline communication is often characterised as personal reciprocal interaction. In these interactions, two people disclose more and more intimate information to each other (Altman & Taylor, 1973; Collins & Miller, 1994; Derlega & Chaikin, 1977). Their relationship develops with this increasing self-disclosure intimacy (Altman & Taylor, 1973; C. R. Berger & Calabrese, 1975; C. R. Berger, Gardner, Clatterbuck, & Schulman, 1976). Higher self-disclosure intimacy promotes feelings of trust (Jourard, 1971) and increases liking (Fitzgerald, 1963; Halverson Jr. & Shore, 1969; Jourard, 1959; Taylor, Gould, & Brounstein, 1981), except when self-disclosures are too intimate (Cozby, 1972).

This research assumes that self-disclosures are reciprocal. The receivers match their self-disclosure intimacy to their partner's previous self-disclosure intimacy (Archer & Berg, 1978; Cozby, 1973; Jourard, 1959; Sprecher, Treger, Wondra, Hilaire, & Wallpe, 2013). But this is often not the

case on social media. There, users can upload and share self-disclosures with their entire social network (O'Sullivan, 2005). These 'posts' are then consumed by other users, many of whom will not interact with the posts. The receivers remain unknown to the self-discloser and there is a lack of reciprocity. Because of these large differences between passive consumption and offline communication, it is uncertain whether previous knowledge of offline communication applies to passive consumption. It, therefore, remains unclear whether the results of offline studies explain the effects of passive consumption. Recent studies have however linked online self-disclosure intimacy with increasing relationship strength (Bazarova, 2012; Utz, 2015). We, therefore, hypothesise that offline and online intimate self-disclosures affect relationship development similarly.

H1: Higher intimacy self-disclosures increase relationship closeness more than lower intimacy self-disclosures, while very high intimacy self-disclosures cause a decrease in relationship closeness.

### **Valence and relationship development**

Researchers have also found that self-disclosure valence affects relationship development. Valence indicates to what extent the information shared is positive, neutral or negative. People use positive self-disclosures to signal that they are rewarding interaction partners (Gilbert & Horenstein, 1975; Tolstedt & Stokes, 1984). This strengthens a developing relationship (Gable & Reis, 2010). These findings are applicable to social media research. Social media users post more about positive experiences (Bazarova, Choi, Schwanda Sosik, Cosley, & Whitlock, 2015; Utz, 2012). Positive posts increase relationship intimacy (Park, Jin, & Annie Jin, 2011) and liking, especially when the relationship is weak (Gilbert & Whiteneck, 1976; Rains & Brunner, 2015). Disclosure positivity of updates and private messages on social media also increases connectedness (Utz, 2015).

Furthermore, many effects found studying offline interaction replicate on social media. For example, capitalisation theory proposed that sharers of offline positive information receive many positive reactions (Gable, Reis, Impett, & Asher, 2004; Langston, 1994). Similarly, social media users with high self-esteem share more positive information online. These users then receive more positive

reactions. They are thus benefiting more from social media than users with low self-esteem (Forest & Wood, 2012). Furthermore, people assign more weight to negative than positive offline self-disclosures (Kellermann, 1984). This also occurs during passive consumption (Rains & Brunner, 2015). There is therefore ample evidence that previous research about offline self-disclosure valence can be applied to passive consumption.

H2: Positive self-disclosures increase relationship closeness more than negative self-disclosures.

### **Self-disclosure perception and homophily**

This study therefore examines how post valence and intimacy affect online relationship development. Additionally, we ask about the pathway by which these characteristics influence that process. We particularly want to determine whether this pathway is similar to the one found in studies of offline interaction. We focus on two possible mediators: self-disclosure perception and perceived homophily.

Self-disclosure perception refers to how the receivers view, evaluate and interpret the self-disclosures. We chose to study self-disclosure perception because of longstanding research results. Research has shown that self-disclosures themselves do not strengthen a relationship; rather, it is the perception of the self-disclosures that determines relationship outcomes (Altman & Taylor, 1973; Collins & Miller, 1994; Jones, 1972). Perceived appropriateness is an example of self-disclosure perception. It measures whether receivers perceive the posts as being appropriate to the social situation. During offline self-disclosure, this determines whether relationship strength increases (Collins & Miller, 1994). An inappropriate self-disclosure also hinders relationship development in an online setting (Bazarova, 2012).

We also test whether homophily influences relationship development. Homophily measures how similar the receiver feels towards the self-discloser (McPherson, Smith-Lovin, & Cook, 2001; Montoya, Horton, & Kirchner, 2008). There has been general support that homophily influences the selection of social relationships (Cohen, 1977; Duck, 1973; Kandel, 1978). Homophily of

psychological characteristics like intelligence (Almack, 1922), attitudes (Byrne, 1961; Newcomb, 1956), values (review Huston & Levinger, 1978) and behaviour (Cohen, 1977; Kandel, 1978) determines relationship formation. Some researchers thus suggest that only self-disclosures demonstrating similarity increase relationship closeness (C. R. Berger & Calabrese, 1975; Byrne, 1961). Laboratory experiments also demonstrated that perceived homophily causes higher levels of social attraction (Byrne & Griffitt, 1973). Homophily is even of importance when two people have minimal contact (Hampton & Wellman, 2000). Additionally, social media research has demonstrated that Facebook users with homogeneous personal values and personality are more likely to be friends (Lönnqvist & Itkonen, 2016).

