

Social Network Size: The Effect of Construal Priming on Social Groups

by

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Abstract

Four studies examined how people group their relationships with other people and how social groups are structured. Study 1 provided a baseline for the number and types of social groups that individuals construct as their social network. Studies 2 and 3 examined whether construal mindset changes the way people sort their relationships. I expected that individuals adopting an abstract mindset would report having fewer, more vague social groups (e.g., "friends"), compared to those adopting a concrete mindset, who would report more, specific groups (e.g., "school friends"). Results suggested that construal mindset did not affect social group structures. As a follow-up on this unexpected result, a comparison of the effect of construal on social-groups-sorting versus household-object-sorting confirmed that construal mindset's influence might simply not extend to cognition about social groups (Study 4). Together, these studies suggest that while social group structures are malleable they are not significantly shifted by construal mindset.

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Table of Contents

Introduction.....	1
Identification of Social Groups	2
Implications of Structuring Social Groups.....	6
Managing resources.....	7
Sustaining meaningful relationships.....	8
Perception of group members.....	9
Factors in Social Group Structuring.....	11
Demographic variables.....	12
Personality variables.....	13
Cognitive variables.....	14
Mental Construal.....	15
Construal Level Theory.....	15
Construal Level Theory and social groups.....	17
Rationale and Hypotheses.....	19
Study 1: Counting Social Groups	20
Method	21
Participants	21
Procedure.....	21
Results.....	24
Types of Social Groups	24
Number of Social Groups.....	25
Social Groups and Time and Energy Investment.....	26
Discussion	27
Study 2: Shifting Social Groups	31
Method.....	32
Participants	32

Procedure	33
Results	35
Number of Social Groups	35
Social Groups and Relational Investment	36
Discussion	37
Study 3: Sorting Relationships	39
Study 3a: Distinct Social Groups	41
Method	41
Results	44
Number of Relationships per Social Group	46
State Construal	46
Study 3b: Overlapping and Nested Social Groups	47
Method	47
Results	50
Construal Level and Differences in Categorization	52
Number of Relationships per Social Group	52
State Construal	53
Discussion	53
Study 4: Understanding the Null Effect of Construal Priming on Relationships ..	55
Method	57
Participants	57
Procedure	58
Results	62
Number of Groups	62
Group Composition	63
Grouping Preferences	65
State Construal	66

Discussion	67
General Discussion	69
Implications for Construing Relationships.....	70
Practical Implications	72
Limitations and Future Directions.....	73
Conclusion.....	76
References.....	78

List of Tables

Table 1	88
Table 2	89
Table 3	90
Table 4	91
Table 5	92

List of Illustrations

Figure 1	93
Figure 2.	94

Appendices

Appendix A: Survey Materials for Study 1	95
Appendix B: Survey Materials for Study 2	99
Appendix C: Survey Materials for Study 3a	105
Appendix D: Survey Materials for Study 3b.....	110
Appendix E: Survey Materials for Study 4	115

Social Network Size: The Effect of Construal Priming on Social Groups

On a daily basis individuals encounter and interact with many different people. Some of these people may be strangers or slight acquaintances; others may be family, friends, and colleagues – a variety of social relationships. Social relationships are important because they can decrease one's risk of mortality (Berkman & Syme, 1979), improve positive physiological functioning and provide social support (Hirsch, 1979; Uchino, Cacioppo, & Kiecolt-Glaser, 1996), as well as facilitate goal achievement (Fitzsimons & Finkel, 2010). This research attempts to contribute to the research on social relationships by understanding how people group their various relationships and how the structure of these social groups may be flexible.

Individuals like to organize and have structure across many domains of life (e.g., Thaler, 2008), one of which may include the social world. Doing so may be important to both relationship development and maintenance. Moreover, how people structure their social world, social groups, and specific relationships and how this structure changes is especially important to research on relationship development and maintenance. Understanding how individuals structure their social networks can provide a framework for understanding interpersonal relationships and one's behaviour within those relationships. For instance, Jessica may imagine her social world to consist of very few, but global groups such as: family, friends, and colleagues. Matthew, on the other hand may perceive his

social world to consist of many specific groups such as: immediate family members, school friends, and sports friends. Structure may be important for relationships as individuals like Matthew might sustain many distinct relationships and in turn have different relational experiences (e.g., more support systems and more social interactions) than someone like Jessica who views her social world as consisting of more broad and cohesive relationships. Thus, the perceptions and interactions individuals have with these various people may change by virtue of how they think about and structure their various social groups.

Despite many attempts to map the social world (e.g., Milardo, 1992), the literature has yet to establish how individuals explicitly structure their social networks and whether this structure may be malleable. Thus, the primary goal of this research will be to explore how individuals structure (and re-structure) their social worlds. I will also explore consequences of structuring the social world. It is possible that people organize their relationships with close others into social groups as this may help them to not only distinguish between their various social relationships but also manage a variety of resources such as time, money, and energy investment.

Identification of Social Groups

For decades, research has tried to conceptualize interpersonal relationships and how individuals understand the world around them, though definite classifications still remain elusive (Milardo, 1988; 1992). One reason the

conceptualization of the social world remains unclear is because there are an abundance of terms and definitions in the literature that are quite often used interchangeably. For instance, the term “social group” which defines a specific group one identifies with has also been used interchangeably with: social world (e.g., Strauss, 1978), social networks (e.g., Milardo 1988; 1992; Salzinger, 1982), social bonds, social support, primary relationships (e.g., family and friends), and informal groups (Miller, 1986). Furthermore, while these terms are often used interchangeably, they have also been differentiated inconsistently in other research. The current research will first investigate what social group labels are common among individuals. Rather than looking at social groups strictly in terms of global (large, generic) social groups or local (small, specific) social groups, the current research will examine both in the attempts of addressing this problem of inconsistency. For the purpose of this research I will use the term *social group* to represent a cluster of people that an individual knows and frequently interacts with, who are interconnected, and are grouped on the basis of specific behavioural and affective distinctions (e.g., Milardo, 1988; Rands, 1988). The term *social network* will be used to represent one’s entire sum of interpersonal relationships and social groups.

According to Strauss (1978), a social group comprises of individuals who regularly communicate and interact with one another and who share similar interests, space, and technology. Each social group may be based around a

primary activity (Kazmer & Haythornthwaite, 2001), context (Miller, 1986), and perceived connectedness (Salzinger, 1982). Within those groups, relationships must be mutual and include a sense of belonging or affirmation, interdependence, and affect or intimacy (Miller, 1986). The number of social groups varies from person to person and over the life cycle (Miller, 1986; McPherson, Popielarz, Drobnic, 1992). Social structure might also depend on the presence of “clusters”, which Salzinger (1982) defines as reinforcing social structures that consist of small, dense groups of people. It was found that cluster members, that is, individuals who have connectedness to only one cluster (i.e., group), tended to have fewer best friends and a more stabilized social network in comparison to non-cluster members (i.e., individuals who were not connected to any particular cluster). Overall, non-cluster members reported a greater number of best friends, because friendships tended to be less restricted for non-cluster members than they were for individuals who are part of a single cluster (Salzinger, 1982). These results suggest that the connectedness individuals feel towards particular groups may impact the overall stability of their entire social network. Taken together, this suggests that people do tend to cognitively structure and organize their social network into distinct social groups.

Within the social network, individuals tend to have multiple types of primary social groups. In a literature review, Milardo (1992) states that there are four common types of social groups. The first group is “significant others” and

are described as people who are closest and most important in one's social network. The "significant others" social group generally consists of an average of five people and is largely inclusive of family, followed by close friends, and romantic partner. The second group is "exchange networks" and includes people whom provide support and overall resources. This category tends to consist of mostly friends, colleagues, and neighbours. The number of people included within this social group tends to vary between 6 and 34 (95% confidence interval), with the average group size being 20. The third type of social group is the "interactive network". The "interactive network" includes people that one frequently interacts with, though is not necessarily overlapped with significant and exchange networks. Finally, the last type of social group is the "global network". The "global network" encompasses everyone within one's overall social network (i.e., members of the other three groups).

While Milardo (1992) provides a solid base for classifications of social groups within the social network, one disadvantage is that other studies have failed to consistently document similar numbers of group size for these social groups – specifically for the exchange and interactive networks. One study noted that individuals had an average of 26 interactive network members and interacted with an average of 4.6 of these members per day (Milardo, Johnson, & Huston, 1983). In another study, Milardo (1989) indicated that individuals have 16 members in their interactive network group and interact with an average of 2.4 of

these people per day. Asendorpf and Wilpers (1998) concluded that young adults maintain an overall average of 37 meaningful social relationships. Some of the literature has suggested that various individual differences and the saliency of certain groups (e.g., Sudman, 1985) may be accountable for the inconsistency in the number of social groups identified in past research (Pollet, Roberts, & Dunbar, 2011; Roberts, Wilson, Fedurek, & Dunbar, 2008). However, this conflicting evidence might also suggest that people's social groups are malleable, per se, and that there are a number of factors – both situational and intrapersonal, that determine the sizes and numbers of social groups.

Implications of Structuring Social Groups

Why does size and structure of social groups matter? The size and structure of specific social groups may have several implications for interpersonal relationships. One implication includes how satisfied one feels about their interpersonal relationships. Stokes (1983) states that there are four important variables related to satisfaction among social groups: the size of the social group, the number of meaningful relationships, the number of relatives, and the density or interconnectedness of the network. Specifically, meaningfulness is one crucial variable in building satisfying relationships (Stokes, 1983) which might change based on how one perceives their social network. The structure of social groups might also affect how resources are invested into each of these social groups and

how group members of each of these social groups are perceived. These points will be discussed in the next three sections.

Managing resources. Another way in which the structuring of social groups may be important is that structure might facilitate the management of resources. To sustain positive relationships, people have to invest time, money, and cognitive energy (e.g., Dunbar, 1993). A lack of self-regulatory resources is detrimental to relationships and can negatively affect interpersonal functioning (Ayduk, Gyurak, & Luerssen, 2008; Finkel & Campbell, 2001; Peetz & Kammrath, 2011; Vohs & Ciarocco, 2004). For example, depleted romantic partners were less likely to offer support to their partners (Feeney & Collins, 2003) and less likely to respond constructively during conflict in their romantic relationships (Finkel & Campbell, 2001). People who maintain a large number of social groups have to divide their overall resources (e.g., energy, time, and money) across each of their social groups. Consequently, these individuals might feel more depleted than those who have a smaller number of social groups. Thus, people with a large number of social relationships might need to avoid depletion by self-regulating through the structure of their social groups. That is, they might manage their resources by social group rather than by individual relationships (i.e., allocating energy, time, and money for each social group). People might invest less energy and less time per social group if they structure their social

world into many social groups, relative to people who have fewer (but larger, more inclusive) social groups.

One can also imagine that in certain social situations, people might have to make trade-offs. For instance, in wedding celebrations people often evaluate their various relationships and make decisions about whom to invite. In recent years, the average North American social network has been found to consist of 250 people (Killworth, Johnsen, Bernard, Shelley, & McCarty, 1990), and for some, having a wedding with 250 guests on each side of the family is not often practical. The bride and groom might consider relational factors such as how meaningful someone is to them and how often they interact with someone in order to evaluate their relationships and make trade-offs of whom they can and cannot invite. Thus, there are existing real-world situations where people might use social group structures to assist how they will regulate their resources – in this case, invitations. As such, the regulation of cognitive energy is an important concept within interpersonal relationships, and understanding how people structure their social world may be imperative to understanding how people regulate the amount of resources they allocate to their specific relationships.

Sustaining meaningful relationships. The ways people structure their social world may be valuable in understanding the development of meaningful relationships. As previously mentioned, humans have a strong desire to form and maintain meaningful relationships, especially with those whom we have ongoing

and positive communication with (Baumeister & Leary, 1995). Though because of the limited capacity to maintain relationships, individuals may need to limit their number of relationships in order to sustain more satisfying and meaningful relationships (Dunbar, 1993; Stokes, 1983). In fact, the strong ties that one has to their various relationships may be a result of how they structure their social groups (e.g., Salzinger, 1983). Perhaps individuals who construe their social network in terms of smaller and more specific social groups are more capable of maintaining meaningful relationships. Because small social groups may be more distinct and unique, it might be possible that people feel they have developed more meaningful relationships when they classify their network in terms of small social groups. By focusing on fewer individuals or smaller groups, as opposed to many individuals and larger groups, individuals may also be able to better allocate their time and energy across social groups – allocating more energy to their most meaningful relationships and thereby developing longer-lasting and more fulfilling relationships. Since people like to categorize things, it might be adaptive for people to think of their social network in terms of many small social groups.

Perception of group members. The perceptions of group members might also be different based on how one structures their social groups. Similarity of the self to a relational target is a central factor in interpersonal relationship research and group dynamics (e.g., Bacev-Giles & Haji, in review; Pelham, Mirenber, & Jones, 2002). Among friends, dating partners and married partners, people tend to

like each other more when they share similar rather than dissimilar attitudes, values, and beliefs (Byrne, 1971; Caspi & Herbener, 1990). Thus, likeness begets liking.

Group members under one social group label may be perceived as more alike than they actually are, by virtue of group membership alone. Simply thinking of a person as belonging to one specific social group (e.g., "golf friends"), as opposed to another (e.g. "party friends"), might affect how similar that person is perceived to people in the same social group (e.g., the person classified as "golf friend" might subsequently be rated more athletic and less extraverted than the "party friend"). Thus, understanding how individuals structure their social network may have implications for the perception of people grouped under a specific social group label. In addition, the number of social groups in the social network may have implications for the perception of all the people that form their social network. For instance, people who structure their relationships into many, different groups might perceive less similarity among all the people they know (since they are sorted into numerous, differently labelled groups). Conversely, people who structure their social connections into few groups might perceive more similarity among the people they know (e.g., if they are all labelled "friends").

Taken together, there are a number of possible implications of the structure of our social network, including – but perhaps not limited to – how resources such as

time and energy are managed, how meaningful relationships are perceived and how individual people are perceived. Investigating the structure of social groups is important to research as it may provide greater understanding of social cognition within social relationships and how the perceptions of social groups may affect one's individual relationships and interactions with others.

Factors in Social Group Structuring

The conceptualization of social groups is an important and understudied topic within the literature. There are a variety of factors which may affect not only the number of people that are grouped into a specific social group, but also in determining who belongs to which group. For instance, people might group their relationships on the basis of one particular situation (e.g., people from their psychology course) or multiple situations (e.g., people they know from their psychology and sociology course), of which may change both the number and distinction of relationships in that group. Given the large number of factors that may influence how social groups are structured, it is quite likely that the structure of social groups is malleable and thus can be shifted.

There may be a number of factors that shift social group size (e.g., demographic variables, personality variables, past experiences, situational variables, and cognitive processes). The literature has provided some information of the influence of demographic and personality variables social group structure, as reviewed below. In the present research, I propose to also look at one novel

factor: the role of cognition, specifically mental construal mindset, in the (re)structuring of social groups.

Demographic variables. Historically, research has struggled to identify consistent factors influencing the structure of social groups. Relationship status (e.g., Milardo, Johnson, & Huston, 1983; Surra, 1985; Rands, 1988), gender (Dunbar & Spoor, 1995; Pollet, et al., 2011; Roberts et al., 2008), age (Pollet et al., 2011; Roberts et al., 2008), education (McPherson, Popielarz, Drobnic, 1992; Pollet et al., 2011), occupation and income (Belle, 1982) all influence network size and structure. The size of social groups and the overall social network can differ depending on these demographic factors. Overall social network size tends to decrease among the progressing stages of romantic courtship as single or recently dating individuals tend to have larger social networks than individuals who have been dating for longer periods of time or are engaged (Milardo et al., 1983; Surra, 1985). Differences for daily social interactions were also found between single, dating, and engaged couples, suggesting that the frequency and duration of social interactions tends to also decrease with later stages of courtship (Milardo et al., 1983). One reason why social networks might decrease in size with stages of courtship is that romantic partners tend to become more interdependent, and interdependent partners withdraw from (all) their social groups more than partners who are less interdependent (Surra, 1985). Other research indicates that the transition from marriage to separation affects the

stability of one's social network. Interactions with others during the marital stage are predominately with one type of social group (e.g., kin), whereas after a separation one's network size begins to resemble the premarital network, that is, longer-lasting interactions with other types of social groups (e.g., friends) and fewer interactions with kin (Rands, 1988).

