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**The extended warming effect of social media: Examining whether the cognition of
online audiences offline drives prosocial behavior in ‘real life’**

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Abstract

Online audiences (e.g. Facebook friends, Instagram followers) shape users’ self-presentation online, but little is known about whether or not they impact users’ actions in ‘reality’, so offline, when they are not engaged directly with a site interface. To bridge this gap, we provide the first investigation of the ‘extended warming effect’ of social media, a special form of a phenomenon in which saliency (cognition) of online audiences in offline encounters triggers impression management behavior in the pursuit of a more desirable online public image. Across two controlled experiments in the context of charity fundraising, we support the existence of the extended warming effect. We find that as online audiences become more salient, people show greater intentions of engaging in prosocial behavior offline (e.g. enhanced likelihood of making a donation). This effect is mediated by higher public self-awareness and extrinsic motivations. In addition, we find that the extended warming effect is amplified for more intense social media users. Theoretical contributions and practical implications are discussed.

Keywords: Social Media; Charity; Warming effect; Self-awareness; Impression Management; Prosocial

1. Introduction

Facebook friends, Instagram and Twitter followers, known collectively as “our” online audience, are widely known to shape the selves we present on these sites (Bareket-Bojmel, Moran, and Shahar, 2016; Johnson and Ranzini, 2018; Rui, 2018). We frequently engage in impression management of our online persona to distil a more desired image in the minds of these audiences. However, the way we appear online also extends into the offline world, having the profound effect of impacting our exhibited behavior ‘in reality’. This goes some way to explaining why Generation Z (those born after the mid-90s) are frequently referred to as generation ‘boring’, with lower levels of engagement in risqué offline behaviors (sex, alcohol and other drugs) as compared to previous generations (Iqbal, 2018).

Recently, Marder et al. (2016) provided seminal empirical support for the influence of online audiences on individuals’ offline impression management behavior, coining the resulting phenomenon as the ‘extended chilling effect’ of social media; that is, the constraining of behavior in reality (i.e. offline) as a consequence of the perceived expectation these online audiences hold. Whilst this prior work paints a somewhat black ‘Orwellian’ image of social media, the authors hint at the possibility for a flip side to the ‘chilling’ outcomes, where online audiences also have the potential to stimulate positive behavioral outcomes. Responding directly to Marder et al.’s (2016) calls for further exploration of this phenomenon, the current research introduces and provides the first examination of the extended ‘warming effect’ of social media.

Whether the effect of online audiences on an individual’s behavior in ‘reality’ (behaviors that do not occur directly with the site interface) is *warming* or *chilling*, depends on the goal-directed behavior of the individual. Indeed, Marder et al. (2016) coined the extended chilling effect as an impression management device to mitigate undesired images being projected to online audiences (i.e. negatively directed impression management). They

showed the key trigger for this was an increase in public self-awareness, which manifests in situations where online audiences become salient in an offline setting. However, there is also a potential flip side to the coin. Heightened public self-awareness can stimulate approach-based behaviors, which include activities that are implemented to create a positive self-referent point (Carver and Scheier, 2001; Froming, Walker, and Lopyan, 1982). We call this *positively directed impression management* (PDIM). As such, we propose and investigate the extended warming effect, that is, the notion that heightened awareness of online audiences in the offline domain leads to PDIM to be enacted offline.

This research provides three theoretical contributions to extant work on impression management associated with social media. First, we provide the earliest empirical support for the extended warming effect of social media. The research is executed in the context of charitable giving offline. We show that when individuals are confronted with an opportunity to act prosocially in reality (e.g. donate to charity, sign a climate change petition), greater PDIM is enacted when online audiences become salient. For example, if a person is thinking about social media and their follower base (i.e. online audiences) when being invited to make an offline charitable contribution, they respond in a more prosocial manner – ultimately, donating more money.

Second, based on Objective Self-awareness theory (Duval and Wicklund, 1972), often used to conceptualize the trigger for impression management (Leary, 1995), we unpack the process behind the extended warming effect, therefore developing, testing and validating a model that can be used in subsequent studies examining the phenomenon. Specifically, the model shows that when online audience saliency is high, a person experiences increased public self-awareness, which enhances their extrinsic motivation to behave prosocially. In turn, this drives PDIM.

Third, we examine the moderating role of social media intensity on PDIM (Ellison, Steinfield, and Lampe, 2007). Principally, we test whether the extended warming effect is more pronounced for people who are more (versus less) intense social media users. Lastly, we provide actionable implications for charities and site designers.

2. Conceptual Background

2.1 Surveillance, impression management, and self-awareness

When in the presence of others, individuals – intentionally or otherwise – act and express themselves in a carefully controlled manner that builds their identity (Leary and Kowalski, 1990). Individuals regularly evaluate how they are perceived by others to ensure that their public persona is credible and consistent with the impressions they want to convey, frequently altering their behavior to affect the perception of others (Hogan, Jones, and Cheek, 1985; Leary and Kowalski, 1990). This process of impression management is known to occur in two ways based on the valence of the reference state. First, individuals amend their behavior to avoid undesired impressions in the eyes of other people. For example, a person will be likely to apologize for bumping into another person in the street. Marder et al. (2016) coined this as *negatively directed impression management* (NDIM). Second, and in direct contrast to this, people attempt to curate a desired representation of themselves, rather than simply avoiding undesired impressions. For example, a person wears a suit to an interview to appear professional. In line with Marder et al. (2016), we use the term *positively directed impression management* (PDIM).

The use of NDIM vs PDIM depends largely on situation and context as well as the individual's self-regulatory orientation. Generally, people will be pre-directed towards one type of impression management style (Lalwani, Shrum, and Chiu, 2009), and research has demonstrated that one's orientation is linked to one's personality traits, such as avoidance

and neuroticism or approach and extroversion (Elliot and Thrash, 2002). Situations that cause a person's public image to come under threat (i.e. a self-presentational predicament) tend to be associated with NDIM; whereas when there is no imminent threat, PDIM is more common (Leary, 1995). It is important to note that Marder et al.'s (2016) examination focused exclusively on situations in which a person's image was threatened (e.g. engaging in risqué social rather unacceptable activities), which explains why they concluded that social media has a chilling effect on offline behavior. However, we approach the current research from a prosocial perspective (i.e. making charitable donations), which provides the opportunity for an individual to create and forge a more desirable public image, and so, PDIM is instead our focus. This perspective is justified by research on the motivations for a person to behave prosocially, which contends that people are more focused on social gains than losses, such as career enhancement (Clary and Snyder, 1991; Finkelstien, 2009).

