SOCIAL INFLUENCE ON THE NET: A MINDSET APPROACH

By

Young June Sah

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Information and Media—Doctor of Philosophy

2017

ABSTRACT

SOCIAL INFLUENCE ON THE NET: A MINDSET APPROACH

By

Young June Sah

Social media afford a context within which users interact with other users. Recognizing variations in contexts afforded by social media, the current study classified social media into two types, i.e., *relational media*, which allow users to build individual social connections, and *categorical media*, which support group-based connections. Effects of relational and categorical media were examined, employing a mindset approach as a theoretical framework. The mindset approach manifests the situated nature of cognition, emphasizing individuals' tendency to harness immediate contexts in meaning-making processing. Based on this postulation, the current study proposed that social media induced distinctive mindsets, entailing self-concept, goal-orientation, and concrete-abstract level in perceiving others.

The current study also examined effects of social media on users' group identification and belief change. Based on previous literature on social identity, it is proposed that distinctive mechanisms determine group identification in relational and categorical media. For relational media users, perception of individual relations to other users was expected to mediate the effect of relational media on group identification. In contrast, for categorical media users, perception of being a member of a group and perception of a homogeneous group were expected to mediate the effect of categorical media on group identification. Furthermore, based on the automatic social influence literature, the present study proposed that relational and categorical media, compared to non-social media, induce greater belief changes, and the belief changes are mediated by group identification.

The predictions were tested using an online experiment (N = 705), in which participants used a mock-up social media, in which they formed social connections of either relational or categorical type, or used it without building social connection. Participants read others' posts and comments revealing their opinions on health-related issues. Participants' mindset, social perception, group identification, and belief changes were assessed.

Results revealed that using social media influenced participants' mindset: The relational group reported greater in-group self-concept and considered in-group goals more important, and used less concrete terms when describing their group members. Also, the categorical group considered in-group goals more important. Furthermore, using social media influenced group identification: The relational and categorical group reported greater group identification than the control group. Yet, the relative contributions of predictors of group identification differed across the conditions. For the relational media, relational perception was a dominant determinant of group identification and homogeneity perception was the least influential. For the categorical group, homogeneity perception was a predictor as significant as others. Lastly, effects of social media use on belief changes was not different across the social media type.

The current study contributes to our understanding of how social media influence users by employing a novel theoretical framework, mindset approach, in examining subtle differences generated by social media. The mindset approach enables us to find nuanced effects: Different types of social media afford distinctive mindsets and psychological mechanisms for group identification.

Copyright by
YOUNG JUNE SAH
2017

This dissertation is dedicated to Yunjeong and Joonu, my wife and son,
who had stood by me completing this dissertation.

ACKNOWLEDGEMENTS

I would not have completed this dissertation without help from many people. They influenced me developing my dissertation in intellectual and emotional ways, thus I would like to acknowledge their contributions. Dr. Rabindra Ratan, my dissertation committee chair, has been a patient advisor, warm-hearted mentor, creative inspirer, and understanding friend in my Ph.D. program. He involved every step of my dissertation and helped me to complete my Ph.D. Also, I would like to express my gratitude to my dissertation committee. Dr. Joseph Cesario introduced me to situated cognition, which structured my dissertation and reshaped my way of thinking research agendas. His advice made my dissertation more rigorous and competent. Also, Drs. Jingbo Meng and John Basely helped me to find implications in the field of communication, by asking how my dissertation broadens our understanding of media effects.

Also, I thank my colleague, Janine Slaker, Julia DeCook, Minjin Rheu, and Wonkyung Kim, for invaluable comments on this work. I could improve my experiment, revisit implications, and improve the structure of my dissertation from their help. My deepest thanks go to my previous advisors, whose support has been important cornerstone for me being a scholar. Dr. Kwan Min Lee guided me to the field of communication and technology and his advice shaped my scholarly identity. Collaboration with Dr. Wei Peng was a great opportunity to learn to conduct research and present it in academic papers.

Finally, I would like to express my love and gratitude to my family. My son, Joonu, gave energy to me going back to my office every night. My wife, Yunjeong Choi, successfully defended her dissertation before me and allowed me to concentrate on my dissertation for the last couple of months. Her support and dedication made it possible for me to finish my dissertation.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Social media connect users to other users, situating them in social contexts over the Internet. Social media allow users to develop relationship with others and communicate by exchanging messages and creating posts. One notable trend in the contemporary social media is a diversion in their ways to support developing social connections and maintaining relationship. Some social media, such as Facebook and LinkedIn, are *relational*, as they allow users to build individual connections with other users. Their connections are based on individual relationship either offline (e.g., family, friends, or colleague) or virtual (e.g., online dating partners). Other social media, such as online communities, are *categorical*, as users in the social media belong with a group by obtaining a membership. This type of social media presents a category distinguishing in-group members from non-members or members of other groups. Compared to social media not supporting social connections, the relational and categorical media present users with a distinctive social context, shaping the ways they think about themselves, others, and their relationship.

Influence generated by social interaction on the Internet has been a popular topic for communication and media-effect scholars. Particularly scholars in communication technology and computer-mediated communication (CMC) focus on technology factors and examine how novel features of communication and information technologies (ICTs) induce cognitive and psychological influence (e.g., E.-J. Lee, 2007; K. M. Lee & Nass, 2004). Scholars of communication technologies (e.g., Walther, 1996) suggested that online environments, despite the impersonal nature of CMC, may generate greater social influence than face-to-face settings, particularly when the CMC manifests users' social identity (E.-J. Lee, 2007; Postmes & Spears,

1998; Postmes, Spears, & Lea, 2002). These studies evidenced individuals' abilities in adapting themselves into social contexts afforded by computer-mediated environments.

While a large volume of previous research in CMC presents implications on cognitive characteristics in computer-mediated interpersonal settings, less scholarly attempts have been made to examine influence generated by different types of social media. Considering their different ways of affording social connections, social media may influence distinctive cognitive states and information processing. To this end, the present study examined influence of different types of social media, i.e., relational and categorical media, in comparison to media not affording social connections, or non-social media. In the current study, the relational and categorical social media are assumed to situate users in a unique social context, i.e., relational and categorical context, respectively, and that the context determines users' making sense of themselves and their relationship with others, which in turn influence further cognition processes.

Social psychology literature suggests classifications of groups similar to our relational and categorical distinction, and informs of characteristics of individuals' cognitive states in these group contexts. Discussing relationship between self-identity and social structures (i.e., Stryker & Serpe, 1982; Turner, 1984), Deaux and Martin (2003) introduced interpersonal network and social category as two distinctive group contexts. The former implies a collection of reciprocal relationships with others, whereas the latter refers to as a context manifesting a categorical membership (see also, Postmes, Baray, Alexander, Morton, & Swaab, 2006). Similarly, Prentice, Miller, and Lightdale (1994) proposed a classification of common-bond group and common-identity group. Their dinstiction is based on the origin of group attachment. Common-bond groups are based on attachment to other members, whereas common-identiy groupas on

attachment to group identity. Note that these lines of literature present similar classifications of group contexts from different theoretical origins: Deaux and Martin (2013)'s classification based on identity shift, whereas Prentice et al. (1994)'s classification on group attachment. The difference in their origins evidence that multiple aspects of cognitive states are associated in a particular social contexts and situating people in a social context may result in different psychological outcomes influenced by the context.

To understand the multi-faceted aspects of social media influence, the present dissertation proposes a theoretical framework built upon *situated cognition* (Barsalou, 2009; Jonas & Cesario, 2013) and *cultural mindset* (Oyserman, 2015; Oyserman, Coon, & Kemmelmeier, 2002; Oyserman & Lee, 2007). These lines of literature, based on knowledge activation (Förster & Liberman, 2007), underline the importance of situation or context in individuals' cognition. In opposition to the notion of automatic cognition (Bargh, Chen, & Burrows, 1996), which advocates a thought of direct and context-independent operation of cognition, situated cognition emphasizes the role of social and natural environments in cognitive processes (Jonas & Cesario, 2013). Based on this perspectives, Oyserman conceptualized cross-cultural psychology as *mindset* situated in cultural contexts (Oyserman, 2015; Oyserman et al., 2002). In their work, culture is interpreted as a social context presenting a meaning-making framework, through which individuals adjust their understanding of self, others, and their relations (Oyserman, 2015).

Following the situated cognition and mindset perspectives, the current dissertation assumes users' adaptive cognitive states, determined as immediate responses to a context afforded by social media, and conceptualized the states as *mindset*. In the current dissertation, mindset is defined as a set of knowledge, or mental representations or cognitive schemata, which entails *self-concept*, *goal-orientation* and *social perception*, all of which are used to make

meaning of the social context[1]. Previous studies on self-concept, goal-orientations, and social perception evidenced their vulnerability to environmental cues by showing that these constructs are temporarily primed in experimental settings (Oyserman et al., 2002). The current study further suggests that social media also influence these constructs by presenting different social contexts. Particularly, relational and categorical media, compared to media non-social media, cause users to conceive *relational* and *in-group mindset* respectively, as results of their understanding of the given social context.

The merit of the mindset approach is that it allows us to develop predictions on nuanced differences in high-level cognitive process influenced by social media use. Of particular interest in the current dissertation are group identification and belief changes. Following the previous literature providing the cognitive basis of group attachment (Prentice et al., 1994) and in-group favoritism (e.g., the social identity theory, Tajfel & Turner, 2004), the current dissertation predicted that the mindset emerged from using social media will be a cognitive basis of development of group identification. While Turners' social identity approach mainly discussed in-group favoritism based on social identity, later scholars suggested relation-oriented group attachment as a complementary way of developing group attachment (e.g., Prentice et al., 1994). Particularly, the current study proposes that the way social media users perceive their group members (i.e., social perception) influence users with relational and in-group mindset develop group identification (see Figure 1). Building on their argument, the current dissertation

[1] Previous studies view mindset from a restricted perspective, often define it as a procedural knowledge (Crusius & Mussweiler, 2012; Fujita & Trope, 2014; Wyer, 2015). In this dissertation, I followed Oyserman's approach (2011), in which mindset is defined in an inclusive manner. Her definition of cultural mindset is "a set of mental representations or cognitive schema containing culture-congruent mental content, cognitive procedures, and goals."

examined distinctive mechanisms in developing group identification.

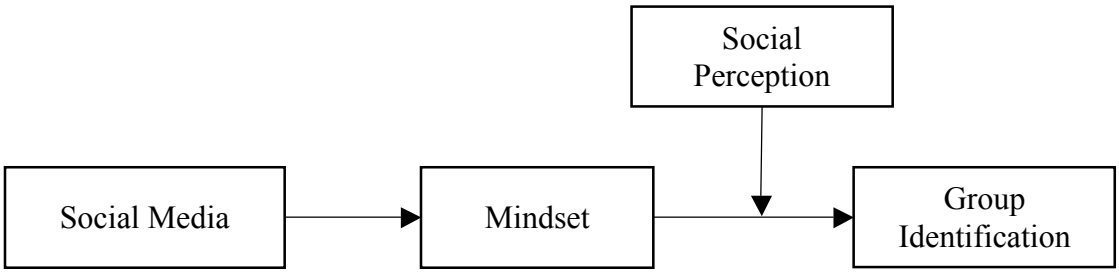

Figure 1. Diagram for examining effects of social media on group identification.

Furthermore, the current dissertation examined the effect of social media on belief changes. Recent studies on social cognition proposed the automatic nature of social influence (Dijksterhuis, 2001; Galdi, Arcuri, & Gawronski, 2008; Newell & Shanks, 2014; Smith & Mackie, 2015), arguing that individuals are influenced by others' thoughts, opinions, and beliefs, by automatically representing others' inner states but misidentifying the ownership of the representations as their own (Smith & Mackie, 2015). Our mindset approach suggests that the relational and categorical context facilitate this automatic social influence, leading to greater belief changes on relational and categorical media than on non-social media.

The current study assumes that social media users are influenced by other users when they read their posts and comments, and the influence is reinforced by the social connection. Thus, the present study examined the reinforcing effects of social media and mindset on comments influence (see Figure 2).

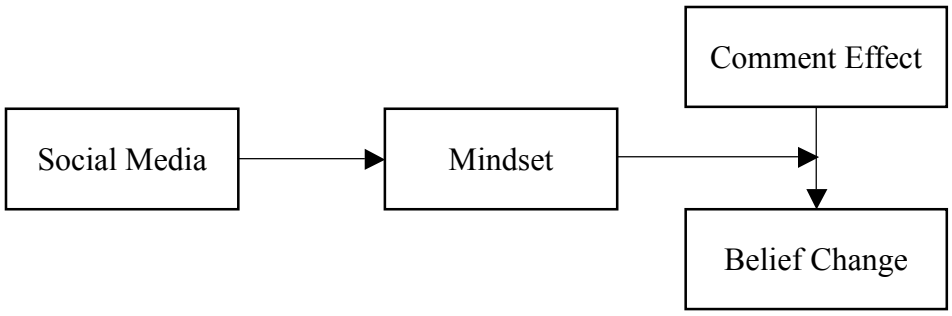

Figure 2. Diagram for examining effect of social media on belief change.

The structure of the dissertation is as follows. Chapter 2 presents the theoretical framework, mindset approach, discussing knowledge activation and situated cognition. In Chapter 3, group identification and belief changes are discussed as outcomes of social media use. Chapter 4 is a method section, which introduces an online experiment conducted to test hypotheses regarding the mindset, group identification, and belief changes. Results of the experiment are presented in Chapter 5. Chapter 6 presents discussion, including summary of the findings, implications, and limitations of the current study.

CHAPTER 2

MINDSETS IN SOCIAL MEDIA

The current chapter proposes mindset as a theoretical framework to examine cognitive influence of social media use. The mindset approach suggests that social media prime users with a set of knowledge, compatible with a social context given in the media. The present study proposed two different types: relational and in-group mindset. Relational mindset is assumed to be primed by a social context afforded by relational media, in which users build individual relationship with other members (e.g., LinkedIn). In-group mindset is prompted by a social context afforded by categorical media, in which users have a membership and build collective relationship with others (e.g., Reddit). These mindsets are considered as activated knowledge resulting from meaning-making process of a context afforded by social media. Particularly in the present dissertation, mindsets are viewed from three different types of knowledge, including knowledge about themselves (i.e., self-concept), knowledge about what is important (i.e., goal-orientation), and knowledge about processing information of other people (i.e., social perception).

The mindset is developed from situated cognition (Jonas & Cesario, 2013; Semin & Smith, 2013), a larger theoretical framework built upon knowledge activation (Förster & Liberman, 2007). This chapter starts by discussing basic principles of knowledge activation, followed by delineating the interdependent nature of knowledge being activated concurrently in a social context. Then, characteristics of the relational and in-group mindset are discussed, with a focus on self-concept, goal-orientations and social perception.

Knowledge Activation and Mindset

Knowledge Activation

Knowledge activation, also known as priming, is a cognitive function by which knowledge, or mental representation or schema, in human memory is *activated* or *primed* by processing stimuli associated with the knowledge, *and* the activated knowledge consequently becomes *accessible* to be used in later cognitive operations (Förster & Liberman, 2007; Higgins, 1989; Molden, 2014; Schwarz, Bless, Wänke, & Winkielman, 2003; Wyer, 2008). Activation and accessibility are key concepts in knowledge activation, and they are well-illustrated in a seminal work by Higgins, Rholes, and Jones (1977). In their experiment, participants were unobtrusively exposed to a personality trait (e.g., adventurous), and then evaluated an ambiguously described person in an unrelated task. Their prediction was a spillover effect of the activated trait: Participants were likely use the previously activated concept in the subsequent evaluation task. Supporting their prediction, participants evaluated the target person consistently with the previously-activated personality trait (i.e., the person is brave). This study has opened a door to a new experimental paradigm examining unconscious operation of human cognition (Bargh, 2014; Bargh & Chartrand, 2000), and knowledge activation has become one of dominant theoretical frameworks to understand human cognitive process (Higgins, 1989) as well as a methodological tool.

Higgins, Rholes, and Jones (1977)'s priming study is based on *semantic knowledge activation*: The personality trait used in the priming phase is related in its meaning to the concept used in the later task (e.g., Neely, 1977). The semantic knowledge activation suggests that activation spreads over a semantically-associated memory network (e.g., adventurous-independent), proving its usefulness in explaining perceptual and judgmental assimilation (Bargh

& Pietromonaco, 1982; Correll, Park, Judd, & Wittenbrink, 2002; Srull & Wyer, 1979) and direct impact on behavior (Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998). Later studies have expanded its boundaries of knowledge activation, by suggesting that various types of psychological constructs are structured as the form of mental representation, and their influence can be understood as knowledge activation. In the current study, of interest are three types of knowledge: self-concept, goal, and procedural knowledge.

Self-concept, Goal, and Procedural Knowledge

Self-concept. Studies on self-concept suggest that ones' view of self is constructed in a social context, and their self-understanding is adaptive to needs of the context (Markus, 1983; Oyserman, 2015; Oyserman & Lee, 2007). That is, ones' self-concept in its nature is malleable to a situation: People change their ways of viewing themselves highlighting aspects appropriate to a given social context and concealing irrelevant parts (Brewer, 1991; Higgins, 1987; Markus & Kunda, 1986; Markus & Nurius, 1986; Oyserman, 2001). Using terms borrowed from the knowledge activation literature, it can be stated that social context activates self-concept congruent to the context as a sense-making process, and the self-concept becomes accessible influencing further cognitive process (Oyserman, 2001).

Several lines of literature have evidenced the vulnerability of self-concept. The social identity theory (Tajfel & Turner, 2004) suggests that identity is vulnerable to a social context, easily shifting between one based on individuality and one based on group membership. The identity governs ones' behavior, resulting in in-group favoritism and outgroup hostility. Also, studies applying knowledge activation to the cross-cultural self-concept argued that a particular self-concept can be activated by external cues regardless of ones' cultural background (Oyserman, 2015; Oyserman & Lee, 2007). That is, self-concepts are in a form of self-

knowledge stored in memory, and thus they are chronically accessible due to repeated activation in their culture (i.e., interdependent self-concept for East Asians and independent self-concept for Westerners), but also temporarily activated by external cues (Gardner, Gabriel, & Dean, 2004; Gardner, Gabriel, & Lee, 1999).

Goal. Psychologists also consider goals as a sort of knowledge, stored in one's memory as a form of mental representations. Thus, goals are activated and become accessible unconsciously by associated cues embedded in a surrounding environment, often resulting in behavioral consequences (Custers & Aarts, 2010; Dijksterhuis & Aarts, 2010). Bargh, Gollwitzer, Lee-Chai, Barndollar, and Trötschel (2001) showed that participants exposed to words denoting a goal of high performance (e.g., win, compete, succeed) or a goal of cooperating with others (e.g., dependable, helpful, support) showed greater performance or cooperation in the following task than those exposed to neutral words. Goal activation occurs not only from exposure to context-free semantic words, but also from cues embedded in a social context from which one may infer a goal (Aarts, Gollwitzer, & Hassin, 2004; Dik & Aarts, 2007). Aarts, Gollwitzer, and Hassin (2004) examined effects of goal activation, using a story about a person in need of money for a vacation. Their results suggest that participants reading the story were more eagerly engaged in behavior with monetary incentives than a control group.

Procedural knowledge. Similarly to self-concept and goal, procedural knowledge is also stored in memory, and when activated, it becomes accessible and exerts influences in consequential tasks (Smith, 1994). Wyer and Xu (2010) reviewed several cognitive procedures and suggested procedural knowledge activation influences cognitive processes at different levels, including perception (e.g., holistic *vs*. piecemeal information process, Higgins & Chaires, 1980), evaluation (e.g., counter-arguing *vs.* bolstering, Xu & Wyer, 2012), and decision-making (e.g.,

deliberative *vs*. implemental, Gollwitzer & Bayer, 1999). For example, procedural knowledge of abstract *vs.* concrete thinking influence subsequent tasks at the perception level (Trope & Liberman, 2010). Wakslak, Trope, Liberman, and Aloni (2006) showed that using the concrete-*vs.* abstract-thinking procedure impacted participant's performance in a perceptual task, such that when prompted to use abstract thinking. Participants performed better on abstracting stimuli from a background (i.e., a task requiring abstract thinking) and worse on paying attention to details (i.e., a task requiring concrete thinking) than those who used concrete thinking.