Personality variables. In addition to demographic variables, social networks have been found to vary based on personality characteristics – particularly extraversion and neuroticism. Extraversion is especially important to social circumstances. Specifically, extraverts tend to possess better social skills (Lieberman & Rosenthal, 2001), have greater interaction with others and receive more support (Asendorpf & Wilpers, 1998), as well as participate in more social activities (Argyle & Lu, 1990). Extraversion might thus be beneficial in promoting relationships that are more meaningful. One study suggested that extraversion is correlated to the size of one's support groups (e.g., best friends and intimates) but not correlated to the size of one's sympathy groups (e.g., one's principle group of friends) (Roberts et al., 2008). This suggests that people who are more extraverted might have a larger number of specific social groups (e.g., activity friends) when compared to people who are less extraverted, however extraversion does not seem to affect global social group categories (e.g., friends).

While investigating the effects of extraversion on emotional intensity of social relationships researchers found that there was an overall tendency for

extraverts to have larger social networks. Extraversion predicted the size of some social groups (e.g., friends) but not others (e.g., family; Pollet et al., 2011). In addition, extraversion was not related to emotional closeness, even when social group size was controlled for (Pollet et al., 2011). This suggests that while extraverts tend to have a larger number of relationships and consequently a larger social network, the quality of their relationships might be very different compared to people who are less extraverted. However, extraversion might only affect one's number of social groups at some stages in life, as research suggests that extraversion tends to decline with age (McCrae et al., 1999).

In contrast, there has been mixed research when investigating another personality trait, namely, neuroticism. One study found that individuals who possess characteristics of neuroticism tend not only have smaller social networks but also interact with their social groups less than people who score lower on neuroticism (Kalish & Robins, 2006). However, Roberts and colleagues (2008) suggest that neuroticism is uncorrelated to network size.

Cognitive variables. One factor that might affect the size of social groups is the cognitive mindset, such as the state of mind one is in when considering their social network. To date, the literature has yet to systematically study whether cognitive variables might affect the way relationships are grouped and how people perceive their various social groups. The effects of cognitive variables, such as construal level mindset, on perceptions within other domains is well

known (Liberman & Trope, 2008; Trope & Liberman, 2003; Trope & Liberman, 2010) and might extend to our perception of the social world. One large field of research has examined the cognitive mindset of individuals. Construal Level Theory (Trope, 1999) suggests that people can quite easily adopt either an abstract (i.e., general) or concrete (i.e., specific) mindset. In the present research I propose to examine the effect of construal level mindset on social group structuring, as well as investigate the factors that cause people to structure their social groups differently.

Mental Construal

Construal Level Theory. One influential theory, which describes the different cognitive frames of mind that people may possess is Construal Level Theory (e.g., Trope, 1999). Based on Action Identification Theory (Vallacher & Wegner, 1987; 1989) which states that actions can be construed through high- or low- levels of abstraction, Construal Level Theory states that the entire mindset of an individual may be relatively more abstract (high-level) or relatively more concrete (low-level). Abstract, high-level construals capture the global, primary features of an event, compared to concrete, low-level construals that capture the local, secondary features of an event (Trope, 1999; Fujita, Trope, Liberman, & Levin-Sagi, 2006). For example, someone who is presented with a picture of a kitchen may perceive the picture to consist of specific labels (e.g., stove, fridge, toaster) rather than a global label such as a room. This is an example of how

individuals might “see” the trees before the forest – that is, perceive details rather than the overall picture. Similarly, reading an article could be viewed as either intellectual stimulation (the overall *purpose* of an action, or abstract construal) or as following a series of words on a page (the *process* towards a specific action, or concrete construal) (Schmeichel, Vohs, & Duke, 2010; Liberman & Trope, 2008; Trope & Liberman, 2003; Vallacher & Wegner, 1989).

Small, everyday subtleties such as construal mindset have been found to affect our perceptions of the world we live in. For instance, construal mindset affects our ability for self-control – specifically, high-level construals are associated with greater performance, less inhibition and overall more self-control than low-level construals (Fujita et al., 2006; Schmeichel et al., 2010). Construal level also affects behaviors, including one’s engagement in activities (Liberman, Trope, McCrea, & Sherman, 2007), as well as future behaviours, everyday tasks, and the planning of leisure activities (Liberman, Sagristano, & Trope 2002). Given that construal mindset offers insight for how people perceive various situations and occurrences in their day-to-day lives it is also possible that construal mindset may affect one’s perceptions of their social network. Construal mindset can vary spontaneously in everyday life (e.g., Vallacher & Wegner, 1987), but one essential component of Construal Level Theory is that it can be manipulated. For example, Freitas, Gollwitzer, and Trope (2004) investigated the induction of construal mindsets and whether or not an adopted mindset impacts

one's attention in goal-relevant situations. Participants were assigned to an abstract- or concrete- induced mindset where they were then presented with an exercise illustrating mundane actions as to *why* a person may want to pursue a goal or *how* they would pursue a goal, for the abstract and concrete conditions, respectively. In each condition, participants were presented with this goal of health improvement and were asked to think of three actions that would help in achieving the goal. This thought exercise resulted in an overall abstract (or concrete) mindset that carried over to subsequent tasks. Then, in an unrelated task on social-intelligence assessment, participants' responses implied they had adopted an abstract (or concrete) mindset. Thus, an adopted mindset can in fact increase the accessibility of the respective (high-level or low-level) cognitive operations. The influence of construal mindset is relevant to the current research as mental construal has been shown to make a fundamental difference in how we perceive the world (Liberman & Trope, 2008; Trope & Liberman, 2003; Trope & Liberman, 2010). Thus, this important aspect of our cognitive mindsets might affect the way in which we mentally structure social relationships.

Construal Level Theory and social groups. How might construal mindset affect our understanding of our social world? Within an everyday context, different mindsets can affect daily experiences. The activation of high- versus low-construal mindsets may be pertinent when understanding how individuals interpret and structure their social worlds. Most pertinently, Liberman

and colleagues (2002) showed that categorization of objects can change based on construal level theory. In one study, they had participants imagine either an upcoming or future event (e.g., moving out) and then had participants group and categorize related objects (e.g., computer, pictures, and dinner plates).

Participants who imagined the event concretely (i.e., the near future condition) constructed more, specific categories to classify the objects for the imagined scenario, compared to those imagining the event abstractly (i.e., the distant future condition) who sorted the objects into fewer, more global categories.

The activation of one construal mindset over the other may be crucial to the investigation of social groups. An individual who views their social world through an abstract (global) framework may perceive their world differently than someone who views their social world through a concrete (specific) framework. As Liberman and colleagues (2002) suggested, objects can be organized differently by adopting a particular construal mindset. Similarly, in the domain of social groups, it is expected that individuals who adopt an abstract construal should organize their social network into larger, but few social groups compared to people who adopt a concrete construal. Conversely, when adopting a concrete mindset people should construe their social network into a larger number of specific social groups. Hence, the malleability in the organization of one's social network and the malleability of social groups, specifically, may be tested by manipulating individuals' construal mindset. Thus, the aim of the present research

is to apply Construal Level Theory – a prominent and well-established theory in social psychology – to this novel context of social groups.

Rationale and Hypotheses

The present research seeks to understand how people navigate their increasingly complex social world, specifically whether one cognitive factor – construal level mindset might change the way relationships are mentally grouped. Understanding the structure of social networks may help the functioning of interpersonal relationships and will contribute to research on relationships and social cognition. Attesting to the importance of social structures, people spontaneously engage in a variety of social networking sites (e.g., Facebook, Google+) which help sort and categorize their different relationships. For example, Facebook prompts its users to sort contacts into “close friends” versus “acquaintances” while also allowing users to create names for other personalized categories. In 2013 Facebook had 1.26 billion users and just over half of these users reported using the site daily (Smith, 2013). Overall, the purpose of the current research was to determine how individuals structure their social network and the implications of such (regarding resource management, meaningfulness, and perceptions of group members). I explored whether (and how) social groups can shift depending on context and cognitive reframing. First I explored the composition of social groups. I expected to find that while social groups would generally be distinct from person to person, some social group labels might be

more commonly mentioned than others. Thus, Study 1 established the number of social groups individuals associate with as well as the common labels people attach to these groups.

Furthermore, I expected that social groups are malleable and can be changed through cognitive factors, one of which may include a construal level mindset. In Study 2, construal level was manipulated to investigate whether the number of social groups can be shifted depending on construal mindset. In Study 3, I further investigated whether construal level has an effect on the (re)structuring of social groups. Specifically, Study 3 consisted of two parts (Study 3a and 3b), each of which replicated the procedure of Study 2 while using an additional, improved measure to assess social groups. Finally, Study 4 investigated the effect of construal priming not only for social groups but also among a second domain which has been previously established in the literature – objects – as a comparison domain.

Study 1: Counting Social Groups

The purpose of Study 1 was to establish the number of social groups individuals have and the labels they choose to attach to their various groups. This study also explored implications of social grouping, specifically, how time and energy resources are allocated among various social groups.

Method

Participants

One-hundred and fifty-four participants (84 females and 70 males, M age = 31.21, $SD = 9.87$) completed this study. All participants were Americans recruited from Amazon's Mechanical Turk.¹ Participants received \$0.50 US as compensation.

Procedure

Participants signed up for an online study on "Social Networks". They completed a listing social group measure, followed by items of time and energy investment, a counting social groups measure, a demographics section, and finally a measure of state depletion (for all materials for Study 1 see Appendix A). Lastly, participants were presented with the debriefing form. The measures are listed as follows.

Listing social groups. In an open-ended question, participants listed up to 10 of their social groups. For this study, *social groups* were defined as "a group of people sharing some common social relations (e.g., people you know from a specific event, such as golf friends, or in a specific social situation, such as friends from work, neighbours,

¹ Research suggests that Mechanical Turk participants are demographically diverse and the data obtained from these samples are as reliable as those from traditional methods (Buhrmester, Kwang, & Gosling, 2011).

or other groups that have “special status” in your mind, such as extended family, close family, romantic partner).”

Next, participants listed the initials for up to 10 people that they frequently interact with and the corresponding social groups for each of these people.

Although participants were told to think of those they “interact” with, no definition was provided. That is, participants’ perception of what an interaction encompassed was left to be very subjective.²

Time and energy investment. For each of the social groups listed at the beginning of the survey, participants thought about how much time and energy they spend with each of these social groups during a typical week. Specifically, the online questionnaire populated the social group fields so that participants were reminded of the idiosyncratic social groups they had listed during the first task, and then answered the following questions based on each of those specific social groups.

Using the list from before, participants first thought about how much time they spend with each of the listed social groups and then estimated the number of hours they spend with people in that group during a typical week. For energy, participants thought about how much energy (e.g., doing favours, being nice even though one is tired, and actively listening) they invest into each of the listed social

² These instructions were included in the subsequent social group measures in the current research and should be considered in overall interpretations.

groups. They estimated the amount of energy they invest with people in that specific social group during a typical week, using a 7-point scale ranging from 1 (*none at all*) to 7 (*a lot*). A mean score of time investment per social groups was computed by averaging the number of hours invested for each of the listed social groups. A mean score of energy investment was computed by averaging energy investment ratings for each of the listed social groups.

Counting social groups. A second way to assess the number of social groups was achieved by having participants answer three closed-ended questions about their 1) family, 2) friend, and 3) colleague categories. Specifically, participants read:

“When thinking about your entire *family*, family could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between members of your family and you might think of different groups within your family. For example, you might distinguish between immediate and extended family, siblings, grandparents, aunts, uncles, cousins, family living in the same town vs. family living abroad, married-in members vs. born-in members.”

For each category participants were asked to select whether that category consisted of one, two, three, four, or five or more social groups. They provided the respective labels for these specific social groups. A composite score was

created to assess the total number of social groups listed across all three closed-ended questions. For example, someone who reported one social group for their family, two friends groups, and one colleague group would have a total of four social groups in this composite score.

Demographics. This section assessed the following demographic variables: age, gender, ethnicity, relationship status, number of children, and the number of hours they worked and commuted to work per week.

Depletion. Finally, an 8-item measure was included to assess participants' recent state depletion (Finkel & Campbell, 2001). Using a response scale ranging from 1 (*very infrequently*) to 7 (*very frequently*), participants rated how true responses were regarding their behaviours in the past few days. Sample items included: "did something that I did not want to do" and "worked long hours (at a job or at home)".

Results

Types of Social Groups

Based on an examination of the literature on common social groups (e.g., Kazmer & Haythornthwaite, 2001; Milardo, 1983; 1989; 1992), and the social groups present in the current sample, I analyzed the current dataset for reoccurring social groups. Because participants listed more than one social group each, the total percentage of social groups mentioned below exceeds 100%.

Three commonly mentioned categories were colleagues (68.8%), family (mentioned as general category: 43.5%), and friends (mentioned as general category: 28.6%). Furthermore, participants distinguished between specific social groups: activity friends (generalized across various specific extracurricular activity groups; 62.3%), school friends (44.2%), best friends (22.7%), social networking friends (14.3%), and other friend groups (7.8%). They also listed finer distinctions for their family members: extended family (40.3%), immediate family (37.0%), significant other (27.9%), household family (1.9%) and in-laws (3.2%). In addition, several participants mentioned the social groups: neighbours (20.1%), and acquaintances (9.1%). Any other listed social groups, including those which were not recognizable groups (e.g., social groups distinguished by abbreviations or acronyms) were categorized as “others” (7.8%).

Number of Social Groups

The average number of social groups listed in the open-ended listing task was 6.33 ($SD = 2.54$). The composite score of the counting social groups measure showed an average of 5.04 social groups ($SD = 2.20$). Table 1 illustrates the specific frequencies for participants' range of responses per social group category. The two measures assessing number of social groups were significantly correlated with one another, $r(151) = .42, p < .001$. However, the average number of social groups listed in the open-ended listing task was significantly greater than the composite score of the counting measure, $t(152) = -6.10, p < .001, \eta^2 = .20$.

Social Groups and Time and Energy Investment

On average, participants reported spending a moderate amount of energy per social group ($M = 4.41$, $SD = .98$), and invested an average of 15.39 hours ($SD = 28.92$) per social group, per week. There was a significant negative relationship between the number of social groups listed and the average time spent per social group, as the more social groups people listed in the open-ended measure, the less time they invested per social group, $r(152) = -.32$, $p < .001$. A negative relationship was also observed between the number of social groups listed and the average energy invested per group, suggesting that the more social groups people listed the less energy they invested per social group, $r(152) = -.15$, $p = .06$. This pattern was replicated with the composite score of the counting social groups measure, in which a greater number of groups was also negatively related to the average time invested per group, $r(152) = -.24$, $p = .002$, and to the energy invested per group, $r(152) = -.23$, $p = .005$.

Participants also reported their depletion in the past few days ($M = 4.81$, $SD = 1.03$). There was a significant positive correlation between the amount of energy participants invested into each of their social groups and state depletion, $r(152) = .24$, $p = .003$. This suggests that the more energy participants spent per social group, the more depleted they felt or vice versa. The correlation between the number of hours invested per social groups and state depletion was not significant, $r(152) = .12$, $p = .16$.

Discussion

An analysis of participants' commonly listed social groups suggested that people tend to have three main social group categories: family, friends, and colleagues. This finding is consistent with the social groups encompassed in Milardo's (1989; 1992) three types of social groups: significant others, exchange groups, and interactive groups. Aside from the three main social group categories, participants also mentioned a variety of more specific social groups. It appears that these three main social group categories may be further divided into other groups (e.g., immediate family, school friends, and activity friends).

Both an open-ended measure prompting participants to list social groups and a closed-ended composite score of the counting social groups measure suggested that on average, participants identify with approximately five to six different social groups. While the two measures were highly correlated with one another, participants listed fewer social groups in for the closed-ended measure than they did for the open-ended measure. One reason for this might be that participants in the closed-ended measure were forced to think about and classify their groups into three main categories. As noted in the analysis for the open-ended measure, there were a high percentage of people who mentioned a social group which represented smaller more specific categories (e.g., neighbours and acquaintances). In addition, the closed-ended question was limited as it allowed for a maximum response of five or more social groups. That is, it is possible that

those participants who stated that their family, friend, or colleague categories consisted of “five or more” specific groups (counted as “five”) may have meant to specify six or more groups which was not reflected in the overall mean number of social groups. Finally, it is possible that unemployed participants did not have a colleague social group, thus limiting the total number of social groups for the counting social groups measure. This suggests that the open-ended measure was likely a more accurate and valuable measure for assessing social groups, relative to the closed-ended measure. For this reason, I will continue to use the open-ended measure in subsequent studies. One limitation with the listing measure was that it was unclear how long it took participants to list their various social groups and whether there were any differences in the number of social groups participants identified with and the amount of time taken to think of them. In future studies, it may be important to assess the length of time taken when listing one’s social groups.