There are many hypotheses why homophily increases attraction towards a person (for reviews see Huston & Levinger, 1978; McPherson et al., 2001). Cognitive theories suggest that to achieve consistent mental states people feel attracted to similar people (C. R. Berger & Calabrese, 1975; Festinger, 1957; Heider, 1958; Huston & Levinger, 1978). It could also be that people who respond in similar ways increase comfort and self-esteem (Arrowood & Short, 1973; C. D. Johnson, Gormly, & Gormly, 1973; Leonard, 1975). Similar people are likely to help each other more in the future (D. W. Johnson & Johnson, 1972; Karylowski, 1976; Sole, Marton, & Hornstein, 1975; Stapleton, Nacci, & Tedeschi, 1975). Additionally, the rewarding nature of homophily can reinforce a relationship (Altman & Taylor, 1973) and reduce uncertainty (C. R. Berger & Calabrese, 1975). Homophily could thus be mediating the influence of self-disclosure perception on relationship development.

H3: Self-disclosure intimacy affects relationship development, with perception of a) self-disclosure appropriateness and b) homophily mediating this effect.

H4: Self-disclosure valence affects relationship development, with perception of a) self-disclosure appropriateness and b) homophily mediating this effect.

## Method

### Participants



Our longitudinal experiment mimicked the process of passive consumption. Study recruitment took place in two parts. We recruited for the experimental manipulation conditions and the control condition separately. Using print and social media advertising at two universities, we first recruited 209 participants for the experimental condition. If the participants completed the study, they could win a main prize of £100 or 4 runner-up prizes of £25. For the control condition, we used the same advertising methods to recruit a further 57 participants directly after the first recruitment wave. If these participants completed the study they could win a raffle prize of £50. In total, 243 participants (91% of recruited participants) completed the study (167 female, 72 male, 4 did not disclose; mean age  $22.47 \pm 5.59$  years).

## **Procedure**

We used the Qualtrics survey platform to conduct the study. In the first participant information window participants gave informed consent. They then completed a variety of questions about their demographics and Facebook use. Participants were told they would be paired with a person (a fictional avatar, from now on called the ‘target’). This target would send them a social media post every day for the next twelve days. Participants could read the target’s very basic Facebook profile showing her name, hometown and university. The target’s profile picture was a composite picture of a female face of white ethnicity (Little Lab University of Stirling, 2016).

Participants were asked to rate how close they felt to the target using a variety of measures that will be explained in more detail below. After finishing the questionnaires, the participants needed to submit a valid email address. This was necessary so that they could receive the target’s daily posts for the next twelve days. The posts consisted of a picture (of a non-animate scene) and a caption, like posts uploaded to Instagram or Facebook. Participants recruited for the experimental conditions were randomly allocated to one of four conditions. For three of the experimental conditions participants received either high, medium or low intimacy self-disclosures. 15 non-psychology graduate students pretested these self-disclosures. This was to ensure the posts only varied in intimacy and not valence. The valence scores did not change across conditions ( $F(2,35) = 0.065, p = 0.937$ ). The three

conditions did show different mean intimacy ratings ( $F(2,35) = 130.78, p < 0.001$ , all post-hoc Tukey's HSD tests significant).

The participants in the previous three conditions received self-disclosures of mixed valence. Participants in the fourth experimental condition however received posts of only positive valence. Their posts were of the same intimacy as in the low intimacy/mixed valence condition. Seven pre-test participants ranked the posts' valence and intimacy. A  $t$ -test showed a significant difference in the valence of the mixed ( $M = 3.82, S.D. = 1.82$ ) and positive valence ( $M = 2.58, S.D. = 1.13$ ) conditions ( $t = 5.28, df = 138.67, p < 0.001$ , equal variances not assumed). There was no difference in the intimacy of the mixed ( $M = 3.69, S.D. = 1.58$ ) and positive valence ( $M = 3.73, S.D. = 1.52$ ) conditions ( $t = -0.149, df = 166, p = 0.88$ , equal variances assumed). Participants allocated to the control condition did not receive any photos or self-disclosures. When clicking on the link to the target's posts they were only shown her picture and name.

Participants who opened at least 10 of the 12 posts were included in the study. On the last day, participants completed a final questionnaire. It contained questions about their feelings of social connection to the target, like in the questionnaire they had completed on day 1. They were also asked about their perception of the target's post (e.g. how appropriate they felt the posts had been).