Situated Nature of Human Cognition

The aforementioned studies focused on singling out activation effects of one knowledge type controlling for influence of other. Yet, different types of knowledge activation can induce influence simultaneously when stimuli activate several knowledge types concurrently (Bry, Follenfant, & Meyer, 2008; Crusius & Mussweiler, 2012; DeMarree, Wheeler, & Petty, 2005; Keller & Molix, 2008; Mussweiler & Damisch, 2008; Sui & Han, 2007). Simultaneous influence of knowledge activation is consistent with situated cognition, in a sense that both lines of literature emphasize contextual influence in knowledge activation (Jonas & Cesario, 2013; Smith & Semin, 2004). Situated cognition, attempting to overcome the perspective of the direct human cognition (e.g., Bargh et al., 1996), focuses on knowledge activation mechanism contingent on various contextual factors (Castelli & Tomelleri, 2008; Fitzsimons & Fishbach, 2010; Jonas & Sassenberg, 2006). Under the situated cognition tradition, knowledge activation and their psychological consequences are understood from a holistic perspective: Knowledge activation is a cognitive process governed by individual's meaning-making process and adaptive reactions to a given context. Thus, understanding effects of knowledge activation should include

examining how contextual cues activate a set of knowledge and what high-level psychological consequences are involved in the activated knowledge set.

To illustrate, consider the *motivated preparation account* for priming effects (Cesario, Plaks, Hagiwara, Navarrete, & Higgins, 2010; Cesario, Plaks, & Higgins, 2006). Cesario et al. (2010) investigated how a physical surrounding moderates the effects of activating a threatening outgroup. Their experiment showed that priming participants with a threatening outgroup member generated opposite effects, depending on physical environment surrounding the participants: They showed distancing cognitive and behavioral responses in an open-ended environment, but aggressive responses in a closed booth.

This result evidences the situated natures of human cognition, showing how people integrate their physical environment into meaning-making process of the threatening target. For those situated in an open field affords distancing behaviors, a threatening person *means* a target from whom they should escape. In contrast, for those situated in a closed space, a threatening person means a target against whom they should fight. Thus, effects of priming a threatening target can be understood as a meaning-making process, adopted by individuals motivated to prepare for social interaction.

Using the language from knowledge activation, being exposed to a threatening target activates *a goal of protecting oneself* from the target. The observed effect of the activation is moderated by activation of a procedural knowledge. An open context activates a procedure of escaping leading to the escaping responses, whereas a closed context activates a procedure of confronting the threating target, resulting in the fighting response. This finding suggests that the effect of knowledge activation in real-life settings can be fully understood by examining how a given situation co-activates other types of knowledge.

Mindset in Social Media

Social media afford a context, in which users build their relationships with other people and develop social meaning from the relationships. Employing the situated cognition perspective, the present study proposes that the context afforded by social media activates knowledge, which is adequate for the context. Particularly, the current study focuses on three different knowledges relevant to the context presented by social media: the way people define themselves (i.e., *self-concept*), goals considered important in the context (i.e., *goal-orientation*), and the way people perceive other people in the context (i.e., *social perception*). The present study proposes that these types of knowledge tend to activate together in a given social context generated by social media, constructing a mindset.

Relational vs. In-group Self-concept

When using social media, individuals will adjust their self-concept to accommodate a social context afforded by the media. People using relational media may view themselves in reference to relations they develop with other users. For example, Facebook users maintain social connections with their offline friends, family members, and colleagues, and using the medium reminds them of the particular social connections, prompting them to think of themselves as a friend, family member, and colleague, respectively. Alternatively, people using categorical media may view themselves as a group member. Users of Reddit may refer themselves as a Redditor adopting the group identity as their own. This postulation is supported by literature on social identity and self-concept, which suggest that people may have different self-concept depending on social contexts, and their self-concept shifts by nuanced cues in social contexts (Brewer & Gardner, 1996; Tajfel & Turner, 1986).

Social identity and group identity. Scholars examining self-concept postulate that individual's understanding of self is multifaceted, activated by different social and cultural contexts (Brewer & Gardner, 1996; Cross, Hardin, & Gercek-Swing, 2011; Kashima et al., 1995; Markus & Kitayama, 1991; Postmes, Spears, Lee, & Novak, 2005; Tajfel & Turner, 1986). The social identity approach put forward by Tajfel and Turner (1979), for example, suggests a distinction between individual- and group-oriented self-concept (David & Turner, 2001; Turner, Oakes, Haslam, & McGarty, 1994). Tajfel and Turner (1986) proposed that people may view themselves as beings with unique attributions distinguished from others, or with attributes from a group they belong to. People can adaptively change their identity from one to the other by redefining their identity along with the intergroup-interpersonal continuum (Tajfel & Turner, 1979; Turner, 1984). These social identities lead to different behavioral consequences: group-oriented self-concept often results in behaviors governed by group norms or in-group favoritism, whereas individual-oriented self-concept engenders behaviors determined by individuals' personality (Tajfel & Turner, 1986).

The social identity approach provides a useful framework to understand intergroup behaviors, but it does not inform the relational aspect of social identity. On this regard, Postmes, Baray, Alexander, Morton, and Swaab (2006) proposed two different types of group identity: deductive *vs.* inductive group identity. The deductive group identity is a top-down process of adopting an identity. It is based on a categorical distinction between in- and out-group, similarly to the Tajfel and Turner's (1986) sense of social identity. In contrast, the inductive group identity is a bottom-up process, through which individuals develop interpersonal bond with each group members. Thus, inductive group identity emerges from building connections with individuated group members.

Collective, relational, and individualistic self-concept. In a similar vein to the deductive and inductive distinction, scholars on self-concept suggest a tripartite model of self-concept. Brewer and Gardner (1996) suggested three types of self-representation associated with a different level of social situation: personal, relational, and collective self. At the individual level is the personal self, defined as the differentiated, individuated self-concept. The relational self is the self-concept at the interpersonal level, defined by roles determined in relationships with significant others (similarly, the relational-interdependence, Cross, Bacon, & Morris, 2000; the interdependent self, Markus & Kitayama, 1991). Finally, at the group level is the collective self, defined as a member of a group (i.e., social identity, Hogg, Abrams, Otten, & Hinkle, 2004; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987).

The present study proposes that the same topology of self-concept can be applied to users of social media. For those who use relation-oriented media, ones' self-concept is overlapped with self-concept of their interaction partners. For those who use group-based social media, self is represented as a group and other members sharing the same membership is also included in ones' conceptual boundary of self. Based on this argument, the first hypothesis predicts that:

H1(*a*/*b*): Compared to people using non-social media, (*a*) people using relational media construct relational self-concept to a greater extent, and (*b*) people using categorical media construct in-group self-concept to a greater extent.

Further research questions are proposed regarding effect of relational media on in-group self-concept, and effect of categorical media on relational self-concept as not concrete evidence has been reported.

RQ1(*a*/*b*): Does using (*a*) relational media influence in-group self-concept and (*b*) using categorical media influence relational self-concept?

Goal-orientation in Relational and In-group Context

The present study also suggest that people conceive different goals in using social media, depending on the media type they use. When using non-social media, people are less likely to think of a group norm and free from normative concerns. When using group-oriented social media, however, people may perceive goals for their group more important than when using a medium in a non-social context.

This prediction is in line with previous studies in the social identity approach. Studies under the social identity evidenced that people with a group identity showed in-group favoritism (Hertel & Kerr, 2001), indicating that their behaviors are guided by a goal of maximizing group benefits. The in-group favoritism of the social identity approach assumes that ones' innate motivation of the self-enhancement transforms to group-oriented behaviors, as people identify themselves with a group. That is, individuals, being identified with group in a group context, consider maintaining individual identity and addressing individual concerns less important. In contrast, goals can be focused on a specific relationship among users. People often consider their partners' goal, particularly when they define themselves in terms of the relationship with others (Gore, Cross, & Kanagawa, 2009). Thus, using categorical media users are more likely to value group-oriented goals, such as complying to group norms, than individual-oriented goals, such as being unique to others.

In contrast, goals can be focused on a specific relationship among users. People often consider their partners' goal, particularly when they define themselves in terms of the relationship with others (Gore et al., 2009). While not many studies focused on effects of contextual cues on relational goal-orientation, the current study proposed that people using relation-oriented social media may conceive goals associated with specific relationships they

form in the media. Situating in a context where ones' interpersonal relationships are at the center of attention may prompt individuals to remind significance of social relationship, and thus relational goals may be perceived as important in a such social context. Thus, our hypothesis predicts as follows.

H2(*a*/*b*): Compared to when using non-social media, (*a*) people using relational media consider relational goals more important and (*b*) people sing categorical media consider in-group goals more important.

Also, research questions are proposed regarding effects of relational media on valuing in-group goals, and effects of categorical media on valuing relational goals.

RQ2(*a*/*b*): Does using (*a*) relational media influence one's valuation of in-group goals and (*b*) using categorical media influence one's valuation of relational goals?

Procedural Knowledge: Global vs. Local Processing

The current study also suggests that social media activates a particular procedural knowledge compatible with the social context afforded by the social media, and people employ the knowledge in processing information of other group members. Of particular interests in this dissertation are *global*- vs. *local*-processing (Dijkstra, van der Pligt, van Kleef, & Kerstholt, 2012; Eyal & Fishbach, 2010; Förster, 2012; Ledgerwood & Trope, 2010). When global-processing becomes accessible, people tend to perceive a stimulus as a whole (i.e., Gestalt of the stimulus), whereas when local-processing becomes activated, people focus on its details.

Previous studies are suggestive of precursors of the global-local processing. Förster and his colleague (Förster, 2012; Förster & Dannenberg, 2010), for example, proposed that novelty of stimuli invites global processing, because global meanings of stimuli are more useful to learn about the stimuli than their details. This reasoning seems inconsistent with other studies

discussing level of abstraction in cognitive process. Action identification theory (Vallacher & Wegner, 2012; Vallacher, Wegner, & Frederick, 1987; Wegner, Vallacher, Kiersted, & Dizadji, 1986), for example, suggests that people rather pay attention to global aspects for fluent actions and familiar events but to local details for unfamiliar actions and events (Vallacher & Wegner, 2012). Similarly, construal-level theory (Liberman & Förster, 2009; Shapira, Liberman, Trope, & Rim, 2012; Trope & Liberman, 2010) proposes that psychologically distal (thus unfamiliar) objects and events tend to be construed as high-level abstracts, because processing abstract and stable information is an effective way to understand highly uncertain stimuli. As a result, people tend to construe mental representations of stimuli with abstract, conceptual gist (i.e., global-processing), when feeling that an even or social being psychologically distal. Yet when feeling proximal to the stimuli, they tend to construe them with concrete, perceptual details (i.e., local-processing).

In addition to the phenomenological characteristics of stimuli, the present study proposes that contextual characteristics may influence procedural knowledge. That is, mindset approach suggests that a social context activates a procedural knowledge adequate to the context. Particularly, the current study proposes that, relational media, compared to non-social media, may induce users to employ local processing. In relational media, people form individual relationship with others and see others as unique entities. In this context, differences among others play a significant role for ones to recognize uniqueness of their relationship. Thus, people may pay attention to the differences among their social connections.

A large volume of studies on self-concept and cognitive style (Cross & Morris, 2003; Cross, Morris, & Gore, 2002; Kühnen, Hannover, & Schubert, 2001; Kühnen & Oyserman, 2002; Mourey, Oyserman, & Yoon, 2013; Niedenthal & Beike, 1997) documented evidence for

this argument. Kühnen et al. (2001), for example, showed participants primed with interpersonal self-concept paid greater attention to context-specific information (thus concrete) than participants primed with independent self-concept. Similarly, people primed with a concept of interrelatedness were more likely to use subordinate (thus concrete) terms to describe their relational partners than those primed with independent self (Kühnen & Oyserman, 2002).

Further, the current study suggests that people using categorical media may employ global-processing procedural knowledge. According to the social identity approach (Turner, 1984), people who have their social identity salient define themselves as group properties and others as members of the game group. This perceptual process, called depersonalization, requires ones to focus on similarities and abstract features of group members by paying less attention to any individual characteristics that may distinguish one from another. Based on this line of arguments, our third hypothesis predicts that:

H3(*a*/*b*): Compared to those using non-social media, (*a*) people using relational media perceive other group members at more of a concrete level and (*b*) people using categorical media perceive other group members at more of an abstract level.

CHAPTER 3

INFLUENCE OF SOCIAL MEDIA USE

This chapter focuses on two psychological outcomes of using social media and their underlying mechanisms: group identification and belief change. Drawing on social identity formation (Jans, Postmes, & Van der Zee, 2011, 2012; Postmes et al., 2005) and the mindset account, the current study predicts distinctive group-identification processes emerging from social media use. Also, building upon the automatic social influence perspective (Smith & Mackie, 2015), the current study predicts reinforcing effects of social connection afforded by social media on belief change, and a mediational effect of group identification.

Group Identification in Social Media

In a social context, people identify themselves with others, making psychological and behavioral commitment. Previous studies on group identity suggest distinctive group identification processes (Jans et al., 2011, 2012, Postmes et al., 2006, 2005; Prentice et al., 1994), suggesting that the different social media trigger distinctive cognitive process of group identification.

Deductive vs. Inductive Group Identity Formation

Prentice, Miller, and Lightdale (1994) examined characteristic of social groups college students form or join in their college life and found two distinctive types, common-bond and common-identity group, by identifying the way members develop attachment to their group. Members of common-bond groups develop attachment to fellow group members, and their group identification emerges from the attachment to individual members and interpersonal relationship with individual members of a group. The strength of group identification thus depends on the extent to which ones know, like, rely on, and feel connected to other members of the group. In a

common-identity group, in contrast, members form attachment to group identity, and members' group identification originates from viewing the group as a unity. This is in line with the definition of social identity of the social identity approach, which proposes that people define themselves using a group-level identity depending on an external condition (Tajfel & Turner, 1979, 2004). In this type of group, people feel attached and commit themselves to the group, not because of their intimate relationships with group members, but because of psychological benefit of being a member of the group (e.g., self-enhancement).

In a similar vein, Postmes and his colleagues' deductive and inductive group identity (Jans et al., 2011, 2012; Postmes et al., 2005) is indicative of two distinctive identification processes. The deductive process, parallel to the common-identity group (Prentice et al., 1994) and the social identity account of intergroup behaviors, proposes that people in an intergroup context tend to disregard unique characteristics of group members and define themselves with group-level attributes (e.g., Turner & Reynolds, 2012). Thus, in a categorical social context, the extent to which participants consider members as indistinguishable group member and homogeneous entities, participants would experience group identification. In this process, depersonalization plays a key role for group identification process.

The inductive process, in contrast, implies group identification process originating from interpersonal interaction and intimacy toward each group member. Thus, in the inductive process, individuals' group identification is dependent on the extent to which they perceive uniqueness of their interaction partners (Jans et al., 2011, 2012). This is in line with the common-bond group (Prentice et al., 1994), in which people feel attached to a group through individuated interactions.

Mindset and Group Identification

Under the mindset framework of the current study, the deductive process can be interpreted as in-group mindset developing group identification: In-group self-concept and global processing of in-group mindset facilitates the deductive identification process. People having in-group mindset view themselves and others as in-group members, focusing on global characteristics among others. Relational mindset, in contrast, fosters the inductive group identification. Relational self-concept based on interpersonal relationships with others and the local processing guide users to process information of other members focusing on unique characteristics of individual members.

Based on this reasoning, hypotheses regarding the effects of relational and categorical media on group identification are proposed as follows:

H4 (*a*/*b*): People using (*a*) relational and (*b*) categorical media have greater group identification with their group members than those using non-social media do.

Further, the current study proposes mediating effects of the mindset outcomes. As the current study conceptualizes, relational and categorical media prime users to develop a specific mindset, and this mindset may be associated with their group identification. Self-concept and goal-orientation, conceptualized respectively as individuals' knowledge regarding how they understand themselves and what is important in the current context, are closely related to group identification. That is, the greater extent participants define themselves in terms of others (i.e., relational self-concept and in-group self-concept), the stronger group identification they may develop from others. Thus, hypotheses predicting mediational effects of self-concept and goal-orientation are proposed as follows.

H5(*a*/*b*): Self-concept mediates the effect of (*a*) relational and (*b*) categorical media on

group identification.

H6(*a*/*b*): Goal-orientation mediates the effect of (*a*) relational and (*b*) categorical media on group identification.

Social Perception and Group Identification

In addition to our predictions on effects of relational and in-group mindset on group identification, the current study also suggests that perceptual-level outcomes of using social media also facilitate group identification. That is, people using relational and categorical media experience stronger *perception of relatedness* (either interpersonal or in-group) with group members, which may lead to group identification. As indicated in the two group identification processes (Jans et al., 2011, 2012; Postmes et al., 2005), individuals may feel greater group identification to the extent to which they perceive other people as individually associated members (i.e., relational perception), *or* to the extent to which they perceive others as deindividuated, homogeneous members (i.e., homogeneity perception) and members belonging to a group (i.e., categorical perception)(e.g., E.-J. Lee, 2004).

Based on this line of argument, the current study suggests that a dominant mechanism of group identification may differ depending a social context individuals are situated. That is, relational perception may facilitate group identification when individuals use relational media, whereas homogeneity perception or categorical perception may expedite group identification when individuals use categorical media.

Thus, the current study suggests that perceiving others as individually associated members (relational perception), as members belong in a group (categorical perception), and as homogeneous members leads to group identification.

H7 (*a*/*b*/*c*): (*a*) Relational perception, (*b*) categorical perception, and (*c*) homogeneity

perception lead to group identification.

Lastly, hypotheses regarding relative contribution of social perception to group identification are proposed as follows.

H8(*a*): Relational media moderate the relationship between relational perception and group identification, such that relational perception has stronger association with group identification for relational media users than for a control group.

H8(*b*/*c*): Categorical media moderate (*b*) the relationship between categorical perception and group identification and (c) the relationship between homogeneity perception and group identification, such that (b) categorical perception and (c) homogeneity perception has stronger association with group identification for categorical media users than for a control group.

Social Influence of Belief Change

In a social context, people often change their beliefs, opinions, and attitudes, in line with beliefs, opinions, and attitudes of others (Asch, 1951; Chaiken & Stangor, 1987; Wood, 2000). Previous studies on social influence suggest that motivations associated with specific social contexts (e.g., informational or normative motives, Cialdini & Goldstein, 2004; Cialdini & Trost, 1998; Wood, 2000) and information processing (e.g., systematic vs. heuristic information processing, Chaiken, 1980) determines social influence process. Recent studies on knowledge activation, however, focused on the automatic, unconditional nature of human cognition, and revisited the social influence process from the automatic social influence perspective (Heyes, 2011; Loersch & Payne, 2012; Smith & Mackie, 2015). Under this approach, it is assumed that people may change their beliefs by merely recognizing others' opinions, without any explicit motivations (Smith & Mackie, 2015).

This automatic social influence is well portrayed in Smith and Mackie (2015)'s

Representation and Incorporation of Close Others' Responses (RICOR) model of social influence (for similar approaches, see Heyes, 2011; Loersch & Payne, 2012). Drawing on the knowledge activation, the RICOR model proposes two-stage automatic social influence. First, people spontaneously bring others' mental states into their own mind when they observe or imagine others (Stage 1). When observing others expressing their negative attitude toward a target, for example, people have a corresponding knowledge activated in their mind (i.e., the negative attitude toward a target). Second, the activated knowledge is often used as the one's own responses (Stage 2). It is because that the activated knowledge of other's negative attitudes is more accessible than other knowledge (e.g., positive attitudes), and the activated knowledge is not highly informative of the origin of the activation. Identifying the source of activation is an effortful, demanding processing, thus people do not engage in such activity unless being motivated to do so (Gawronski & Bodenhausen, 2006).