Furthermore, while these results demonstrate some common social group labels people use, these findings should be interpreted with caution. Specifically, in both the listing social groups and counting social groups measures examples of groups were provided of social groups that people might identify with. These examples may have thus biased the social group labels that participants reported. In addition, the listing social group measure asked participants to think of people they *frequently interact with* and to identify their corresponding social groups.

This instructional component in the current measure was also limiting as it did not account for how qualitatively different relationships may be from person to person. For instance, it is unclear whether the people whom participants have frequent interactions with encompassed individuals who they see each morning in the elevator and only exchange few words with, versus someone with whom they have a more frequent and established relationship with.

An exploratory analysis of time and energy investment was also conducted in this first study. Interestingly, participants spent less time and less energy, per social group, when they had a larger number of social groups. This suggests that time and energy might represent finite resources that are divided evenly across social groups – the more social groups a person listed, the more thinly spread were their resources. In accordance with previous research, the maintenance of various relationships is cognitively depleting (Dunbar, 1993), and perhaps people have to make more trade-offs and disperse their overall resources more when they have a larger number of social groups. While intriguing, these findings are preliminary and the measures used to assess resource allocation do have limitations. Obviously, time and energy are not invested indiscriminately. A parent with young children may invest most of their time and energy resources into their “household family” social group, but hardly any resources to their other social groups. On the other hand, an unhappily married person may invest little resources to their “household family” and most of their resources in their

“friends” and “colleagues” social groups. The composite score used to assess overall resources across social groups is likely not a very representative measure of resource allocation as it might not capture cases like these and how resources are really allocated from one social group to the next. Moreover, it would be useful in future research to track resource allocation for each social group and each member of that group. In addition, it was unclear as to what basis participants used to assess their overall time and energy investment. For instance, did participants actively set aside resources for someone they know (e.g., driving a friend to an appointment) or was their investment rated on a more passive basis (e.g., occasionally communicated with a colleague in a nearby cubicle for the entire work day)? Thus, future research on resource allocation should investigate the various ways people invest (and perceive they invest) their energy and time resources across their social network.

Overall, Study 1 made some initial incursion into the number of social groups and the types of social groups that people tend to identify with. Some participants listed more abstract categories such as “family”, whereas others listed more specific social group categories such as “household family” and “extended family”. It could be that participants view their social groups through varying levels of abstraction (i.e., low-level versus high-level construal). That is, it is possible that different levels of construal might affect how people think about their social groups. As such, it is possible that the structure of social groups might

vary based on how abstractly people think about their various social groups. Next, Study 2 examined whether one's number of social groups are malleable via a construal level mindset.

Study 2: Shifting Social Groups

From Study 1 it was suggested that social groups tend to be variable across people, and that social groups might be construed at more abstract levels ("family") versus more specific levels ("household family"). Thus, the purpose of Study 2 was to examine whether social groups might shift depending on the mindset participants happen to be in. Specifically, Study 2 examined whether the number of social groups one identifies with might change when inducing either an abstract mindset or a concrete mindset via a well-established construal manipulation (Freitas et al., 2004).

First, I predicted that participants who adopted an abstract mindset would report fewer, more inclusive social groups (e.g., "friends") compared to those who adopted a concrete mindset who would report many specific social groups (e.g., "best friends", "school friends", and "activity friends"). I assessed the number of social groups using the open-ended listing social groups measure as well as the closed-ended composite score for the counting social groups measure (Study 1). Because the open-ended measure seemed to be more accurate and a more inclusive measure of one's various social groups than the closed-ended measure, I

will primarily focus on the results for the open-ended listing social groups measure.

Second, given that a greater number of social groups may allow for less energy and time investments allotted to each group (Study 1), participants with a greater number of social groups should again report spending less time and less energy per social group, compared to people with fewer social groups.

Method

Participants

Eighty-nine American participants were recruited to participate in a study from Amazon's Mechanical Turk.³ Participants received \$0.50 US as compensation. Of the original sample, one participant was excluded for not completing the manipulation and two were excluded for not listing any social groups. Furthermore, two participants were excluded as outliers (their score for the main dependent variable was greater than 3 standard deviations from the mean). The final sample included 84 participants (44 females, 40 males) with a mean age of 30.81 years ($SD = 10.07$).

³ While I aimed to have a sample size of 80 participants (40 per condition) and posted this number of time slots on Mechanical Turk, the actual number of participants who completed the study was slightly higher. This difference in number of participants represents an unaccounted but usual common variance within Mechanical Turk samples (see LeBel et al., 2013). Subsequent studies using Mechanical Turk samples (Studies 3a and 3b) showed the same slight discrepancies between posted timeslots and actual participants.

Procedure

Participants signed up for an online study on “Social Networks”. They first completed the construal manipulation where they were randomly assigned to either an abstract or concrete construal mindset condition. Next, they were asked to complete the listing social groups measure, counting social groups measure, pro-relational behaviours measure, time and energy investment measure, followed by the demographics section, and the debriefing (for all materials for Study 2 see Appendix B). The measures are explained as follows.

Construal manipulation. Adapted from previous research, a thought exercise was employed to prime participants to think about a goal using either an abstract (high-level) or concrete (low-level) induced mindset (e.g., Freitas et al., 2004; Schmeichel et al., 2010). The thought exercise asked participants to think about the goal “improving and maintaining one’s physical health”. Participants completed four statements which reflected either why (abstract mindset) or how (concrete mindset) they would maintain this goal. Instructions and examples that were adapted from Freitas and colleagues (2004) were used to help participants in completing the thought exercise.⁴

⁴ Construal level was also manipulated using a relevant goal (e.g., improving and maintaining good personal relationships) to investigate whether results would be consistent when priming a relevant domain. The study design was identical though with the exception of the slight difference in construal manipulation – a less established measure than the non-relevant goal construal which was used in

Listing social groups. Using the same definition of social groups as in Study 1, participants listed the names of up to 10 social groups that they regularly interact with. A social group score was computed for the number of social groups listed.

Counting social groups. To assess the number of social groups in second way participants indicated how many social groups they identify with, within the following categories: 1) family, 2) friends, and 3) colleagues, as in Study 1.

Time and energy investment. As in Study 1, participants thought about how much time and energy they spend with each of their social groups (i.e., each of the 10 listed groups in the open ended measure) during a typical week.

Responses were averaged across social groups and then computed to create a composite score for both time and energy depletion.⁵

Study 2. This manipulation was unsuccessful and instead seemed to prime relationship importance.

⁵ An additional measure on pro-relational behaviours was included to assess certain actions and behaviours that might be depleting and to ensure that participants felt depleted when investing energy into their relationships. Participants were presented with a list of actions which were thought to be depleting in the maintenance of social groups and were directed to select all items that they felt were applicable. Some items included: setting time aside, making plans, talking on the phone, actively listening to the person, and doing favours. These items supported the importance of the energy investment measure – all participants reported that at least one of these behaviours were depleting in the maintenance of their social groups.

Demographics. A short demographics section also assessed: age, gender, relationship status, number of hours of worked per week, average total time to commute to work, as well as occupation title.

Results

Number of Social Groups

The current study aimed to have equal distribution across conditions – a traditional convention for reducing the risk of violating the assumption of equal variances in the data (e.g., Glass & Stanley, 1970), yet the randomization of the software used to conduct the study resulted in an unequal number of participants per condition. Thirty-five participants were assigned to the abstract mindset condition, and 49 to the concrete mindset condition. Due to the uneven sample sizes, the variance of the main dependent variables within each condition was examined. For the open-ended measure, variances were unequal between the abstract condition ($s^2 = 3.90$) and concrete condition ($s^2 = 5.79$). Notably, the number of listed groups varied more in the condition that had a greater number of participants. Because the independent t -test assumes equal variances in both conditions that are to be compared, Welch's t -test was used instead.

Overall, participants listed 5.30 ($SD = 2.25$) social groups. Recall that I predicted that the number of social groups would vary depending on the induced mindset, as participants in the concrete mindset condition were expected to divide their social networks into more social groups than those in the abstract mindset

condition. I conducted Welch's *t*-test to compare the number of social groups by condition. Participants listed slightly more social groups when they were assigned to the concrete mindset condition ($M = 5.57, SD = 2.41$) compared to the abstract mindset condition ($M = 4.91, SD = 1.98$), however this result was not statistically significant, $F(1, 80.34) = 1.88, p = .174, \eta^2 = .02$. The open-ended measure correlated moderately with the closed-ended social group measure, $r(82) = .46, p < .001$.

As in Study 1, participants reported fewer social groups in the closed-ended measure ($M = 4.97, SD = 1.95$) than in the open-ended measure ($M = 5.30$), $t(82) = 2.13, p = .04, \eta^2 = .05$. For the closed-ended measure, variances were also unequal between the abstract condition ($s^2 = 4.24$) and concrete condition ($s^2 = 3.58$). The closed-ended measure did not differ by construal condition, $F(1, 69.49) = .01, p = .956, \eta^2 = .00$.

Social Groups and Relational Investment

Overall, participants reported investing a moderate amount of energy per social group, per week ($M = 4.34, SD = 1.13$). They also invested approximately 21 hours per week, per social group ($M = 20.90, SD = 20.21$). The measures for invested energy and time were positively correlated with one another, $r(82) = .44, p < .001$.

It was predicted that participants who reported a larger number of social groups would invest less time and energy per social group than participants who

reported fewer social groups. Supporting this prediction and replicating Study 1, the more social groups participants listed, the less energy they reported investing per social group, $r(82) = -.43, p < .001$, and the less time they reported investing per social group, $r(82) = -.26, p = .015$. The composite score of the counting social groups measure also correlated with both invested energy, $r(83) = -.26, p = .017$ and invested time, $r(82) = -.29, p = .009$. The pattern of correlations was the same across both construal conditions. Table 2 highlights the correlational analyses split by condition. However, there was no effect of construal condition on energy investment, $t(82) = -1.47, p = .15, \eta^2 = .03$, nor on time investment $t(82) = .71, p = .48, \eta^2 = .00$.

Discussion

The results for effects of construal mindset condition on participants' generated number of social groups did suggest that there is some very preliminary evidence for the malleability of social groups. Note that the social groups listed by participants refer to personal social relationships – a variable which may be very stable and difficult to move around. Thus, even a small non-significant difference might be noteworthy and justify examining this question further with improved manipulations or more sensitive measures.

First, the measure of social groups might be improved. While the open-ended social groups measure was positively correlated with the closed-ended social groups measure, the number of social groups for two of the measures were

statistically different. As mentioned in Study 1, the closed-ended measure was likely a poor measure of number of social groups compared to the open-ended measure, which was expected to be more accurate. Rather than continue to include the closed-ended measure I instead will employ an improved measure of social groups. Instead of simply listing one's social groups, having participants think about their relationships and then sort them into meaningful social groups might provide further implications as to how individuals allocate their resources among their various groups.

Second, the manipulation used in this study may have contributed to the non-significant result. Despite existing empirical support for the established construal level manipulation used in this study (Freitas et al., 2004), the manipulation may not have been strong enough to allow participants to adopt one construal mindset over the other. Note however that this manipulation is well-established and has been used in more than 200 published papers (Google Scholar, 2014). Since the measure of social groups will be changed in the following study, I will continue to use this same construal manipulation – while making sure that the two conditions are equal in number – to continue investigating the effect of construal mindset on social groups.

The second hypothesis, which examined time and energy investment among social groups, was confirmed. Specifically, the more social groups people had, the less time and less energy they tended to invest per social group. To

ensure that people are effectively maintaining their various relationships, people might use social group structure as a way to allocate and manage their limited resources. That is, a finite amount of resources may be divided across social groups rather than between individuals. People might intuitively be aware of the limited cognitive resources associated with maintaining various relationships and use social group structure as a way to ensure resources are being allocated across all of their distinct sets of relationships. It is possible that those with many social groups might have to be more stringent with their available resources, as they would have to divide their overall resources across more individual groups of people than would people who have few social groups. This finding replicated the time and energy results found in Study 1.

Study 3: Sorting Relationships

The purpose of Study 3 was to replicate Study 2 and further investigate the effects of construal priming on social network structure. Specifically, because Study 2 indicated that it was difficult to shift people around in their construction of social groups, a more sensitive measure may be needed. Therefore, Study 3 introduced a new, potentially more sensitive measure of social groups. First, participants listed their various relationships (i.e., social contacts) and engaged in a *drawing* social groups task. In this task participants were asked to recall the relationships they previously mentioned and then physically draw circles to represent their various social groups. They categorized the people mentioned into

their respective social groups. Rather than simply listing social groups, this task was expected to be a more active and cognitively-demanding process in which participants would have to think about the varying aspects of their relationships before categorizing and physically drawing social groups and the people they encompass. In order to account for the fact that people might group their relationships differently I included two parts to this study. In Study 3a, participants grouped their various relationships into only *distinct* social groups (i.e., circles that do not overlap). In Study 3b, participants completed the same task but were also allowed to categorize their various relationships into not only distinct but also *overlapping* or *nested* social groups (i.e., circles that overlap with one another and circles within circles). Both measures were included to increase the chances of detecting the influence of construal level on differences in categorization of relationships.

As before, it was expected that participants assigned to the abstract mindset condition would sort their relationships into fewer (more inclusive) social groups than participants assigned to the concrete mindset condition. The hypotheses were identical in both Study 3a and b. The open-ended listing social groups measure that was used in Studies 1 and 2 was included for validation purposes.

For further validation to the main construal task participants also completed a measure of state construal. It was predicted that the construal mindset

participants adopted earlier on in the study would also influence participants' tendency to think abstractly or concretely during the state construal measure. That is, participants who previously adopted an abstract construal mindset should have a tendency to perceive items from the state construal task as more abstract, in comparison to participants who previously adopted a concrete construal mindset. State construal level should also be negatively linked to the number of social groups – participants who sorted their relationships into more groups should score lower on state abstraction.

Study 3a: Distinct Social Groups

Method

Participants

Eighty-five participants were recruited in the tunnels at Carleton University to complete a short study on social groups. Participants were volunteers but received candy bars as incentive to participate. A total of four participants were excluded as they did not complete the main variables in the survey and seven participants were excluded for not following the instructions of the construal task (e.g., did not complete survey in sequence, responses for construal task were nonsensical). One additional participant was excluded as their score for the main dependent variable (number of social groups drawn) was greater than 3 standard deviations from the mean. The final sample consisted of 73 participants (34 females, 39 males) with a mean age of 21.54 ($SD = 6.26$).

Procedure

Participants were recruited for a study entitled “Sorting Social Groups”. The survey was distributed on paper (see Appendix C for complete survey materials). They first completed a short demographics section followed by the listing relationships measure. Then, construal level was manipulated as in Study 2 (e.g., Freitas et al., 2004; Schmeichel et al., 2010). Participants were assigned to adopt either an abstract or a concrete mindset by thinking about *why* or the *how* they would improve and maintain their health. Next, participants completed a drawing task as well as listing social groups task. Lastly, participants completed the self construal measure and were debriefed.

Demographics. A short demographics section assessed participants’ age and gender.

Listing relationships. Participants thought about 30 people they knew and regularly interacted with. Because prior research indicates that people have approximately 26 to 37 relationships in their social network, 30 relationships was thought to be a comprehensive yet sufficient number of relationships to examine (also see Milardo, Johnson, & Huston, 1983; Asendorpf & Wilpers, 1998). Space was provided for participants to record the initials for each of their various relationships.

Construal level. As in Study 2, construal level was manipulated (Freitas et al., 2004). Participants were assigned to adopt either an abstract or concrete

mindset regarding the goal of improving and maintaining health. Instructions on the task were provided.

Drawing social groups. After reading the definition of social group (see Study 1), participants thought about the people they mentioned at the start of the survey and drew circles to represent their different social groups. Participants sorted their relationships into groups (i.e., circles). They were instructed that the groups had to be distinct and could not overlap with one another, however there was no limit to the number of people they could or could not include per group. A blank page was provided for participants to complete this task. Furthermore, participants were asked to indicate the name of each social group at the top of the circle. An example of this task was provided to participants and a template of how participants would have responded is presented in Figure 1.