As previously mentioned, both positive and negative impression management is underpinned by heightened awareness of audiences (Leary and Kowalski, 1995). Indeed, the notion that actual or perceived surveillance impacts behavior has been widely explored in research, which largely confirms that surveillance increases socially desirable behavior (Becker, 1968), whilst at the same time reduces more undesirable practices (Pierce, Snow, and McAfee, 2013). Self-awareness theory posits that when a person is aware of an audience, they will perform a form of mental calculation that factors any discrepancy between their desired, current and predicted image in, which then leads to behavior to reduce discrepancies (Carver and Scheier, 2001; Leary and Kowalski, 1990). Hence, attention to the public self drives behavior to become "more consistent with societal expectations" (Froming, Walker, and Lopyan, 1982, p. 476). It is worth highlighting that traditional studies in psychology have either used actual or perceived audiences (e.g. by showing respondents a video camera) to prompt public self-awareness (Froming, Walker, and Lopyan, 1982; Joinson, 2001; Scheier

and Carver, 1980). However, as we continue to argue, the presence, or more specifically, the cognition of *online* audiences through social media should also trigger public self-awareness in a manner consistent with these classical studies.

2.2 Online audiences and impression management

Social network sites (SNSs), a subset of the broader family of social media technologies (boyd and Ellison, 2007), are arenas for self-presentation, which are well known to foster impression management practices amongst users through “mutual or participatory surveillance of connections” (Faucher, 2014, p. 45). Yao and Flanagin (2006) suggested that SNS environments emphasize the social side of people who use them, as well as their “sensitivity to group and social identities”, which in turn influences individuals’ behaviors in line with the standards of their audiences (p. 525). Increased self-disclosure in SNSs has a positive impact on a person’s earned respect and likability (Batenburg and Bartels, 2017). As such, people tend to use SNSs to contribute to and maintain their self-concept by strategically interacting, both publicly and conspicuously, with other users and brands congruent with their perception of self (Hollenbeck and Kaikati, 2012; Marder et al., 2018; Taylor and Strutton, 2016). SNSs provide an environment where behavior is largely extrinsically motivated by social gains, with the trigger for these actions largely being surveillance or, more specifically, public self-awareness. A plethora of research has shown how users practice NDIM online to avoid social losses, for example, by de-tagging and deleting content that might cast them in an undesired light to others (DeGroot and Vik, 2017; Lang and Barton, 2015; Ranzini and Hoek, 2017). At the same time, several studies have shown how PDIM is practiced via SNSs to gain social benefits, such as career enhancement (Tifferet and Vilnai-Yavetz, 2018), and to attract romantic partners (Guadagno, Okdie, and Kruse, 2012; Walther, 2007).

Whilst our focus in this research is also on PDIM stemming from an increased awareness of online audiences, in contrast to previous studies we focus on how PDIM behavior is enacted offline rather than online. In doing so, we build on Marder et al.'s (2016) examination of the extended chilling effect of social media, which is the practice of impression management behavior offline with respect to online audiences. Their mixed method research found that Facebook users practiced NDIM offline (i.e. chilled their behavior) when they perceived that their actions fell below the expectations of their online audiences, and that these actions might be indeed broadcasted. For example, the authors found in their qualitative inquiry that people would refrain from smoking at parties in the fear a photo would be taken and tagged. This phenomenon was further supported by an experiment that found people required greater compensation to go on a trip to a venue that would show them in an undesired light to online audiences if they were told photos were likely to be posted on Facebook, compared to the circumstance when there was no explicit mention of posting photos. Marder et al.'s (2016) focus was on situations offline that if broadcasted online would cast a negative persona. Thus, extending these findings, we attend to *offline situations* with the potential to project *positive personas online* and therefore predict PDIM, here prosocial behavior, under these circumstances. Hence, instead of investigating the 'extended chilling effect', this research focuses on the 'extended warming effect'.

2.3 Prosocial behavior and extrinsic motivation

Prosocial behavior has been described by Eisenberg, Fabes, and Spinrad (2006) as "voluntary behavior intended to benefit another" (p. 646). People are generally intrinsically motivated to behave prosocially, either because of altruism or because of a strong personal interest in a particular social cause (Ariely, Bracha, and Meier, 2009). Such intrinsic motives

are generally underpinned by feeling good about oneself through helping others, known as the “warm glow” effect (Andreoni, 1989; Bandura, 1977; Batson and Shaw, 1991).

Nonetheless, intrinsic motivation is rarely the sole motive for prosocial behavior (Cox et al., 2018). Indeed, anonymous charitable donations are decidedly rare (Bénabou and Tirole, 2006). People tend to engage more in such activities when their identity is revealed within the public domain, supporting the presence of extrinsic motivation (Clingsmith and Sheremeta, 2018). Locke (2018) defined these “mean-ends relationships” as a form of extrinsic motivation, because the driver behind such actions is to gain social value rather than doing it completely for its own sake.

With regard to the practice of prosocial behavior, extrinsic motivation is linked to the reward or gratification a person feels after behaving in a prosocial manner, which includes being perceived in a positive light by others (Ariely, Bracha, and Meier, 2009). Thus, prosocial behavior that occurs in the presence of an audience is more prevalent, when an individual perceives a need to (i) reinforce, repair or improve their own self-image, (ii) be consistent with perceived social norms, and/or (iii) communicate a surplus of resources like time, money or moral values (Basil, Ridgway, and Basil, 2006; Grant and Mayer, 2009).

As the preceding discussion supports, extrinsically motivated prosocial behavior is a form of PDIM, borne from the enhanced visibility to a wider audience a person feels. In other words, prosocial behavior directed to present oneself in a good light to others is a form of impression management, specifically PDIM. Though a person may hold some intrinsic motivation to some extent, seeking the reward of a warm glow from prosocial behavior, extrinsic motivation is indeed dominant if the central motivation is associated with self-presentation. Thus, the reward sought is associated with social gains, identity reaffirmation, or self-esteem (Leary, 1996).

Given the prominence of such “audiences” on SNSs, prosocial behaviors are quite widely evident in users’ impression management strategies. For example, users frequently and publicly share social cause content (Choi and Seo, 2017) and sign online petitions (Wilkins, Livingstone, and Levine, 2019). A notable study by Cox et al. (2018), which analyzed data about investors of an online prosocial lending crowdfunding platform, found that self-presenting funders with publicly visible profiles made higher value loans than those who did not have a visible profile. It is therefore apparent that PDIM associated with prosocial behaviors through technologies is stimulated by awareness of online audiences; however, scholars have yet to examine whether such online audiences drive prosocial behavior ‘offline’, that is, when the user is not directly engaged with the technology.

2.4 The present research

The overarching goal of this research is to demonstrate the ‘extended warming effect’ of social media in order to contribute to knowledge about the effect of online audiences on users’ impression management. Specifically, we aim to show that merely thinking about SNS audiences can increase charitable behaviors offline. In doing so, we build a conceptual model and test four hypotheses, underpinned by psychological theory, in two experimental studies.