While the RICOR model suggests the automatic social influence as a default mechanism, it also proposes that the two stages of automatic influence depend on relationship between self and others. Individuals are more likely to activate mental representation of others' responses and less likely to identify a correct source of activation, when they have interpersonal relationship or share membership with others. Previous studies suggest that the automatic social influence varies along with interpersonal bonds (Sinclair, Huntsinger, Skorinko, & Hardin, 2005), indicating that people are likely to represent likable interaction partners' responses (Stage 1), and use activated knowledge as their own responses (Stage 2). Considering that the interpersonal bond is based on individuated interaction, this finding suggests that social influence process in relational media can be facilitated by the individuating interaction partners.

Also, literature showing influence of group membership can be interpreted as the

reinforced automatic social influence (e.g., Weisbuch & Ambady, 2008). Thus, categorical media, compared to non-social media, may facilitate automatic social influence, because in-group categorization may foster forming mental representation of others' responses and using the representation as their own responses. Based on this line of argument, the current study predicts that people using relational and categorical media are more likely to change their beliefs in line with others than those using non-social media. Furthermore, it is expected that the effect is mediated by the extent to which they experience group identification with others. Thus, hypotheses regarding the effect of social media on belief change and mediational effect of group identification are proposed as follows:

H9(*a*/*b*): Compared to those using non-social media, people using (*a*) relational and (*b*) categorical media change their beliefs toward other members' belief to a greater extent.

H10: Belief change facilitated by relational and categorical media is mediated by group Identification.

CHAPTER 4

METHOD

Study Design and Participants

An online experiment was conducted to test hypotheses proposed in Chapter 2 and 3. It was a 3 (media type: relational, categorical, *or* control) X 3 (message: positive, negative, or no messages) between-subjects design. While effects of message are not of interest of the current study, it is added for generalizability of findings.

Participants were recruited from Amazon Mechanical Turk (MTurk, https://www.mturk.com/), users of which participated in various tasks for monetary incentives. MTurk users are demographically diverse (Buhrmester, Kwang, & Gosling, 2011) and attentive to their tasks (Hauser & Schwarz, 2016). Furthermore, data collected from MTurk are not critically vulnerable to issues associated with online convenient samples, such as multiple account holders, information sharing with other users, and high attrition on longitudinal studies (Chandler, Mueller, & Paolacci, 2013). Thus, MTurk has been a reliable source for data collection for empirical studies in Communication and Psychology (e.g., Bolkan & Rains, 2015; Kim & Hancock, 2016; Merolla & Harman, 2016; Panero et al., 2016).

Participations in the experiment were rewarded with 1 USD. After deleting duplicate IP addresses and incomplete records, N = 1,381 responses were used for analysis (male = 42.7%, female = 56.2%, not revealed = 1.16%). Participants ranged in age from 18 to 80, with an average age of 33.59 (SD = 10.94). The nationalities of participants were 73.0% US, 9.1% UK, 7.7% India, 1.5% Canada, and 8.8% other, and the ethnicities were 74.2% White, 14.2% African American, 6.8% Asian, and 4.8% other.

Procedure

The experiment followed the mindset prime guideline (Bargh & Chartrand, 2000), which emphasizes participants' unawareness of an association between a priming phase and measuring phase. Particularly in mindset studies, participants are often asked to intentionally and consciously have a certain procedural knowledge or goal activated (e.g., writing an essay about a life of an African American' life, citation), increasing likelihood of participants to notice researchers' intentions of examining priming effects (citation).

To minimize such bias, a cover story was prepared for informing participants that they participated in several studies unrelated to each other. Participants started from a research portal (Figure 1), in which they were asked to complete in four studies selected in a study pool.

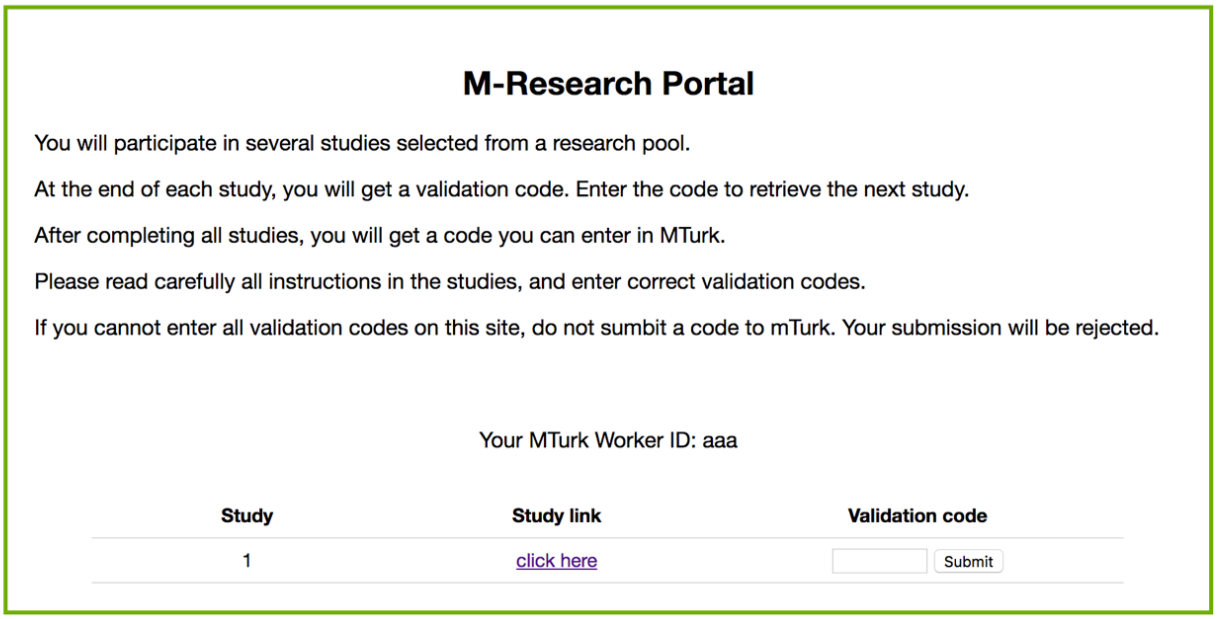

Figure 3. Captured image of research portal.

First, they participated in a health-behavior evaluation study (Study 1), in which they were asked to reveal their prior beliefs on four different health behaviors, including taking a small amount of artificial sweeteners, the topic of interest. After that, participants moved to the social-media evaluation study (Study 2), in which they were asked to use Stay Well Together for

five minutes and evaluate it at the end of the study. Participants of the relational and categorical condition were instructed to sign up for Stay Well Together and asked to either build individual connections with other users (relational condition) or join in an existing group (categorical condition). After building social connection, they moved to the main page. Participants of the control condition skipped the sign-up and connection building phases, and directly visited the main page (see Apparatus and Manipulation for details). The main page of Stay Well Together displayed posts and comments. Indicated by appended characters and usernames, the posts and comments were ostensibly generated by other users in participants' social connections. After three minutes of using the main page, a pop-up window showed up and guided participants to a post-use survey, which measured their perception of other members in their group and level of identification with their group members.

After Study 2, participants moved to a purportedly unrelated test (Study 3), which informed participants that they would answer questions measuring their personality. In this study, participants' self-concept and goal-orientation were measured. Then, participants moved to another health-behavior evaluation study (Study 4), in which they reported their opinions on four different health-related behaviors, including taking artificial sweeteners.

Apparatus and Manipulation

Stay Well Together (http://www.staywelltogether.com/) was designed as a social media platform for exchanging information and opinions on health-related topics. Its functions and design were adopted from existing social media including LinkedIn, Reddit, and Facebook. For example, participants could have posted comments and replies and clicked "Like" for others' comments. Initial designs were tested through two small pilot studies, results of which were used to update the site with new functions and design. These updates include adding buttons for

deleting their posts and comments in the main page, presenting relational connections one by one, and presenting a confirmation page for their connections at the end of the sign-up page.

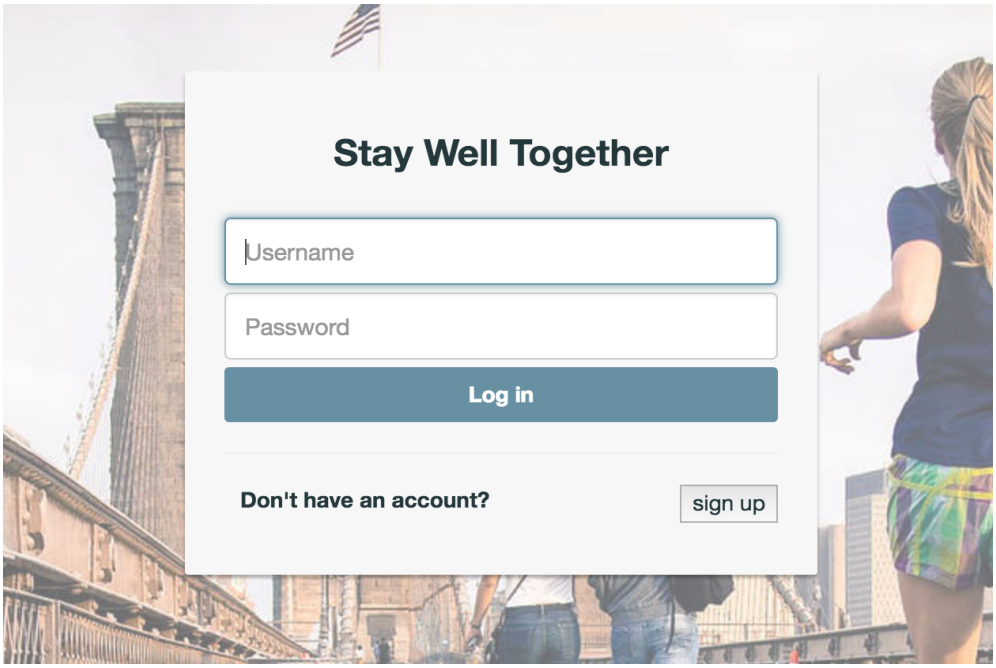

Figure 4. Initial page of Stay Well Together.

Participants of the relational and categorical conditions were driven to the front page of Stay Well Together (Figure 2). Being their first time to use the site, it was necessary for them to sign up. In the sign-up page, they were asked to select a username, password, and profile image, and enter their gender and health interests. The personal information asked was kept minimal, considering participants' reluctance to provide private information to an unfamiliar website (see Figure 3).

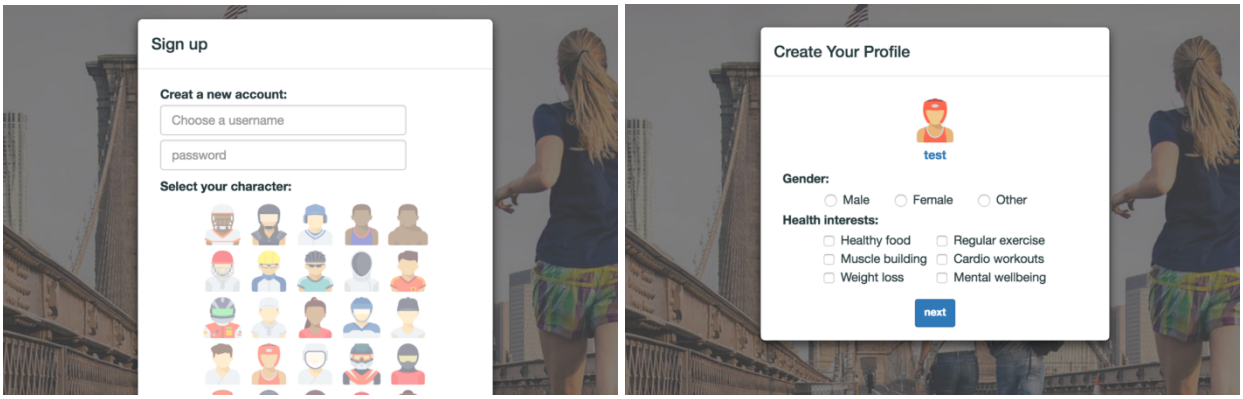

Figure 5. Pages for generating user profile.

During the sign-up, participants were also asked to build their connections, either of a relational or categorical type (see Figure 4). The relational group was given an opportunity to scrutinize candidates of their connection. A list of users recommended by system were presented one at a time and participants selected if they want to build a connection (see the left panel in Figure 4). After reviewing eight candidates, another list of users was displayed and informed users that those users also want to make connection with the participant. This page implied that other participants also had taken the same steps of connections building and chosen to connect with the participants.

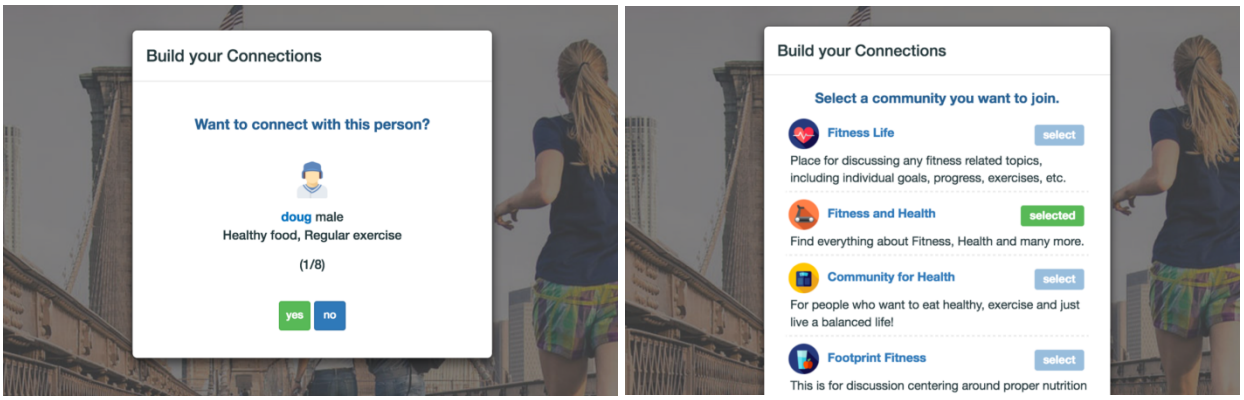

Figure 6. Pages for building connection. Left: relational, right: categorical connection.

The categorical group was presented with a list of seven groups, purportedly recommended by the system (see the right panel in Figure 4). Descriptions of the groups and icons were accompanied with the group names, indicating that they were online communities for

exchanging health-related information with slightly different foci.

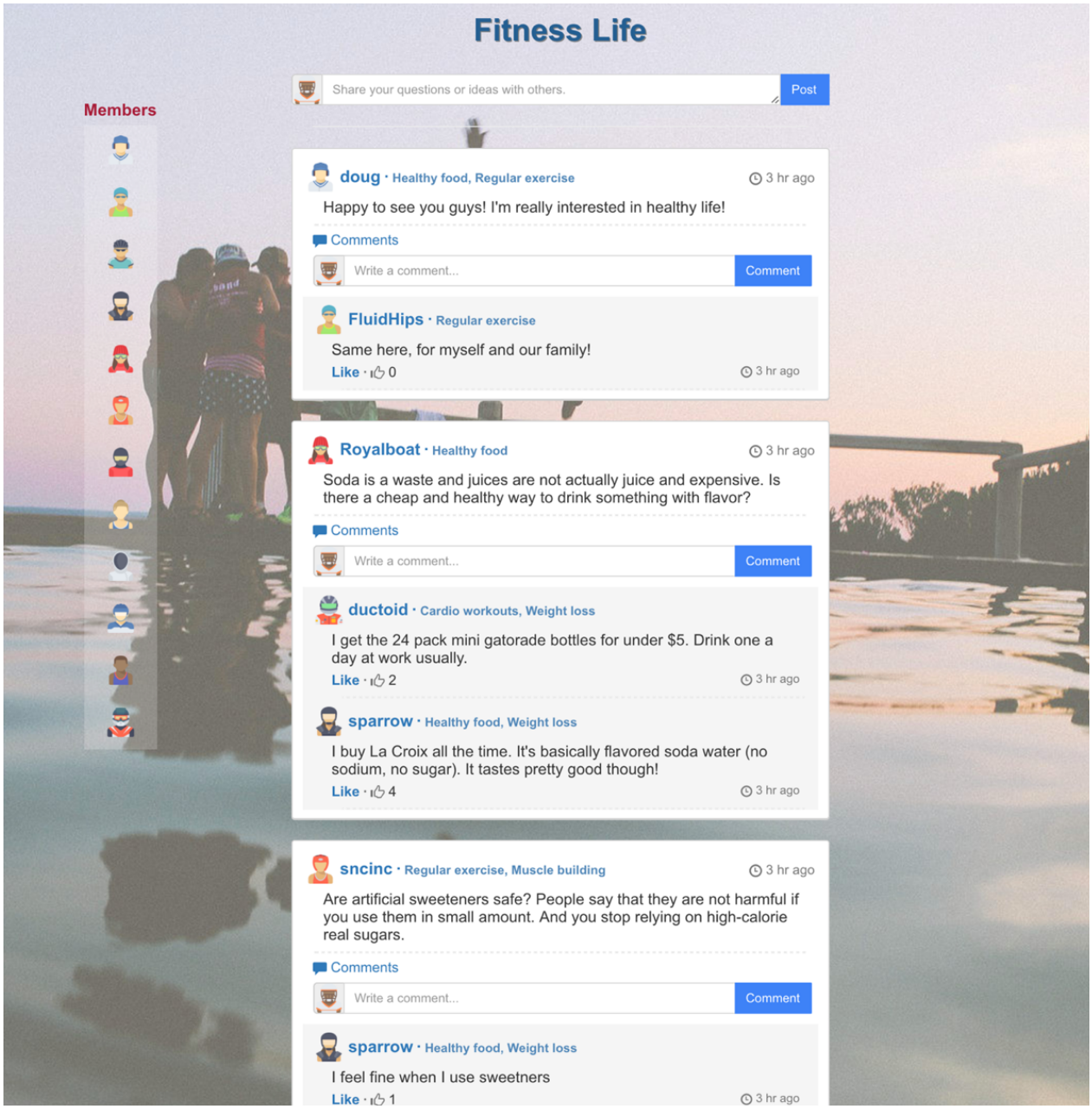

Figure 7. Main page displaying posts and comments (categorical media, positive comments).

After building connections, the relational and categorical group arrived at the main page (Figure 5). The control group did not go through the sign-up phase but revealed their gender and health interests in an anonymous survey before they visited the main page of Stay Well Together. When moving to the main page, the control group was informed that they used the site as an

anonymous user.

The interface of the main page was slightly differentiated to accommodate each media type. First, a narrow panel was located at the left side of the page for the relational and categorical conditions, displaying a list of participants' connections. This panel did not appear for the non-social condition. The main page displayed four posts, each of which had one to six comments, collected and modified from existing social media. The third post had a message, of which was intended to examine effects of social media use on belief change. The post asked others' opinions whether taking a small amount of artificial sweeteners are safe. The topic is chosen to examining effects on belief change, because it found to be controversial so that it feels plausible if people agree or disagree in comments. Also, a previous study suggest that people have neither in-depth knowledge of nor strong attitudes toward the topic, so that they are susceptible to the social influence of the comments (Sah & Peng, 2016).

For the positive and negative comment conditions, six comments were associated with the post, either supporting (for the positive condition) or opposing (for the negative condition) taking a small amount of artificial sweetener with naturally diverse tones (see Appendix A for all comments used in the experiment). For the no message condition, no comment was appended to the post.

Measures

Mindset. In Study 3, participants answered questions regarding mindset, which included self-concept, goal-orientation and level of abstraction of group members.

Self-concept. Self-concept was assessed by items modified from the self-representation scale developed by Brewer and Chen (2007). Participants rated the extent to which they agree with each item on 7-point scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Three

items were used to measure *individualistic self-concept*, i.e., "I enjoy being unique and different from others in many ways," "I often do my own thing," "I am a unique individual." These items were reliable, $\alpha = 0.80$, and averaged to create a composite measure, $M = 5.78$, $SD = 0.95$. *Relational self-concept* was measured by three items, i.e., "My happiness depends very much on the happiness of those around me," "Well-being of people connected with me is important to me," and "My relationships are important parts of my life." These items showed low reliability, $\alpha = 0.64$, and thus only last two items with greater correlation were averaged to create a composite measure, $r(704) = 0.61$, $p < .01$, $M = 6.02$, $SD = 0.96$.[2] *In-group self-concept* was measured using three items, i.e., "Overall, my group memberships have much to do with how I feel about myself," "Social groups I belong to are an important reflection of who I am," "In general, belonging to social groups is an important part of my self-image." The items were reliable, $\alpha = 0.86$, and averaged to make a composite measure, $M = 4.17$, $SD = 1.41$.