## Measures

### Facebook use.

Participants completed two measures about their Facebook use. One was an adapted version of the Facebook Intensity Scale (Ellison, Steinfield, & Lampe, 2007). We removed a question about the participant's number of Facebook friends from the original version. We did this because the relationship between a user's amount of Facebook friends and their intensity of social media use is complex (Brandtzæg, Lüders, & Skjetne, 2010; Tong, Van Der Heide, Langwell, & Walther, 2008; Utz, 2010). The questionnaire asked how long the participants spend on Facebook per day (6-point Likert scale ranging from "less than 10 minutes" to "more than 3 hours"). It also measured the intensity and habitual nature of their Facebook use (e.g. "Facebook is part of my everyday activity";

7-point Likert scale ranging from “strongly disagree” to “strongly agree”). To create a single measure, we transformed all scores to fit a 7-point Likert scale. We then calculated their mean and used a log transformation (Cronbach’s  $\alpha = 0.81$ ).

We also used a self-designed measure to examine use of Facebook for different activities. Participants were asked to rate to what extent they used Facebook for different kinds of activities (e.g. “I use Facebook to stay in touch with friends and family”; 7-point Likert scale ranging from “very infrequently” to “very frequently”). The scale was similar to the one devised by Papacharissi & Mendelson (2011).

### **Relationship Measures.**

The study included seven relationship measures examining the participants’ feelings towards the target. The measures examined attributional confidence, social attraction, homophily, connectedness, social network integration, perceived closeness and social support provision. Participants completed these measures at the beginning (time 1) and at the end (time 2) of the study.

Attributional confidence measures the participants’ confidence predicting the target’s actions and feelings. We used the Attributional Confidence Scale developed by Clatterbuck (1979). It asked participants about their confidence predicting the target’s mental states (e.g. “How accurate are you at predicting Jennifer’s attitudes?”;  $\alpha_{\text{time 1}} = 0.90$ ,  $\alpha_{\text{time 2}} = 0.90$ , 5-point Likert scale ranging from “not well at all” to “extremely well”). The social attraction questionnaire measured motivation to develop a social relationship with the target. It was first developed by McCroskey & McCain (1974) to determine whether “individuals would like to become friends with the target or whether they would like to spend some time with the target” (Utz, 2010). Participants were asked to what extent they agree with 9 different statements (e.g. “I would like to meet Jennifer”; Cronbach’s  $\alpha_{\text{time 1}} = 0.84$ , Cronbach’s  $\alpha_{\text{time 2}} = 0.94$ , 7-point Likert scale ranging from “strongly disagree” to “strongly agree”).

The homophily scale measured how similar the participants feel to the target. We used the Perceived Homophily Measure developed by McCroskey, Richmond, & Daly (1975). It lets participants use three slider scales to show the extent to which the target is similar to them, behaves

like them or thinks like them (Cronbach's  $\alpha_{\text{time } 1} = 0.92$ , Cronbach's  $\alpha_{\text{time } 2} = 0.95$ , 1 to 100 scale ranging from "strongly disagree" to "strongly agree").

To measure connectedness, we used a measure similar to the one developed by Utz (2015). Participants used a 1 to 100 slider scale to show how connected they felt to the target (ranging from "not at all" to "very connected"). To minimise memory cues when they repeated the questionnaire 12 days later, participants were not shown the exact number they had placed their slider on. Using a similar slider scale, we measured the integration of the target into the participants' social network. We used friendship layers identified by Sutcliffe, Dunbar, Binder, & Arrow (2012) as a scale. The researchers proposed that there are layers in human social networks. Each layer comprises a specific number of people. On average, individuals have 5 intimate friends, 15 best friends, 50 good friends, 150 friends, 500 acquaintances and 1500 people they recognise. Each of these layers is inclusive of the layers within them (Zhou, Sornette, Hill, and Dunbar 2005). These layers have been found in online (Dunbar, Arnaboldi, Conti, & Passarella, 2015) and offline (Hill & Dunbar, 2003) social networks. In our study, we used a slider scale transposed on a visual representation of these friendship layers. Participants were asked to show in what layer they would place the target (ranging from "1, my closest friend" to "1500, someone I would recognise").

In addition, we included the Inclusion of the Other in the Self Scale to examine the perceived closeness of the target (Aron, Aron, & Smollan, 1992). The scale uses seven pairs of differently overlapping circles as visual representations of relational closeness. Participants choose the pictorial representation that represents their perceived closeness to the target (from "not at all overlapping" to "almost fully overlapping"). A meta-analysis has proven this to be a very meaningful and reliable scale (Gächter, Starmer, & Tufano, 2015).

The last measure used in this study was the MOS Social Support Survey. It quantified the participants' motivation to provide the target with social support (Sherbourne & Stewart, 1991). Rains & Brunner (2015) modified this scale to include four questions each about informational support and emotional support. Participants were asked whether they agree with eight different statements about providing the target with support (e.g. "I would listen to Jennifer if she needs to talk"; Cronbach's

$\alpha_{\text{time } 1} = 0.93$ , Cronbach's  $\alpha_{\text{time } 2} = 0.92$ , 7-point Likert scale ranging from "strongly disagree" to "strongly agree").

#### **Post perception measures.**

After completing the second questionnaire (on the study's twelfth day), participants were asked to state how they had perceived the target's posts. We used a measure like the one used by Utz (2015), who had adapted the questionnaire from Barash, Ducheneaut, Isaacs, & Bellotti (2010). Using six different 5-step continua, participants indicated how positive, intimate and entertaining the posts had been. There were two continua each for valence (Cronbach's  $\alpha = 0.79$ ), intimacy (Cronbach's  $\alpha = 0.80$ ) and entertainment (Cronbach's  $\alpha = 0.81$ ). We also used a scale developed by Bazarova (2012). Participants completed four different 5-point continua indicating how appropriate for social media the posts had been (e.g. "inappropriate to appropriate"; Cronbach's  $\alpha = 0.87$ , 5-point Likert scale).