Listing social groups. As in the first two studies, participants listed up to 10 various social groups. This measure was included as the second dependent variable as well as a manipulation check to verify whether the same social groups were listed as in the sorting measure.

State construal. In order to assess a second type of construal measure, items from the Behavior Identification Form (BIF; Vallacher & Wegner, 1989) were adopted. Originally, the BIF is a 25-item questionnaire that assesses individual differences in construal orientation. For each item, participants read a behaviour which had two corresponding descriptions; one description reflected an

abstract construal and the second description reflected a concrete construal. Participants selected the description that they believed was most appropriate. For example, a sample behaviour item included, “picking an apple”, with the corresponding responses being: “getting something to eat” (abstract response) and “pulling an apple off a branch” (concrete response). Due to the outdated nature of some of the BIF items, a subset of 13 items were chosen for inclusion in this study. A composite score was created to indicate the proportion of participants’ abstract compared to concrete responses.

Results

Number of Social Groups

Overall, participants listed an average of 26.47 ($SD = 6.73$) people they know and regularly interact with. To recall, it was expected that participants who adopted a concrete construal mindset would sort their relationships into more social groups (with presumably fewer relationships per circle) than those who adopted an abstract construal mindset. Forty participants were assigned to the abstract construal mindset condition and 33 to the concrete construal mindset condition. An aggregate score was created for the number of social groups (i.e., circles) drawn in the drawing measure.

Participants drew an average of 4.34 ($SD = 1.43$) distinct circles to represent their various social groups. The minimum number of social groups drawn during the drawing task was 2 and the maximum number of social groups

drawn was 8. Since the variances were equal ($s^2 = 1.97$ and 2.13 , for the abstract and concrete mindsets, respectively), an independent t -test was conducted using construal condition as the independent variable and the number of social groups drawn as the dependent variable. There was no difference in the number of social groups drawn for participants who adopted the abstract mindset condition ($M = 4.23$, $SD = 1.41$) relative to the concrete mindset condition ($M = 4.48$, $SD = 1.46$), $t(71) = -.77$, $p = .44$, $\eta^2 = .01$.

When asked to list their various social groups, participants indicated an average of 4.54 ($SD = 1.48$) social groups. The minimum number of social groups listed was 3 and the maximum was 8. It was hypothesized that the number of social groups drawn would be positively correlated to the number of social groups listed. The relationship between the number social groups drawn and number of social groups listed was in fact positively correlated, $r = .77$, $p < .001$.

Furthermore, there was no significant difference between the mean number of social groups drawn versus listed, $t(70) = -1.70$, $p = .09$, $\eta^2 = .04$. As with the drawing measure, participants were expected to list fewer social groups when assigned to the abstract construal mindset compared to the concrete construal mindset. Once again, participants listed a similar number of social groups when they were assigned to the abstract construal mindset ($M = 4.45$, $SD = 1.43$) than the concrete construal mindset ($M = 4.64$, $SD = 1.56$), $t(69) = -.53$, $p = .60$, $\eta^2 = .00$.

Number of Relationships per Social Group

It was predicted that the number of relationships per social group would also depend on the construal mindset that participants had previously adopted. In addition to drawing fewer social groups, participants who adopted an abstract construal mindset should sort a greater number of relationships, on average, per social group than participants who adopted the concrete construal mindset. To test this prediction, an aggregate score for average number of relationships per social group was computed. On average, participants included 6.36 ($SD = 2.49$) relationships per social group. There was a minimum of 2.33 relationships per social group and a maximum of 15 relationships per social group.

There was a negative relationship between the total number of social groups drawn and mean number of people per group, $r = -.53, p < .001$. That is, participants who drew fewer total social groups tended to have more relationships per group. Contrary to predictions though, there was no difference between the number of relationships sorted per group for the abstract mindset condition ($M = 6.31, SD = 2.64$) versus the concrete mindset condition ($M = 6.43, SD = 2.32$), $t(70) = -.20, p = .845, \eta^2 = .00$.

State Construal

To assess whether there was an effect of construal condition on a subsequent state construal task, an aggregate score for the 13 self-construal items (from the BIF) were computed. It was predicted that adopting a prior abstract

construal mindset should prime participants to select more abstract responses during the state construal measure, relative to those in the concrete construal mindset condition. The aggregate score represents the total number of abstract responses where the maximum score is 13. Supporting this supposition, participants who had previously adopted an abstract construal mindset had a tendency to select more abstract responses ($M = 10.25$, $SD = 2.25$) than participants who previously adopted a concrete construal mindset condition ($M = 8.48$, $SD = 2.61$), $t(71) = 3.10$, $p = .003$, $\eta^2 = .12$. These results served as a validation for the construal task as a mindset prime. Namely, participants assigned to the abstract construal mindset tended to think more abstractly, while participants assigned to the concrete construal mindset tended to think more concretely.

Notably, state construal level was negatively related to the number of social groups, $r = -.32$, $p = .006$. Participants who drew more social groups tended to score less abstractly (more concretely) on the state construal task.

Study 3b: Overlapping and Nested Social Groups

Method

Participants

Participants were 83 volunteers, recruited in the tunnels at Carleton University. All participants received candy bars as compensation for their time. Of the original sample, nine participants did not complete the survey and seven

were excluded for not following the instructions of the construal task (e.g., did not complete survey in sequence, responses for construal task were nonsensical) with the construal manipulation task. One additional participant was excluded since their score for the main dependent variable (number of social groups drawn) was greater than 3 standard deviations from the mean. The final sample consisted of 66 participants (34 female, 32 male) with a mean age of 21.30 ($SD = 6.48$).

Procedure

Participants completed a study entitled “Sorting Social Groups”. This survey was identical to Study 3a though with exception of the drawing task instructions. Participants completed a short demographics section followed by the listing relationships and construal level (e.g., Freitas et al., 2004; Schmeichel et al., 2010) measures. Next, participants completed the drawing social groups task. Unlike Study 3a, participants were allowed to group their relationships with less restrictions. Finally, participants listed their social groups, completed the state construal measure and were debriefed.

Demographics. A short demographics section assessed participants’ age and gender.

Listing relationships. As in Study 3a, participants thought about 30 people they knew and regularly interacted with. Space was provided to record the initials of each of their relationships.

Construal level. As in Study 2, construal level was manipulated (e.g., Freitas et al., 2004; Schmeichel et al., 2010). Participants were assigned to adopt either an abstract or concrete mindset regarding the goal of improving and maintaining health. Instructions on the task were provided.

Drawing social groups. Similar to Study 3a, participants thought about the people they mentioned at the start of the survey and then sorted them into groups. This time, participants sorted their relationships using a less restrictive drawing task. That is, whereas Study 3a allowed participants to only sort their relationships into distinct social groups (i.e., circles), participants were also allowed the flexibility to draw circles representing not only distinct, but also overlapping or nested groups (i.e., circles within circles) (see Table 2). They were instructed that there was no limit to the number of people they could or could not include per group. Participants indicated the name of each social group at the top of the circle. An example was provided and participants were given a blank page in order to complete the task.

Listing social groups. As in the first three studies, participants listed up to 10 various social groups. This measure was included as the second dependent variable as well as a manipulation check to verify whether the same social groups were listed as in the sorting measure.

State construal. Like Study 3a, 13 items adopted from the BIF were included as a secondary measure of construal. Again, participants read a set of

behaviours, each containing two descriptions regarding the behaviour in question: one abstract description and one concrete description. Participants selected the description that they believed was most appropriate. A composite score was created to indicate the proportion of participants' abstract compared to concrete responses.

Results

Number of Social Groups

Participants listed an average of 27.33 ($SD = 5.86$) people they know and regularly interact with. A total of 35 participants were assigned to the abstract mindset condition and 30 were assigned to the concrete mindset condition. Once again, the number of circles drawn was counted in order to compute an aggregate score for the total number of social groups. This time, the number of distinct circles, overlapping circles and nested circles were counted for each participant. Participants drew an average of 3.98 ($SD = 1.42$) social groups. Of this, participants drew an average of 2.32 ($SD = 1.68$) distinct social groups, 1.38 ($SD = 1.48$) overlapping social groups and .27 ($SD = .74$) nested social groups. Table 3 highlights the frequencies for the various social group categorizations. As in Study 3a, it was expected that participants would draw fewer social groups when they had been assigned to the abstract construal mindset rather than concrete mindset condition. Since the variances for the abstract ($s^2 = 2.24$) and concrete mindsets ($s^2 = 1.75$) were unequal, Welch's t -test was conducted. Contrary to

predictions, there was no difference in the number of social groups participants drew when they were assigned to the abstract construal mindset ($M = 4.14$, $SD = 1.50$) compared to the concrete construal mindset ($M = 3.80$, $SD = 1.32$), $F(1, 63.75) = .95$, $p = .33$, $\eta^2 = .01$.

Participants listed an average of 4.71 ($SD = 1.89$) social groups. The minimum number of social groups listed was 2 and the maximum was 11. As in Study 3a, it was hypothesized that the number of social groups drawn would be positively correlated to the number of social groups listed. The relationship between the number social groups drawn and number of social groups listed was positively correlated, $r = .64$, $p < .001$. However, the number of social groups drawn versus listed was statistically different, $t(64) = -3.96$, $p < .001$, $\eta^2 = .20$, with a greater number of social groups listed than drawn. Next, I tested whether construal level would affect the number of *listed* social groups. Welch's t -test was again computed to account for the unequal variance across construal mindset ($s^2 = 4.54$ and 2.03 for the abstract and concrete mindset conditions, respectively). Participants listed more social groups when they were assigned to the abstract construal mindset ($M = 5.14$, $SD = 2.13$) than to the concrete construal mindset ($M = 4.20$, $SD = 1.42$). Although this finding was contrary to predictions, the effect was significant, $F(1, 59.68) = 4.51$, $p = .038$, $\eta^2 = .06$.

Construal Level and Differences in Categorization

To assess whether construal level has an effect on the level of social group differentiation, a number of *t*-tests were conducted for the different ways participants could draw their social groups. Specifically, there was no difference between the number of distinct circles drawn in the abstract construal mindset ($M = 2.89$, $SD = 1.73$) compared to concrete construal mindset ($M = 2.77$, $SD = .99$), $t(52) = .32$, $p = .75$, $\eta^2 = .00$. There was also no significant difference between the number of overlapping social groups drawn by participants assigned to the abstract construal mindset ($M = 2.59$, $SD = .85$) than the concrete construal mindset ($M = 2.75$, $SD = .97$), $t(32) = -.50$, $p = .62$, $\eta^2 = .00$. The results for the effect of construal mindset and the number of nested social groups drawn was approaching statistical significance. Namely, participants drew more nested social groups when they were in the abstract construal mindset ($M = 2.50$, $SD = .58$) compared to concrete construal mindset ($M = 1.75$, $SD = .50$), $t(6) = 1.96$, $p = .10$, $\eta^2 = .39$. However, in sum, none of these indicators of potentially different ways to construe one's social world was significantly different between construal conditions.

Number of Relationships per Social Group

The average number of relationships per social group was also computed. Participants had an average of 7.53 ($SD = 3.40$) relationships per social group. The minimum number of average relationships per group was two and the

maximum was 19. Supporting Study 3a, the more social groups participants drew, the fewer relationships they sorted per group, on average, $r = -.44, p < .001$.

Participants in the abstract mindset condition sorted fewer relationships per social group, on average ($M = 6.74, SD = 3.06$) than those in the concrete mindset condition ($M = 8.47, SD = 3.60$), $t(64) = -2.11, p = .039, \eta^2 = .07$.

State Construal

A measure of state construal was added for validation to assess not only whether construal level affected participants' responses in a subsequent state construal task, but also whether the number of social groups drawn was related to one's later state construal level. Once again, an aggregate score was created for the sum abstract responses for the state construal task, where the maximum score could be 13. Unlike Study 3a, there was no significant difference for the number of abstract responses selected for those participants that adopted an abstract construal mindset ($M = 9.56, SD = 2.25$) compared to those who adopted a concrete construal mindset ($M = 9.40, SD = 2.21$), $t(64) = .28, p = .78, \eta^2 = .00$.

Discussion

Overall, there was mixed effectiveness of construal priming and of the effect on construal on the number of social groups that participants drew. The state construal measure at the end of Study 3 suggested that the construal manipulation was successful for Study 3a, but not for Study 3b. For Study 3a, results suggested that after adopting a particular construal mindset at the start of

the study, participants later selected responses indicative of the mindset they were primed with. Namely, participants who were assigned to an abstract construal mindset tended to select more abstract items from the BIF scale.

There were mixed results for the construal effect on the drawing and listing social groups measures. Neither Study 3a nor 3b found any difference in the number of social groups drawn between abstract relative to concrete construal mindset. Similarly, Study 3a did not find a construal mindset effect on listed number of social groups. However, in Study 3b – the study in which the state construal measure failed to confirm any measurable effect of the manipulation – more groups were listed in the abstract condition than in the concrete condition, a reversal of the predicted effect. Overall, the findings for construal mindset in Study 3 suggests that while social groups might be malleable, there is no consistent evidence that adopting a construal mindset changes the structure of social groups.

These results also suggest, that the drawing measure from Study 3a is likely to be a more reliable measure of social groups for inclusion in future studies. In Study 3b, there was a significant difference between the number of social groups drawn in the drawing versus listed social group measures and thus the validation check failed. Also, while participants in Study 3b were instructed to sort their relationships into distinct, nested, and/or overlapping social groups, far fewer used the latter two group structures when sorting their relationships. For

these reasons, the drawing measure used in Study 3a was determined to be a better measure of social group size for future research.

Study 4: Understanding the Null Effect of Construal Priming on Relationships

To now, the current set of studies have been unsuccessful in observing an effect of construal level on malleability of social groups. Studies 2, 3a, and 3b all suggested that construal priming does not change the way social groups are sorted. Perception of one's social world may be a special case which is unaffected by a cognitive mindset such as construal level. Continuing with the well-established construal manipulation (Freitas et al., 2004), it would be beneficial to conduct research comparing the effect of construal priming among domains aside from personal relationships. To further test whether it is the manipulation that did not work or if the null effect on social group sorting is meaningful, the final study in this program of research examines the effect on construal on two domains: one that involves relationships and one that does not.

Research has illustrated that construal level affects a variety of different domains, including: self-regulation (Freitas et al., 2004; Fujita et al., 2006), engagement in activities (Liberman et al., 2007) and action identification (Fujita, Henderson, Eng, Trope, & Liberman, 2006). There is also a vast amount of research examining how differences in construal level can affect one's perceptions of temporal distance. Namely, Liberman and colleagues (2002) have

suggested that people construe the distant future more abstractly than the near future (which is construed more concretely). Their research suggests that events (e.g., planning leisure activities) and experiences (e.g., daily experiences, everyday tasks) are construed differently when exposed to an abstract versus concrete construal mindset. In particular, researchers randomly assigned participants to think about a hypothetical scenario (e.g., going camping, moving out, going on a NYC visit) while adopting either a near (concrete) or distant future (abstract) mindset. They were presented with a list of 38 objects related to the particular scenario and asked to sort each item based on what items belong with each other. Participants drew circles around each set of objects to classify them into distinct groups (similar to the drawing measures in Study 3). The researchers counted the number of groups drawn and found that when thinking about the distant future, participants drew fewer groups to classify the objects than participants who thought about the near future. These effects illustrate one domain in which the classification of general objects can change when the construal mindset is changed.

The purpose of Study 4 was to investigate whether the construal manipulation used in the current set of studies would have a significant effect on a domain other than relationships which has been widely investigated in the past (i.e., household objects) while replicating the null effect for social groups. Specifically, social groups may *not* be malleable depending on a cognitive

mindset. I examined the effects of construal priming using two domains: relationships and household objects. Household objects was chosen as a comparison domain since previous research has suggested that objects can be grouped differently on the basis of a construal manipulation (Liberman et al., 2002). Like relationships, participants should be able to generate a number of familiar household objects, yet there should still be variation in the level of abstraction when these objects are grouped.

Study 4 utilized a 2 by 2 between-subjects design where participants were assigned to a construal level mindset (abstract versus concrete), followed by a sorting task (relationships versus objects). It was hypothesized that participants assigned to the concrete construal mindset would generate more (and more specific) groups when sorting than participants assigned to the abstract construal mindset. However, based on the null results in Studies 2 and 3, it was also expected that this effect would only occur for participants who were assigned to the objects condition, not to the relationships condition.