Goal-orientation. Nine items representing different goal-orientations were developed based on previous studies (Schwartz, 1990, 1992). Participants rated to the importance of each item on a 7-point scale, ranging from 1 (*not at all important*) to 7 (*extremely important*). Three items were intended to capture individualistic, relational, and in-group goal, respectively. The factor structure of the items was examined using data collected from the pilot study ($N = 289$). The exploratory factor analysis with the promax rotation showed that the three factors explained 62.6% of the variance, and all items except one had mid- to high-factor loadings (>. 62) for intended factors. One from the in-group goal items, "national security," was deleted due to small loading on the factor (= 0.18).

---

[2] We conducted inferential tests using both 2- and 3-item versions and found no difference in the results.

Individualistic goal was measured by three items, i.e., "freedom," "independence," and "choosing one's own goals," and were $\alpha = 0.75$, and averaged to create a composite measure, $M = 6.26$, $SD = 0.72$. *Relational goal* was measured by three items, i.e., "friendship," "intimacy," and "establishing a close relationship." The items were reliable, $\alpha = 0.80$, and averaged to create a composite measure, $M = 5.89$, $SD = 0.99$. *In-group goal* was measured by two items, "conforming to group norms," and "social solidarity." They were moderately correlated, $r(704) = 0.30$, $p < .001$, and averaged to create a composite measure, $M = 4.31$, $SD = 1.16$.[3]

Level of Abstraction. Abstraction level of group members was measured by an open-ended question, which asked participants to provide four short sentences describing their group members, starting with "They…" The responses were coded by a coding scheme (see Appendix B for the coding scheme), adopted after modifying the linguistic category model (Semin & Fiedler, 1988). The coding scheme classifies predicates of participants' descriptions at three levels of abstraction: *Action verbs* that describe a behavior involving a clear beginning and end (e.g., talk, help, encourage), *state verbs* that describe mental states of another person (e.g., want, hate, trust), and *adjectives* that describe people in terms of their attributes (e.g., friendly, respectful, helpful). Two independent coders, blind to the conditions, categorized participants' responses and achieved acceptable agreement, Cohen's $k = 0.73$ (Landis & Koch, 1977). Disagreements were resolved by discussion. The number of adjectives was used a measure of abstraction, $M = 1.90$, $SD = 1.18$, and the number of action verb was used as a measure of concreteness, $M = 0.69$, $SD = 0.82$.

Group identification. Group identification was measured by items adopted previous

[3] Because the reliability of the items was not high enough, we conduct analysis using each item, in addition to the composite measure. The referential statistics did not yield different results.

studies (Leach et al., 2008; Postmes, Haslam, & Jans, 2013). Three items were employed from Leach et al (2008)'s solidarity scale, i.e., "I feel a bond with them," "I feel solidarity with them," "I feel committed to them," and one from Postmes, Haslam, and Jans (2013), i.e., "I identify with them." The items were reliable, $\alpha = 0.90$, and averaged, $M = 3.85$, $SD = 1.42$.

Belief change. Participant's beliefs regarding taking a small amount of artificial sweeteners were measured as an indicator of influence of others' comments in Stay Well Together. Participants revealed their beliefs on artificial sweeteners before (Study 1) and after using Stay Well Together (Study 4). In attempt to conceal the relevance between measuring their beliefs and using the social media, items in pretest and posttest were slightly different. In the pretest questionnaire, participants rated on a scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) to what extent they agree on two items, "Even a small amount of artificial sweetener is bad for your health," and "Consuming artificial sweeteners a little is okay." Ratings on the items were highly correlated, $r(704) = .65$, $p < .001$, and averaged to create a composite measure, $M = 4.07$, $SD = 1.47$. In the posttest questionnaire, participated rated two items, "It is okay with using a little of artificial sweeteners," and "Artificial sweetener is bad for your health, even it is a small amount." The ratings were highly correlated, $r(704) = 0.71$, $p < .001$. Belief change was calculated by subtracting pretest belief from posttest belief, $M = 0.03$, $SD = 0.96$.

Social perception. Based on our conceptualization and previous studies addressing perceptual outcomes of group interaction (Hogg, Sherman, Dierselhuis, Maitner, & Moffitt, 2007; Prentice et al., 1994), eight items were developed regarding how participants perceive their connections in social media: two for relational perception, three for categorical perception, and three for homogeneity perception. Using data collected from the pilot study, the structure of the items was examined. The exploratory factor analysis with the promax rotation revealed that the

three factors explained 60.2% of the variance, and all items had mid- to high- factor loadings (>. 45) for intended factors. Thus, these items were adopted for the main study.

Relational perception was measured using two items, i.e., "Each person has unique meaning to me," "I have individual relationship with others." The items were highly correlated, $r(704) = .69$, $p < .001$ and averaged for a composite measure, $M = 3.25$, $SD = 1.51$. *Categorical perception* was measured using three items, i.e., "I felt each member could participate equally in the site," "I connected with others as a group member," and "I used the site as a member of the group." The items were reliable, $\alpha = 0.70$, and averaged to create a composite measure, $M = 4.64$, $SD = 1.29$. *Homogeneity perception* was measured using three items, including "They are a group, not just a collection of individuals," "They are similar to each other," "They are like-minded." The items were found reliable, $\alpha = 0.76$, and averaged to create a composite measure, $M = 4.88$, $SD = 1.06$.

CHAPTER 5

RESULTS

Data Cleaning

Before conducting analysis, inattentive participants were removed from the data. Three attention checking criteria were developed to screen out inattentive participants from different aspects. First, participants' attention to questionnaire was examined. Two attention checking questions were included in questionnaires to check whether participant paid attention to questionnaire items (in Study 2 and Study 4). The attention checking questions asked participants to select a particular answer option, and those who did not choose a correct answer were deleted from the data (n = 78).

Second, participants' attention to the messages embedded on the main page of Stay Well Together was checked by monitoring their idle time. The online platform recorded participants' clicking behaviors, calculating the time difference between a pop-up window appearing for the post-use survey and participant's clicking the window. Participants could not have performed any operation (e.g., scrolling down or writing comments) before clicking a button on the pop-up window. Thus, the longer time difference participants recorded, the less likely they were to pay attention to the website. The current study set the 5-minute threshold and deleted participants who had taken longer (n = 33).

Final attention checking was related to participants' attention to our manipulation of the connection type. We assumed that that participants would recognize social meaning of their connections and report correctly that they are connected or not connected to others, if they paid attention to our manipulation. Specifically, participants were asked in the debriefing survey to report whether they were connected to others as a friend or as a group member, or had no

connection. While a friend and a group member are the accurate answer for the relational group for the categorical group respectively, we considered both friend and group member as acceptable answers for relational and categorical groups. Our assumption for this inclusion was that these participants paid attention to our experiment at least to understand they develop connections with other users in the website. In contrast, the relational and categorical group who failed to recognize they were connected to others and the control group who failed to report that they did not connected were assumed that they did not pay attention to our manipulation.

Table 1.

The Number of Participants in Connection Types by Self-Reported Connection Type

		Assigned Connection Type			
		Relational	Categorical	No connection	Sum
Reported Connection Type	Friends	35	2	7	44
	Group member	182	235	103	520
	No connection	126	145	251	522
	Not answered	68	63	57	188
	Sum	411	445	418	1,274

Note. The identified sample comprises shaded cells (n = 705) and the entire sample comprises all cells (n = 1,274)

Table 1 shows the number of participants reporting each connection type across their experimental conditions. While our instruction stated that they were building connections with other users, a large portion of participants in relational (30.7%, n = 126) and categorical groups (32.6%, n = 145) reported they did not have any connections, suggesting participants' inattentiveness to our instruction. Also, the control group was instructed that they would use a social media platform as an anonymous user without having any connection, but many of them (24.6%, n = 103) misidentified that they were a member of the social medium. This misidentification might have been caused from the procedural similarity between the control group and other social connection groups: The control group went through a phase similar to

signing up a group in a separate page before they visited the main page of Stay Well Together, i.e., selecting an avatar and revealing health interests.[4]

Table 1 shows that 53.0% (n = 217) of the relational group and 53.3% (n = 237) of the categorical group reported that they had connections either as a friend or as a group member, and 60.0% of the control group correctly reported that they did not feel connected to other users. Our assumption for these participants is that they paid enough attention to our manipulation and correctly understood the social context presented by our experiment. Thus, we consider them to be sufficiently attentive participants and refer to this group as the *identified sample.* Although this identified sample was more attentive to the manipulation than other participants (the *misidentified sample*), we did not have strong evidence that these other participants did not pay attention to the rest of the experiment.[5] Thus we present results for both the identified sample (n = 705) and the entire sample (n = 1,274) throughout our analysis. Table 2 shows the number of participants for each condition in the identified and entire samples.

---

[4] We added this extra phase for the control condition to control for the effects of the sign-up phase. But as indicated in the large number of misidentified participants, it may have caused inattentive participants to consider they signed up in a social medium.

[5] We compared other attention checking techniques to the identified sample and the rest of the sample (i.e., misidentified sample) to confirm our assertion that the identified sample were attentive to the experiment whereas the rest were not. Results present mixed evidence: The misidentified sample were more likely to be filtered out in the questionnaire: 5.8% of misidentified group did not pass the first attention check measure compared to 3.1% of the identified participants. Also, the misidentified sample had longer idle time on the main page, M = 188.37, SD = 61.81, than the identified group, M = 182.68, SD = 55.02, but the difference was not statistically different, $t(705.32) = 1.5$, p =.133. Reliabilities of measures for identified and misidentified samples are similar to each other.

Table 2.

The Number of Valid Responses for Each Condition for the Identified Sample and Entire Sample

Identified sample		Connection Type			Total
		Relational	Categorical	Control	
Comment Valence	None	72	71	81	224
	Positive	71	84	84	239
	Negative	74	82	86	242
Total		217	237	251	705
Entire Sample		Connection Type			Total
		Relational	Categorical	Control	
Comment Valence	None	124	137	137	398
	Positive	140	152	148	440
	Negative	147	156	133	435
Total		411	445	418	1,274

Mindset on Social Media

Data Exploration

Table 3 shows descriptive statistics of the mindset outcomes stratified by media types for the identified sample and the entire sample. The descriptive statistics of the identified and entire samples indicate that participants, regardless of media types, focused on their individualistic aspect: Participants in the identified sample were more likely to define themselves using individualistic self-concept, $M = 5.78$, $SD = 0.95$, than using relational self-concept, $M = 5.54$, $SD = 0.99$, $t(704) = 4.97$, $p < .001$, and in-group self-concept, $M = 4.17$, $SD = 1.41$, $t(701) = 24.86$, $p < .001$. Further, participants in the identified sample considered individualistic goals more important, $M = 6.26$, $SD = 0.72$, than relational goals, $M = 5.89$, $SD = 0.99$, $t(704) = 9.23$, $p < .001$, and in-group goals, $M = 4.31$, $SD = 1.16$, $t(704) = 38.85$, $p < .001$. Regarding the abstraction level outcomes, identified sample in general employed global-processing in describing their connections, by using more adjectives, $M = 1.90$, $SD = 1.18$, than action verbs, $M = 0.69$, $SD = 0.82$, $t(704) = 18.54$, $p < .001$.

Table 3.

Means, Standard Deviations (in parenthesis), and Correlation Coefficients of Outcome Variables

	Mean and Standard Deviation			Correlation Coefficients						
	Relational	Categorical	Control	1	2	3	4	5	6	7
Identified Sample										
Self-concept										
1. Individualistic	5.81 (0.98)	5.80 (0.92)	5.73 (0.94)							
2. Relational	5.52 (1.06)	5.61 (0.96)	5.49 (0.93)	.24*						
3. In-group	4.33 (1.48)	4.18 (1.39)	4.00 (1.36)	-.02	.26*					
Goal-orientation										
4. Individualistic	6.26 (0.72)	6.30 (0.73)	6.21 (0.72)	.44*	.21*	.04				
5. Relational	5.84 (1.06)	5.94 (0.98)	5.89 (0.93)	.16*	.53*	.31*	.26*			
6. In-group	4.42 (1.19)	4.38 (1.18)	4.14 (1.11)	.00	.36*	.49*	.13*	.37*		
Level of abstraction										
7. Adjectives	2.00 (1.19)	1.91 (1.21)	1.81 (1.15)	.02	.07	.07	.01	.05	.09	
8. Action verbs	0.61 (0.71)	0.69 (0.85)	0.77 (0.89)	-.02	.01	-.02	.00	.03	-.07	-.47*
Entire sample										
Self-concept										
1. Individualistic	5.81 (0.98)	5.81 (0.93)	5.82 (0.93)							
2. Relational	5.47 (1.02)	5.55 (1.06)	5.55 (0.99)	.17*						
3. In-group	4.17 (1.44)	4.16 (1.47)	4.27 (1.40)	.01	.39*					
Goal-orientation										
4. Individualistic	6.24 (0.75)	6.28 (0.76)	6.24 (0.75)	.46*	.23*	.05				
5. Relational	5.82 (1.05)	5.84 (1.06)	5.89 (0.96)	.20*	.57*	.35*	.31*			
6. In-group	4.32 (1.19)	4.36 (1.24)	4.34 (1.22)	-.02	.37*	.50*	.15*	.37*		
Level of abstraction										
7. Adjectives	2.00 (1.19)	1.91 (1.21)	1.81 (1.15)	.02	.07	.07	.01	.05	.09	
8. Action verbs	0.61 (0.71)	0.69 (0.85)	0.77 (0.89)	-.02	.01	-.02	.00	.03	-.07	-.47*

* $p < .01$.

Correlation coefficients shows that self-concept outcomes were positively related with each other. In the identified sample, individualistic self-concept was positively correlated with relational self-concept, $r(704) = .24$, $p < .001$, and relational self-concept was positively correlated with in-group self-concept, $r(704) = .26$, $p < .001$. Also, sub-scales of goal-orientation were positively correlated with each other. Individualistic goal-orientation was

positively correlated with relational, $r(704) = .26$, $p < .001$, and in-group goal-orientation, $r(704) = .13$, $p < .001$. Relational goal-orientation was positively correlated with in-group goal-orientation, $r(704) = .37$, $p < .001$. Adjectives and action verbs were negatively correlated as these measures were driven from a same question, $r(704) = -.47$, $p < .001$. Similar findings were also observed in the entire sample (see Table 3).

Furthermore, correlation coefficients between mindset outcomes suggest that self-concept and goal-orientation corresponding to a particular mindset are positively associated more than others. That is, individualistic self-concept was positively correlated most with individualistic goal-orientation, $r(704) = .44$, $p < .001$, relational self-concept with relational goal-orientation, $r(704) = .53$, $p < .001$, and in-group self-concept with in-group goal-orientation, $r(701) = .49$, $p < .001$. These results lend support to our assumption that self-concept and goal-orientation co-activated together, as a result of a meaning-making process in a social context. The number of adjectives and action verbs, however, are not correlated with other mindset outcomes, indicating that the procedural knowledge might be independent of other mindset outcomes.

Before conducting analysis to test our hypotheses, bivariate outliers were identified using Tuckey's 1.5 IQR criteria for each outcome (DiLalla & Dollinger, 2006). When outcomes included outliers, we compared their results from data with and without outliers. Results of referential tests were same for the analysis with and without outliers for all outcomes. Results from the outlier-free data were reported for robust estimates. In the identified sample, 22 outliers were deleted from individualistic self-concept, 14 from relational self-concept, 8 from in-group self-concept, 6 from individualistic goals, 14 from relational goals, and 21 from in-group goals. No outlier was detected from adjectives and action verbs from the identified sample. In the entire sample, 17 outliers were deleted from individual self-concept, 24 from relational self-

concept, 4 from in-group self-concept, 14 from individualistic goals, 21 from relational goals, and 6 from in-group goals. No outlier was detected from adjectives and action verbs from the identified sample.

Hypothesis Testing

Self-concept. A series of one-way ANOVA was used to test effects of media types on individualistic, relational, and in-group self-concept. Our H1 suggests that (*a*) the relational group reports greater relational self-concept, and (*b*) the categorical group reports greater in-group self-concept. Analysis using the identified sample revealed that media type did not influence individualistic self-concept, $F(2, 680) = 0.56$, $p = 0.571$, nor relational self-concept, $F(2, 688) = 0.88$, $p = .415$. Thus H1(*a*) was not supported. However, media type had an effect on in-group self-concept, $F(2, 691) = 6.35$, $p = .002$, $\eta_p^2 = 0.02$. Tukey HSD test revealed that the relational group reported greater in-group self-concept than the control group did, $M_{diff} = 0.46$, $p = .001$, 95% CI [0.15 0.76]. While this result failed to support H1(*b*), they suggest an implication for RQ1(*a*): Relational media lead to greater in-group self-concept.

Analysis using the entire sample revealed that media type did not influence individualistic self-concept, $F(2, 1{,}254) = 0.87$, $p = .418$, relational self-concept, $F(2, 1{,}254) = 1.02$, $p = .322$, nor in-group self-concept, $F(2, 1{,}254) = 0.900$, $p = .409$. Thus, using the entire sample, H1(*a*/*b*) were not supported.

Goal-orientation. Our H2 predicts that (*a*) the relational group considers relational goals important more, and (*b*) the categorical group considers categorical goals important more than the control group does. One-way ANOVAs revealed that media type did not have effect on individualistic goal, $F(2, 696) = 1.76$, $p = .173$, nor on relational goal, $F(2, 688) = 0.99$, $p = .373$, failing to support H2(*a*). However, media type influenced in-group goal, $F(2, 681) = 7.637$, $p =$

.001, η_p^2= 0.02. Tukey HSD test revealed that the relational group and categorical group, compared to the control group, valued in-group goal more, M_{diff} = 0.34, p = .002, 95% CI [0.11 0.58], and M_{diff} = 0.27, p = .014, 95% CI [0.04 0.50], respectively. Thus, the results support H2(*b*) and present an implication for RQ2(*a*): relational media and categorical media induce users to recognize importance of in-group goals.

Analysis using the entire sample revealed that media type did not influence individualistic goal, F(2, 1,257) = 2.47, p = .085, relational goal, F(2, 1,250) = 0.503, p = .605, nor in-group self-concept, F(2, 1,265) = 0.084, p = .919. Thus, using the entire sample, H2(*a*/*b*) were not supported.

Level of abstraction. Our H3 proposes that (*a*) the relational group perceives other members at a concrete level and (*b*) the categorical group perceives other members at an abstract level. These hypotheses were tested using Poisson regression on adjectives and action verbs, as they were count variables and their mean and standard deviation were not considerably different for each variable (see Table 2). Poisson regression models included dummy variables indicating the relational and categorical group respectively. Result showed that the number of adjectives used by the relational group and categorical group were not significantly different from the control group, b = 0.09, SE = 0.07, p = .162, and b = 0.06, SE = 0.07, p = .405, respectively. Yet, the number of action verbs was different by media type, such that the relational group used less action verbs than control group did, b = -0.24, SE = 0.12, p = .040. No difference of action verb use was found between the categorical group and control group, b = -0.11, SE = 0.11, p = .328.

Social Perception and Group Identification on Social Media

Data Exploration

Table 3 presents descriptive statistics of social perception outcomes, including relational

perception, categorical perception, and homogeneity perception, and group identification. While participants in all conditions did not perceive their members as individually connected (Mean ratings of relational perception < 4), they perceived their connection as a categorical group members when they used either relational or categorical media (Mean ratings of categorical perception for the relational and categorical group in the identified sample > 5.07). Also, participants of all conditions perceived other members in Stay Well Together homogenous across all media types (Mean ratings of homogeneity perception in the identified sample > 4.72), indicating that the lack of sufficient personal information of group members lead to a high homogeneity perception. Also, these outcomes are positively associated with each other, as indicated by significant correlation coefficients.