For impression management to occur, an individual must be publicly self-aware (Carver and Scheier, 2001; Leary, 1995). The actual or perceived presence of an audience has been found to drive public self-awareness (Joinson, 2001). For instance, Marder et al. (2016) found public self-awareness increased, when Facebook photos were mentioned to participants, making online audiences salient. Our initial hypothesis is similar to that of Marder et al. (2016), though we operationalize it through different triggers (visibility of a go-pro camera and presence of a companion of who has been posting photos online). We expect that:

H1: SNSs users' public self-awareness will increase when online audiences become salient in an offline setting.

If H1 is validated, individuals should engage in greater self-evaluation, comparing their actual/predicted public image with the expectations of a desired image they perceive to be held in the eyes of their audiences (Higgins, 1987). This comparison is likely to lead to the cognition of the opportunity to meet or exceed the expectations of the audience spurring individuals' motivation to do so (Carver and Scheier, 2001). This motivation will be extrinsic, because the aim is to gain approval from the audience (Deci and Ryan, 2010), the level of motivation determined largely by the individual's level of self-awareness (Higgins, 1987; Scheier and Carver, 1980). For example, a person who will publicly speak to a large audience (thus highly self-aware – see Leary and Kowalski, 1995), will be more motivated to perfect their speech in contrast to a person who is just reading a text to their spouse. Following this argument, we propose that,

H2: Increased public self-awareness stimulated by saliency of online audiences will lead to increased extrinsic motivation to present a desired persona online.

In addition, literature supports that prosocial behaviors can be extrinsically rewarding, since they tend to signal positive human qualities and contribute to the gaining of social approval (Meier and Stutzer, 2007). Therefore, if prosocial behaviors are perceived by SNS users as means to approach a desired self, the development of extrinsic motivation should drive the practice of prosocial behaviors. Hence,

H3: Stimulation of extrinsic motivation will lead to greater intention to engage in PDIM offline, that is, to perform prosocial behaviors.

Figure 1 presents the conceptual framework of Study 1, where hypotheses H1 through H3 were tested. Extending this framework, a social media intensity variable was added and investigated in Study 2.

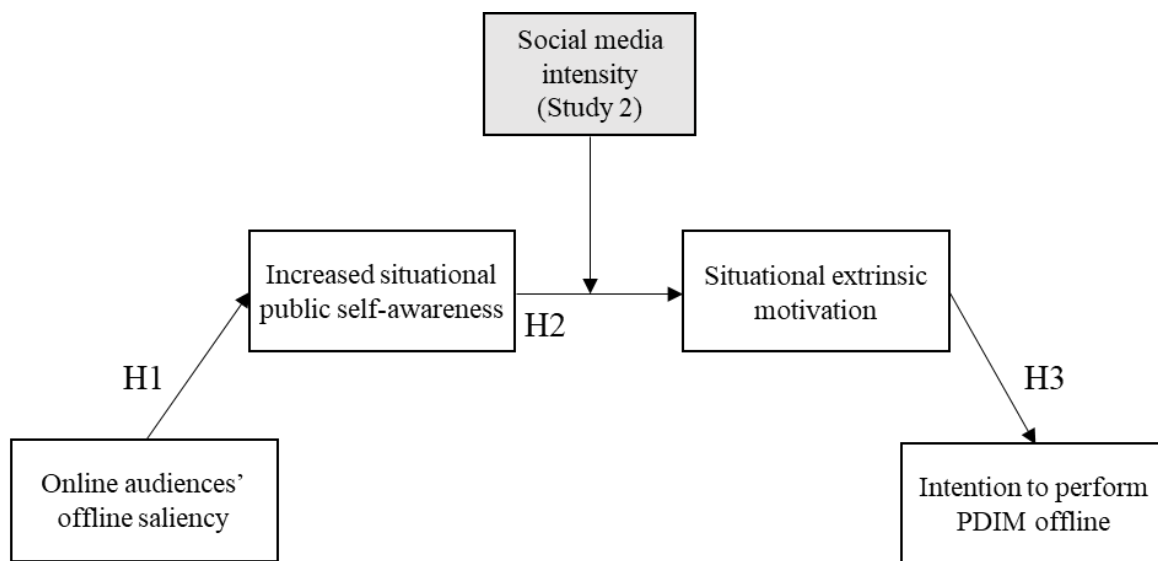


Fig. 1. Hypothesized behavioral process underpinning the extended warming effect of SNSs.

3. Study 1

Through a between-subjects experiment, Study 1 tested the underlying behavioral process depicted in Figure 1, and as such the effect of online audience offline saliency on public self-awareness (H1), how this leads to extrinsic motivation development (H2) and to the practice of offline PDIM through prosocial behaviors (H3). This study was approved based on the ethics procedure at the host institution.

3.1 Participants

The survey was completed by 152 participants (56.6% male; $M_{age} = 36.46$, $SD = 11.41$). In both main studies and associated pre-studies of this research, we employed a purposeful sample consisting of U.S. residents who were 18 years or older and regular users of social media, recruited through Amazon Mechanical Turk. This panel data service provider is commonly used within academic research and involves the posting of a survey link on the platform with an articulated monetary reward for completing the survey. Respondents complete the survey and enter a unique code to receive the reward, which is then verified by the researcher (i.e. accepted).

To safeguard data quality, only respondents with a high track record of past survey completion (i.e. 95% acceptance rate) were recruited, with single IP address restrictions to prevent multiple completions by the same person. Respondents meeting these criteria were asked to complete demographic questions (i.e. age, gender, occupation) before continuing with the charity scenario. An invisible timer was used to ensure participants had carefully read the vignette. Once participants had read the vignette, dependent and control variables were collected.

3.2 Stimuli

To stimulate high vs. low online audience saliency in an offline encounter, vignettes were designed in line with Rungtusanatham, Wallin, and Eckerd's (2011) criteria of being clearly understandable, presenting a realistic scenario and providing adequate context. Participants were asked to imagine an encounter with a representative from a fictitious charity called "Water for Children", which has the mission of providing clean water to children living in developing countries. Participants had to imagine walking to a restaurant with their wallet/purse and bankcard. They were also told that they were carrying a \$10 note

in their pocket. On this journey, they were called out by a charity fundraiser. In the high audience saliency condition, the participants were told that the fundraiser was wearing a portable camera and requested a photo for the charity's social media page, before asking for a donation. In the low saliency condition, no camera or suggestion of social media were mentioned.

A manipulation check was conducted prior to Study 1 to test the stimuli. Based on Lench, Taylor, and Bench's (2014) recommendations, the manipulation check was deliberately conducted separately from the main study in order to avoid biasing subsequent answers through increasing social media saliency further. A pre-study with 100 participants (55% male; $M_{age} = 39.73$, $SD = 13.29$) was conducted, in which participants were shown one of the vignettes and asked to respond to three items captured on a 7-point Likert scale (1 = strongly disagree — 7 = strongly agree, $\alpha = .918$). These were: 'If I was approached by the charity fundraiser...' (1) 'I would be concerned about my image'; (2) 'I would be concerned about my social media presence'; and (3) 'I would be concerned about my online persona'. An independent sample t-test supported the manipulation, which worked as intended ($M_{HighSaliency} = 4.82$, $SE = .24$ vs. $M_{LowSaliency} = 2.72$, $SE = .24$, $p < .001$).