Method

Participants

A total of 201 undergraduate participants from Carleton University were recruited to complete an online study through the SONA system. Participants received 0.25% course credit for their participation. From this sample, two participants were excluded for providing incorrect answers for the two attention-

check items, and 28 participants were excluded for not following instructions (e.g., 23 did not complete one or more of the dependent measures, five did not properly indicate their groups in the drawing task). An additional 40 participants were excluded for spending 60 seconds or less on the main dependent measure, the drawing task.⁶ The final sample consisted of 131 participants (107 female, 24 male) with a mean age of 19.81 ($SD = 3.06$).

Procedure

Participants signed up to participate in an online study titled “Organized world: Sorting items from daily life” (see Appendix E for complete survey materials). They first completed a short demographics section and then were randomly assigned to the listing item task where they listed either 30 relationships or 30 household objects. Next, participants were assigned to either a high- or low-level construal measure (e.g., Freitas et al., 2004; Schmeichel et al., 2010). Participants then completed a drawing groups task where they were asked to sort either the 30 relationships or 30 household objects that they listed before. They

⁶ An identical version of this study was conducted in the lab with an additional 22 participants. From this sample, it was determined that participants spent between 218.40 and 670.38 seconds working on the drawing task ($M = 434.22$, $SD = 114.48$). Thus, 60 seconds or less was justified to be an unreasonably low amount of time to complete this entire task. It is believed that these participants did not actually complete the drawing task. Since the drawing task was an essential measure, they were excluded from the analyses. Note that analyses were also conducted excluding everyone taking less than 319 seconds (one standard deviation below the mean time taken by lab participants) but these exclusions resulted in a sample too small for meaningful analyses ($N = 54$).

then answered a few items regarding their preferences in the drawing task, completed the state construal task, and were provided with the debriefing. Two instructional attention-check questions were added to test whether participants were paying attention to the questions or answering indiscriminately. One item was placed at the start of the set of items for drawing preferences and one was placed in the middle of the state construal task.

Demographics. A short demographics question assessing participants' age, gender and relationship status.

Listing items. Participants were randomly assigned to either a relationships or objects condition. Participants in the relationships condition completed the same relationships listing measure from Studies 3a and 3b, where they listed 30 people they knew and regularly interacted with. Similarly, participants in the objects condition listed 30 household objects that they own and regularly use. Space was provided to list the initials of their relationships or household objects.

Construal level. As in Studies 2, 3a and 3b, construal level was manipulated (e.g., Freitas et al., 2004; Schmeichel et al., 2010). Participants were assigned to adopt either an abstract or concrete mindset regarding the goal of improving and maintaining health. Instructions were provided.

Drawing groups. In the next task, participants were asked to have a pen and paper on hand. They were then provided with instructions for one of two

drawing tasks, depending on whether they were previously assigned to the relationships or objects condition. The drawing task for the relationships condition was identical to that of Study 3a, where participants drew distinct circles to represent their various social groups while sorting the initials of the 30 people listed at the start of the questionnaire. A similar task was constructed for the objects condition. Participants were told that household objects were goods or products that were found in one's home and told that they can be grouped into a variety of different groups based on various characteristics. They were instructed to think about the 30 household objects listed before and to draw circles to indicate their distinct groups for these objects, then sort the listed objects into these circles. As with the relationships condition, participants were instructed that there is no limit to the number of objects they could or could not include per group. An example was provided for each condition. The responses from the listing task were also redirected to the page with the drawing instructions in order to refresh participants' memory of the relationships or objects they listed before. Participants were instructed to retain the sheet of paper for the next task. Since this study was conducted online and it was hard to assess the extent of participation in this task, an advanced timer was programmed during this task. The timer kept track of the total time spent on the page.

Furthermore, since it was not possible to see the actual drawings provided by participants (as in Studies 3a and 3b), participants answered a series of

questions related to what they drew. First, they indicated the total number of groups (i.e., circles) that were drawn. Then, they counted and reported the number of people or objects that were drawn in each circle. In a separate question participants reported the group labels for each of the circles they had drawn.

Drawing preferences. Since Study 3b suggested that people may group their relationships in a variety of ways (e.g., distinct, overlapping or nested groups) it was important to assess participant preferences for how they grouped either their relationships or household objects (e.g., Spencer & Pahl, 2006). To assess difficulty of the drawing task, participants rated how difficult it was to sort their relationships or objects into distinct groups. This was rated on a 7-point scale from 1 (*not at all difficult*) to 7 (*very difficult*). On a scale from 1 (*never*) to 7 (*always*), participants rated how often they think about their various relationships (or household objects) in terms of specific groups. Then, participants were asked to respond either “yes” or “no” to whether they: found it easy to group their relationships (or objects) into distinct groups, preferred to have less specific instructions for grouping, and preferred to have been able to group into overlapping or nested groups. Space was provided for participants to provide any additional comments about the drawing task and what influenced them to group their relationships (or household objects) the way they did.

State construal. Like Studies 3a and 3b, the same 13 items adopted from the BIF were included as a secondary measure of construal. For each item,

participants read a behaviours and chose one of the descriptions that they felt best represented that behaviour: one abstract description or one concrete description. A composite score was created to indicate the proportion of participants' abstract relative to concrete responses.

Results

Number of Groups

Sixty-four participants were randomly assigned to the relationships condition and 67 to the household objects condition. The average number of relationships listed was 28.63 ($SD = 4.31$) and the average number of household objects listed was 29.90 ($SD = .74$), $t(129) = -2.38$, $p = .019$, $\eta^2 = .04$.

Furthermore, the minimum number of relationships listed was 12 and the minimum number of household objects listed was 24. Sixty-six participants were assigned to the abstract construal mindset and 65 were assigned to the concrete construal mindset.

To recall, it was expected that construal priming would not significantly affect the number of social groups participants drew to classify their relationships. On the other hand, construal priming was expected to significantly affect the number of groups that participants drew to classify their household objects. A 2(construal mindset: why versus how) by 2(sorting domain: relationships versus household objects) between-subjects analysis of variance (ANOVA) was conducted on the number of groups drawn. Participants listed an average of 4.63

($SD = 1.58$) groups in the relationships condition and 4.64 ($SD = 1.80$) groups in the household objects condition. The main effect of sorting domain was non-significant, $F(1, 127) = .011, p = .915, \eta^2 = .00$, suggesting that there was no difference between the number of groups drawn in each condition. Overall, participants listed significantly fewer groups when they adopted an abstract construal mindset ($M = 4.32, SD = 1.65$) relative to those who adopted a concrete construal mindset ($M = 4.95, SD = 1.68$). The main effect for construal mindset was statistically significant, $F(1, 127) = 4.64, p = .033, \eta^2 = .03$. The interaction between construal mindset and sorting domain on the number of groups was marginally significant, $F(1, 127) = 3.06, p = .083, \eta^2 = .02$. To follow up on the marginal interaction, simple effects were conducted. Among participants who were assigned to the relationships sorting condition there was no significant difference between those who adopted an abstract versus concrete construal mindset, $F(1, 127) = .08, p = .78, d = -.08$. For participants assigned to the household objects condition, there was a significant difference in number of groups drawn between those who adopted an abstract versus concrete construal mindset, $F(1, 127) = 7.81, p = .006, d = -.67$.

Group Composition

The minimum for number of people per social group was two and the maximum was 10. Comparatively, the minimum number of objects per group was one and the maximum was 15. A 2 by 2 ANOVA was also conducted to assess

whether the composition of groups differed by a construal mindset. Participants in the relationships sorting condition sorted an average of 6.59 ($SD = 2.15$) people per social group, compared to the household objects condition where an average of 6.91 ($SD = 2.71$) objects were sorted per group. This difference was not statistically significant, $F(1, 116) = .68, p = .411, \eta^2 = .00$. There was a significant main effect for construal condition, suggesting that participants who adopted an abstract construal mindset sorted a greater number of items, on average, per group ($M = 7.24, SD = 2.67$) compared to those who adopted a concrete construal mindset ($M = 6.21, SD = 2.03$), $F(1, 116) = 6.00, p = .016, \eta^2 = .05$. The interaction between construal mindset condition and sorting condition on the number of items per group was not statistically significant, $F(1, 116) = 2.68, p = .104, \eta^2 = .02$.

Next, simple effects were conducted. The simple effect for the relationship sorting condition when comparing abstract versus concrete construal condition was non-significant, $F(1, 116) = .33, p = .565, d = .16$. However, among the household objects sorting condition there was a significant difference between the abstract versus concrete construal mindset, $F(1, 116) = 8.26, p = .005, d = .69$, as more objects were included per group in the abstract condition.

Participants who drew many social groups tended to sort fewer people per social group, $r = -.67, p < .001$. Similarly, when participants drew more household object groups, they sorted fewer objects per group, $r = -.82, p < .001$.

Grouping Preferences

An exploratory analysis was conducted to test the idea of whether people believe they naturally think about their relationships versus household objects in terms of groups. These frequencies are summarized in Table 4. Participants in the sorting relationships condition reported that they sometimes thought about their relationships in terms of specific groups ($M = 3.74, SD = 1.53$). Less often, participants reported thinking about their household objects in terms of groups ($M = 2.70, SD = 1.57$). This difference was statistically significant, $t(124) = 3.77, p < .001, \eta^2 = .10$. Interestingly, there was a positive relationship between the number of social groups people drew and their tendency to normally think about their relationships in terms of specific social groups, $r = .31, p = .016$. That is, participants who often think of their relationships in terms of specific social groups tended to sort their relationships into more social groups than those who do not think of their relationships in terms of specific groups. The relationship between tendency to sort household objects into groups and number of groups was not significant, $r = -.001, p = .992$.

There were some differences in participants' overall sorting experiences during the drawing task. The frequencies for number of groups drawn by condition are presented in Table 5. There was no statistical difference in how difficult participants rated the objects sorting task to be ($M = 3.69, SD = 1.76$)

compared to the relationships sorting task ($M = 3.38$, $SD = 1.72$), $t(125) = -.99$, $p = .323$, $\eta^2 = .01$.

To assess any further difficulty with the drawing task, participants were asked if they would have preferred less specific instructions for how they could have grouped their relationships (or household objects). In both conditions, the majority of participants said there was limited preference for less specific instructions (81.3% and 74.6% for the relationships and objects conditions, respectively).⁷ When asked if they would have liked to sort their relationships into overlapping groups, 65.6% in the relationships condition agreed and 52.2% in the objects condition agreed. When asked if they would have preferred to have been able to draw nested groups, 40.6% in the relationships condition agreed and 28.4% in the objects condition agreed.

State Construal

It was expected that participants who adopted an abstract construal mindset would select more abstract and fewer concrete responses in the state construal measure. To test this, the sum score for abstract responses was computed for state construal task and then ran in a 2 by 2 ANOVA where the independent variables were construal condition and sorting task condition and the dependent variable was the sum number of abstract scores on the state construal

⁷ Of the frequencies listed, a total of 1.6% from the relationship condition and 4.5% from the objects condition were attributed to missing data not provided by participants.

measure. There was no significant difference in the number of abstract responses selected by participants who had previously adopted an abstract construal mindset ($M = 9.49, SD = 2.37$) compared to concrete construal mindset ($M = 9.15, SD = 2.39$), $F(1, 123) = .76, p = .384, \eta^2 = .01$. There was also no difference for the number of abstract responses selected for participants who were assigned to the household objects condition ($M = 9.52, SD = 2.46$) compared to the relationships condition ($M = 9.13, SD = 2.30$), $F(1, 123) = .95, p = .333, \eta^2 = .01$. Furthermore, the interaction between construal mindset, sorting condition, and abstract state construal was non-significant, $F(1, 123) = .19, p = .668, \eta^2 = .00$.

Discussion

This final study was intended to clarify whether the null effect of construal mindset on social group structures – found in Studies 2 and 3, signified a failure of the construal manipulation or signified that social groups are not (easily) shifted around by construal mindset.

Results again suggested that there was no effect of construal mindset on the number of groups drawn in the relationships condition. Specifically, while there may be a tendency for participants to draw more social groups after previously adopting a concrete mindset, and draw fewer social groups after previously adopting an abstract mindset the effect was not significant. Moreover, there was a significant effect of construal level on how participants sorted their household objects. Consistent with research from Liberman and colleagues

(2002), participants who adopted an abstract construal mindset drew fewer groups to classify everyday household objects than participants who adopted a concrete construal mindset. It is evident that the grouping of household objects shifted more easily than the structure of relationships. However, it is still possible that a very strong manipulation of construal mindset could shift the structure of relationships.

The measure of state construal at the end of Study 4 indicated that the construal mindset adopted earlier on in the study may have dissipated for participants in both sorting conditions. Namely, participants were no more likely to hold an abstract relative to concrete construal mindset, dependent on the condition they were previously assigned to. These results could be attributed to the fact that this measure was included at the end of the study and separated by several tasks from the construal level manipulation. Mindset might have also shifted over the course of the study. In future research it will be important to include a secondary measure of construal level immediately after the first construal manipulation and see whether participants hold that adopted mindset. It might also be beneficial to see how long one might hold a construal mindset as a result of the manipulation, before the effect dissipates.

Exploratory analyses indicated that the sorting task was relatively easy for the relationship and object conditions, alike. Furthermore, while relationships were more difficult to list than objects, people sorted their relationships versus

objects equally. As well, while objects might be grouped more simplistically (i.e., grouped less distinctly), relationships tend to be grouped in more complex ways (i.e., grouped more distinctly). These analyses suggest that when asked to, people are able to spontaneously think of their relationships (and objects) in terms of groups. On a day-to-day basis the categorization of relationships into social groups might help sustain one's various relationships. Relationships are often quite dynamic, require active participation and effort, and are not often tangible. In contrast, household objects are quite the opposite. Thus, it seems likely that the ways people think about and sort their relationships versus household objects is quite different. And while some domains might be affected by construal level priming, other domains, such as relationships, might not.

General Discussion

The current research was designed to test the hypothesis that construal level might change the overall structure of one's social network, as well as explore the general composition of social groups. Similar to other domains, relationships might be malleable and were expected to change based on the construal level one adopts. Study 1 provided initial descriptive findings for how social groups may be structured, as well as suggested an average number of social groups people regularly interact with and the types of social group labels they might use to distinguish between groups. Other findings from Study 1 provided initial evidence for how the overall allocation of time and energy investment

might change based on the number of groups one identifies with. Studies 2 and 3 investigated the core component of this research – the potential influence of construal mindset on how people structure their social groups. Overall, these studies provided evidence to suggest that social groups do not change based on the construal mindset one adopts. Study 4 employed a control condition (household objects) to clarify whether construal mindset might affect some domains but not others. Yet again, construal mindset did not affect the way people grouped their relationships – but it did affect the way household objects were grouped. With a well-established manipulation of construal level and four different dependent measures for number of social groups, these findings suggest that the structure of social groups does not change based on whether people adopt an abstract versus concrete construal mindset.

Implications for Construing Relationships

Although there was no effect of construal level on the way people grouped their relationships, understanding naturally existing social group structures is still important to the advancement of social network research. Just as research investigating temporal self-appraisal has suggested that people often maintain a boundary between their past and present selves (e.g., Maglio & Hershfield, 2014), people might also maintain similar boundaries between the selves that correspond to their various social groups. Boundary theory (e.g., Matthews & Barnes-Farrell, 2010) states that people maintain various gateways that are representative of

different domains. There are often characteristics of these boundaries which allow for malleability and permeability between life domains (e.g., work versus home life) that change one's ability to transition from one role to another (Ashforth, Kreiner, & Fugate, 2000). Similarly, boundaries might also distinguish social groups. The characteristics of one's social groups and the boundaries they set between different groups could affect how similar or closely connected they perceive one group to the next. Depending on such, this might have implications for how one transitions from one social group role to the next. The conceptualization of one's social network may also have implications for overall relational experiences. For instance, work-family conflict has been linked to a lack of boundaries between work and family domains – where individuals have a hard time separating one from the other (e.g., Matthews & Barnes-Farrell, 2010). Similar situations might occur among social groups.