Table 4.

Means, Standard Deviations (on parenthesis), and Correlation of Outcome Variables

	Mean and Standard Deviation			Correlation		
	Relational	Categorical	Control	1	2	3
			Identified Sample			
1. Relational perception	3.54 (1.48)	3.37 (1.56)	2.87 (1.41)			
2. Categorical perception	5.18 (1.12)	5.07 (1.00)	3.78 (1.22)	0.43*		
3. Homogeneity perception	4.97 (1.09)	4.98 (0.97)	4.72 (1.09)	0.26*	0.34*	
4. Group identification	4.24 (1.34)	4.06 (1.35)	3.32 (1.40)	0.64*	0.62*	0.42*
			Entire sample			
1. Relational perception	3.27 (1.57)	3.31 (1.55)	3.25 (1.54)			
2. Categorical perception	4.76 (1.29)	4.77 (1.24)	4.30 (1.39)	0.48*		
3. Homogeneity perception	4.88 (1.06)	4.94 (1.03)	4.89 (1.10)	0.28*	0.37*	
4. Group identification	3.82 (1.46)	3.95 (1.49)	3.81 (1.51)	0.65*	0.64*	0.42*

* $p < .001$.

Tuckey's 1.5 IQR criteria identified 9 outliers from group identification, 7 from

homogeneity perception, 8 from categorical perception in the identified sample, and 10 from homogeneity perception and 11 from categorical perception in the entire sample. They were deleted from the dataset before analysis.

Hypothesis Testing

Effect of media type on group identification. Our H4 predicts that (*a*) relational (*b*) categorical group report greater group identification than the control group does. A one-way ANOVA using the identified sample showed that media type had a significant effect on group identification, $F(2, 693) = 39.86$, $p < .001$, $\eta_p^2 = 0.10$. Tukey HSD test revealed that all pairwise comparisons yielded a significant difference: The relational and categorical group reported greater group identification than the control group did, $M_{diff} = 0.11$, $p < .001$, 95% CI [0.77 1.35], and $M_{diff} = 0.75$, $p < .001$, 95% CI [0.47 1.03], respectively. The relational group reported greater group identification than the categorical group did, $M_{diff} = 0.31$, $p < .034$, 95% CI [0.02 0.61]. Thus H4(*a*/*b*) were supported. In the entire sample, media type did not influence group identification, $F(2, 1{,}271) = 1.25$, $p = .287$. Thus, using the entire sample, H4(*a*/*b*) were not supported.

Mediational effect of mindset outcomes. H5 and H6 proposes that self-concept and goal-orientation mediate the effects of relational and categorical media on group identification in the identified sample. As our finding suggest that the relational media influenced in-group self-concept and in-group goal-orientation, and categorical media influenced in-group goal-orientation, these constructs were tested as potential mediators in path models (see Figure 6).

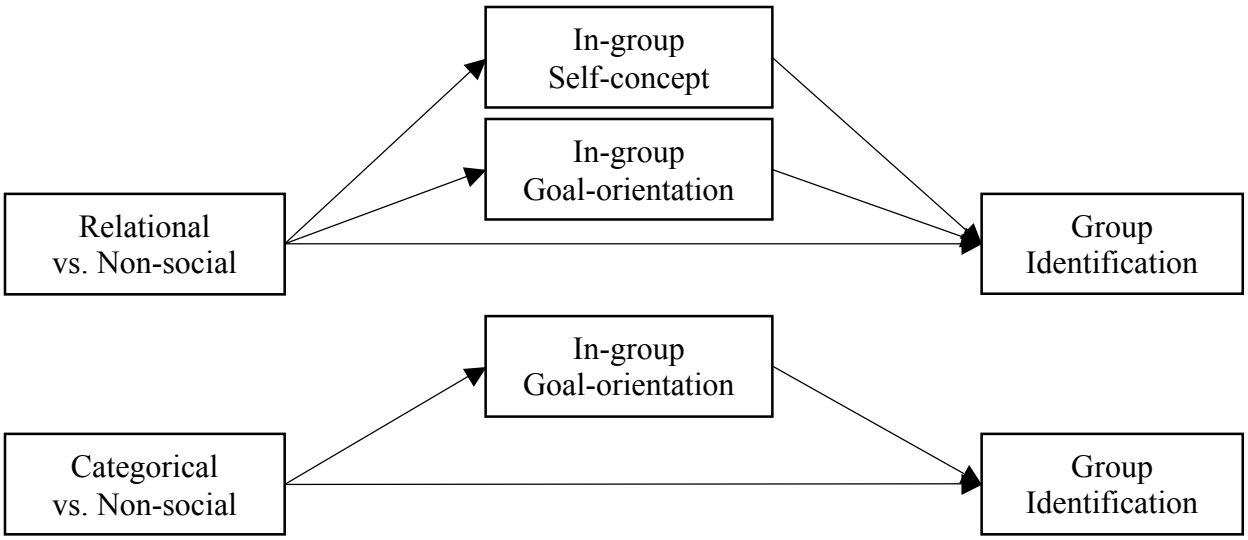

Figure 8. Mediating effects of self-concept and goal-orientation.

Results showed that the effect of relational media on group identification was mediated by in-group self-concept, $b = 0.048$, $SE = 0.024$, $p = .044$, and by in-group goal orientation, $b = 0.065$, $SE = 0.029$, $p = .025$. Direct effect of relational media is also significant, $b = 0.803$, $SE = 0.123$, $p < .001$. Also, the effect of categorical media on group identification was also mediated by in-group goal-orientation, $b = 0.070$, $SE = 0.033$, $p = .032$. Direct effect of categorical media is also significant, $b = 0.684$, $SE = 0.121$, $p < .001$.

Influence of social perception and moderating effect of media type. H7 proposes that social perception outcomes are associated with group identification, and H8 predicts that the strengths of the associations are moderated by media type. The main effect of social perception and moderating effect of media type was examined in an ordinal least squares (OLS) regression model (Model 1 in Table 5). The model included relational perception, categorical perception, homogeneity perception, and categorical variables representing relational and categorical type respectively, and their interaction terms. The categorical variable were coded using the effect-coding scheme (i.e., 1 for the relational and categorical type and -1 for the control group). In the effect coding, coefficients of the interaction terms are corresponding to interaction in a factorial

ANOVA (Kugler, Trail, Dziak, & Collins, 2012). The social perception outcomes were centered before included in the model.

Table 5.

Result of OLS Regression Predicting Group Identification

	Model 1: All group	
	b (SE)	
Variable	Identified Sample	Entire Sample
Constant	3.84** (0.04)	2.86** (0.03)
RP	0.63** (0.04)	0.62** (0.03)
CP	0.52** (0.04)	0.57** (0.03)
HP	0.27** (0.04)	0.24** (0.03)
RT	0.04 (0.06)	-0.09* (0.04)
CT	-0.05 (0.05)	< .01 (0.04)
RP X RT	0.09 (0.06)	0.03 (0.05)
RP X CT	-0.15** (0.06)	-0.02 (0.04)
CP X RT	-0.04 (0.07)	< .01 (0.05)
CP X CT	0.06 (0.07)	-0.03 (0.04)
HP X RT	-0.12* (0.05)	-0.09* (0.04)
HP X CT	0.19** (0.06)	0.14 ** (0.04)
Adj. R^2	0.59	0.59
F	92.34**	163**
N	705	1,274

Note. RP = Relational Perception; CP = Categorical Perception; HP = Homogeneity Perception; RT = Relational Type; CT = Categorical Type; ** $p < .01$, * $p < .05$.

Result of the OLS regression showed that social perception outcomes positively predicted group identification in the identified sample: Participants in the identified sample reported stronger group identification when they had greater relational perception, $b = 0.63$, $SE = 0.04$, $p < .001$, categorical perception, $b = 0.52$, $SE = 0.04$, $p < .001$, and homogeneity perception, $b = 0.27$, $SE = 0.04$, $p < .001$. Also, participants in the entire sample reported greater group identification when they had greater relational perception, $b = 0.62$, $SE = 0.03$, $p < .001$,

categorical perception, $b = 0.57$, $SE = 0.03$, $p < .001$, and homogeneity perception, $b = 0.24$, $SE = 0.03$, $p < .001$ (Model 1 in Table 5). Similar results were also observed in the entire sample. Thus, H7(*a*/*b*/*c*) were supported.

Table 6.

Result of OLS Regression Predicting Group Identification

	Identified Sample			Entire Sample		
	Model2: Relational type	Model 3: Categorical type	Model 4: Control group	Model2: Relational type	Model 3: Categorical type	Model 4: Control group
Variable	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*	*b (SE)*
Constant	3.89** (0.06)	3.80** (0.06)	3.85** (0.08)	3.76** (0.05)	3.86** (0.05)	3.96** (0.05)
RP	0.72* (0.07)	0.48** (0.06)	0.67** (0.07)	0.65* (0.05)	0.61** (0.05)	0.62** (0.05)
CP	0.47** (0.08)	0.58**(0.09)	0.50** (0.07)	0.57** (0.05)	0.54**(0.06)	0.59** (0.05)
HP	0.15* (0.06)	0.46** (0.07)	0.19** (0.06)	0.15* (0.05)	0.38** (0.05)	0.19** (0.05)
Adj. R^2	0.59	0.55	0.51	0.60	0.56	0.59
F	104.00**	98.03**	87.35**	204.7**	186.8**	208.3**
N	217	237	251	411	445	418

Note. RP = Relational Perception; CP = Categorical Perception; HP = Homogeneity Perception; RT = Relational Type; CT = Categorical Type; ** $p < .01$, * $p < .05$.

H8(*a*/*b*/*c*) were tested by examining the interaction terms in the model: the relational perception by relational type interaction for H8(*a*), the categorical perception by categorical type interaction for H8(*b*), and the homogeneity perception by categorical type interaction for H6(*c*). Results showed that H8(*a*) was partially supported, as the association of relational perception with group identification for the relational group was marginally different from the influence for the control group, $b = 0.09$, $SE = 0.06$, $p = .092$ in the identified sample, but the association was not significant, $b = 0.03$, $SE = 0.45$, $p = .574$ in the entire sample. H8(*b*) was not supported as the categorical perception by categorical type interaction was not significant, $b = 0.06$, $SE = 0.07$, $p = .363$ in the identified sample, and $b = -0.03$, $SE = 0.04$, $p = .363$ in the entire sample. Yet, our results lend support to H8(*c*): The homogeneity perception by categorical type

interaction was significant, $b = 0.19$, $SE = 0.06$, $p = <.001$ in the identified sample, and $b = 0.13$, $SE = 0.04$, $p < .001$ in the entire sample, implying that contribution of homogeneity to group identification is greater for the categorical group than for the control group.

These findings were confirmed in a post-hoc analysis, in which associations of social perception and group identification were examined in OLS regression models using subgroup data (Model 2-4 in Table 6). Model 2 showed that the slope of the relational perception for the relational group, $b = 0.72$, $SE = 0.07$, $p < .001$ in the identified sample, and $b = 0.65$, $SE = 0.05$, $p < .001$ in the entire sample, is steeper than for the control group, $b = 0.67$, $SE = 0.07$, $p < .001$ in the identified sample, and $b = 0.62$, $SE = .06$, $p < .001$ in Model 4, respectively. Also, Model 3 revealed that the slopes of the categorical perception for the categorical group, $b = 0.58$, $SE = 0.09$, $p < .001$ in the identified sample was steeper than that of the control group, $b = 0.50$, $SE = 0.07$, $p < .001$. The slopes of the categorical perception for the categorical group in the entire group, $b = 0.54$, $SE = 0.06$, $p < .001$, however, was flatter than that of the control group, $b = 0.59$, $SE = 0.05$, $p < .001$.

Furthermore, Model 1 revealed significant interaction terms, which were not specified by current study's hypotheses. First, the relational perception by categorical type interaction is statistically significant in the identified sample, $b = -0.15$, $SE = 0.06$, $p = .001$, suggesting that the influence of relational perception on group identification is smaller for the categorical group than for the control group. Confirming this interpretation, post-hoc analysis revealed that a less steep slope of relational perception for the categorical group, $b = 0.48$, $SE = 0.48$, $p < .001$ (Model 3), than for the control group, $b = 0.68$, $SE = 0.07$, $p < .001$ (Model 4). Also, Model 1 showed that the homogeneity perception by relational type interaction was significant, $b = -0.12$, $SE = 0.05$, $p < .027$ in the identified sample and $b = -0.09$, $SE = 0.04$, $p = .036$, suggesting that

influence of homogeneity perception was weaker for the relational group than for the control group. Model 3 revealed that the slope of homogeneity perception for the categorical group was steeper, $b = 0.46$, $SE = 0.07$, $p < .001$ in the identified sample and $b = 0.38$, $SE = 0.05$, $p < .001$ in the entire sample, than for the control group, $b = 0.19$, $SE = 0.06$, $p = .002$ in the identified sample and $b = 0.19$, $SE = 0.05$, $p < .001$ in the entire sample.

Effect of Social Media on Belief Change

Data Exploration

Table 7 shows descriptive statistics of belief changes on artificial sweeteners, with positive scores means that participants changed their belief toward an idea that taking artificial sweeteners is less or not harmful.

Table 7.

Means and Standard Deviations (in parenthesis) of Belief Changes by Conditions

	No comment	Positive comments	Negative comments
	Identified Sample		
Control	-0.01 (0.88)	0.23 (0.82)	-0.14 (0.83)
Relational Type	0.19 (0.77)	0.29 (1.04)	-0.35 (1.16)
Categorical Type	0.10 (0.71)	0.28 (0.99)	-0.34 (1.12)
	Entire Sample		
Control	0.04 (0.78)	0.08 (0.95)	-0.21 (0.93)
Relational Type	0.12 (0.73)	0.15 (0.79)	-0.31 (0.85)
Categorical Type	0.12 (0.72)	0.21 (0.85)	-0.25 (1.10)

The descriptive statistics of the identified sample and the entire samples revealed that in general positive comments toward artificial sweeteners changes participants' beliefs in a positive direction, $M = 0.27$, $SD = 0.95$, in the identified sample, and $M = 0.15$, $SE = 0.91$ in the entire sample, whereas negative comments changes in a negative direction, $M = -0.27$, $SD = 1.04$ in the

identified sample, and M = -0.20, SE = 0.85 in the entire sample, compared to the control group, to whom none of comments regarding artificial sweeteners were presented, M = 0.09, SD = 0.97 in the identified sample, and M = 0.09, SD = 0.74 in the entire sample respectively.

Tuckey's 1.5 IQR criteria was applied to each cell to detect outliers and 24 outliers were deleted from the data from the identified sample and 93 outliers were detected from the entire samples.

Hypotheses Testing

To test H9 predicting reinforcing effects of media type, we employed OLS regression, including two effect-coded categorical variables for comment valence and media type, respectively, as well as their cross-product terms. H9 was tested by examining moderating effects of media type. That is, for the relational and categorical groups, compared to the control group, effects of negative and positive comments on belief change would be greater in the negative and positive direction respectively, if our data support H9(a/b).

Results of the regression suggest that comments had a significant effect on belief changes, indicating participants changed their belief in line with the comments after using the website. Participants exposed to negative comments changed their belief in a negative direction, b = -0.21, SE = 0.04, $p < .001$ in the identified sample, and b = 0.20, SE = 0.03, $p < .001$ in the entire sample, whereas participants exposed to positive comments changed their belief in a positive direction, b = 0.16, SE = 0.03, $p < .001$ in the identified sample, and b = 0.11, SE = 0.03, $p < .001$ in the entire sample (Model 5 in Table 8).

The results, however, failed to support H9(a/b), as indicated by non-significant interaction terms in Model 5. Specifically, the negative comments effects of the relational group and the categorical group were not significantly different from those of the control group, b = -

0.07, *SE* = 0.06, *p* = .259, and *b* = 0.06, *SE* = 0.06, *p* = .288, respectively in the identified sample, and *b* = -0.09, *SE* = 0.05, *p* = .259, and *b* = 0.06, *SE* = 0.05, *p* = .288, respectively, in the entire sample. Positive comments effects also were not significantly different between the relational and control group, *b* = 0.02, *SE* = 0.06, *p* = .704, and between the categorical and control group, *b* = -0.06, *SE* = 0.06, *p* = .324.

Table 8.

Result of OLS Regression Predicting Belief Change

	Identified Sample		Entire Sample	
	Model 5	Model 6	Model 5	Model 6
Variable	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)	*b* (*SE*)
Constant	0.06* (0.03)	0.06 (0.03)	0.01 (0.03)	0.01 (0.02)
NC	-0.21** (0.04)	-0.21** (0.04)	-0.30** (0.03)	-0.20** (0.03)
PC	0.16** (0.04)	0.16** (0.04)	0.22** (0.04)	0.11** (0.03)
RT	< 0.01 (0.04)		-0.02 (0.04)	
CT	< 0.01 (0.04)		0.03 (0.04)	
GI		0.02 (0.03)		<0.01 (0.02)
NC X RT	-0.07 (0.06)		-0.11* (0.06)	
NC X CT	0.06 (0.06)		< .01 (0.06)	
NC XGI		< 0.01 (0.04)		0.01 (0.02)
PC X RT	0.02 (0.06)		0.06 (0.05)	
PC X CT	-0.06 (0.06)		0.02 (0.06)	
PC XGI		0.01 (0.04)		< 0.01 (0.02)
Adj. R^2	0.03	0.03	0.05	0.03
F	3.40**	5.17**	8.47**	8.32**
N	705	705	1,270	1,182

Note. NC = Negative Comments; PC = Positive Comments; RT = Relational Type; CT = Categorical Type; GI = Group Identification; ** $p < .01$, * $p < .05$

Our H10 states that group identification mediates the effects of media type on belief change. While media type does not have effects on belief change (i.e., absence of total effect of media type on belief change), it may have indirect effects through mediators and suppressors

exerting influence simultaneously (Hayes, 2009). To test this potential, Model 6 included the mediator, group identification, as a predictor. Results revealed that group identification did not predict belief changes, failing to support H10. Specifically, the effect of negative comments on belief changes was not contingent on group identification, b = -0.002, SE = 0.04, p =.971, nor was the effect of positive comments, b = 0.01, SE = 0.04, p = .754 in the identified sample, and b = 0.01, SE = 0.02, p = .569 and b = <.01, SE = 0.02, p = .907, in the entire sample.

CHAPTER 6

DISCUSSION

Recognizing that the defining nature of contemporary social media is to support connections among users, the current study identified two types of social media based on the different ways of connecting users: *relational media*, which support individual connections with other users, and *categorical media*, which support group-based social connections. Results of the current study suggest that social media shape users' mindset: Using relational and categorical media cause people to employ group-oriented cognition in defining oneself, evaluating goals, and processing information of others. The current study also suggests that social media facilitate group identification: Relational and categorical media encourage users to identify with their group, by allowing them to perceive other users as individually connected or belonging to a same group. Detailed findings with interpretations and their boundary conditions are summarized as follows.

Effects of Social Media Use on Mindset

Drawing on the knowledge activation (Förster & Liberman, 2007) and situated cognition (Oyserman & Lee, 2007), the present study proposed that relational and categorical media present users with a particular social context, and users situated in the social context develop a corresponding mindset. Mindset in the current study was defined as a set of knowledge co-activated in a given context. Based on this framework, the current study examined three different aspects of mindset, including the way participants define themselves (i.e., self-concept), goals they perceive important (i.e., goal-orientation), and the way they describe other group members (i.e., level of abstraction). Results of the online experiment, particularly from the identified sample, revealed that the relational and categorical media influenced users' mindset,

stated as follows.