3.3 Measures

For the public self-awareness measure, participants completed a three-item scale adapted from Govern and Marsch (2001), using a 7-point Likert scale (1 = strongly disagree — 7 = strongly agree). Participants were instructed to respond to each statement based on how they would feel if they were in the scenario presented. Items were: (1) 'I would be concerned about my image'; (2) 'I would be aware of what others would think about me if I were to engage with Water for Children'; and (3) 'I would be aware that engaging with Water for Children would enhance my image' ($\alpha = .857$).

To check whether participants developed extrinsic motivation, they were asked to complete a four-item 7-point Likert scale (1 = strongly disagree — 7 = strongly agree) adapted from Guay, Vallerand, and Blanchard (2000). Questions included: (1) ‘You feel you have to engage with the charity in some way’; (2) ‘It would be perceived positively by others and enhance your image’; (3) ‘You would not want to be perceived negatively by others if you do not engage with the charity’; and (4) ‘You feel like this is what others expect from you’ ($\alpha = .822$).

In line with Marder et al. (2016), participants’ intention to perform PDIM offline was measured using a composite created from two responses. The first captured the likelihood of giving money to the charity using a 7-point Likert scale (1 = very unlikely — 7 = very likely), and the other recorded the amount of money they would be willing to give to the charity (from \$0 to \$10). The likelihood of giving money was multiplied by the raw dollar value to create a PDIM variable. According to Marder et al. (2016), such a composite allows for weighing the amount given by respondents who had no intention of giving any money.

To control for participants’ general awareness of their online audiences offline, they were asked the following: (1) ‘I am aware that other people look at my social media profile(s)’; (2) ‘I am aware that what I post on social media can be seen by various audiences (i.e. friends, family, colleagues, strangers)’; and (3) ‘I am aware that the content I post online can be diffused outside my own online network’ ($\alpha = .733$).

3.4 Results and discussion

A one-way ANCOVA was first conducted to support H1. The independent variable (IV) was the saliency condition, the dependent variable (DV) was public self-awareness, and control variables (CVs) were age, gender and general online audience awareness. Table 1 provides the results of the ANCOVA. A significant main effect was found ($F(1,147) = 10.31$,

$p = .002$, $\eta_2 = .066$), with situational self-awareness increasing when social media was made more (versus less) salient ($M_{Scenario 1} = 3.76$, $SE = .18$ vs $M_{Scenario 2} = 4.59$, $SE = .17$). Age was the only significant covariate ($\beta = -.033$, $p = .003$), while the other covariates were found non-significant ($ps > .209$).

Variable	F (1, 147)	sig	η_2
<i>Saliency condition</i>	10.312	.002	.066
<i>General online audience awareness</i>	1.338	.249	.009
<i>Age</i>	8.894	.003	.057
<i>Gender</i>	1.589	.209	.011

Table 1. Study 1: One-way ANCOVA results.

Preacher and Hayes' (2008) model of bootstrapped mediation was used to test the model. A serial multiple mediator model with two mediators (PROCESS v.3, model 6) allowed for the examination of both direct and indirect effects of X (i.e. saliency condition) on Y (i.e. intention to perform PDIM offline). Covariates were age, gender and awareness of online audiences.

The bootstrap resampling was set at 5,000. Mediation, shown through the indirect effect, was established at a 90% level of confidence, deemed acceptable given the one-tailed nature of hypotheses ($Eff = 1.187$, $SE = .789$, $LLCI = .060$, $ULCI = 2.583$), although we provide further acknowledgment of this in our limitations section.

Path analysis confirmed H1, H2, and H3; results are provided in the illustrated model in Figure 2. In particular, a highly significant effect was found with situational public self-awareness increasing extrinsic motivation development ($Eff = .522$, $SE = .059$, $t = 8.866$, $LLCI = .425$, $ULCI = .619$, $p < .001$), supporting H2, and with increased extrinsic motivation

stimulating intention to perform PDIM offline ($Eff = 2.773$, $SE = 1.443$, $t = 1.922$, $LLCI = .385$, $ULCI = 5.162$, $p = .028$), supporting H3.

Study 1 therefore supports that offline saliency of online audiences intensifies public self-awareness (H1), which then leads to enhanced extrinsic motivation development (H2), resulting in greater intention towards PDIM offline (H3). While Study 1 supports the role of public self-awareness and extrinsic motivation as mediator in this process, the stimulus employed in this context was extremely overt (i.e. participants were told a photo would be taken of them). Furthermore, no boundary conditions for this effect were examined. In addition to providing further empirical validation for our model, Study 2 addresses these limitations, employing a far subtler stimulus for online saliency as well as examining individuals' levels of social media intensity (Ellison, Steinfield, and Lampe, 2007) as a moderator of public self-awareness on extrinsic motivation development.

4. Study 2

This study aims to further support H1 through H3 by examining the role of social media intensity as moderator in the model. This study was approved based on the ethics procedure at the host institution. To achieve the study's aims, we draw upon Ellison, Steinfield, and Lampe (2007) by defining the concept as the intensity by which an individual adopts social media, where intensity considers both actual usage and perceived importance. Social media intensity has been shown to be positively associated with life satisfaction of students (Valenzuela, Park, and Kee, 2009) but negatively associated with self-esteem (Blachnio, Przepiorka, and Pantic, 2016). Archer-Brown et al. (2018) found social media intensity was positively related to self-censorship in anticipation of surveillance by colleagues of an individual's Facebook profile, justifying this by explaining that high intensity users tend to put significant emphasis on their online persona and have a stronger

understanding of extrinsic rewards when presenting a desired personal image compared to lower intensity users.

We draw upon psychological research on identity centrality, which asserts that the greater importance a certain identity holds within a person's self-concept, the greater their motivation is to enhance or protect it (Carver and Schierer, 2001; Higgins, 1987). For example, a person who believes beauty is central to their identity is more likely to spend greater amounts of money on related products (see Mandel et al., 2017). Thus, we propose that the effect of public self-awareness on extrinsic motivation will be positively moderated by social media intensity. In other words, when a person becomes more self-aware through online audiences becoming salient to them, if they are a high (low) intensity user of social media, they will feel a greater (lower) motivation to pursue extrinsic rewards. Hence,

H4: Social media intensity positively moderates the positive association between public self-awareness and extrinsic motivation.

4.1 Participants

Using the same procedure and sampling strategy as in Study 1, 197 respondents (51.3% female; $M_{age} = 39.63$, $SD = 12.26$) were recruited in Study 2. Demographic information was collected first, followed by the vignette, the dependent variables and finally control variables, including social media intensity. An attention check was also included to ensure the vignette had been read properly. Participants failing this attention check were exited from the survey.