How people think about their social groups might also have implications for both intrapersonal and interpersonal well-being. Relative to larger groups, individuals might regard smaller groups as having higher importance due to the fewer, more vividly remembered members within that social group. Similarly, variables like relationship quality, meaningfulness, and closeness might differ depending on how one thinks about their social groups. In addition, social networks have been noted to influence the development of a sense of self and sense of belonging (Spencer & Pahl, 2006). Individuals with few social groups

might feel less of a sense of belonging relative to someone with many social groups. However, someone with few social groups might feel more connected to their few groups and feel that these groups provide them with a greater sense of self compared to someone with many social groups (who might feel like they have developed less sense of self). Individuals' assessment of their social groups (and overall social network) might therefore have ramifications for their perception of the self.

Practical Implications

Moreover, the categorization and structure of social relationships is very relevant within a variety of day-to-day occurrences. Every day people engage in pro-relational behaviours which cost time and energy, as a means to sustaining their various relationships. However, it would be very difficult to always help everyone in one's social network, not to mention cognitively depleting (Dunbar, 1993). Research suggests that people might make trade-offs when determining how they will allocate their resources. Particularly, willingness to help others tends to change based on the social group of the person in need of help (Bacev-Giles & Peetz, 2014). Participants were less willing to help someone from the same social group of a person they had recalled recently helping. On the contrary, participants were more willing to help someone when they were a member of a social group whom they had not recalled recently helping. Thus, it is possible that

how one organizes their relationships and overall social network might have implications for how they allocate resources to specific relationships (or groups).

Furthermore, the structure of social groups might have implications for how people perceive members within a particular social group. For instance, perceptions of social group members might be more limited when members are part of a specific rather than broader social group label (e.g., a “hockey friend” might strictly be perceived regarding their level of athleticism rather than other characteristics, while a “friend” might be perceived on many different characteristics). These varying perceptions of social group members may ultimately impact overall interactions with one’s different relationships.

Limitations and Future Directions

Overall, this research provided preliminary findings to suggest that construal level might not change the structure of relationships, though it is possible that a stronger manipulation of construal level might still have an effect. Due to the emotional connection between participants and their self-reported social groups, in future research it would be important to investigate whether a construal mindset might have an effect on the way social groups are structured when the emotional connection of groups is reduced. For instance, participants could instead sort people from someone else’s network of relationships, or other people like political leaders and celebrities whom they do not intimately know. Procedures such as these would help to reduce the perceived psychological and

emotional distance between participants and their social network and see whether there may be an effect of construal level on sorting other relationships. If there is a significant effect of construal mindset here, the results may suggest that while construal level might not affect one's personal relationships (i.e., relationships with greater emotional connection), the effect of construal level may not be entirely unique to the domain of people. Additionally, future research may benefit from inducing construal mindset differently (i.e., through temporal distance) while also including a manipulation check to verify for how long the adopted construal mindset was maintained for.

The various measures of social groups used in the current set of studies also pose important limitations and directions when investigating the social network in future research. First, each of the social group methodologies used in the current research included a definition of social groups which was intended to encompass only participants most salient and closest of personal relationships. Despite the attempts for participants to list people they are more intimately connected with and frequently correspond with, it is possible that these measures were not specific enough and may have allowed for the inclusion of more distant personal relationships, such as acquaintances. Second, the instructions in Studies 3 and 4 asked participants to list their relationships and then sort these people into social groups. It is possible that the ordering of these two measures may have artificially influenced the way people thought about the people they know and

their corresponding social groups. For instance, when listing relationships, participants may have thought of one person (e.g., someone from their hockey team) and then been reminded of other people they know from a similar context (e.g., other hockey teammates). Thus, the salience of one person and similar others thereafter could have artificially induced participants to think about these relationships in terms of groups even before participants were asked to complete the drawing measure. Future research investigating social group structure could explore the effects of construal mindset when these measures are reversed (i.e., draw social groups and then list relationships). Third, the social group measures also capped the number of relationships participants could list. It is possible that participants might know more than 30 people they frequently interact with, and that capping the number of relationships at 30 could have artificially affected the social groups (and people within the social groups) that participants subsequently drew in the drawing measure. Future measures should allow participants to list an unlimited number of relationships. Finally, the instructions and examples provided in the social group measures – particularly Studies 1 and 2 – may have primed participants to list and identify with social groups which were used in the examples, rather than with groups they would actually identify with. In future research, social group measures should be careful not to include any information which might bias participants' responses.

It should be acknowledged that everyone embeds and immerses themselves into their social networks differently. Spencer and Pahl (2006) state that the identification of one's social network is not always apparent and requires reflection by the individual. It is quite possible that people were able to complete the sorting exercise but do not regularly think about their relationships in terms of groups. As such, thinking in terms of social groups might be an artificial process for some. Also, Liberman and colleagues (2002) suggest that construing the world in an abstract mindset is presumably a less effortful task. Despite the various attempts to measure social groups in this research, it is possible that participants defaulted to thinking about their relationships in terms of more abstract (or broad) social groups. Future research could explore social groups by employing naturalistic methods like Facebook and Google+ to see how people naturally sort their relationships. Cluster analysis (e.g., Aldenderfer & Blashfield, 1984) would also be beneficial to this area of research as it could indirectly examine the categorization of social groups instead of relying on self-report measures. This type of analysis would provide valuable information for a number of social group variables (e.g., closeness, frequency of contact, similarity) by grouping one's relationships on these various dimensions.

Conclusion

The present research examined how people mentally group the people they know and encounter in their lives. Contributing to the literature on social groups

and Construal Level Theory, this research investigated how the structure of social groups might change depending on whether participants had adopted an abstract (vague) versus concrete (specific) mindset. Adding to previous research which has suggested that some demographic (e.g., age, marital status) and personality (e.g., extraversion, neuroticism) variables change the structure of social groups, this research provided preliminary evidence to suggest that the type of mindset one adopts does *not* change the way social groups are structured. In addition, this research contributed to the literature on interpersonal relationships by suggesting a solid number of social groups and common social group labels that people may regularly adopt. While the number of people one knows may differ from person to person and from one situation to the next, this research made some incursion into mapping our representation of the social world.

References

- Aldenderfer, M. S., & Blashfield, R. K. (1978). Cluster analysis and archaeological classification. *American Antiquity*, *43*, 502-505.
- Argyle, M., & Lu, L. (1990). The happiness of extroverts. *Personality and Individual Differences*, *11*, 1011–1017.
- Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology*, *74*, 1531-1544.
- Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management Review*, *25*, 472–491.
- Ayduk, O., Gyurak, A., & Luerssen, A. (2008). Individual differences in the rejection-aggression link in the hot sauce paradigm: The case of rejection sensitivity. *Journal of Experimental Social Psychology*, *44*, 775-782.
- Bacev-Giles, C. & Haji, R. (2014). Favourable first impressions: Evaluating personality and physical appearance of online profiles. Manuscript under review.
- Bacev-Giles, C., & Peetz, J. (2014). I just helped one of you, so let me help one of the others: Social group affects willingness to help. Unpublished research, Department of Psychology, Carleton University, Ottawa, Canada.

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497-529.
- Belle, D. E. (1982). The impact of poverty on social networks and supports. *Marriage and Family Review, 5*, 89–103.
- Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County residents. *American journal of Epidemiology, 109*(2), 186-204.
- Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science, 6*, 3-5.
- Byrne, D. (1971). *The attraction paradigm*. New York: Academic Press.
- Finkel, E. J., & Campbell, W. H. (2001). Self-control and accommodation in close relationships: An interdependence analysis. *Journal of Personality and Social Psychology, 81*, 263-277.
- Caspi, A., & Herbener, E. S. (1990). Continuity and change: Assortative marriage and consistency of personality in adulthood. *Journal of Personality and Social Psychology, 58*, 250-258.
- Cheema, A., & Soman, D. (2006). Malleable mental accounting: The effect of flexibility on the justification of attractive spending and consumption decisions. *Journal of Consumer Psychology, 16*, 33-44.

- Dunbar, R. I. M. (1993). Coevolution of Neocortical size, group size and language in humans. *Behavioral and Brain Sciences*, *16*, 681–735.
- Dunbar, R., & Spoor, M. (1995). Social networks, support cliques, and kinship. *Human Nature*, *6*, 273–290.
- Feeney, B. C., & Collins, N. L. (2003). Motivations for caregiving in adult intimate relationships: Influences on caregiving behavior and relationship functioning. *Personality and Social Psychology Bulletin*, *29*, 950-968. doi: 10.1177/0146167203252807
- Finkel, E. J., & Campbell, W. K. (2001). Self-control and accommodation in close relationships: An interdependence analysis. *Journal of Personality and Social Psychology*, *81*, 263-277.
- Fitzsimons, G. M., & Finkel, E. J. (2010). Interpersonal influences on self-regulation. *Current Directions in Psychological Science*, *19*, 101-105.
- Freitas, A. L., Gollwitzer, P., & Trope, Y. (2004). The influence of abstract and concrete mindsets on anticipating and guiding others' self-regulatory efforts. *Journal of Experimental Social Psychology*, *40*, 739-752.
- Fujita, K., Henderson, M. D., Eng, J., Trope, Y., & Liberman, N. (2006). Spatial distance and mental construal of social events. *Psychological Science*, *17*, 278-282.

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology, 90*, 351-367.

Glass, G. V., & Stanley, J. C. (1970). *Statistical methods in education and psychology*. Englewood Cliffs, N. J.: Prentice-Hall.

Google Scholar (2014, March 2). Frietas, Gollwitzer, & Trope (2004) [Citation count]. Retrieved from http://scholar.google.ca/scholar?q=freitas%2C+gollwitzer%2C+trope+2004&btnG=&hl=en&as_sdt=0%2C5

Gourville, J. T., & Soman, D. (1998). Payment depreciation: The behavioral effects of temporally separating payments from consumption. *Journal of Consumer Research, 25*, 160-174.

Harasymchuk, C., & Fehr, B. (2010). A script analysis of relational boredom: Causes, feelings, and coping strategies. *Journal of Social and Clinical Psychology, 29*, 988-1019.

Heath, C. & Soll, J. B. (1996). Mental budgeting and consumer decisions. *Journal of Consumer Research, 23*, 40-52.

Hirsch, B. J. (1979). Psychological dimensions of social networks: A multimethod analysis. *American Journal of Community Psychology, 7*, 263-277.

Hofmann, W., Vohs, K. D., & Baumeister, R. F. (2012). What people desire, feel conflicted about, and try to resist in everyday life. *Psychological Science*, *23*, 582-588.

Kalish, Y., & Robins, G. (2006). Psychological predispositions and network structure: the relationship between individual predispositions, structural holes and network closure. *Social Networks*, *28*, 56-84.

Kazmer, M. M., Haythornthwaite, C. (2001). Juggling multiple social worlds: Distance students online and offline. *The American Behavioral Scientist*, *45*, 510-529.

Killworth, P. D., Johnsen, E. C., Bernard, H. R., Shelley, G. A., & McCarty, C. (1990). Estimating the size of personal networks. *Social Networks*, *12*, 289-312.

LeBel, E. P., Borsboom, D., Giner-Sorolla, R., Hasselman, F., Peters, K. R., Ratliff, K. A., & Smith, C. T. (2013). PsychDisclosure.org: Grassroots support for reforming reporting standards in psychology. *Perspectives on Psychological Science*, *8*, 424-432.

Liberman, N. & Trope, Y. (2008). The psychology of transcending the here and now. *Science*, *322*, 1201-1205.

Liberman, N., Trope, Y., McCrea, S. M., & Sherman, S. J. (2007). The effect of level of construal on the temporal distance of activity enactment. *Journal of Experimental Social Psychology*, *43*, 143-149.

Lieberman, M.D., & Rosenthal, R. (2001). Why introverts can't always tell who likes them: Multitasking and nonverbal decoding. *Journal of Personality and Social Psychology, 80*, 294–310.

Maglio, S. & Hershfield, H. (2014, February 15). When does the future start? In *Malleable time perceptions and their implications for self-control and goal-pursuit*. Symposium conducted at the annual meeting of the Society for Personality and Social Psychology, Austin, TX. Retrieved from <http://spspmeeting.org/2014/Program/Sessions/Symposium-Abstracts.aspx>

Matthews, R. A., & Barnes-Farrell, J. L. (2010). Development and initial evaluation of an enhanced measure of boundary flexibility for the work and family domains. *Journal of Occupational Health Psychology, 15*, 330-346.

McCrae, R. R., Costa, P. T., de Lima, M. P., Simoes, A., Ostendorf, F., Angleitner, A., . . . , Piedmont, R. L. (1999). Age differences in personality across the adult life span: Parallels in five cultures. *Developmental Psychology, 35*, 466–477.

McPherson, J. M. , Popielarz, R. A., Drobnic, S. (1992). Social networks and organizational dynamics. *American Sociological Review, 57*, 153-170.

Milardo, R. M. (1988). Families and social networks: An overview of theory and methodology. In R. M. Milardo (ed.) *Families and Social Networks*, (pp.13-47). Newbury Park, CA: Sage.

- Milardo, R. M. (1989). Theoretical and methodological issues in the identification of the social networks of spouses. *Journal of Marriage and the Family*, *51*, 165-174.
- Milardo, R. M. (1992). Comparative methods for delineating social networks. *Journal of Social and Personal Relationships*, *9*, 447- 461.
- Milardo, R. M., Johnson, M. P., & Huston, T. L. (1983). Developing close relationships: Changing patterns of interaction between pair members and social networks. *Journal of Personality and Social Psychology*, *44*, 964-976.
- Miller, S. (1986). Conceptualizing interpersonal relationships. *Generations*, *10*, 6-9.
- Muraven, M. (2010). Building self-control strength: Practicing self-control leads to improved self-control performance. *Journal of Experimental Social Psychology*, *46*, 465-468.
- Petz, J., Kammrath, L. (2011). Only because I love you: Why people make and why they break promises in romantic relationships. *Journal of Personality and Social Psychology*, *100*, 887-904. doi: 10.1037/a0021857
- Pelham, B. W., Mirenberg, M. C., Jones, J. T. (2002). Why Susie sells seashells by the seashore: Implicit egotism and major life decisions. *Journal of Personality and Social Psychology*, *82*, 469-487.

- Pollet, T. V., Roberts, S. G. B., & Dunbar, R. I. M. (2011). Extraverts have larger social network layers: But do not feel emotionally closer to individuals at any layer. *Journal of Individual Differences, 32*, 161-169.
- Rands, M. (1988). Changes in social networks following marital separation and divorce, in R. M. Milardo (ed.) *Families and Social Networks*, (pp.127-146). Newbury Park, CA: Sage.
- Roberts, S. G. B., Wilson, R., Fedurek, P., & Dunbar, R. I. M. (2008) Individual differences and personal social network size and structure. *Personality and Individual Differences, 44*, 954-964.
- Salzinger, L. L. (1983). The ties that bind: The effect of clustering on dyadic relationships. *Social Networks, 4*, 117-145.
- Schmeichel, B. J., Vohs, K. D., & Duke, C. (2010). Self-control at high and low levels of mental construal. *Social Psychological and Personality Science, 2*, 182-189.
- Smith, C. (2013, October 30). (October 2013 update) By the numbers: 92 amazing Facebook stats. *Digital Marketing Ramblings*. Retrieved from <http://expandedramblings.com/index.php/by-the-numbers-17-amazing-facebook-stats/>
- Spencer, L., & Pahl, R. E. (2006). *Rethinking friendship: Hidden solidarities today*. Princeton, NJ: Princeton University Press.

- Stokes, J. P. (1983). Predicting satisfaction with social support from social network structure. *American Journal of Community Psychology, 11*, 141-152.
- Stokes, J. P. (1985). The relation of social network and individual different variables to loneliness. *Journal of Personality and Social Psychology, 48*, 981-990.
- Strauss, A. (1978). A social world perspective. In N. K. Denzin (Ed.), *Studies in symbolic interaction: An annual compilation of research* (119-128). Greenwich: JAI Press Inc.
- Sudman, S. (1985). Experiments in the measurement of the size of social networks. *Social Networks, 7*, 127-151.
- Surra, C. (1985). Courtship types: Variations in interdependence between partners and social networks. *Journal of Personality and Social Psychology, 49*, 357-375.
- Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making, 12*, 183-206.
- Thaler, R. H. (2008). Mental accounting and consumer choice. *Marketing Science, 27*, 15-25.
- Trope, Y. & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*, 403-421.