#### **Statistical Analysis**

Our SPSS analysis of the data follows a specific seven-part analytical strategy. Firstly, we use a three-stage preliminary analysis to ensure our experimental design and data are valid. We examine the measures' correlations to spot any unusually high inter-correlations between questionnaires. We then use exploratory factor analyses to see whether these questionnaires are measuring the same concept. In a second preliminary analysis, we investigate whether changes in our relationship measurement are due to our experimental manipulation. We do this to control for any exposure effects (that the participants saw the target's face and name 12 days in a row). If changes are due to an exposure effect, we should not see any difference when comparing experimental and control conditions. We only use measurements that show a significant difference in our further analyses. Lastly, we also examine the effect of our intimacy manipulation. Participants' attributional confidence scores should rise with increasing intimacy of received posts. If the manipulation worked, participants in higher intimacy conditions should have higher attributional confidence scores than participants in lower intimacy conditions.

Having done this, we proceed with hypothesis testing. We use a repeated measures MANCOVA, controlling for age, gender and intensity of Facebook use to examine whether post intimacy (H1) and valence (H2) affect relationship development. To determine the effect of intimacy, we analyse the three conditions with equal valence but varying intimacy levels. To examine the effect of valence, we analyse the two conditions with equal intimacy but varying valence levels.

We also analyse post perception and perceived homophily. Do they mediate the effect of intimacy (H3) and valence (H4) on relationship change? To examine mediation effects, we use a Hayes Process regression analysis, controlling for age, gender and intensity of Facebook use (Hayes, 2012; Model 6). In this model we use perceived appropriateness as the measure of post perception. If, however, this model fails, we will repeat our analysis using a slightly different model. We will then use perceived intimacy or perceived valence as our post perception measure. In that case we will use perceived appropriateness as a covariate.

Hayes' approach to mediation does not require the dependent variables to significantly affect the independent variables. Instead, the approach assesses the indirect path and its significance (Hayes, 2009; for further examples see Rucker, Preacher, Tormala, & Petty, 2011). In the model, we used the default bootstrapping method which is part of the SPSS Hayes mediation testing macro (Hayes, 2012). For this, any path is interpreted as being significant if the 95% bias corrected bootstrap confidence intervals (based on 10 000 samples) are non-zero.

## Results

### Descriptives

We collected the following data for our analyses: the participants' feelings towards the target at the beginning and end of the study (Table 1), the participants' perception of the target's posts (Table 2), the participants' intensity of Facebook use ( $M = 1.39$ ,  $SD = 0.14$ ) and whether the participants use social media to keep track of events ( $M = 4.79$ ,  $SD = 1.98$ ), stay in touch with friends ( $M = 5.37$ ,  $SD = 2.12$ ), meet new people ( $M = 3.02$ ,  $SD = 1.98$ ), talk about politics ( $M = 3.73$ ,  $SD =$

1.99), get to know people they would not have otherwise ( $M = 2.97$ ,  $SD = 2.10$ ), share their opinion ( $M = 3.54$ ,  $SD = 1.98$ ) or have fun ( $M = 4.78$ ,  $SD = 1.81$ ).

**Table 1:** Descriptive statistics of the relational measures measured at the beginning of the experiment (Time 1) and the end of the experiment (Time 2)

	Time 1		Time 2	
	M	SD	M	SD
Attributional Confidence	1.41	0.63	1.87	0.80
Social Attractiveness	3.98	0.65	3.54	1.11
Perceived Homophily	42.30	14.75	30.40	21.11
Social Support	4.00	1.24	4.06	1.21
Connectedness	8.56	14.48	21.20	20.63
Integration into the Social Network	1213.49	354.09	979.58	375.55
Inclusion of the Other in the Self Scale	1.40	0.74	1.67	0.92

**Table 2:** Descriptive statistics of the post perception measures, separated by condition (does not include control condition, which did not present the participants with any self-disclosures)

	Low Intimacy Mixed Valence		Medium Intimacy Mixed Valence		High Intimacy Mixed Valence		Low Intimacy Positive Valence	
	M	SD	M	SD	M	SD	M	SD
Perceived Intimacy	2.25	1.04	2.94	0.87	3.95	0.90	2.28	0.89
Perceived Valence	3.08	0.77	2.97	0.72	1.87	0.61	3.32	0.78
Perceived Entertainment	1.92	0.91	2.12	0.83	1.88	0.74	1.86	0.85
Perceived Appropriateness	3.24	0.94	3.55	0.86	2.54	0.74	3.15	0.92

## Preliminary Factor Analyses

Attributional confidence and connectedness were unusually highly correlated (Time 1  $r_{243} = 0.50$ , Time 2  $r_{243} = 0.43$ ). Connectedness was measured using only one question immediately after the

attributional confidence questionnaire. We hypothesised that the attributional confidence questionnaire primed participants when they indicated connectedness. The connectedness question therefore did not measure an independent construct. This can be tested using an Exploratory Factor Analysis. We used a principal component analysis with oblimin rotation for the attributional confidence questionnaire and the connectedness measure (using the scores from the first study questionnaire) to explore this. The KMO of the analysis was 0.864, indicating there is a good sampling size and Bartlett's Test of Sphericity was  $\chi^2 = 1120.17$ ,  $p < 0.001$  indicating the correlations were sufficiently large. The first factor explained 62.3 % of the variance, while adding a second factor explained only 14.5% more. The scree plot's inflection point also supported a one factor solution. We, therefore, decided not to include connectedness in our analyses.