In-group Mindset Emerged from Social Media

The current study suggests that social media supporting social connections, compared to media not supporting social connections, cause individuals to employ group-oriented cognition and develop in-group mindset. Particularly, results of the current study revealed strong evidence for the effects of relational media. In our online experiment, participants who used relational media, compared to those who used non-social media considered that being a group member is an important aspect in defining themselves, as indicated by higher ratings on in-group self-concept. Their group-oriented cognition is also observed in participant's valuation of different levels of goals. Participants who used relational media considered group-oriented goals more important than participants used the non-social media. Furthermore, social media affording relational connections may facilitate global-processing, promoting abstract thoughts in describing other group members. Participants who used relational media were less likely to use concrete terms in describing their social connections. These results suggest that users of relational media construct in-group mindset and employ group-oriented cognition. Although not as much evidence accumulated in the current study, social media supporting categorical connections seems to allow users to construct in-group mindset, particularly regarding goal-orientation. Our results revealed that participants who used categorical media considered in-group goals were important more that the control group did.

From the knowledge activation perspective (Förster & Liberman, 2007; Higgins, 1989, 1996), these findings suggest that the social context afforded by relational media activates self-concept, goals, and procedural knowledge appropriate in a group context from participants' memory. Participants, being temporarily activated with a set of knowledge compatible with the

context, utilized the knowledge set when they were asked to answer questions about their defining features of self and goals considered important, and to describe their connections (Förster & Liberman, 2007). From the situated cognition perspective, these results suggest that participants harnessed the context presented by social media in meaning-making process, and as a result, mindset adequate to the context is activated. Note that participants in the current study were exposed to a series of candidates of social connection (relational media) or a list of existing groups (categorical media) presented by the social media platform, and asked to choose individuals to build connections or a group to join. The platform' presenting social information of candidates or group and requiring users to respond to the context cause users to build meaning from the context, regarding who they are, what should be considered important, and how information should be processed. For participants in such social context of relational and categorical media, social connection become more meaningful in defining oneself, pursuing group-relate goals become important, and information is processed at an abstract level (Oyserman et al., 2002; Oyserman & Lee, 2008, 2007).

Relational Media Not Found to Afford Relational Mindset

Our results did not support the hypothesis that relational media activate relational mindset. Relational media did not prime relational self-concept and goal-orientation, and local-processing. These results indicate that our manipulation of the relational media does not exactly reflect a social context affording relational mindset. The relational media manipulation is based on our recognition that the key feature of relational media is to allow users to build interpersonal connections with other users. Thus, the manipulation is largely focused on building individual connections: Participants in the relational group were asked to review candidates for their connections one-by-one, and decided whether to build a connection for each candidate. This

type of connection building is commonly observed in real-world relational media, such as Twitter, Facebook, and LinkedIn, in which users are presented with a list of candidates recommended by the system and build individual social connections.

Yet, several factors outside the designing feature make the relational media of the current study different from real-world relational media. Particularly, users of real-world relational media are hardly ignorant of their connections. They likely have prior knowledge on candidates for their connections and specific social meaning associated with their candidates. Users of Facebook, for example, are likely to build relational connections with others whom they already know (e.g., classmates or family members) rather than with strangers. And these potential candidates are likely to have different social meanings to the users. Thus, after building social connections, the users of real-world relational media may be motivated to recognize their group members as unique and distinctive.

In contrast, participants of the current study would not consider their group members as distinctive, even the social connections are constructed in the one-on-one manner. The current study used a unique ID and avatar, as well as different health interests for candidates for relational connections (see Figure 4). Yet, given the positive effect of relational media on in-group mindset, participants might not be motivated enough to distinguish their candidates and to assign unique social characteristics to candidates. Rather, participants would perceive candidates as members of a social media platform with similar health-related interests. This line of argument is consistent with our additional analysis showing that the categorical perception and homogeneity perception of the relational group are not different from those of the categorical group, $t(435) = -1.02$, $p = 0.310$, and $t(434) = 0.05$, $p = 0.959$, respectively.

Another potential account for the null effect of relational media on relational mindset is

that our measures for the relational self-concept and relational goal-orientation are built upon conceptualizing relational mindset as *interpersonal intimacy* in a small-group context (e.g., family or close friends, Brewer & Chen, 2007; Cross et al., 2000). For example, an item of the relational self-concept asks participants to rate their agreement on a statement that "my happiness depends very much on the happiness of those around me," or an item of the relational goal-orientation asks to rate the importance of "friendship." These items imply not only the structural aspect of relational connection (i.e., a link connecting two social entity) but also intimacy in interpersonal relationships. The relational media of the current study did not involve any close relationship: Even participants develop individual connections with others in the relational media, they remain as stranger to the participants, and participants hardly perceive having as intimate relationship with them. This line of reasoning presents another reason for participants not constructing relational mindset on relational media. Thus, experiments affording relational connection with a greater ecological validity may allow participants to develop intimate relational connection, and thus show effects of relational media on relational mindset.

Goal-orientation and Procedural Knowledge in Categorical Media

Our finding showed that the categorical media, compared to non-social media, did cause participants to consider group-oriented goals more important (i.e., in-group goal-orientation), but not to use group-oriented terms in describing themselves (i.e., in-group self-concept). One potential explanation is that the effect size of self-concept priming is smaller than that of goal-priming. A meta-analysis conducted by Oyserman and Lee (2008) indicated that effect sizes of cultural priming are greater for goal-orientations than for self-concepts. They reported that studies using a pronoun-circling task generated effects with a larger size on goal-orientations, Cohen's $d = 0.35$, than on self-concept, $d = 0.22$. When using the group-imagination task, in

which participants were asked to imagine oneself in a tennis game or one's family consuming drinks, the effect size *d* of the priming was 0.44 for goal-orientations and 0.28 for self-concept. Likewise, the significant effect on goal-orientation and null effect on self-concept and can be due to the difference in effect sizes and the insufficient power of the current study design.

Another account for the smaller effect size would originate from the absence of out-group contrast in the categorical media. Participants joined in an existing online community and used the site in a categorical context, without any conflicting outgroup presented. Previous studies in social psychology reported group-oriented behavioral and cognitive outcomes employing in-group/out-group contexts (i.e., The minimal group paradigm, Amichai-Hamburger, 2005; Balliet, Wu, & De Dreu, 2014; Brewer, 1979; Diehl, 1990; E.-J. Lee, 2004, 2007). Thus, categorical media presenting out-group contrast may generate effects with larger effect sizes.

Effects of Social Media Use on Group Identification

The current study also examined whether using relational and categorical media facilitate users' group identification, and how social perception are associated. Our results provide evidence that users of social media identify with their group, but the underlying mechanisms of group identification depend on connection type afforded by social media.

Group Identification Enhanced in Social Context

The current study predicted that social media affording relational or categorical connection induce users to identify with their group. Supporting the prediction, the current study showed that participants using the relational and categorical media reported greater group identification than participants using the non-social media did. Particularly, the participants of the non-social media did not identify with their group in an absolute sense, as indicated by their group identification ratings being considerably below 4 ($M = 3.32$, $SD = 1.40$) the mid-point,

labeled "neither agree nor disagree." Given that participants used the site for five minutes without expectation of any future interactions, the low scores are not surprising. In contrast, ratings of participants using the relational (M = 4.24, SD = 1.34) and categorical media (M = 4.06, SD = 1.35) were slightly higher than or around the mid-point, indicating that social connection may mitigate users' detachment from an unfamiliar online venue, or foster group identification, particularly for relational connection.

The reinforcing effect of the relational and categorical media on group identification can be interpreted using the mindset approach, which suggest that participants using social media develop in-group mindset. Participants prompted with in-group mindset consider belonging to a group a significant aspect of oneself (i.e., in-group self-concept) and group-related goals important values to purse (i.e., in-group goal-orientation). Thus, participants with in-group mindset tend to be more susceptible to external cues shifting their identity from one at the individual level to one at the group level, identifying with their group in a context presented by social media. Supporting this argument, additional analysis showed that group identification was correlated with in-group mindset outcomes: a positive correlation with in-group self-concept, $r(701) = .23$, $p < .001$, and in-group goal-orientation, $r\ (704) = 30$, $p < .001$, and a negative correlation with the number of action verb used in describing their social connections, $r\ (704) = -.11$, $p < .004$.

Social Perception and Group Identification

The current study also suggests that group identification is positively predicted by the social perceptual outcomes, such as perceiving others as members being individually-related (i.e., relational perception), members belonging to a same group (i.e., categorical perception), or members being homogenous (i.e., homogeneity perception). While the current study showed

that these predictors are all statistically significant predictors of group identification, the relative contribution of each predictor is different. Additional OLS regression was conducted to examine their relative contribution, and their standardized coefficients indicate that relational perception contributed most to group identification, *beta* = 0.43, followed by categorical perception, *beta* = 0.37. Homogeneity perception was the least contributing factor, *beta* = 0.18.

The relative contributions of the perceptual outcomes further varied across the social media types. First, contribution of the homogeneity perception on the relational media was found to be smaller than on the non-social media. Thus, the least contribution of the homogeneity perception became even smaller on relational media, *beta* = 0.12. Relational perception still had the most contribution, *beta* = 0.53, followed by categorical perception, *beta* = 0.31.

The contribution of the homogeneity perception, however, is larger on the categorical media than on the non-social media. When social media afford categorical connection, perceiving others as homogeneous members contributes as much as perceiving others as individually-related members or members belonging to a same group. Standardized coefficients calculated from the regression model for the categorical group (Model 3 in Table 4) showed that relative contribution of homogeneity perception, *beta* = 0.32, and categorical perception, *beta* = 0.33, was not statistically different from that of relational perception, *beta* = 0.37, $F(1, 233) = 0.05$, $p = .083$, and $F(1, 233) = 0.65$, $p = .421$, respectively. This contribution of relational perception in the categorical media was found to be weaker than the contribution of relational perception in the non-social media. Thus, compared to the modest role of homogeneity perception in the relational media, homogeneity perception in the categorical media play a significant role in fostering group identification.

These results are in line with previous studies indicating that the different underlying mechanisms of group identification for relational and categorical media (Jans et al., 2011, 2012; Postmes et al., 2005). That is, users' group identification in relational media is dominantly determined by users' perception on individual connectedness (i.e., inductive process), whereas group identification in categorical media is determined not only by relational perception, but equally by perception of building a categorical connection and homogeneity from group members (i.e., deductive process).

Effects on Belief Change

Drawing on automatic social influence literature (e.g., Smith & Mackie, 2015), the current study proposed that users change their belief in line with others' opinions, and the influence would be magnified when users have relational or categorical connections with the source of influence, or when they identify themselves with their group. The current study present evidence that individuals shift their belief toward others' opinion on online media. Detailed findings and interpretations were presented as follows.

Non-significant Effect of Social Connection

People are susceptible to social influence: Individuals shift their attitudes, beliefs, and emotions toward attitudes, beliefs, and emotions of others (Cialdini & Trost, 1998; Dijksterhuis, 2001; Ledgerwood & Chaiken, 2007; Wood, 2000). Supporting this argument, results of our study showed that participants changed their belief on a health topic in line with others' belief revealed in comments on the online media, regardless of whether the media afford social connection or not.

The current study, however, failed to present evidence that affording social connection may magnify social influence. Our prediction on the reinforcing effects of social connection was

based on the two-stage model of automatic social influence (Heyes, 2011; Smith & Mackie, 2015). The model assumes two automatic stages in social influence, i.e., representing others' responses in their own mind, and incorporating the others' mental representation into their own (Smith & Mackie, 2015). The model proposes that self-other relation can facilitate the two stages. That is, individual are more likely to represent the mental states of close others than strangers because they tend to pay greater attention to close others than to strangers (i.e., input modulation, Heyes, 2011). The self-other relation also foster incorporating others' response into their own. That is, the closer individual perceive others are, the more likely they consider others' response as theirs, as the relationship weakening the self-other boundary. Previous studies on behavioral mimicry (Miles, Griffiths, Richardson, & Macrae, 2010) or emotional contagion (Weisbuch & Ambady, 2008) showed that individuals experience greater difficulties distinguishing origin of mental representations when self-other are closely related than when self-other are clearly divisible (i.e., output moderation, Heyes, 2011).

In a similar vein, our predictions on the reinforcing effects of social connections were that participants used social media or experienced greater group identification in the current study may be motivated to concentrate on their social connections' opinion and thus readily form mental representations of their thoughts (i.e., input modulation). Further, the participants with social connection or group identification may experience greater difficulties in distinguishing the ownership of mental representation than those used the non-social media (i.e., output modulation). However, our results showed that the relational or categorical connection did not reinforce the belief change effect, suggesting that our manipulation of relational and categorical connection did not induce strong effects on the input and output modulation. Given the overall effects of comments on participants' belief changes, this finding suggests that one can be easily

influenced by others even though he or she does not know much about them.

Another possibility for the null effect of the social media is that the sample included participants with various levels of belief strength. Previous studies suggest that initial belief strength influences the extent to which people are influenced by other people (Abelson, 1995; Haugtvedt & Wegener, 1994; Petty, Haugtvedt, & Smith, 1995; Pomerantz, Chaiken, & Tordesillas, 1995; Tormala & Petty, 2004). That is, individuals with modest initial belief are more likely to misidentify the ownership of the mental representation formed by others' opinion and incorporate them as their own. In contrast, individuals with strong initial belief may have their own mental representation chronically activated. Thus, even observing others' opinion may allow individuals to form mental representation, the mental representation may be kept as separate knowledge temporarily activated, resulting in strong-belief participants less susceptible to social influence. This line of argument suggests that incorporating initial belief in examining effects of belief changes may allow us to observe greater effects of comments and reinforcing effects of social connections.

Contribution

The present study contributes to the field of communication and technology in general, and to our knowledge on psychological effect of social media use specifically.

Mindset Approach to Communication and Technology Research

The first contribution of the current study is to introduce a mindset approach to the field of communication and technology. The mindset approach, built upon the knowledge activation framework (Förster & Liberman, 2007), sheds light on unconscious aspects of cognition. Indeed, several lines of communication and technology research allude to unconsciousness in psychological effects of communication technologies. The CASA (Computers-Aar-Social-

Actor) paradigm, for example, suggests that computer users tend to apply social rules (e.g., in-group favoritism or reciprocity) or attribute human characteristics (e.g., personality) to computers using a conversational language (E.-J. Lee, Nass, & Brave, 2000; Moon & Nass, 1998; Nass & Moon, 2000; Nass, Steuer, & Tauber, 1994). They interpreted their findings as *mindless responses* (Langer, 1992), as participants were not aware and thus unconscious of their applying social rules to computers (Nass & Moon, 2000). Another example of unconscious effects of communication technology is a line of research on effects of avatars in a digital game or virtual environment, initial studies of which reported that players' behaviors and cognitions were in line with social meanings of their avatar (Proteus effect, Bailenson & Yee, 2005; Yee & Bailenson, 2007). Later studies proposed priming as a theoretical framework, highlighting unconsciousness of the avatar effects (Peña, 2011; Peña & Blackburn, 2013; Sah, Ratan, Tsai, Peng, & Sarinopoulos, 2016; Yoon & Vargas, 2014).

The current study extends the literature examining unconscious aspects of communication technology effects, such as the mindlessness account of the CASA paradigm and the priming account of the avatar effects, by presenting a more inclusive theoretical framework, mindset. Thus, the mindset approach provides us with parsimonious interpretations of the previous studies' findings. Findings of the CASA studies imply that computers using a humanlike language present a social context, activating users with interpersonal goals or procedural knowledge. This knowledge governs users' cognition and behaviors in human-computer interaction, causing users to apply social rules to computers (i.e., treating the computer in a friendly manner). Also, priming effects of avatar can be interpreted that a concept implemented in an avatar (e.g., wearing a black robe) not only activates the semantic meaning associated with the visual representation (e.g., aggressiveness), but also activates context-

consistent self-concept (e.g., being an executor) and goals (e.g., attacking enemies).

Employing mindset approach to communication technology also allows us to turn our attention to research questions difficult to develop from previous frameworks. Understanding psychological effects of communication technologies as results of a meaning-making process, the mindset approach proposes that communication technology simultaneously primes different types of knowledge involved in the meaning-making process (i.e., self-concept, goal-orientation, and procedural knowledge). Thus, predictions on effects of communication technology are in nature comprehensive. For example, the mindset approach suggests that human-computer interaction in CASA paradigm (Nass et al., 1994) presents an interpersonal context. Thus, one may predict that users interacting with a human-like computer may define themselves as an interaction partner in the interpersonal communication context, consider interpersonal goals more important, and rely on low-level information processing appropriate to the interpersonal context, influencing self-concept, goal-orientation and procedural knowledge (e.g., Sah & Peng, 2015).

For another example of enriched development of research questions using mindset approach, the priming effects of avatar use can be understood as situated cognition. That is, in addition to avatar's semantic activation influencing ones' cognition and behaviors, one may examine how effects of contextual cues surrounding an avatar in virtual settings interplay with the effects of semantic activation. Priming game players with the black-robe avatar (Peña, 2011), for example, may lead to assimilating or contrasting effects depending on how the users make meaning of the stimulus in a context. That is, avatar users may show *avatar-consistent* behaviors and cognitions (e.g., anti-social behavior) when they consider the avatar representing themselves and developing meaning of identifying with the avatar from using the avatar. In

contrast, avatar users may reveal behaviors and cognition *contrasting against* the avatar when they pay attention to difference between their avatar and themselves and constructing meaning of a comparative reference from their avatar (e.g., the active-self account, Wheeler, DeMarree, & Petty, 2014).

Group Identification as Function of Connection Structure

Further, the current study's findings on group identification present implications from a practical perspective. Professionals who are interested in harnessing social media to facilitate group identification may consult the findings of the current study. Note that the current study presented same conditions for the social and non-social media except the social connections (e.g., the same level of information of group members revealed, or the same number of members in the group). Thus, merely acknowledging that they are associated with others in the site, users are likely to identify with their group members. Considering group identification is positively associated with group participation (Ling et al., 2005; Ma & Agarwal, 2007; Zhou, 2011), the current study suggests that presenting a way to build social connection with other group members may facilitate group identification and thus commitment and participation to the group.

Furthermore, the current study suggests distinctive mechanisms for different types of connections: Relational perception dominates group identification for relational media, but categorical and homogeneity perception are as significant as relational perception for categorical media. Thus, social media's strategy to encourage group identification should accommodate the type of connections an online media platform affords. For example, for social media affording relational connections, allowing them to perceive relatedness by notifying users with their connections' updates can be a key factor for group identification to develop. In contrast, for social media affording categorical connections, highlighting common identity and dulling

individual differences in members' visual representation, by manifesting group identity and providing avatars designed in a similar style may help to develop group identity.

Belief Change on Social Media

An additional contribution of the current study relates to the findings on belief changes. To compare belief changes in social media and non-social media, the current study employed the automatic social influence and the two-stage model as a theoretical framework. To our knowledge, not many studies in the field of communication and technology have employed this framework. Previous studies examining effects of communication technology on belief change relied on the information processing approach, such as the heuristic-systematic model (Chaiken & Ledgerwood, 2012) or the elaboration likelihood model (Petty & Briñol, 2012). For example, studies examining persuasion on online platforms employed the source credibility account, hinging on the information processing approach (e.g., Hu & Sundar, 2010; Jones, Sinclair, & Courneya, 2003; J. Y. Lee & Sundar, 2013). They assume that persuasion effects are mediated by perception of source credibility (Dou, Walden, Lee, & Lee, 2012) or perception of cognitive elaboration (Westerman, Spence, & Van Der Heide, 2014). The current study's automatic social influence model does not rely on cognitive elaboration nor credibility perception. Rather, the model alludes to the unconscious aspect of persuasion effects. Thus, the current study extended the previous literature by suggesting an alternative way to investigate persuasion effect in an online environment.

Limitations and Direction for Future Research

The present study has several limitations, which can be addressed in further research. First, the current study employed an one-time online experiment, which presents an environment significantly different from real-world social media. Our results of the online experiments are

observed from participants used the online media one time, for short period of time. Thus, participants hardly experience interpersonal intimacy or strong group solidarity, although our social media platform afford users to build social connection. In contrast, users of social media in real life tend to use their media for a long time and develop intimate relationship with their group members compared to participants of the current study. Also, users of social media may keep in mind the possibility of future interaction, and such recognition may influence users' psychological states and intimacy (e.g., the hyperpersonal model, Walther, 1996). Thus, although they do not build social connections, people may develop relational or in-group mindset from repeated use of social media, generating effects different from those of the current study. Furthermore, even social media present users with an in-group social context, users may develop relational mindset eventually by developing interpersonal relationship with other users from regular visits.