4.2 Stimuli

A vignette approach was used again to prime high and low audience saliency. We revised the name of the fictitious charity to “Monkey’s Palm”, which is geared around raising awareness and collecting funds to address the consequences of palm oil production and consumption on orangutans. As part of the vignette, participants were shown a picture of an orangutan on a deforested field and a tagline stating that 25 orangutans die every day for palm oil production to provide understanding of the cause, a common strategy used by fundraisers.

Participants were asked to imagine it was a sunny weekend day and that they had been walking around town with a friend, doing some shopping and relaxing. As in Study 1, they were told that, in addition to their bankcard, they had a \$10 note in their pocket. Whilst walking around the city, they came across the charity’s stall and were called out by the mascot of the charity wearing a monkey costume. A picture of a monkey mascot accompanied by a passing woman was also displayed to study participants to materialize the mascot. In the high saliency condition, participants were told that their friend had been taking pictures all day, posting some of these photos on social media. In the low saliency condition, participants were not informed of this. These stimuli were intended to be more subtle than those used in Study 1 in order to show that the warming effect may occur not only when photo posting in charitable giving situations is directly mentioned but also when the potential of photo posting indirectly inferred. As for Study 1, a manipulation check was conducted through a pre-test with 100 participants (67% female; $M_{age} = 39.03$, $SD = 12.49$), using the same procedure and the same three-items 7-point measure as before ($\alpha = .922$). Results confirmed the manipulation ($M_{HighSaliency} = 3.37$, $SE = .21$ vs. $M_{LowSaliency} = 2.50$, $SE = .21$, $p = .005$).

4.3 Measures

The same scales as for Study 1 were used in Study 2 for situational public self-awareness ($\alpha = .821$), extrinsic motivation ($\alpha = .824$) and general online audiences awareness ($\alpha = .765$). However, PDIM was measured differently than in Study 1 to increase internal validity of the study series by providing a broader range of potential prosocial behaviors. Instead of using a composite calculated by multiplying participants' likelihood of giving with the amount they would be willing to give, this time PDIM was measured by calculating the mean of three items using a 7-point Likert scale format (1 = strongly disagree — 7 = strongly agree), including: (1) 'Still thinking about the scenario that was given to you, how likely would you sign the petition?'; (2) 'Still thinking about the scenario that was given to you, how likely would you take the flyer?'; and (3) 'Still thinking about the scenario that was given to you, how likely would you give money?' ($\alpha = .824$).

To measure social media intensity, respondents were presented with an adaptation of Ellison, Steinfield, and Lampe's (2007) Facebook intensity scale, amended for social media more generally. This includes seven items (e.g. 'I am proud to tell people I'm on social media') as well as a measure of time spent on social media a day, all measured along a 7-point scale ($\alpha = .853$). In addition, we measured trait-based public self-awareness as a potential covariate, adapted from Scheier and Carver's (1985) seven-item scale (e.g., 'I'm concerned about my style of doing things'; $\alpha = .889$), captured on a 7-point Likert scale (1 = strongly disagree — 7 = strongly agree). The reason for including this measure was the subtlety of the manipulation in this study compared to Study 1, resulting in a need to control more stringently for individual differences.

4.4 Results and discussion

A one-way ANCOVA was first conducted to confirm the manipulation of the situational self-awareness through the saliency condition. Gender, age, awareness of online audiences, and general public self-awareness were added as covariates. Results are summarized in Table 2. A significant main effect was found ($F(1,191) = 4.72, p = .031, \eta_2 = .024$), with situational self-awareness increasing when social media was made salient ($M_{LowSaliency} = 3.42, SE = .12$ vs $M_{HighSaliency} = 3.80, SE = .12$). Age ($\beta = -.017$), awareness of online audiences ($\beta = -.280$) and general public self-awareness ($\beta = .610$) were found significant ($ps < .022$), while gender was found non-significant ($p = .299$).

Variable	F (1, 147)	sig	η_2
<i>Saliency condition</i>	4.715	.031	.024
<i>General online audience awareness</i>	5.566	.019	.028
<i>Trait Public self-awareness</i>	71.519	.000	.272
<i>Age</i>	5.369	.022	.027
<i>Gender</i>	1.085	.299	.006

Table 2. Study 2: One-way ANCOVA results.

Preacher and Hayes' (2008) model of bootstrapped mediation was once again used to test the conceptual framework, this time including social media intensity as a moderator of the relationship between situational self-awareness and extrinsic motivation. A serial moderated mediation model with two mediators and one moderator was used (PROCESS v.3, model 91), the same as in Study 1 with W (i.e. social media intensity) as the moderator.

The bootstrap resampling was set at 5,000 and mediation could be established at a 90% level of confidence in the PROCESS macro (version 3) for SPSS. The same covariates were added as before. The moderated mediation was significant ($Eff = .045, SE = .029, LLCI = .004, ULCI = .096$), with all path coefficients (illustrated on Figure 2) supporting our

hypotheses. H1 could be supported again ($Eff = .379, SE = .175, t = 2.171, LLCI = .091, ULCI = .667, p = .016$). More importantly, the role of social media intensity as a moderator (H4) of situational public self-awareness on extrinsic motivation development was supported ($Eff = .081, SE = .043, t = 1.892, LLCI = .010, ULCI = .151, p = .03$). The positive impact of extrinsic motivation development on intention to perform PDIM offline (H3) could also be validated ($Eff = .233, SE = .097, t = 2.409, LLCI = .073, ULCI = .394, p = .009$).

Study 2 therefore further supports the validity of our model and our hypotheses. Of specific interest is that the warming effect remains, even when a subtle audience saliency manipulation is employed, and this effect is exacerbated for higher intensity social media users.