### Controls

We then compared the relationship measure changes during experimental and control conditions. For this we transformed all measures to fit a 1 to 100 scale and used a repeated measures MANOVA. We found an interaction between the change in relationship measures and whether the participant was part of an experimental manipulation group (Wilks' Lambda  $F(6, 236) = 8.76$ ,  $p < 0.001$ ). The experimental manipulation therefore changed relationship measures over and above an exposure effect. Measures of social support, perceived closeness and integration into the social network were not affected by experimental manipulation (Table 3). The experimental manipulation, however, increased attributional confidence, and decreased social attraction and homophily, over and above the exposure effect. A more detailed analysis of these three measures is thus required. Three outliers showing extreme changes in homophily (changes above 49) or social attractiveness scores (changes below -4.1) were excluded. This made the homophily and social attractiveness distributions normal. These exclusions did not affect the results of our analyses for H1-H4.

**Table 3:** Results of a repeated-measures MANOVA showing both the main effect and the effect of the condition.

	Effect of Manipulation	
	F (1, 240)	p
Attributional Confidence	36.62	0.00



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Social Attractiveness	6.47	0.01
Perceived Homophily	9.60	0.00
Social Support	0.84	0.36
Perceived Closeness	1.28	0.26
Integration into the Social Network	0.19	0.66

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### Attributional Confidence

We next used a repeated measures ANOVA to compare the attributional confidence scores of participants in different experimental conditions while controlling for age, gender and intensity of Facebook use. We found that attributional confidence is affected by the participants' condition ( $F(4,181) = 13.25, p < 0.001, \eta^2 = 0.18$ ). When examining post-hoc tests (without covariates and with a Bonferroni correction applied), we found no difference in the attributional confidence scores for participants in conditions with different valence characteristics but equal intimacy levels ( $MD = 2.31, SE = 3.24, p = 1.00$ ). There was no significant difference in participants' attributional confidence scores in the low and medium intimacy conditions ( $MD < 6.85, SE < 3.20, p > 0.20$ ). High intimacy posts, however, caused larger increases in attributional confidence than low intimacy ( $MD < 18.81, SE < 3.25, p < 0.001$ ) and medium intimacy posts ( $MD = 11.96, SE = 3.20, p = 0.001$ ). Thus, our manipulation – at least when comparing low/medium and high intimacy posts – worked. The results, however, also suggest that while the low and medium intimacy conditions were perceived to be of different intimacy levels, they caused no difference in attributional confidence. Thus the intimacy difference at lower intimacy levels is unlikely to have affected the relationship outcomes this study was measuring.

### The Effect of Intimacy

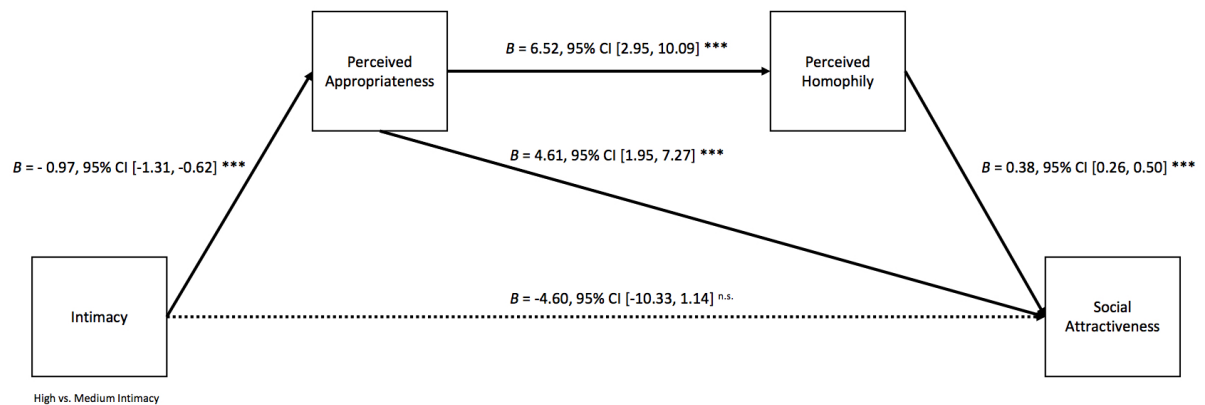
Self-disclosure intimacy significantly affected relationship change during the study. Relationship change was measured using social attractiveness and perceived homophily. We demonstrated intimacy's effect using a repeated measures MANCOVA, controlling for age, gender