Thus, future research may address this issue, by employing a social media platform allowing users to visit the platform repeated times and examining how mindset constructs changes over time. This investigation enables us to examine effects of media- and human-factor simultaneously: How media effects are generated from interaction between information system and human's adaptation.

Second limitation is also related to the lack of ecological validity of the current study. While users of real-world relational media are likely to have prior knowledge on candidates for their connection, participants of the relational condition in the current study did not have any knowledges on the candidates. As indicated in the discussion on the mindset effects of relational media, the lack of prior knowledge and motivation for constructing individual connection with group members may cause participants to develop in-group mindset (i.e., in-group self-concept,

in-group goal-orientations, global-processing), rather relational mindset (i.e., relational self-concept, relational goal-orientations, local-processing). Thus, future study may address this issue using an experimental setting affording social connection with different levels of prior knowledge to test its effect on relational mindset.

A third limitation is related to our study design only employing media type and comment valence as independent variables, but measuring mindset outcomes (i.e., self-concept, goal-orientations, and procedural knowledge) and social perception outcomes (i.e., relational, categorical, and homogeneity perception). While our theoretical framework postulates that social media induce a particular mindset and this mindset leads to greater group identification (and potentially belief change), this relationship may stem from a third variable's influence or a reverse causal relationship, such that greater group identification may induce participants' in-group mindset. Thus, this causal relationship should be tested in a rigorous experimental environment in which participants' mindsets are manipulated and effects on group identification and belief change are examined. Similarly, our findings on social perception is susceptible to third variable effects. Thus, future study may manipulate these social perception constructs, for example using similar or distinctive visual representations of users for homogeneity perception (E.-J. Lee, 2004), and rule out any potential third-factor influence.

Lastly, our findings on the effect of social media on mindset measures are based on the identified sample, participants who correctly identified that they are connected or not connected to others. Our assumption is that participants in this sample were attentive to our manipulation of social connection while participants excluded are not, resulting in the expected effects of social media use on mindset outcomes for the identified sample. Yet, without strong evidence for their inattentiveness of the excluded participants, our interpretation is subject to criticism. That

is, misidentification of their connection in social media may not be caused by their inattention but by the weakness of our manipulation or artificiality of connecting participants in an experiment setting. Considering the participants' cognitive effort and psychological significance in developing social connections in real-world settings, the social connections supported by the current experiment lacks ecological validity, not strong enough for participants to consider their connection meaningful. Also, building connection with strangers in an artificial setting of an online study may not motivate participants to believe they are situated in a social context. Thus, only participants who considered their social connections meaningful developed the expected social mindset, revealing greater in-group self-concept, in-group goal-orientation, and global processing. These potential accounts can be tested using an experiment with greater ecological validity, allowing participants to perceive their social connections as more meaningful.

Conclusion

The current study present a theoretical framework and empirical evidence regarding psychological influence of social media. While contemporary social media has been widely accepted by users, not much academic work has been devoted to a theoretical framework distinguishing influence of using social media of different types. Using the framework, the current work presents evidence that social media influence users' meaning-making process, entailing their self-concept, goal-orientations, and social perception, as well as high-level cognition including group identification and belief changes. In conclusion, the current work evidenced that a mindset approach is a useful framework for understanding nuanced difference in social influence generated by different social media.

APPENDICES

APPENDIX A: Comments Used in Stay Well Together

Negative comments

Artificial sweeteners are everywhere even in health foods, so a small amount can be bad for your health. You should be concerned about it.

Artificial sweeteners are bad for those who have a metabolic problem.

To my knowledge, there's evidence that excessive use of artificial sweeteners is associated with health risk.

I stop using Splenda.

Artificial sweeteners are bad for your health. There are many natural alternatives, like fruits or honey.

they are not safe for our health

Artificial sweeteners are harmful only

Positive comments

Sweeteners are much sweeter than sugar, so you only need a very small amount to sweeten your food. If used normally, there's no need to be concerned about it.

Artificial sweeteners are good alternatives for those who have diabetes. They should avoid sugar because it raises blood sugar.

To my knowledge, there's no clear evidence that moderate use of artificial sweeteners is associated with health risk.

I use Splenda without any issue.

Artificial sweeteners are helpful for those who want to lose weight. They add virtually no calories to your diet.

i think in small amount it is safe

I feel fine when I use sweeteners

APPENDIX B: Coding Scheme

Action Verb (AV)

- **Characteristic Features**: Reference to a behavioral event associated with visible actions
- **Examples**: They asked questions; They helped each other; They post questions often.

Stave Verb (SV)

- **Characteristic Features**: Psychological (emotional or cognitive) state of a person
- **Examples**: They want to help; They do not have proof of their claims; They like to exercise.

Adjective (ADJ)

- **Classification criteria**: Describing the state; characteristics of a person; qualification of object or act
- **Examples**: They are not experts, They are like me, They are helpful.

REFERENCES

REFERENCES

Aarts, H., Gollwitzer, P. M., & Hassin, R. R. (2004). Goal contagion: Perceiving is for pursuing. *Journal of Personality and Social Psychology*, *87*(1), 23–37. https://doi.org/10.1037/0022-3514.87.1.23

Abelson, R. P. (1995). Attitude extremity. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 25–41). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Amichai-Hamburger, Y. (2005). Internet minimal group paradigm. *CyberPsychology & Behavior*, *8*(2), 140–142. https://doi.org/10.1089/cpb.2005.8.140

Asch, S. E. (1951). Effects of group pressure upon the modification and distortion of judgments. In H. Guetzkow (Ed.), *Groups, leadership and men; research in human relations* (pp. 177–190). Oxford, England: Carnegie Press.

Bailenson, J. N., & Yee, N. (2005). Digital chameleons: Automatic assimilation of nonverbal gestures in immersive virtual environments. *Psychological Science*, *16*(10), 814–819. https://doi.org/10.1111/j.1467-9280.2005.01619.x

Balliet, D., Wu, J., & De Dreu, C. K. W. (2014). Ingroup favoritism in cooperation: A meta-analysis. *Psychological Bulletin*, *140*(6), 1556–1581. https://doi.org/10.1037/a0037737

Bargh, J. A. (2014). The historical origins of priming as the preparation of behavioral responses: Unconscious carryover and contextual influences of real-world importance. *Understanding Priming Effects in Social Psychology*, 218.

Bargh, J. A., & Chartrand, T. L. (2000). The mind in the middle: A practical guide to priming and automaticity research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 253–285). New York, NY, US: Cambridge University Press.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, *71*(2), 230–244. https://doi.org/10.1037/0022-3514.71.2.230

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Trötschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology*, *81*(6), 1014–1027. https://doi.org/10.1037/0022-3514.81.6.1014

Bargh, J. A., & Pietromonaco, P. (1982). Automatic information processing and social perception: The influence of trait information presented outside of conscious awareness on impression formation. *Journal of Personality and Social Psychology*, *43*(3), 437–449. https://doi.org/10.1037/0022-3514.43.3.437

Barsalou, L. W. (2009). Situating concepts. In P. Robbins & M. Aydede (Eds.), *The Cambridge Handbook of Situated Cognition* (pp. 236–263). New York, NY: Cambridge University Press.

Brewer, M. B. (1979). In-group bias in the minimal intergroup situation: A cognitive-motivational analysis. *Psychological Bulletin*, *86*(2), 307–324. https://doi.org/10.1037/0033-2909.86.2.307

Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin*, *17*(5), 475–482. https://doi.org/10.1177/0146167291175001

Brewer, M. B., & Chen, Y.-R. (2007). Where (who) are collectives in collectivism? Toward conceptual clarification of individualism and collectivism. *Psychological Review*, *114*(1), 133–151. https://doi.org/10.1037/0033-295X.114.1.133

Brewer, M. B., & Gardner, W. (1996). Who is this "we"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, *71*(1), 83–93. https://doi.org/10.1037/0022-3514.71.1.83

Bry, C., Follenfant, A., & Meyer, T. (2008). Blonde like me: When self-construals moderate stereotype priming effects on intellectual performance. *Journal of Experimental Social Psychology*, *44*(3), 751–757. https://doi.org/10.1016/j.jesp.2007.06.005

Castelli, L., & Tomelleri, S. (2008). Contextual effects on prejudiced attitudes: When the presence of others leads to more egalitarian responses. *Journal of Experimental Social Psychology*, *44*(3), 679–686. https://doi.org/10.1016/j.jesp.2007.04.006

Cesario, J., Plaks, J. E., Hagiwara, N., Navarrete, C. D., & Higgins, E. T. (2010). The ecology of automaticity: How situational contingencies shape action semantics and social behavior. *Psychological Science*, *21*(9), 1311–1317. https://doi.org/10.1177/0956797610378685

Cesario, J., Plaks, J. E., & Higgins, E. T. (2006). Automatic social behavior as motivated preparation to Interact. *Journal of Personality and Social Psychology*, *90*(6), 893–910. https://doi.org/10.1037/0022-3514.90.6.893

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, *39*(5), 752–766. https://doi.org/10.1037/0022-3514.39.5.752

Chaiken, S., & Ledgerwood, A. (2012). A theory of heuristic and systematic information processing. In P. Van Lange, A. Kruglanski, & E. T. Higgins, *Handbook of Theories of Social Psychology: Volume 1* (pp. 246–266). London: SAGE Publications Ltd.

Chaiken, S., & Stangor, C. (1987). Attitudes and attitude change. *Annual Review of Psychology*, *38*(1), 575–630. https://doi.org/10.1146/annurev.ps.38.020187.003043

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, *55*(1), 591–621. https://doi.org/10.1146/annurev.psych.55.090902.142015

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The Handbook of Social psychology* (4th ed., Vol. 2, pp. 151–192). New York, NY: McGraw-Hill.

Correll, J., Park, B., Judd, C. M., & Wittenbrink, B. (2002). The police officer's dilemma: Using ethnicity to disambiguate potentially threatening individuals. *Journal of Personality and Social Psychology*, *83*(6), 1314–1329. https://doi.org/10.1037//0022-3514.83.6.1314

Cross, S. E., Bacon, P. L., & Morris, M. L. (2000). The relational-interdependent self-construal and relationships. *Journal of Personality and Social Psychology*, *78*(4), 791–808. https://doi.org/10.1037/0022-3514.78.4.791

Cross, S. E., Hardin, E. E., & Gercek-Swing, B. (2011). The what, how, why, and where of self-construal. *Personality and Social Psychology Review*, *15*(2), 142–179. https://doi.org/10.1177/1088868310373752

Cross, S. E., & Morris, M. L. (2003). Getting to know you: The relational self-construal, relational cognition, and well-being. *Personality and Social Psychology Bulletin*, *29*(4), 512–523. https://doi.org/10.1177/0146167202250920

Cross, S. E., Morris, M. L., & Gore, J. S. (2002). Thinking about oneself and others: The relational-interdependent self-construal and social cognition. *Journal of Personality and Social Psychology*, *82*(3), 399–418. https://doi.org/10.1037/0022-3514.82.3.399

Crusius, J., & Mussweiler, T. (2012). To achieve or not to achieve? Comparative mindsets elicit assimilation and contrast in goal priming. *European Journal of Social Psychology*, *42*(6), 780–788. https://doi.org/10.1002/ejsp.873

Custers, R., & Aarts, H. (2010). The unconscious will: How the pursuit of goals operates outside of conscious awareness. *Science*, *329*(5987), 47–50. https://doi.org/10.1126/science.1188595

David, B., & Turner, J. C. (2001). Majority and minority influence: A single process self-categorization analysis. In C. K. W. De Dreu & N. K. De Vries (Eds.), *Group consensus and minority influence: Implications for innovation* (pp. 91–121). Malden, MA: Blackwell Publishing.

Deaux, K., & Martin, D. (2003). Interpersonal networks and social categories: Specifying levels of context in identity processes. *Social Psychology Quarterly*, *66*(2), 101–117. https://doi.org/10.2307/1519842

DeMarree, K. G., Wheeler, S. C., & Petty, R. E. (2005). Priming a new identity: Self-monitoring moderates the effects of nonself primes on self-judgments and behavior. *Journal of*

Personality and Social Psychology, *89*(5), 657–671. https://doi.org/10.1037/0022-3514.89.5.657

Diehl, M. (1990). The minimal group paradigm: Theoretical explanations and empirical findings. *European Review of Social Psychology*, *1*(1), 263–292. https://doi.org/10.1080/14792779108401864

Dijksterhuis, A. (2001). Automatic social influence: The perception–behavior links as an explanatory mechanism for behavior matching. In J. P. Forgas & K. D. Williams (Eds.), *Social influence: Direct and indirect processes* (pp. 95–108). New York, NY, US: Psychology Press.

Dijksterhuis, A., & Aarts, H. (2010). Goals, attention, and (un)consciousness. *Annual Review of Psychology*, *61*, 467–490. https://doi.org/10.1146/annurev.psych.093008.100445

Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behavior, or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology*, *74*(4), 865–877. https://doi.org/10.1037/0022-3514.74.4.865

Dijkstra, K. A., van der Pligt, J., van Kleef, G. A., & Kerstholt, J. H. (2012). Deliberation versus intuition: Global versus local processing in judgment and choice. *Journal of Experimental Social Psychology*, *48*(5), 1156–1161. https://doi.org/10.1016/j.jesp.2012.05.001

Dik, G., & Aarts, H. (2007). Behavioral cues to others' motivation and goal pursuits: The perception of effort facilitates goal inference and contagion. *Journal of Experimental Social Psychology*, *43*(5), 727–737. https://doi.org/10.1016/j.jesp.2006.09.002

DiLalla, D. L., & Dollinger, S. J. (2006). Cleaning up data and running preliminary analyses. In J. T. Austin & F. T. L. Leong (Eds.), *The psychology research handbook: A guide for graduate students and research assistants* (2nd ed., pp. 241–253). Thousand Oaks, CA: Sage.

Dou, X., Walden, J. A., Lee, S., & Lee, J. Y. (2012). Does source matter? Examining source effects in online product reviews. *Computers in Human Behavior*, *28*(5), 1555–1563. https://doi.org/10.1016/j.chb.2012.03.015

Eyal, T., & Fishbach, A. (2010). Do global and local systems feel different? *Psychological Inquiry*, *21*(3), 213–215. https://doi.org/10.1080/1047840X.2010.503184

Fitzsimons, G. M., & Fishbach, A. (2010). Shifting closeness: Interpersonal effects of personal goal progress. *Journal of Personality and Social Psychology*, *98*(4), 535–549. https://doi.org/10.1037/a0018581

Förster, J. (2012). GLOMOsys: The how and why of global and local processing. *Current Directions in Psychological Science*, *21*(1), 15–19. https://doi.org/10.1177/0963721411429454

Förster, J., & Dannenberg, L. (2010). GLOMOsys: A systems account of global versus local processing. *Psychological Inquiry*, *21*(3), 175–197. https://doi.org/10.1080/1047840X.2010.487849

Förster, J., & Liberman, N. (2007). Knowledge activation. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed., pp. 201–231). New York, NY, US: Guilford Press.

Galdi, S., Arcuri, L., & Gawronski, B. (2008). Automatic mental associations predict future choices of undecided decision-makers. *Science*, *321*(5892), 1100–1102. https://doi.org/10.1126/science.1160769

Gardner, W. L., Gabriel, S., & Dean, K. K. (2004). The individual as "melting pot": The flexibility of bicultural self-construals. *Cahiers de Psychologie Cognitive/Current Psychology of Cognition*, *22*(2), 181–201.

Gardner, W. L., Gabriel, S., & Lee, A. Y. (1999). "I" value freedom, but "we" value relationships: Self-construal priming mirrors cultural differences in judgment. *Psychological Science*, *10*(4), 321–326. https://doi.org/10.1111/1467-9280.00162

Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin*, *132*(5), 692–731. https://doi.org/10.1037/0033-2909.132.5.692

Gollwitzer, P. M., & Bayer, U. (1999). Deliberative versus implemental mindsets in the control of action. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 403–422). New York, NY, US: Guilford Press.

Gore, J. S., Cross, S. E., & Kanagawa, C. (2009). Acting in our interests: Relational self-construal and goal motivation across cultures. *Motivation and Emotion*, *33*(1), 75–87. https://doi.org/10.1007/s11031-008-9113-1

Haugtvedt, C. P., & Wegener, D. T. (1994). Message order effects in persuasion: An attitude strength perspective. *Journal of Consumer Research*, *21*(1), 205. https://doi.org/10.1086/209393

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*(4), 408–420. https://doi.org/10.1080/03637750903310360

Hertel, G., & Kerr, N. L. (2001). Priming in-group favoritism: The impact of normative scripts in the minimal group paradigm. *Journal of Experimental Social Psychology*, *37*(4), 316–324. https://doi.org/10.1006/jesp.2000.1447

Heyes, C. (2011). Automatic imitation. *Psychological Bulletin*, *137*(3), 463–483. https://doi.org/10.1037/a0022288

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*(3), 319–340. https://doi.org/10.1037/0033-295X.94.3.319

Higgins, E. T. (1989). Knowledge accessibility and activation: Subjectivity and suffering from unconscious sources. In J. S. Uleman & J. A. Bargh (Eds.), *Unintended thought* (pp. 75–123). New York, NY, US: Guilford Press.

Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (1st ed., pp. 133–168). New York, NY, US: Guilford Press.

Higgins, E. T., & Chaires, W. M. (1980). Accessibility of interrelational constructs: Implications for stimulus encoding and creativity. *Journal of Experimental Social Psychology*, *16*(4), 348–361. https://doi.org/10.1016/0022-1031(80)90027-X

Higgins, E. T., Rholes, W. S., & Jones, C. R. (1977). Category accessibility and impression formation. *Journal of Experimental Social Psychology*, *13*(2), 141–154. https://doi.org/10.1016/S0022-1031(77)80007-3

Hogg, M. A., Abrams, D., Otten, S., & Hinkle, S. (2004). The social identity perspective intergroup relations, self-conception, and small groups. *Small Group Research*, *35*(3), 246–276. https://doi.org/10.1177/1046496404263424

Hogg, M. A., Sherman, D. K., Dierselhuis, J., Maitner, A. T., & Moffitt, G. (2007). Uncertainty, entitativity, and group identification. *Journal of Experimental Social Psychology*, *43*(1), 135–142. https://doi.org/10.1016/j.jesp.2005.12.008

Hu, Y., & Sundar, S. S. (2010). Effects of online health sources on credibility and behavioral intentions. *Communication Research*, *37*(1), 105–132.

Jans, L., Postmes, T., & Van der Zee, K. I. (2011). The induction of shared identity: The positive role of individual distinctiveness for groups. *Personality and Social Psychology Bulletin*, 146167211407342.

Jans, L., Postmes, T., & Van der Zee, K. I. (2012). Sharing differences: The inductive route to social identity formation. *Journal of Experimental Social Psychology*, *48*(5), 1145–1149. https://doi.org/10.1016/j.jesp.2012.04.013

Jonas, K. J., & Cesario, J. (2013). Introduction to the special issue: Situated social cognition. *Social Cognition*, *31*(2), 119–124.