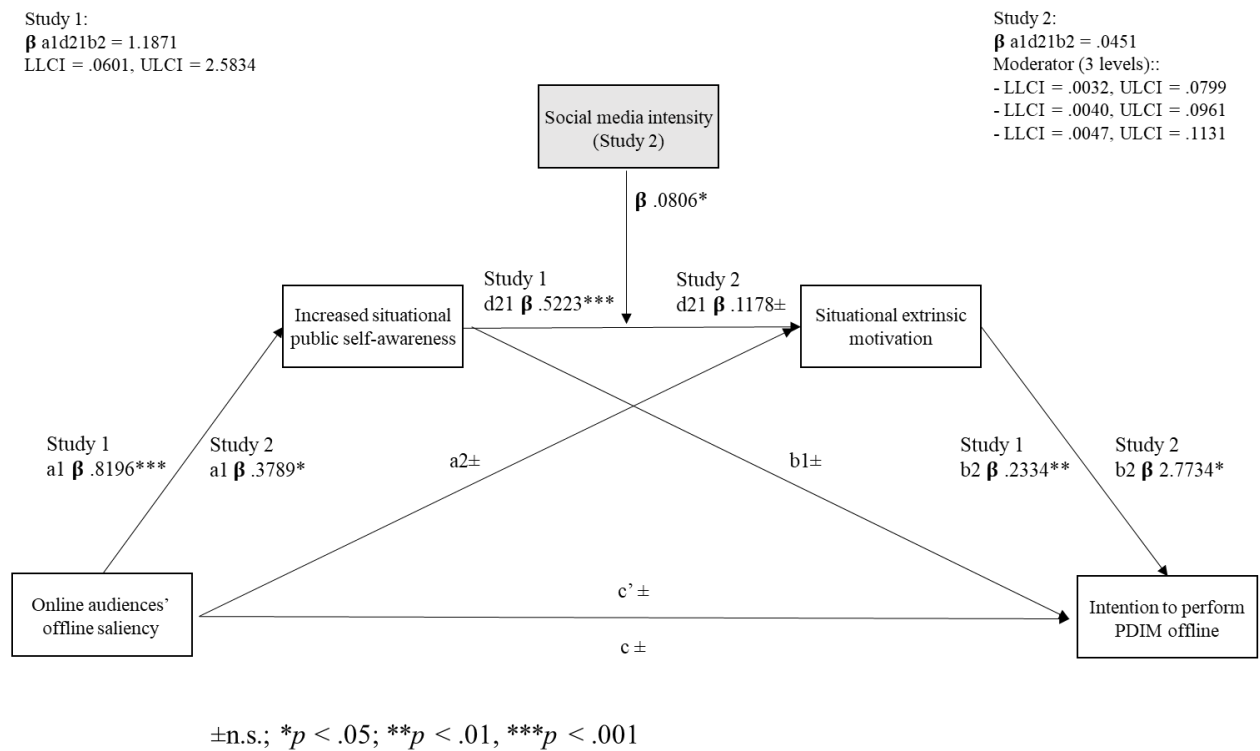


Figure 2. Behavioral process supported by significant coefficient paths.

5. General Discussion

The aim of the present research was to provide initial evidence for the extended warming effect of social media in the context of prosocial charitable behaviors. In two experimental studies, we found that social media users enact PDIM offline with respect to online audiences. The theoretical contributions are three-fold:

First, although impression management of online selves with respect to online audience standards has received a wealth of research, only one study has directly examined impression management offline in relation to online audience expectations. This aforementioned study focused on NDIM, evidencing that salience of online audience chills behavior offline, portraying the creation of a rather ‘Orwellian’ world by the imagined presence of online surveyors (Marder et al., 2016).

Our study provides evidence for the brighter side of the same coin, namely the extended warming effect. Thus, in situations offline where a person’s online image is not under direct threat, when online audiences are made salient, the individual becomes self-aware, which then entices motivation for extrinsic reward leading to PDIM. Specifically, when people were made aware of their online audiences within a charitable donation encounter offline, they intended to act more prosocially, based on the knowledge that if these behaviors were to be communicated online, they would result in extrinsic gains from their audience. This finding supports the profound effect social media or more specifically online audiences can have on the lives of users, because PDIM does not only occur online in the presence of audiences (e.g. Tifferet and Vilnai-Yavetz, 2018), but this effect is now realized offline, in ‘reality’, too. This finding does not only enhance our understanding of impression management associated with social media but also contributes to broader debates on surveillance, extending Marder et al. (2016) to show that surveillance is not necessarily constraining but rather liberating under the right conditions (see Allmer, 2013).

Second, we provide a conceptual model for examining the extended warming effect of social media, based on longstanding psychological theory (Carver and Scheier, 2001). Our model describes the process in which the saliency of online audiences triggered in an offline setting leads to heightened public self-awareness, which, in turn, increases extrinsic motivation, leading to greater PDIM. A model for a warming effect is novel in itself, and it extends Marder et al.'s (2016) conceptualization of the chilling effect by empirically validating the important mediating role of extrinsic motivation within the process. An important discussion point related to our model are the triggers for audience salience, which lead to increased public self-awareness. Study 1 supports broad prior work of actual audiences as stimulus for public self-awareness (e.g. Scheier and Carver, 1980) and more closely the presence of possible audiences through the direct subjection to surveillance devices (e.g. cameras) (Joinson, 2001). Study 2 stimulates audience salience, and therefore public self-awareness, through a more subtle means, as the person was neither told they may be photographed (Marder et al., 2016) nor were in the direct focus of a camera (Joinson, 2001). Instead, audience saliency increased with the mere presence of a friend who had been taking pictures that day, suggesting that increased public self-awareness may rather be an unconscious bi-product of a social-media-using society, opposed to something that must be overtly triggered. This highlights the intriguing potential that when social media users surround themselves with other social media users, a ubiquitous phenomenon, public self-awareness is intrinsically higher, leading to both chilling and warming effects on people's behavior. This potential helps shed light on why generation Z are better behaved and more prosocial than prior non-digital generations (Hessekiel, 2018; Iqbal, 2018).

Our final contribution is the understanding of the moderating effect of social media intensity. The warming effect evidence here, which theoretically applies to the chilling effect too (Marder et al., 2016), is exacerbated by how intensely social media is ingrained in the life

of the individual. Specifically, we found that the effect of self-awareness on extrinsic motivation is increased when the subject is a more intense social media user, theorized based on the centrality and thus importance of their online persona to their self-concept (see Carver and Scheier, 2001; Higgins, 1987). This finding provides further support for the argument put forward above relating to generation Z, known to be intense social media users (Williams, 2015). It also concurs with Archer-Brown et al. (2018) who found social media intensity to predict online impression management strategies, suggesting younger generations be more eager to gain/avoid losses with regards to their online audiences. Our work extends their findings by showing such effect has shifted offline.

5.1 Implication for practitioners

Our findings provide a number of implications for practitioners. For charities, our results suggest that making online audiences salient in fundraising encounters will drive greater positive response. Charities could therefore design initiatives to trigger salience of online audiences, both in online and offline settings. For example, in line with Cox et al. (2018), charities could use methods to make donations or other desired interactions conspicuous. In offline encounters, organizations could build connections between the face-to-face offline interaction and the online domain, for example, by branding their clothing with social media insignia, providing photo opportunities (e.g. a mascot or an Instagram frame with a hashtag), or even mentioning that they would like to post and tag or connect people's donations on their social media accounts.

Along the same lines, also site designers could benefit from our findings. Specifically, they should consider ways to make prosocial behavior more conspicuous and shorten the user journey in enacting prosocial behaviors offline and receiving extrinsic rewards online. For example, when people check-in or are geo-positioned at prosocial events, social media sites

may provide prompts to upload content of them on these sites, for example, with claims such as “Show your friends you care about XY cause!”