and intensity of Facebook use ( $F(4,268) = 3.81, p < 0.01$ ). Social attractiveness decreased significantly more in the high intimacy compared to the low intimacy condition ( $MD = -6.44, SE = 2.63, p < 0.05$ ). It also decreased more in the high intimacy compared to the medium intimacy condition ( $MD = -7.89, SE = 2.59, p < 0.01$ ). Furthermore, there was a trend that perceived homophily decreased more in the high intimacy compared to medium intimacy condition ( $MD = -7.18, SE = 3.12, p = 0.07$ ). High intimacy posts, therefore, caused a decrease in relationship closeness. This partially supports H1. Again, there was no difference between relationship change in low and medium intimacy conditions. The intimacy levels in the low and medium intimacy conditions were perceived to be different. But it could be that intimacy changes at low intimacy levels do not affect relationship change.

Did perceived appropriateness and homophily mediate self-disclosure intimacy's influence on social attraction? We found that perceived appropriateness differs across conditions,  $F(2,141) = 17.54, p < 0.00$ . High intimacy self-disclosures were perceived to be more inappropriate than medium intimacy ( $MD = -1.00, SE = 0.17, p < 0.001$ ) and low intimacy ( $MD = -0.71, SE = 0.18, p < 0.001$ ) self-disclosures. When comparing low and medium intimacy conditions we found no difference in perceived appropriateness ( $MD = 0.29, SE = 0.17, p = 0.29$ ). This supports our previous hypothesis; low and medium intimacy conditions did not affect attributional confidence or relationship measures differently. In our following mediation analyses, we therefore did not investigate the change between low and medium intimacy. We only investigated 'oversharing', comparing the high vs. medium intimacy conditions. Comparing the high intimacy condition to a combined medium and low intimacy condition gave the same results.

Our Hayes process mediation model, as described in the *Methods*, was significant ( $r^2 = 0.22, p < 0.001$  see Figure 1). Oversharing decreased perceived appropriateness (Unstandardized  $B = -0.97, SE = 0.18, t = -5.52, p < 0.001, 95\% CI [-1.31, -0.62]$ ), which in turn decreased perceived homophily (Unstandardized  $B = 6.52, SE = 1.81, t = 3.61, p < 0.001, 95\% CI [2.95, 10.09]$ ). Both perceived homophily (Unstandardized  $B = 0.38, SE = 0.06, t = 6.21, p < 0.001, 95\% CI [0.26, 0.50]$ ) and appropriateness (Unstandardized  $B = 4.61, SE = 1.35, t = 3.43, p < 0.001, 95\% CI [1.95, 7.27]$ )

predicted the social attractiveness of the target. This supported H3. Sharing intimate self-disclosures online decreased social attractiveness indirectly. Perceived appropriateness mediated this relationship. Perceived appropriateness also influenced perceived homophily, which is - in turn - influenced social attractiveness.



**Figure 1:** Representation of the regression analyses showing an indirect relationship between intimacy and social attractiveness. Intimacy influences perceived appropriateness which in turn influences levels of perceived homophily and social attractiveness. Perceived homophily also significantly influences social attractiveness. [ $p < 0.05 = *$ ,  $p < 0.005 = **$ ,  $p < 0.001 = ***$ ]

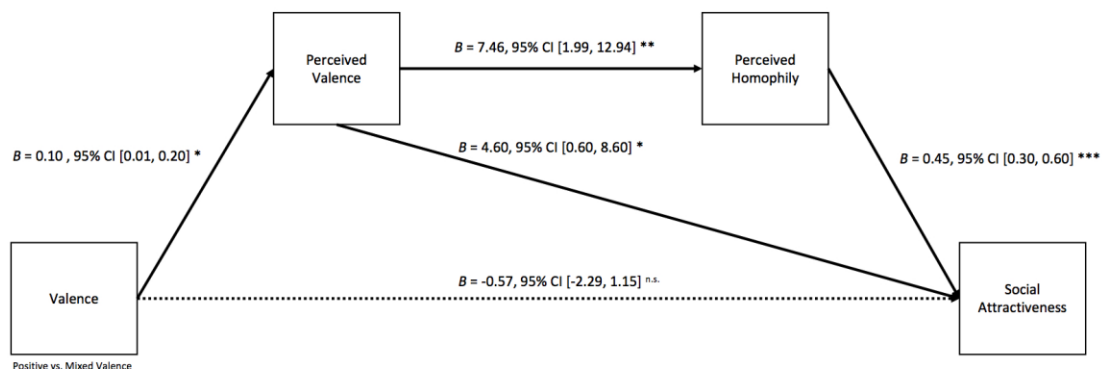
### The Effect of Valence

Next we examined whether self-disclosure valence affected relationship development; for this, we used a MANCOVA, controlling for age, gender and intensity of Facebook use. We found that valence did not affect relationship change ( $F(2,86) = 0.031$ ,  $p = 0.97$ ). It induced no changes in perceived homophily or social attractiveness scores ( $F(1,87) < 0.06$ ,  $p > 0.81$ ). Perceived appropriateness of the self-disclosures also showed no change ( $MD = 0.07$ ,  $SE = 0.19$ ,  $t = 0.35$ ,  $p = 0.73$ ). Thus, H2 was not supported.