- Trope, Y. & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review*, *117*, 440-463.
- Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: a review with emphasis on underlying mechanisms and implications for health. *Psychological bulletin*, *119*(3), 488-531.
- Vallacher, R. R. & Wegner, D. M. (1987). What do people think they're doing? Action identification and human behavior. *Psychological Review*, *94*, 3-15.
- Vallacher, R. R., & Wegner, D. M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology*, *57*, 660-671.
- Vohs, K. D., & Ciarocco, N. J. (2004). Interpersonal functioning requires self-regulation. In K. D. Vohs, N. J. Ciarocco (Eds.), *Handbook of self-regulation: Research, theory, and applications* (392-407). New York: Guilford Press.

List of Tables

Table 1

Frequency of Number of Social Groups by Category (Counting Social Groups Measure)

Number of Groups	Social Categories					
	Family		Friends		Colleagues	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	72	46.8	73	47.4	111	72.1
2	51	33.1	28	18.2	25	16.2
3	19	12.3	29	18.8	4	2.6
4	6	3.9	16	10.4	2	1.3
>5	3	1.9	7	4.5	1	0.6
Not Applicable	3	1.9	1	0.6	11	7.1

Note. The not applicable option includes frequencies for participants who both left the answer incomplete or did not feel there was a suitable option.

Table 2

Correlations Among Study Variables

	Energy Investment			Time Investment		
	Condition			Condition		
	Overall	Abstract	Concrete	Overall	Abstract	Concrete
<i>M</i>	4.34	4.55	4.19	20.90	10.04	22.23
<i>SD</i>	1.13	1.18	1.08	20.21	19.17	21.01
Correlation with Listed Social Groups	-.44**	-.46*	-.39**	-.26*	-.33	-.26

*Note: The overall correlations are reflective of the whole sample. * $p < .05$, ** $p < .01$.

Table 3

Frequency of Number of Social Groups by Type of Circle Categorization

Number of Circles	Social Groups							
	Total Number of Circles		Distinct Circles		Nested Circles		Overlapping Circles	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	0	0	12	18.2	56	84.8	31	47.0
1	1	1.5	11	16.7	1	1.5	0	0
2	6	9.1	10	15.2	5	7.6	20	30.3
3	20	30.3	18	27.3	2	3.0	7	10.6
4	20	30.3	11	16.7	0	0	6	9.1
>5	19	28.9	4	6.0	0	0	1	1.5

Table 4

Frequency of Thinking in Terms of Groups by Condition

Frequency of thinking of specific groups	Drawing Task Condition			
	Relationships		Household Objects	
	Frequency	Percent	Frequency	Percent
1	3	4.8	17	26.6
2	14	22.6	15	23.4
3	11	17.7	18	28.1
4	11	17.7	4	6.3
5	15	24.2	6	9.4
6	7	11.3	2	3.1
7	1	1.6	2	3.1

**Note:* Participants rated how often they think of either relationships or household objects in terms of specific groups. A rating of 1 indicates they never think of in terms of groups and 7 represents they always think in terms of groups.

Table 5

Frequency of Number of Groups by Condition

Drawing Task Condition								
Number of Circles	Relationships				Household Objects			
	Why Condition		How Condition		Why Condition		How Condition	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
1	0	0	0	0	0	0	0	0
2	1	2.9	0	0	3	9.7	1	2.8
3	9	25.7	5	17.2	8	25.8	7	19.4
4	13	37.1	7	24.1	13	41.9	8	22.2
>5	12	34.4	17	58.6	7	22.6	20	55.7

List of Illustrations

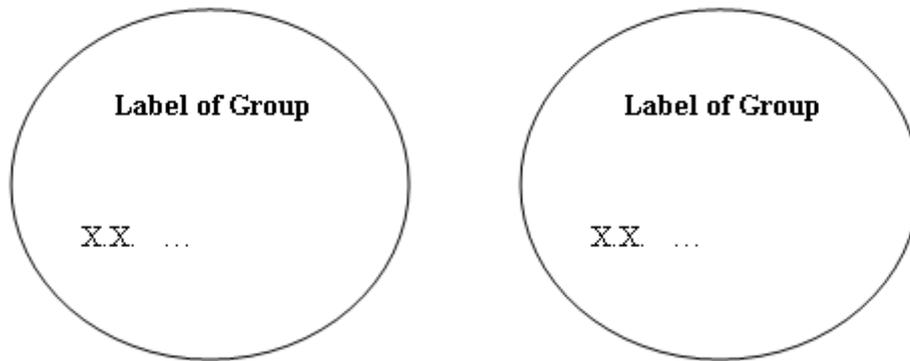


Figure 1. Template of how participants in the distinct sorting task sorted their relationships (or household objects).

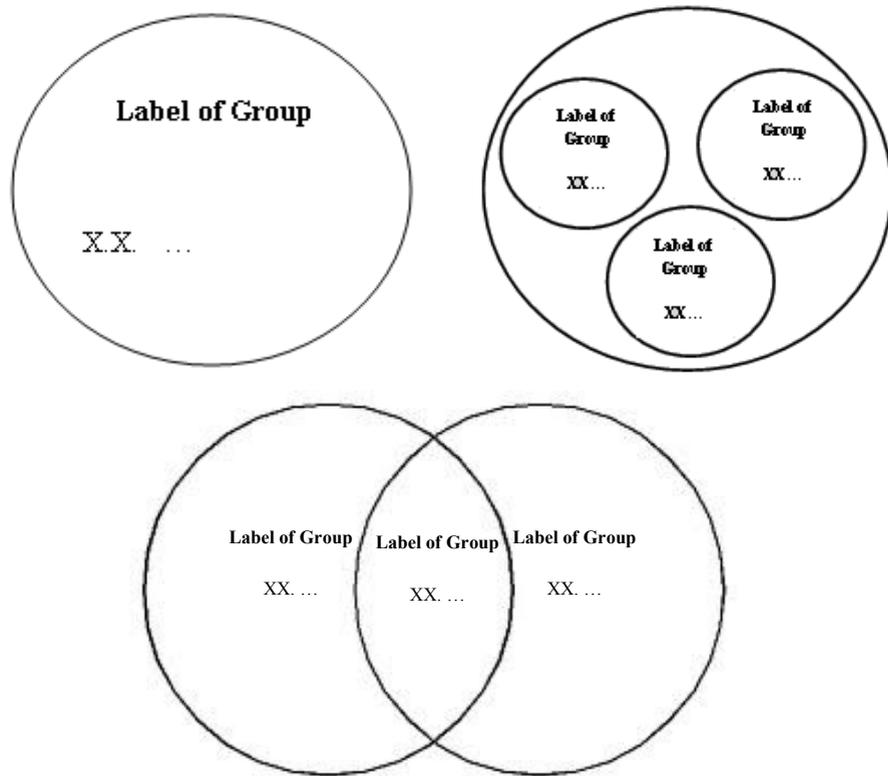


Figure 2. Template of how participants in the non-distinct circle task sorted their relationships (or household objects).

Appendices

Appendix A: Survey Materials for Study 1

Thank you for participating in the Social Networks Study. This study will take about 15 minutes. Please read each question carefully.

A **social group** is defined as a group of people sharing some common social relation (e.g. people you know from a specific event, such as golf friends, or in a specific social situation, such as friends from work, neighbours, or other groups that have "special status" in your mind, such as extended family, close family, romantic partner) Please list your various social groups.

Please list up to 10 people you know and interact with. Please write down their initials to remember who they are. Next to each initial, please indicate which social group each individual is part of (e.g. you may know some people from school, work, neighbours, activity group friends, etc.).

How many different people do you interact with on a daily basis (i.e., you see them most days)? _____ (please estimate a number)

a) Which social groups do these people belong to? _____

How many different people do you interact with on a monthly basis (i.e., you see them only sometimes, like once in a month)? _____ (please estimate a number)

a) Which social groups do these people belong to? _____

Now, we would like you to think about how much time you spend with all these different social groups. Please estimate the number of hours you spend with people in that category in a typical week.

Social group: _____ hours per week: _____

.....

Now, we would like you to think about how much energy you invest in all these different social groups. Sometimes, when we spend time with another person, we invest energy such as doing effortful things for the other person (doing favors, being nice even though one is tired, listening actively). Please estimate the energy you invested with people in that category in a typical week.

Social group: _____ energy I invest: (1)None at all --- (7)A lot

Social group: _____ energy I invest: (1)None at all --- (7)A lot

Social group: _____ energy I invest: (1)None at all --- (7)A lot

Social group: _____ energy I invest: (1)None at all --- (7)A lot

.....

When thinking about your entire **family**, family could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between members of your family and you might think of different groups within your family. For example, you might distinguish between immediate and extended family, siblings, grandparents, aunts, uncles, cousins, family living in the same town vs. family living abroad, married-in members vs. born-in members. Which of the following statements do you agree most with:

- a) I consider my family as one large social group
- b) I consider my family to consist of 2 social groups, such as _____
(list these here)
- c) I consider my family to consist of 3 social groups such as _____
(list these here)
- d) I consider my family to consist of 4 social groups such as _____
(list these here)
- e) I consider my family to consist of 5 or more social groups such as _____
(list these here)
- f) Not applicable

When thinking about all your **friends**, friends could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between these friends. For example, you might distinguish between friends you have known a longtime ago vs recent friends, "best friends" versus "Facebook friends". Which of the following statements do you agree most with:

- a) I consider my friends as one large social group
- b) I consider my friends to consist of 2 social groups, such as _____
(list these here)
- c) I consider my friends to consist of 3 social groups such as _____
(list these here)
- d) I consider my friends to consist of 4 social groups such as _____
(list these here)

- e) I consider my friends to consist of 5 or more social groups such as _____ (list these here)
- f) Not applicable

When thinking about all your **colleagues** (either at work or at school), colleagues could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between these colleagues. For example, you might distinguish between colleagues in one job versus the other job, your bosses versus your employees. Which of the following statements do you agree most with:

- a) I consider my colleagues as one large social group
- b) I consider my colleagues to consist of 2 social groups, such as _____ (list these here)
- c) I consider my colleagues to consist of 3 social groups such as _____ (list these here)
- d) I consider my colleagues to consist of 4 social groups such as _____ (list these here)
- e) I consider my colleagues to consist of 5 or more social groups such as _____ (list these here)
- f) Not applicable

Demographic Background

1. What age are you? _____
2. What gender are you? _____
3. What ethnicity are you? _____
4. What is your current relationship status?
 - a) Single, not dating
 - b) Single, casually dating
 - c) Cohabiting and/ or engaged
 - d) Married
 - e) Other (please specify): _____
5. Do you have any children? Yes or No
6. If you do have children, please list their age(s). _____
7. If you do have children, do your children live at home or away from home? Please select the statement that best describes your children's living situation. If you do not have children, please continue to the next question.
 - a) My child(ren) live at home
 - b) My child(ren) live away from home
 - c) My child(ren) live at home part-time
 - d) I have children that live both at home and away from home

- e) Other (please specify): _____
8. How many hours per week do you typically work? _____ hours
9. How many hours do you commute to work? _____ hours

Please indicate how much each of the past behaviors is true of you.

In the last few days I have:

1. Used my willpower to get through a situation [very infrequently(1).. very frequently(7)]
2. Withheld my negative emotions or opinions [very infrequently(1) very frequently(7)]
3. Did something that I did not want to do [very infrequently(1) very frequently(7)]
4. Resisted temptation [very infrequently(1) very frequently(7)]
5. Inhibited impulses [very infrequently(1) very frequently(7)]
6. Multitasked [very infrequently(1) very frequently(7)]
7. Worked long hours (at a job or at home) [very infrequently(1) very frequently(7)]
8. Not gotten enough sleep [very infrequently(1) very frequently(7)]

Appendix B: Survey Materials for Study 2

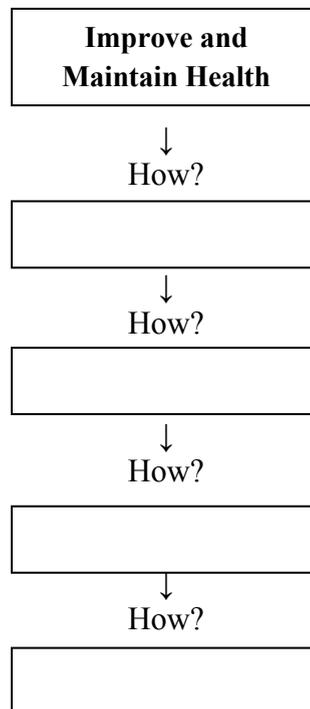
Thank you for participating in the Social Networks Study 2. This study will take about 15 minutes. Please read each question carefully.

Concrete Condition

For everything we do, there is always a process of *how* we do it. We often can follow our broad life-goals down to our specific behaviours. For example, like most people, you probably hope to find happiness in life. How can you do this? Perhaps finding a good job, or being educated, can help. How can you find these things? Perhaps by earning a college degree. How do you earn a college degree? By satisfying course requirements. How do you satisfy course requirements? By dedicating your time to your courses.

Now you will complete a small thought exercise which is intended to focus your attention on *how* you do the things you do. For this exercise, please consider the following activity “*improving and maintaining one’s physical health.*”

Start from the box at the top and think of a reason *how* you would obtain this goal. For that response, ask yourself *how* you would fulfill the statement. Continue doing so until you reach the bottom box.



Abstract Condition

For everything we do, there always is a reason *why* we do it. We often can trace the causes of our behavior back to broad life-goals that we have. For example, you currently are participating in a psychology experiment. Why are you doing this? Perhaps to gain interest in the current research. Why are you looking to gain interest in this topic? Maybe because you want to know how the research is applicable to everyday life. Why do you want to know how the research is applicable in everyday life? Perhaps so that you can apply what you learn to your everyday situations. Why do you want to apply what you learn to everyday situations? Maybe so you can react more effectively to these situations.

Now you will complete a small thought exercise which is intended to focus your attention on *why* you do the things you do. For this thought exercise, please consider the following activity: “*improving and maintaining one’s physical health.*”

Start from the bottom box and think of a reason *why* you would obtain this goal. For that response, ask yourself *why* you would fulfill the statement. Continue doing so until you reach the top box.

Why?



Why?



Why?



Why?



**Improve and
Maintain Health**

A **social group** is defined as a group of people sharing some common social relation (e.g. people you know from a specific event, such as golf friends, or in a specific social situation, such as friends from work, neighbours, or other groups that have "special status" in your mind, such as extended family, close family, romantic partner) Please list your various social groups.

When thinking about your entire **family**, family could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between members of your family and you might think of different groups within your family. For example, you might distinguish between immediate and extended family, siblings, grandparents, aunts, uncles, cousins, family living in the same town vs. family living abroad, married-in members vs. born-in members. Which of the following statements do you agree most with:

- a) I consider my family as one large social group
- b) I consider my family to consist of 2 social groups, such as _____
(list these here)
- c) I consider my family to consist of 3 social groups such as _____
(list these here)
- d) I consider my family to consist of 4 social groups such as _____
(list these here)
- e) I consider my family to consist of 5 or more social groups such as _____
(list these here)
- f) Not applicable

When thinking about all your **friends**, friends could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between these friends. For example, you might distinguish between friends you have known a longtime ago vs recent friends, "best friends" versus "Facebook friends". Which of the following statements do you agree most with:

- a) I consider my friends as one large social group
- b) I consider my friends to consist of 2 social groups, such as _____
(list these here)
- c) I consider my friends to consist of 3 social groups such as _____
(list these here)
- d) I consider my friends to consist of 4 social groups such as _____
(list these here)
- e) I consider my friends to consist of 5 or more social groups such as _____
(list these here)
- f) Not applicable

When thinking about all your **colleagues** (either at work or at school), colleagues could be classified simply as one "social group". However, sometimes one might feel that there are other important distinctions between these colleagues. For example, you might distinguish between colleagues in one job versus the other job, your bosses versus your employees. Which of the following statements do you agree most with:

- a) I consider my colleagues as one large social group
- b) I consider my colleagues to consist of 2 social groups, such as _____ (list these here)
- c) I consider my colleagues to consist of 3 social groups such as _____ (list these here)
- d) I consider my colleagues to consist of 4 social groups such as _____ (list these here)
- e) I consider my colleagues to consist of 5 or more social groups such as _____ (list these here)
- f) Not applicable

We each invest our energy differently among our different social groups. For instance, talking to a close friend over Facebook may require a lot of energy to one person, and little energy to another person. Or, making dinner plans and setting aside time with a friend may require little energy for some people, but may require a lot of energy for others.

When thinking about your different social groups, on average, indicate which actions you feel consume the most amount of energy. Select all that apply.