Lastly, policy makers should consider the ability of online audiences to change people’s actions in reality, also in relation to prior work on the extended chilling effect (Marder et al., 2016). Specifically, they need to consider the wider implications on society based on ubiquitous surveillance offered by social media, in a similar vein that CCTV and national identity cards are considered, weighing up the potential advantages (e.g. increased prosocial behavior and reduction in anti-social behavior) with the potential dark sides, such as constraints on liberties.

5.2 Limitations and future research

Although this research provides important theoretical contributions and a replication of relationships across two studies, we acknowledge the following limitations. First, while the controlled online experiments benefitted from good internal validity, they lacked ecological validity. Future studies should therefore aim to replicate our scenarios in ‘real life’ settings. Second, we assessed our indirect effects at a 90% confidence interval. This is relatively common within social science research (e.g. Reer and Kramer, 2014; Trepte, Reinecke, and Juechems, 2012), especially when directional hypotheses are provided, and we find comfort in the fact that our findings related to the mediation were replicated over two experiments. Yet, future experiments should aim to replicate our findings with a larger sample size, benefitting from increased power with a more stringent level of confidence. Third, in particular in Study 1 we did not control for participants’ income levels and general charity giving, which is likely to be a determinant of giving amount and of the impact that donations may have on the perceptions of others when evaluating identity-related prosocial behavior. Future studies should therefore control for individuals’ income in similar contexts.

Fourth, based on the underpinning theory, it follows that the warming effect should be related to feelings of excitement, whereas the chilling effect to feelings of anxiety, but neither this nor Marder et al.'s (2016) study directly tested emotion. Further studies could expand our conceptualization by investigating the potentially mediating role of emotion to deepen our understanding of the overall impact of online audience surveillance on users in reality. Lastly, our experiments were based on charity fundraising scenarios with a sample of U.S. adults. Future work could therefore assess the extended warming effect in a broader range of contexts (e.g. political rally) with respondents from different cultures.

References

- Allmer, T. (2013). Critical internet surveillance studies and economic surveillance. In: C. Fuchs, K. Boersma, A. Albrechtslund and M. Sandoval (Ed.), *Internet and Surveillance: The Challenges of Web 2.0 and Social Media* (pp.144-164). New York, London: Routledge.
- Andreoni, J. (1989). Giving with impure altruism: Applications to charity and Ricardian equivalence. *Journal of Political Economy*, 97(6), 1447-1458.
- Archer-Brown, C., Marder, B., Calvard, T. and Kowalski, T. (2018). Hybrid social media: employees' use of a boundary-spanning technology. *New Technology, Work and Employment*, 33(1), 74-93.
- Ariely, D., Bracha, A. and Meier, S. (2009). Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially. *American Economic Review*, 99(1), 544-555.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, London: Prentice-Hall.
- Bareket-Bojmel, L., Moran, S. and Shahar, G. (2016). Strategic self-presentation on Facebook: Personal motives and audience response to online behavior. *Computers in Human Behavior*, 55, 788-795.
- Basil, D. Z., Ridgway, N. M. and Basil, M. D. (2006). Guilt appeals: The mediating effect of responsibility. *Psychology and Marketing*, 23, 1035-1054.
- Batenburg, A. and Bartels, J. (2017). Keeping up online appearances: How self-disclosure on Facebook affects perceived respect and likability in the professional context. *Computers in Human Behavior*, 74, 265-276.
- Batson, C. D. and Shaw, L. L. (1991). Evidence for altruism: Toward a pluralism of prosocial motives. *Psychological Inquiry*, 2(2), 107-122.

- Becker, G. S. (1968). Crime and punishment: an economic approach. *Journal of Political Economy*, 76(2), 169-217.
- Bénabou, R. and Tirole, J. (2006). Incentives and Prosocial Behavior. *American Economic Review*, 96(5), 1652-1678.
- Blachnio, A., Przepiorka, A. and Pantic, I. (2016). Association between Facebook addiction, self-esteem and life satisfaction: A cross-sectional study. *Computers in Human Behavior*, 55, 701-705.
- Boyd, D. M. and Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of computer-mediated Communication*, 13(1), 210-230.
- Carver, C. S. and Scheier, M. F. (2001). *On the self-regulation of behavior*. Cambridge, UK: Cambridge University Press.
- Choi, J. and Seo, S. (2017). Goodwill intended for whom? Examining factors influencing conspicuous prosocial behavior on social media. *International Journal of Hospitality Management*, 60, 23-32.
- Clary, E. G. and Snyder, M. (1991). A functional analysis of altruism and prosocial behavior: The case of volunteerism. *Review of personality and social psychology*, 12, 119-148.
- Clingingsmith, D. and Sheremeta, R. M. (2018). Status and the demand for visible goods: experimental evidence on conspicuous consumption. *Experimental Economics*, 21(84), 877-904.
- Cox, J., Nguyen, T., Thorpe, A., Ishizaka, A., Chakhar, S. and Meech, L. (2018). Being seen to care: The relationship between self-presentation and contributions to online prosocial crowdfunding campaigns. *Computers in Human Behavior*, 83, 45-55.
- Deci, E. L. and Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum.

- DeGroot, J. M. and Vik, T. A. (2017). "We were not prepared to tell people yet": Confidentiality breaches and boundary turbulence on Facebook. *Computers in Human Behavior*, 70, 351-359.
- Duval, S. and Wicklund, R. A. (1972). *A theory of objective self-awareness*. New York: Academic Press.
- Eisenberg, N., Fabes, R. A., and Spinrad, T. L. (2006). Chapter 11 Prosocial Development. In: W. Damon, R. Lerner and N. Eisenberg (Ed.), *Handbook of Child Psychology, Social, Emotional, and Personality Development Volume 3 of Handbook of Child Psychology*, 6th ed (pp.646-718). Hoboken: John Wiley & Sons.
- Elliot, A. J., and Thrash, T. M. (2002). Approach-avoidance motivation in personality: approach and avoidance temperaments and goals. *Journal of personality and social psychology*, 82(5), 804.
- Ellison, N., Steinfield, C. and Lampe, C. (2007). The Benefits of Facebook "Friends": Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*, 12(4), 1143-1168.
- Faucher, K. X. (2014). Veblen 2.0: Neoliberal Games of Social Capital and the Attention Economy as Conspicuous Consumption. tripleC: Communication, Capitalism & Critique. *Open Access Journal for a Global Sustainable Information Society*, 12(1), 40-56.
- Finkelstien, M. A. (2009). Intrinsic vs. extrinsic motivational orientations and the volunteer process. *Personality and Individual Differences*, 46(5-6), 653-658.
- Froming, W. J., Walker, G. and Lopyan, K. J. (1982). Public and private self-awareness: When personal attitudes conflict with societal expectations. *Journal of Experimental Social Psychology*, 18(5), 476-487.