To examine H4, we planned to test whether perceived appropriateness and homophily mediated valence's influence on social attractiveness. However, there was no significant relationship between valence and perceived appropriateness ( $B = -0.03$ ,  $SE = 0.06$ ,  $t = -0.45$ ,  $p = 0.65$ ). So

perceived appropriateness could not be a mediator. We, therefore, tested our mediation model using perceived valence instead of perceived appropriateness. To use perceived valence, we needed to exclude an additional outlier. The outlier had received mixed valence posts but had rated the posts as extremely negative throughout the study. This exclusion affected the relationship found between valence and appropriateness.

Our Hayes regression model was successful ( $r^2 = 0.21$ ,  $p < 0.0001$ , see Figure 2). Lower self-disclosure valence predicted lower perceived valence ( $B = 0.10$ ,  $SE = 0.05$ ,  $t = 2.16$ ,  $p < 0.05$ , 95% CI [0.01, 0.20]). Low perceived valence in turn predicted lower perceived homophily ( $B = 7.46$ ,  $SE = 2.75$ ,  $t = 2.71$ ,  $p < 0.01$ , 95% CI [1.99, 12.94]). Both perceived valence ( $B = 4.60$ ,  $SE = 2.01$ ,  $t = 2.29$ ,  $p < 0.05$ , 95% CI [0.60, 8.60]) and perceived homophily predicted the target's social attractiveness ( $B = 0.45$ ,  $SE = 0.08$ ,  $t = 5.96$ ,  $p < 0.001$ , 95% CI [0.30, 0.60]). Perceived valence therefore mediated the relationship between self-disclosure valence and perceived homophily. Perceived valence and homophily in turn influenced the target's social attractiveness. This partially supported H4.



**Figure 2:** Representation of the regression analyses showing an indirect relationship between valence and social attractiveness. Valence influences perceived valence which in turn influences levels of perceived homophily and social attractiveness. Perceived homophily also significantly influences social attractiveness. [ $p < 0.05 = *$ ,  $p < 0.005 = **$ ,  $p < 0.001 = ***$ ]

## Discussion

We examined the effects of passively consuming a target's social media posts. Posts of higher intimacy decreased the target's social attractiveness and perceived homophily ratings. This partially supported H1. Post valence did not influence these relationship measures, not supporting H2. The result of most interest, however, concerns the pathways used by these two effects. Post perception and perceived homophily mediated the effect of intimacy and valence on social attractiveness. Perceived post appropriateness and homophily mediated the influence of post intimacy on the target's social attractiveness. This supported H3, see Figure 1. Perceived post valence and homophily mediated the influence of post valence on the target's social attractiveness. This partially supported H4, see Figure 2. Experiments examining offline relationship development have demonstrated similar results. Self-disclosure perception and perceived homophily also mediate how face-to-face self-disclosures affect an offline relationship. Therefore, online and offline self-disclosures affect relationship development via a similar (or identical) pathway. Our results thus suggest that passive consumption, while a novel form of communication, is, nonetheless, governed by the same or similar rules as interpersonal face-to-face communication.

### **Intimacy**

Previous friendship formation theories have directly linked self-disclosure intimacy to relationship strength (Altman & Taylor, 1973). Our study suggests otherwise. We found that perceived appropriateness and homophily mediated how intimacy affects relationship development. It is not the self-disclosures themselves, but their interpretation that determines relationship change (Marston, 1976). Posts deemed inappropriate hinder relationship development, instead of supporting it (Bazarova, Taft, Choi, & Cosley, 2012; Collins & Miller, 1994).

People who abide by others' social norms and behave appropriately are liked more (Chaikin & Derlega, 1974; Chelune, 1976). Especially because shared expectations are a key constituent of culture (P. L. Berger & Luckmann, 1966). Culture motivates people to act towards an outcome of mutual benefit (Curry, Roberts, & Dunbar, 2013). Thus, the evolutionary reasons why self-disclosure appropriateness influences social attraction become clear. Internet communities create their own cultures and norms concerning self-disclosure (Miller et al., 2016); this in turn impacts on how social

media self-disclosures influence social attraction (Bazarova, 2012). Many online communities dislike “oversharing” and in our study high intimacy posts were perceived to be inappropriate. This decreased both perceived homophily and social attraction towards the target. Thus, in both online and offline environments norms are present and influential.

Perceived appropriateness of self-disclosures also predicted perceived homophily. In turn, perceived homophily influenced the social attractiveness of the target. This is in line with previous studies examining offline interaction. These demonstrated the importance of homophily in human social networks: people form social ties with those who are most like them (C. R. Berger & Calabrese, 1975; for review see McPherson et al., 2001). Shared attitudes stimulate positive feelings that support the formation of a social connection (Byrne, 1961). This is especially the case at the beginning of a social relationship (Duck & Spencer, 1972). The outcome differs if participants note something dissimilar between them and the target. Then new information about the target has a higher chance of being interpreted as supporting dissimilarity. This leads to less liking (Norton, Frost, & Ariely, 2007). Our study replicates this homophily effect found offline in an online context.