Jonas, K. J., & Sassenberg, K. (2006). Knowing how to react: Automatic response priming from social categories. *Journal of Personality and Social Psychology*, *90*(5), 709–721. https://doi.org/10.1037/0022-3514.90.5.709

Jones, L. W., Sinclair, R. C., & Courneya, K. S. (2003). The effects of source credibility and message framing on exercise intentions, behaviors, and attitudes: an integration of the

elaboration likelihood model and prospect theory1. *Journal of Applied Social Psychology*, *33*(1), 179–196. https://doi.org/10.1111/j.1559-1816.2003.tb02078.x

Kashima, Y., Yamaguchi, S., Kim, U., Choi, S.-C., Gelfand, M. J., & Yuki, M. (1995). Culture, gender, and self: A perspective from individualism-collectivism research. *Journal of Personality and Social Psychology*, *69*(5), 925–937. https://doi.org/10.1037/0022-3514.69.5.925

Keller, J., & Molix, L. (2008). When women can't do math: The interplay of self-construal, group identification, and stereotypic performance standards. *Journal of Experimental Social Psychology*, *44*(2), 437–444. https://doi.org/10.1016/j.jesp.2007.01.007

Kugler, K. C., Trail, J. B., Dziak, J. J., & Collins, L. M. (2012). *Effect coding versus dummy coding in analysis of data from factorial experiments* (pp. 1–32). The Pennsylvania State University. Retrieved from http://methodology.psu.edu/db/node/353

Kühnen, U., Hannover, B., & Schubert, B. (2001). The semantic–procedural interface model of the self: The role of self-knowledge for context-dependent versus context-independent modes of thinking. *Journal of Personality and Social Psychology*, *80*(3), 397–409. https://doi.org/http://dx.doi.org.proxy2.cl.msu.edu/10.1037/0022-3514.80.3.397

Kühnen, U., & Oyserman, D. (2002). Thinking about the self influences thinking in general: cognitive consequences of salient self-concept. *Journal of Experimental Social Psychology*, *38*(5), 492–499. https://doi.org/10.1016/S0022-1031(02)00011-2

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33*(1), 159–174. https://doi.org/10.2307/2529310

Langer, E. J. (1992). Matters of mind: Mindfulness/mindlessness in perspective. *Consciousness and Cognition*, *1*(3), 289–305. https://doi.org/10.1016/1053-8100(92)90066-J

Leach, C. W., van Zomeren, M., Zebel, S., W, L., Pennekamp, S. F., Doosje, B., … Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of in-group identification. *Journal of Personality and Social Psychology*, *95*(1), 144–165. https://doi.org/10.1037/0022-3514.95.1.144

Ledgerwood, A., & Chaiken, S. (2007). Priming us and them: Automatic assimilation and contrast in group attitudes. *Journal of Personality and Social Psychology*, *93*(6), 940–956. https://doi.org/10.1037/0022-3514.93.6.940

Ledgerwood, A., & Trope, Y. (2010). Attitudes as global and local action guides. In J. P. Forgas, J. Cooper, & W. D. Crano (Eds.), *The 12th annual Sydney symposium of social psychology: The psychology of attitudes and attitude change* (pp. 39–58). New York: Psychology Press.

Lee, E.-J. (2004). Effects of visual representation on social influence in computer-mediated communication. *Human Communication Research*, *30*(2), 234–259. https://doi.org/10.1111/j.1468-2958.2004.tb00732.x

Lee, E.-J. (2007). Deindividuation effects on group polarization in computer-mediated communication: The role of group identification, public-self-awareness, and perceived argument quality. *Journal of Communication*, *57*(2), 385–403. https://doi.org/10.1111/j.1460-2466.2007.00348.x

Lee, E.-J., Nass, C., & Brave, S. (2000). Can computer-generated speech have gender?: An experimental test of gender stereotype. *CHI '00 Extended Abstracts on Human Factors in Computing Systems*, 289–290. https://doi.org/10.1145/633292.633461

Lee, J. Y., & Sundar, S. S. (2013). To tweet or to retweet? That is the question for health professionals on Twitter. *Health Communication*, *28*(5), 509–524. https://doi.org/10.1080/10410236.2012.700391

Lee, K. M., & Nass, C. (2004). The multiple source effect and synthesized speech: Doubly-disembodied language as a conceptual framework. *Human Communication Research*, *30*(2), 182–207. https://doi.org/10.1111/j.1468-2958.2004.tb00730.x

Liberman, N., & Förster, J. (2009). The effect of psychological distance on perceptual level of construal. *Cognitive Science*, *33*(7), 1330–1341. https://doi.org/10.1111/j.1551-6709.2009.01061.x

Ling, K., Beenen, G., Ludford, P., Wang, X., Chang, K., Li, X., … Kraut, R. (2005). Using social psychology to motivate contributions to online communities. *Journal of Computer-Mediated Communication*, *10*(4), 00–00. https://doi.org/10.1111/j.1083-6101.2005.tb00273.x

Loersch, C., & Payne, B. K. (2012). On mental contamination: The role of (mis)attribution in behavior priming. *Social Cognition*, *30*(2), 241–252. https://doi.org/10.1521/soco.2012.30.2.241

Ma, M., & Agarwal, R. (2007). Through a glass darkly: Information technology design, identity verification, and knowledge contribution in online communities. *Information Systems Research*, *18*(1), 42–67. https://doi.org/10.1287/isre.1070.0113

Markus, H. (1983). Self-knowledge: An expanded view. *Journal of Personality*, *51*(3), 543–565. https://doi.org/10.1111/j.1467-6494.1983.tb00344.x

Markus, H., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*(2), 224–253. https://doi.org/10.1037/0033-295X.98.2.224

Markus, H., & Kunda, Z. (1986). Stability and malleability of the self-concept. *Journal of Personality and Social Psychology*, *51*(4), 858–866. https://doi.org/10.1037/0022-3514.51.4.858

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, *41*(9), 954–969. https://doi.org/10.1037/0003-066X.41.9.954

Miles, L. K., Griffiths, J. L., Richardson, M. J., & Macrae, C. N. (2010). Too late to coordinate: Contextual influences on behavioral synchrony. *European Journal of Social Psychology*, *40*(1), 52–60. https://doi.org/10.1002/ejsp.721

Molden, D. C. (2014). Understanding priming effects in social psychology: An overview and integration. *Understanding Priming Effects in Social Psychology*, 252.

Moon, Y., & Nass, C. (1998). Are computers scapegoats? Attributions of responsibility in human. *International Journal of Human-Computer Studies*, *49*(1), 79–94. https://doi.org/10.1006/ijhc.1998.0199

Mourey, J. A., Oyserman, D., & Yoon, C. (2013). One without the other seeing relationships in everyday objects. *Psychological Science*, *24*(9), 1615–1622. https://doi.org/10.1177/0956797613475631

Mussweiler, T., & Damisch, L. (2008). Going back to Donald: How comparisons shape judgmental priming effects. *Journal of Personality and Social Psychology*, *95*(6), 1295–1315. https://doi.org/10.1037/a0013261

Nass, C., & Moon, Y. (2000). Machines and mindlessness: Social responses to computers. *Journal of Social Issues*, *56*(1), 81–103. https://doi.org/10.1111/0022-4537.00153

Nass, C., Steuer, J., & Tauber, E. R. (1994). Computers are social actors. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 72–78. https://doi.org/10.1145/191666.191703

Neely, J. H. (1977). Semantic priming and retrieval from lexical memory: Roles of inhibitionless spreading activation and limited-capacity attention. *Journal of Experimental Psychology: General*, *106*(3), 226–254. https://doi.org/10.1037/0096-3445.106.3.226

Newell, B. R., & Shanks, D. R. (2014). Unconscious influences on decision making: A critical review. *Behavioral and Brain Sciences*, *37*(1), 1–19. https://doi.org/10.1017/S0140525X12003214

Niedenthal, P. M., & Beike, D. R. (1997). Interrelated and isolated self-concepts. *Personality and Social Psychology Review*, *1*(2), 106–128. https://doi.org/10.1207/s15327957pspr0102_1

Oyserman, D. (2001). Self-concept and identity. In A. Tesser & N. Schwarz (Eds.), *Blackwell handbook of social psychology: Intraindividual processes* (pp. 499–517). Blackwell Publishers Inc. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/9780470998519.ch23/summary

Oyserman, D. (2015). Culture as situated cognition. In *Emerging Trends in the Social and Behavioral Sciences*. John Wiley & Sons, Inc. Retrieved from http://onlinelibrary.wiley.com/doi/10.1002/9781118900772.etrds0067/abstract

Oyserman, D., Coon, H. M., & Kemmelmeier, M. (2002). Rethinking individualism and collectivism: Evaluation of theoretical assumptions and meta-analyses. *Psychological Bulletin*, *128*(1), 3–72. https://doi.org/10.1037/0033-2909.128.1.3

Oyserman, D., & Lee, S. W. S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin*, *134*(2), 311–342. https://doi.org/10.1037/0033-2909.134.2.311

Oyserman, D., & Lee, S. W.-S. (2007). Priming "culture": Culture as situated cognition. In S. Kitayama & D. Cohen (Eds.), *Handbook of cultural psychology* (pp. 255–279). New York, NY, US: Guilford Press.

Peña, J. (2011). Integrating the influence of perceiving and operating avatars under the automaticity model of priming effects. *Communication Theory*, *21*(2), 150–168. https://doi.org/10.1111/j.1468-2885.2011.01380.x

Peña, J., & Blackburn, K. (2013). The priming effects of virtual environments on interpersonal perceptions and behaviors. *Journal of Communication*, *63*(4), 703–720. https://doi.org/10.1111/jcom.12043

Petty, R. E., & Briñol, P. (2012). The elaboration likelihood model. In P. Van Lange, A. Kruglanski, & E. T. Higgins, *Handbook of theories of social psychology* (Vol. 1, pp. 224–245). London: Sage.

Petty, R. E., Haugtvedt, C. P., & Smith, S. M. (1995). Elaboration as a determinant of attitude strength: Creating attitudes that are persistent, resistant, and predictive of behavior. In R. E. Petty & J. A. Krosnick (Eds.), *Attitude strength: Antecedents and consequences* (pp. 93–130). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Pomerantz, E. M., Chaiken, S., & Tordesillas, R. S. (1995). Attitude strength and resistance processes. *Journal of Personality and Social Psychology*, *69*(3), 408–419. https://doi.org/10.1037/0022-3514.69.3.408

Postmes, T., Baray, G., Alexander, S., Morton, T. A., & Swaab, R. I. (2006). The dynamics of personal and social identity formation. In T. Postmes & J. Jetten (Eds.), *Individuality and the group: Advances in social identity* (pp. 215–236). Thousand Oaks, CA, US: Sage Publications, Inc.

Postmes, T., Haslam, S. A., & Jans, L. (2013). A single-item measure of social identification: Reliability, validity, and utility. *British Journal of Social Psychology*, *52*(4), 597–617. https://doi.org/10.1111/bjso.12006

Postmes, T., & Spears, R. (1998). Deindividuation and antinormative behavior: A meta-analysis. *Psychological Bulletin*, *123*(3), 238–259. https://doi.org/10.1037/0033-2909.123.3.238

Postmes, T., Spears, R., & Lea, M. (2002). Intergroup differentiation in computer-mediated communication: Effects of depersonalization. *Group Dynamics: Theory, Research, and Practice*, *6*(1), 3–16. https://doi.org/10.1037/1089-2699.6.1.3

Postmes, T., Spears, R., Lee, A. T., & Novak, R. J. (2005). Individuality and social influence in groups: Inductive and deductive routes to group identity. *Journal of Personality and Social Psychology*, *89*(5), 747–763.

Prentice, D. A., Miller, D. T., & Lightdale, J. R. (1994). Asymmetries in attachments to groups and to their members: Distinguishing between common-identity and common-bond groups. *Personality and Social Psychology Bulletin*, *20*(5), 484–493. https://doi.org/10.1177/0146167294205005

Sah, Y. J., & Peng, W. (2015). Effects of visual and linguistic anthropomorphic cues on social perception, self-awareness, and information disclosure in a health website. *Computers in Human Behavior*, *45*, 392–401. https://doi.org/10.1016/j.chb.2014.12.055

Sah, Y. J., & Peng, W. (2016). Social influence on the Net: Majority effect on posters and minority effect on lurkers. Presented at the 98th annual conference of the Association for Education in Journalism and Mass Communication, Minneapolis, MN.

Sah, Y. J., Ratan, R., Tsai, H., Peng, W., & Sarinopoulos, I. (2016). Are you what your avatar eats? Health-behavior effects of avatar-manifested self-concept. *Media Psychology*. https://doi.org/10.1080/15213269.2016.1234397

Schwartz, S. H. (1990). Individualism-collectivism: Critique and proposed refinements. *Journal of Cross-Cultural Psychology*, *21*(2), 139–157. https://doi.org/10.1177/0022022190212001

Schwartz, S. H. (1992). Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. In M. P. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 25, pp. 1–65). Academic Press. Retrieved from http://www.sciencedirect.com/science/article/pii/S0065260108602816

Schwarz, N., Bless, H., Wänke, M., & Winkielman, P. (2003). Accessibility revisited. In G. V. Bodenhausen & A. J. Lambert (Eds.), *Foundations of Social Cognition: A Festschrift in Honor of Robert S. Wyer, Jr* (pp. 51–77). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.

Semin, G. R., & Fiedler, K. (1988). The cognitive functions of linguistic categories in describing persons: Social cognition and language. *Journal of Personality and Social Psychology*, *54*(4), 558–568. https://doi.org/10.1037/0022-3514.54.4.558

Semin, G. R., & Smith, E. R. (2013). Socially situated cognition in perspective. *Social Cognition*, *31*(2), 125–146. https://doi.org/10.1521/soco.2013.31.2.125

Shapira, O., Liberman, N., Trope, Y., & Rim, S. (2012). Levels of mental construal. In S. T. Fiske & C. N. Macrae (Eds.), *The SAGE Handbook of Social Cognition* (pp. 229–251). London: SAGE Publications Ltd. Retrieved from http://dx.doi.org/10.4135/9781446247631

Sinclair, S., Huntsinger, J., Skorinko, J., & Hardin, C. D. (2005). Social tuning of the self: Consequences for the self-evaluations of stereotype targets. *Journal of Personality and Social Psychology*, *89*(2), 160–175. https://doi.org/10.1037/0022-3514.89.2.160

Smith, E. R. (1994). Procedural knowledge and processing strategies in social cognition. In R. S. Wyer & T. K. Srull (Eds.), *Handbook of social cognition, Vol. 1: Basic processes; Vol. 2: Applications (2nd ed.)* (pp. 99–151). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.

Smith, E. R., & Mackie, D. M. (2015). Representation and incorporation of close others' responses: The RICOR model of social influence. *Personality and Social Psychology Review*, 1088868315598256. https://doi.org/10.1177/1088868315598256

Smith, E. R., & Semin, G. R. (2004). Socially situated cognition: Cognition in its social context. In B.-A. in E. S. Psychology (Ed.), *Advances in experimental social psychology* (Vol. 36, pp. 53–117). San Diego, CA: Academic Press. Retrieved from http://www.sciencedirect.com/science/article/pii/S0065260104360028

Srull, T. K., & Wyer, R. S., Jr. (1979). The role of category accessibility in the interpretation of information about persons: Some determinants and implications. *Journal of Personality and Social Psychology*, *37*(10), 1660–1672. https://doi.org/10.1037/0022-3514.37.10.1660

Stryker, S., & Serpe, R. T. (1982). Commitment, Identity Salience, and Role Behavior: Theory and Research Example. In W. Ickes & E. S. Knowles (Eds.), *Personality, Roles, and Social Behavior* (pp. 199–218). Springer New York. https://doi.org/10.1007/978-1-4613-9469-3_7

Sui, J., & Han, S. (2007). Self-construal priming modulates neural substrates of self-awareness. *Psychological Science*, *18*(10), 861–866.

Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–48). Chicago, IL: Nelson-Hall.

Tajfel, H., & Turner, J. C. (1986). Social identity theory of intergroup behavior. In S. Worchel & W. G. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Chicago, IL: Nelson-Hall Publishers.

Tajfel, H., & Turner, J. C. (2004). The social identity theory of intergroup behavior. In J. T. Jost & J. Sidanius (Eds.), *Political psychology: Key readings* (pp. 276–293). New York, NY, US: Psychology Press.

Tormala, Z. L., & Petty, R. E. (2004). Resistance to persuasion and attitude certainty: The moderating role of elaboration. *Personality and Social Psychology Bulletin*, *30*(11), 1446–1457. https://doi.org/10.1177/0146167204264251

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, *117*(2), 440–463. https://doi.org/10.1037/a0018963

Turner, J. C. (1984). Social identification and psychological group formation. In H. Tajfel (Ed.), *The Social Dimension: European Developments in Social Psychology* (Vol. 2, pp. 518–538). Cambridge: Cambridge University Press. Retrieved from https://www.cambridge.org/core/books/the-social-dimension/social-identification-and-psychological-group-formation/DD3A41A4187FC86A09003CFBDCF5ED21

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory* (Vol. x). Cambridge, MA, US: Basil Blackwell.

Turner, J. C., Oakes, P. J., Haslam, S. A., & McGarty, C. (1994). Self and collective: Cognition and social context. *Personality and Social Psychology Bulletin*, *20*(5), 454–463. https://doi.org/10.1177/0146167294205002

Turner, J. C., & Reynolds, K. J. (2012). Self-categorization theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. 2). London, UK: SAGE Publications Ltd.

Vallacher, R. R., & Wegner, D. M. (2012). Action identification theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories in social psychology* (pp. 327–348). London: Sage.

Vallacher, R. R., Wegner, D. M., & Frederick, J. (1987). The presentation of self through action identification. *Social Cognition*, *5*(3), 301–322. https://doi.org/10.1521/soco.1987.5.3.301

Wakslak, C. J., Trope, Y., Liberman, N., & Alony, R. (2006). Seeing the forest when entry is unlikely: Probability and the mental representation of events. *Journal of Experimental Psychology: General*, *135*(4), 641–653. https://doi.org/10.1037/0096-3445.135.4.641

Walther, J. B. (1996). Computer-mediated communication: Impersonal, interpersonal, and hyperpersonal interaction. *Communication Research*, *23*(1), 3–43. https://doi.org/10.1177/009365096023001001

Wegner, D. M., Vallacher, R. R., Kiersted, G. W., & Dizadji, D. (1986). Action identification in the emergence of social behavior. *Social Cognition*, *4*(1), 18–38. https://doi.org/10.1521/soco.1986.4.1.18

Weisbuch, M., & Ambady, N. (2008). Affective divergence: Automatic responses to others' emotions depend on group membership. *Journal of Personality and Social Psychology*, *95*(5), 1063–1079. https://doi.org/10.1037/a0011993

Westerman, D., Spence, P. R., & Van Der Heide, B. (2014). Social media as information source: Recency of updates and credibility of information. *Journal of Computer-Mediated Communication*, *19*(2), 171–183. https://doi.org/10.1111/jcc4.12041

Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2014). Understanding prime-to-behavior effects: Insights from the active-self account. *Social Cognition*, *32*(Supplement), 109–123. https://doi.org/10.1521/soco.2014.32.supp.109

Wood, W. (2000). Attitude change: Persuasion and social influence. *Annual Review of Psychology*, *51*(1), 539–570. https://doi.org/10.1146/annurev.psych.51.1.539

Wyer, R. S., Jr. (2008). The role of knowledge accessibility in cognition and behavior: Implications for consumer information processing. In C. P. Haugtvedt, P. M. Herr, & F. R. Kardes (Eds.), *Handbook of consumer psychology* (pp. 31–76). Mahwah, NJ: Erlbaum.

Wyer, R. S., Jr., & Xu, A. J. (2010). The role of behavioral mind-sets in goal-directed activity: Conceptual underpinnings and empirical evidence. *Journal of Consumer Psychology*, *20*(2), 107–125. https://doi.org/10.1016/j.jcps.2010.01.003

Xu, A. J., & Wyer, R. S., Jr. (2012). The role of bolstering and counterarguing mind-sets in persuasion. *Journal of Consumer Research*, *38*(5), 920–932. https://doi.org/10.1086/661112

Yee, N., & Bailenson, J. N. (2007). The Proteus Effect: The effect of transformed self-representation on behavior. *Human Communication Research*, *33*(3), 271–290. https://doi.org/10.1111/j.1468-2958.2007.00299.x

Yoon, G., & Vargas, P. T. (2014). Know thy avatar: The unintended effect of virtual-self representation on behavior. *Psychological Science*, *25*(4), 1043–1045. https://doi.org/10.1177/0956797613519271

Zhou, T. (2011). Understanding online community user participation: A social influence perspective. *Internet Research*, *21*(1), 67–81. https://doi.org/10.1108/10662241111104884