- Govern, J. M. and Marsch, L. A. (2001). Development and Validation of the Situational Self-Awareness Scale. *Consciousness and Cognition*, 10(3), 366-378.
- Grant, A. M. and Mayer, D. M. (2009). Good Soldiers and Good Actors: Prosocial and Impression Management Motives as Interactive Predictors of Affiliative Citizenship Behaviors. *Journal of Applied Psychology*, 94(4), 900–912.
- Guadagno, R. E., Okdie, B. M. and Kruse, S. A. (2012). Dating deception: Gender, online dating, and exaggerated self-presentation. *Computers in Human Behavior*, 28(2), 642-647.
- Guay, F., Vallerand, R. and Blanchard, J. (2000). On the Assessment of Situational Intrinsic and Extrinsic Motivation: The Situational Motivation Scale (SIMS). *Motivation and Emotion*, 24(3), 175–213.
- Hessekiel, D. (2018) *Engaging Gen Z In Your Social Impact Efforts*. Retrieved from <https://www.forbes.com/sites/davidhessekiel/2018/06/26/engaging-gen-z-in-your-social-impact-efforts/#693783b96499>
- Higgins, E. T. (1987). Self-Discrepancy: a theory relating self and affect. *Psychological Review*, 94(3), 319-340.
- Hogan, R., Jones, W. H. and Cheek, J. M. (1985). Socioanalytic theory: An alternative to armadillo psychology. In: B. R. Schlenker (Ed.), *The self and social life* (pp.175-198). New York: McGraw- Hill.
- Hollenbeck, C. R. and Kaikati, A. M. (2012). Consumers' use of brands to reflect their actual and ideal selves on facebook. *International Journal of Research in Marketing*, 29(4), 395- 405.
- Iqbal, N. (2018). *Generation Z: 'We have more to do than drink and take drugs'*. Retrieved from <https://www.theguardian.com/society/2018/jul/21/generation-z-has-different-attitudes-says-a-new-report>

- Johnson, B. K. and Ranzini, G. (2018). Click here to look clever: Self-presentation via selective sharing of music and film on social media. *Computers in Human Behavior*, 82, 148-158.
- Joinson, A. N. (2001). Self-disclosure in computer-mediated communication: The role of self-awareness and visual anonymity. *European Journal of Social Psychology*, 31, 177-192.
- Lalwani, A. K., Shrum, L. J. and Chiu, C. Y. (2009). Motivated response styles: The role of cultural values, regulatory focus, and self-consciousness in socially desirable responding. *Journal of Personality and Social Psychology*, 96(4), p.870.
- Lang, C. and Barton, H. (2015). Just untag it: Exploring the management of undesirable Facebook photos. *Computers in Human Behavior*, 43, 147-155.
- Leary, M. R. (1995). *Self-presentation: Impression management and interpersonal behavior*. Madison: Brown & Benchmark.
- Leary, M. R. and Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin*, 107(1), 34-47.
- Leary, M. R. and Kowalski, R. M. (1995). *Social anxiety*. New York: Guilford Press.
- Lench, H. C., Taylor, A. B. and Bench, S. W. (2014). An alternative approach to analysis of mental states in experimental social cognition research. *Behavior Research Methods*, 46(1), 215-228.
- Locke, E. A. (2018). Long range thinking and goal-directed action. In: G. Oettingen, A. T. Sevincer and P. M. Gollwitzer (Ed.), *The psychology of thinking about the future* (pp. 377-391). New York: Guilford Press.
- Mandel, N., Rucker, D. D., Levav, J., and Galinsky, A. D. (2017). The compensatory consumer behavior model: How self-discrepancies drive consumer behavior. *Journal of Consumer Psychology*, 27(1), 133-146.

- Marder, B., Joinson, A., Shankar, A. and Houghton, D. (2016). The extended 'chilling' effect of Facebook: The cold reality of ubiquitous social networking. *Computers in Human Behavior*, 60, 582-592.
- Marder, B., Marchant, C., Archer-Brown, C., Yau, A. and Colliander, J. (2018). Conspicuous political brand interactions on social network sites. *European Journal of Marketing*, 52(3/4), 702-724.
- Meier, S. and Stutzer, A. (2007). Is Volunteering Rewarding in Itself?. *Economica*, 75, 39-59.
- Pierce, L., Snow, D. and McAfee, A. (2013). *Cleaning house: The impact of information technology monitoring on employee theft and productivity*. Cambridge: MIT Sloan School of Management.
- Preacher, K. J. and Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891.
- Ranzini, G. and Hoek, E. (2017). To you who (I think) are listening: Imaginary audience and impression management on Facebook. *Computers in Human Behavior*, 75, 228-235.
- Reer, F. and Krämer, N. C. (2014). Underlying factors of social capital acquisition in the context of online-gaming: Comparing World of Warcraft and Counter-Strike. *Computers in Human Behavior*, 36, 179-189.
- Rungtusanatham, M., Wallin, C. and Eckerd, S. (2011). The Vignette in a Scenario-based Role-playing Experiment. *Journal of Supply Chain Management*, 47(3), 9-16.
- Rui, J. R. (2018). Objective evaluation or collective self-presentation: What people expect of LinkedIn recommendations. *Computers in Human Behavior*, 89, 121-128.

- Scheier, M. F. and Carver, C. S. (1980). Private and public self-attention, resistance to change, and dissonance reduction. *Journal of Personality and Social Psychology*, 39(3), 390-405.
- Scheier, M. F. and Carver, C. S. (1980). The Self-Consciousness Scale: A Revised Version for Use with General Populations. *Journal of Applied Social Psychology*, 15(8), 687-699.
- Taylor, D. G. and Strutton, D. (2016). Does Facebook usage lead to conspicuous consumption? *Journal of Research in Interactive Marketing*, 10(3), 231-248.
- Tifferet, S. and Vilnai-Yavetz, I. (2018). Self-presentation in LinkedIn portraits: common features, gender, and occupational differences. *Computers in Human Behavior*, 80, 33-48.
- Trepte, S., Reinecke, L. and Juechems, K. (2012). The social side of gaming: How playing online computer games creates online and offline social support. *Computers in Human Behavior*, 28(3), 832-839.
- Valenzuela, S., Park, N. and Kee, K. F. (2009). Is There Social Capital in a Social Network Site?: Facebook Use and College Students' Life Satisfaction, Trust, and Participation. *Journal of Computer-Mediated Communication*, 14(4), 875-901.
- Walther, J. B. (2007). Selective self-presentation in computer-mediated communication: Hyperpersonal dimensions of technology, language, and cognition. *Computers in Human Behavior*, 23(5), 2538-2557.
- Wilkins, D. J., Livingstone, A. G. and Levine, M. (2019). All click, no action? Online action, efficacy perceptions, and prior experience combine to affect future collective action. *Computers in Human Behavior*, 91, 97-105.
- Williams, A. (2015). Move Over, Millennials: Here Comes Generation Z. *The New York Times*, p. 1.

Yao, M. Z. and Flanagin, A. J. (2006). A self-awareness approach to computer-mediated communication. *Computers in Human Behavior*, 22(3), 518-544.