#### **Valence**

Perceived valence and homophily mediated how post valence influences relationship development. Previous research supports these findings. Positive posts have been found to increase liking more than negative posts (Bazarova, 2012; Rains & Brunner, 2015). People who are perceived as more positive, are also seen as more attractive, helpful and approachable (Altman & Taylor, 1973; Gilbert & Horenstein, 1975; Rains & Brunner, 2015; Tolstedt & Stokes, 1984). The valence part of our study also re-demonstrated the importance of perceived homophily. Homophily influenced the target’s change in social attractiveness in both our valence and intimacy models.

H4 was, however, not completely supported. We found no relationship between post valence and perceived appropriateness. This may have been because both valence conditions contained self-disclosures of low intimacy. Low intimacy social media posts might be generally perceived as appropriate. It could also be that our conditions lacked the breadth of valence levels needed to evoke a

change in appropriateness scores. Particularly, the study lacked an all negative self-disclosure condition.

While valence did not affect perceived appropriateness, post perception was still of high importance: perceived valence influenced relationship development. We, therefore, demonstrated the importance of post perception during passive consumption. When varying both valence and intimacy characteristics separately, post perception was a mediator of their effect on relationship change.

### **Implications for Theory and Practice**

This longitudinal study complements and extends previous cross-sectional and retrospective research findings. The study's results support previous findings that self-disclosure valence (Park et al., 2011; Utz, 2015) and intimacy (Bazarova, 2012; Rains & Brunner, 2015; Utz, 2015) influence relationship development. This has practical implications for social media users and what they should share to increase how their online friends like them. Furthermore, this is of interest to campaigning and advertisement on social media, as they have as their goal to create social bonds with users. For both situations, our study demonstrates that excessive intimacy and negativity is detrimental not only in offline communication but in online sharing.

More importantly, this study examined possible mediators of these effects. Homophily and self-disclosure perception have been shown to influence the effect of offline self-disclosure characteristics. We investigated whether these factors also influence the effects of passive consumption. We therefore integrate knowledge about offline interaction into the social media research literature. This consolidation improves our understanding of the nature and characteristics of passive consumption.

Our results also influence broader interpretations about the nature of social media. We found that passive consumption and offline communication influence relationship development via a similar pathway. This shows that there is no fundamental difference in how humans process interactions in those two environments. Passive consumption might differ substantially from interpersonal communication, however it is not "replacing, revolutionizing or reversing the impacts of other

interpersonal communication modes” (Baym et al., 2007). Our results thus seem to negate the claim that social media fundamentally changes the psychology and methodology of human communication.

In sum, it seems that passive consumption might not revolutionise human psychology and communication after all. Yet, even when using similar pathways, it can still lead to very different social outcomes from interpersonal communication. By analogy, the process of baking is always very similar (you mix wet and dry ingredients, put them into a baking tray and bake them at a high temperature), but you can get a very different outcome if the ingredients are altered or changed in dosage. Thus social media seems to affect relationship development via similar pathways as interpersonal communication, yet social media and passive consumption can still cause very different social outcomes.

### **Limitations and Future Directions**

One major limitation of this study, already mentioned above, was the small range of valence conditions. To investigate valence, we compared a condition with only positive posts to a condition with both positive and negative posts. We did not have a condition with only negative posts. With this third condition included, we might have found a correlation between valence and perceived appropriateness. To ensure our findings illustrate the range of valence effects, a replication study with more valence conditions would be helpful.

Furthermore, the difference between low and medium intimacy conditions did not affect experimental relationship measures. The participants did perceive the conditions to be of different intimacy levels (shown in the pre-test and experimental perceived intimacy measure). Yet, this did not evoke a difference in relationship measures. There might have been a too small difference in intimacy between the conditions. Another explanation is that changes at low and medium intimacy levels do not affect relationship change.

Due to the controlled experimental nature of the study, we needed to sacrifice some ecological validity. The target was an unknown avatar, not a known person taken from the



participants' social networks. Furthermore, there was no naturalistic setting for passive consumption because it did not occur on a social media site. Ecological validity is a common problem with experimental manipulations. Our results however replicate previous findings obtained using more naturalistic cross-sectional or retrospective methods (Lin & Utz, 2015; Rains & Brunner, 2015; Utz, 2015). It, therefore, does not seem likely that the lack of ecological validity significantly affected our study.

### Conclusion

In this study we investigated the effects of passively consuming self-disclosures on social media. In particular, we examined whether passive consumption and offline communication cause different relational changes. To do this, we successfully used a novel longitudinal manipulation mimicking passive consumption. We demonstrate that self-disclosure valence and intimacy affect online relationship development. The same effect has been shown during offline relationship development. In both instances, the perception of the self-disclosures and perceived homophily with the self-discloser mediates this effect. Our study therefore suggests that online and offline self-disclosures affect relationship development via a similar (or identical) pathway. The study establishes a firm link between studies of offline and online interaction. This gives further support to the growing body of research treating passive consumption as a new communication method, based on the same principles as traditional face-to-face communication.

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