- a) Setting aside time (e.g. making sure you have nothing else going on)
- b) Making plans (e.g. what you plan on doing during that time)
- c) Seeing that person/ group
- d) Talking on the phone
- e) Texting
- f) Doing favours (e.g., helping the person, running errands)
- g) Being nice (e.g., even when you don't feel like it)
- h) Actively listening to a person/ group
- i) Thinking about that person/ group
- j) Communicating through social media (e.g. Facebook, Twitter, etc.)
- k) Other (please specify): _____

Now, we would like you to think about how much time you spend with all these different social groups. List a given social group and then estimate the number of hours you spend with people in that category in a typical week.

Social group: _____ hours per week: _____

.....

Now, we would like you to think about how much energy you invest in all these different social groups. Sometimes, when we spend time with another person, we invest energy such as doing effortful things for the other person (doing favors, being nice even though one is tired, listening actively). List a given social group and then estimate the energy you invested with people in that category in a typical week.

Social group: _____ energy I invest: (1)None at all --- (7)A lot

Social group: _____ energy I invest: (1)None at all --- (7)A lot

Social group: _____ energy I invest: (1)None at all --- (7)A lot

Social group: _____ energy I invest: (1)None at all --- (7)A lot

.....

How many different people do you interact with on a daily basis (i.e., you see them most days)? _____ (please estimate a number)

a) Which social groups do these people belong to? _____

How many different people do you interact with on a monthly basis (i.e., you see them only sometimes, like once in a month)? _____ (please estimate a number)

a) Which social groups do these people belong to? _____

Demographic Background

1. What age are you? _____

2. What gender are you?

a) Female

b) Male

3. What ethnicity are you? _____

4. What is your current relationship status?

a) Single, not dating

b) Single, casually dating

c) In a steady relationship

d) Cohabiting and/ or engaged

e) Married

f) Other (please specify): _____

5. How many hours per week do you typically work? _____ hours

6. How many hours do you commute to work each day? _____ hours

7. What is your occupation? _____

8. Do you have any comments about this study? _____

Appendix C: Survey Materials for Study 3a

Thank you for participating in the Social Networks Study. This study will take about 10 minutes. Please read each question carefully.

Think about 30 people who you know and regularly interact with (e.g., family, friends, colleagues, people you know from Facebook, Google+, etc.). Please write down their initials to remember who these people are.

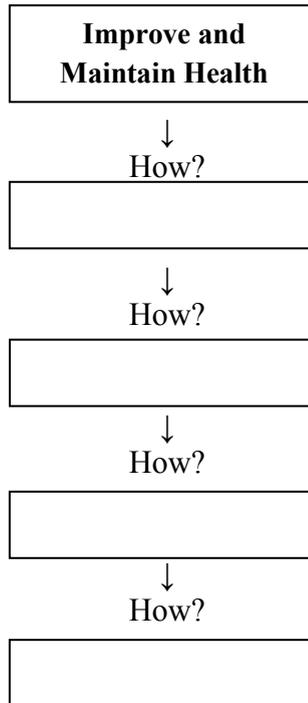
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Concrete Condition

For everything we do, there is always a process of *how* we do it. We often can follow our broad life-goals down to our specific behaviours. For example, like most people, you probably hope to find happiness in life. How can you do this? Perhaps finding a good job, or being educated, can help. How can you find these things? Perhaps by earning a college degree. How do you earn a college degree? By satisfying course requirements. How do you satisfy course requirements? By dedicating your time to your courses.

Now you will complete a small thought exercise which is intended to focus your attention on *how* you do the things you do. For this exercise, please consider the following activity “*improving and maintaining one’s physical health.*”

Start from the box at the top and think of a reason *how* you would obtain this goal. For that response, ask yourself *how* you would fulfill the statement. Continue doing so until you reach the bottom box.



Abstract Condition

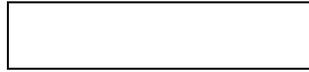
For everything we do, there always is a reason *why* we do it. We often can trace the causes of our behavior back to broad life-goals that we have. For example, you currently are participating in a psychology experiment. Why are you doing this? Perhaps to gain interest in the current research. Why are you looking to gain interest in this topic? Maybe because you want to know how the research is applicable to everyday life. Why do you want to know how the research is applicable in everyday life? Perhaps so that you can apply what you learn to your everyday situations. Why do you want to apply what you learn to everyday situations? Maybe so you can react more effectively to these situations.

Now you will complete a small thought exercise which is intended to focus your attention on *why* you do the things you do. For this thought exercise, please consider the following activity: “*improving and maintaining one’s physical health.*”

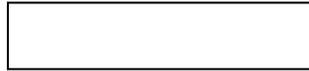
Start from the bottom box and think of a reason *why* you would obtain this goal. For that response, ask yourself *why* you would fulfill the statement. Continue doing so until you reach the top box.



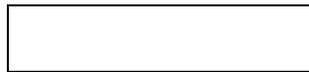
Why?



Why?



Why?



Why?



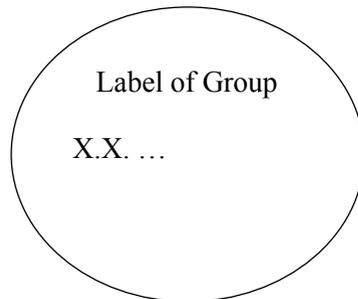
A **social group** is defined as a group of people sharing some common social relation (e.g. people you know from a specific time in your life, or people who have specific characteristics in common, or groups that have "special status" in your mind).

Every person has a unique way of thinking of their social contacts; we all have different social groups in which we fit the people we know. Think about the people you listed before, and use the space below to categorize these people. Draw circles to represent **distinct social groups** and sort these people into different circles (i.e., different social groups).

Make sure that each person is sorted into a social group and that you **do not include anyone in more than one social group**. There is no limit to the number of people you can or cannot include in each group (i.e., you can include 1 - 30 people in a circle).

Please use the initials to indicate your social contact's membership within a specific social group. At the top of each circle please write the name of each specific social group.

Example:



Please list your various social groups.

Finally we are interested in your thoughts about the following behaviors. People differ in their preferences for these behaviors. Your task is to choose the identification, *a* or *b*, that best describes the behavior for you. *Simply circle the identification statement that you pick. Please circle only one alternative for each pair.* Of course, there are no right or wrong answers. Remember, choose the description that *you personally believe* is more appropriate in each pair.

1. Making a list
 - a) Getting organized
 - b) Writing things down
2. Reading
 - a) Following lines of print
 - b) Gaining knowledge
3. Washing clothes
 - a) Removing odors from clothes
 - b) Putting clothes into the machine
4. Picking an apple
 - a) Getting something to eat
 - b) Pulling an apple off a branch
5. Painting a room
 - a) Applying brush strokes
 - b) Making the room look fresh
6. Paying the rent
 - a) Maintaining a place to live
 - b) Writing a check
7. Locking a door
 - a) Putting a key in the lock
 - b) Securing the house
8. Voting
 - a) Influencing the election
 - b) Marking a ballot
9. Taking a test
 - a) Answering questions
 - b) Showing one's knowledge
10. Greeting someone
 - a) Saying hello
 - b) Showing friendliness
11. Eating
 - a) Getting nutrition
 - b) Chewing and swallowing
12. Growing a garden
 - a) Planting seeds
 - b) Getting fresh vegetables
13. Pushing a doorbell
 - a) Moving a finger
 - b) Seeing if someone's home

Appendix D: Survey Materials for Study 3b

Thank you for participating in the Social Networks Study. This study will take about 10 minutes. Please read each question carefully.

Think about 30 people who you know and regularly interact with (e.g., family, friends, colleagues, people you know from Facebook, Google+, etc.). Please write down their initials to remember who these people are.

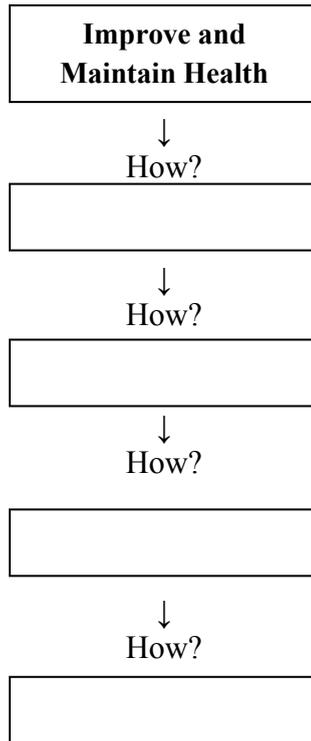
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Concrete Condition

For everything we do, there is always a process of *how* we do it. We often can follow our broad life-goals down to our specific behaviours. For example, like most people, you probably hope to find happiness in life. How can you do this? Perhaps finding a good job, or being educated, can help. How can you find these things? Perhaps by earning a college degree. How do you earn a college degree? By satisfying course requirements. How do you satisfy course requirements? By dedicating your time to your courses.

Now you will complete a small thought exercise which is intended to focus your attention on *how* you do the things you do. For this exercise, please consider the following activity “*improving and maintaining one’s physical health.*”

Start from the box at the top and think of a reason *how* you would obtain this goal. For that response, ask yourself *how* you would fulfill the statement. Continue doing so until you reach the bottom box.

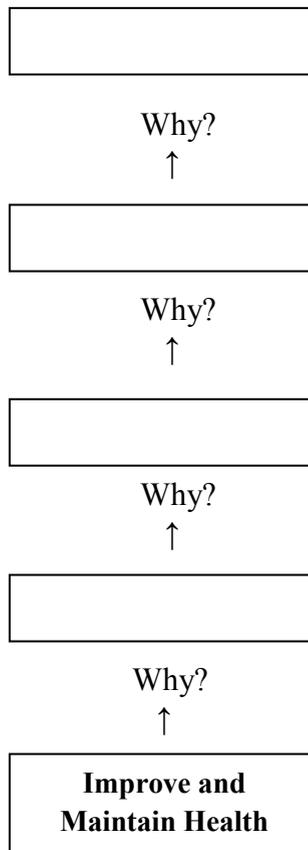


Abstract Condition

For everything we do, there always is a reason *why* we do it. We often can trace the causes of our behavior back to broad life-goals that we have. For example, you currently are participating in a psychology experiment. Why are you doing this? Perhaps to gain interest in the current research. Why are you looking to gain interest in this topic? Maybe because you want to know how the research is applicable to everyday life. Why do you want to know how the research is applicable in everyday life? Perhaps so that you can apply what you learn to your everyday situations. Why do you want to apply what you learn to everyday situations? Maybe so you can react more effectively to these situations.

Now you will complete a small thought exercise which is intended to focus your attention on *why* you do the things you do. For this thought exercise, please consider the following activity: “*improving and maintaining one’s physical health.*”

Start from the bottom box and think of a reason *why* you would obtain this goal. For that response, ask yourself *why* you would fulfill the statement. Continue doing so until you reach the top box.



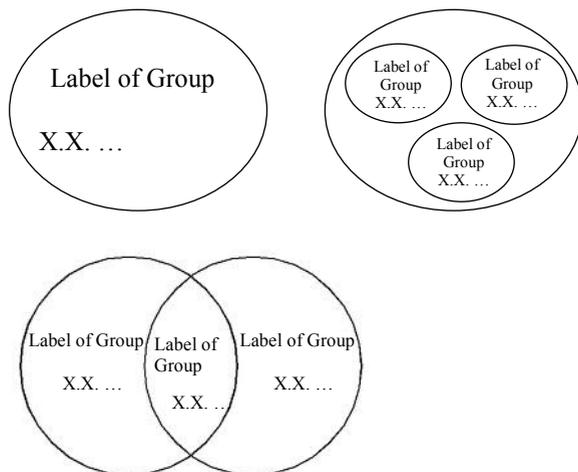
A **social group** is defined as a group of people sharing some common social relation (e.g. people you know from a specific time in your life, or people who have specific characteristics in common, or groups that have "special status" in your mind).

Every person has a unique way of thinking of their social contacts; we all have different social groups in which we fit the people we know. Think about the people you listed before, and use the space below to categorize these people. Draw circles to represent social groups and sort these people into different circles (i.e., different social groups). If you feel that certain social groups overlap, you can show this by drawing overlapping circles. If you feel that certain social groups consist of many groups you can show this by drawing circles within circles.

Make sure that each person is sorted into a social group and that you **do not include anyone in more than one social group**. There is no limit to the number of people you can or cannot include in each group (i.e., you can include 1-30 people in a circle).

Please use the initials to indicate your social contact's membership within a specific social group. At the top of each circle please write the name of each specific social group.

Examples:



Please list your various social groups.

Finally we are interested in your thoughts about the following behaviors. People differ in their preferences for these behaviors. Your task is to choose the identification, *a* or *b*, that best describes the behavior for you. *Simply circle the identification statement that you pick. Please circle only one alternative for each pair.* Of course, there are no right or wrong answers. Remember, choose the description that *you personally believe* is more appropriate in each pair.

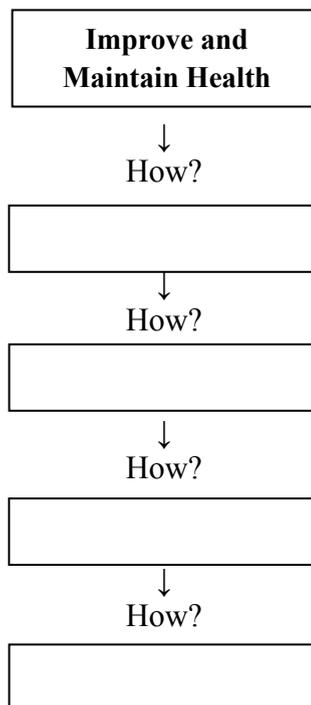
- | | |
|-------------------------------------|------------------------------|
| 1. Making a list | 7. Locking a door |
| a) Getting organized | a) Putting a key in the lock |
| b) Writing things down | b) Securing the house |
| 2. Reading | 8. Voting |
| a) Following lines of print | a) Influencing the election |
| b) Gaining knowledge | b) Marking a ballot |
| 3. Washing clothes | 9. Taking a test |
| a) Removing odors from clothes | a) Answering questions |
| b) Putting clothes into the machine | b) Showing one's knowledge |
| 4. Picking an apple | 10. Greeting someone |
| a) Getting something to eat | a) Saying hello |
| b) Pulling an apple off a branch | b) Showing friendliness |
| 5. Painting a room | 11. Eating |
| a) Applying brush strokes | a) Getting nutrition |
| b) Making the room look fresh | b) Chewing and swallowing |
| 6. Paying the rent | 12. Growing a garden |
| a) Maintaining a place to live | a) Planting seeds |
| b) Writing a check | b) Getting fresh vegetables |
| | 13. Pushing a doorbell |
| | a) Moving a finger |
| | b) Seeing if someone's home |

Concrete Condition

For everything we do, there is always a process of *how* we do it. We often can follow our broad life-goals down to our specific behaviours. For example, like most people, you probably hope to find happiness in life. How can you do this? Perhaps finding a good job, or being educated, can help. How can you find these things? Perhaps by earning a college degree. How do you earn a college degree? By satisfying course requirements. How do you satisfy course requirements? By dedicating your time to your courses.

Now you will complete a small thought exercise which is intended to focus your attention on *how* you do the things you do. For this exercise, please consider the following activity “*improving and maintaining one’s physical health.*”

Start from the box at the top and think of a reason *how* you would obtain this goal. For that response, ask yourself *how* you would fulfill the statement. Continue doing so until you reach the bottom box.

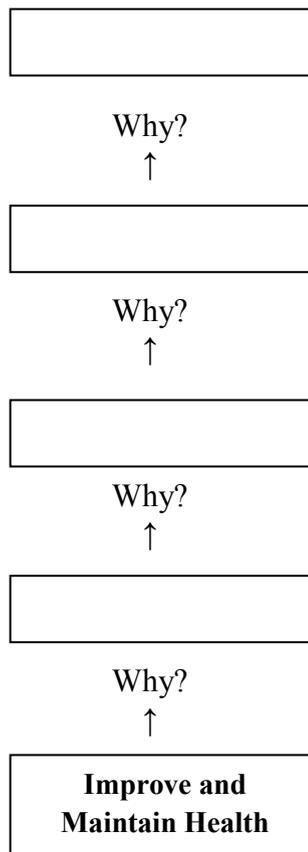


Abstract Condition

For everything we do, there always is a reason *why* we do it. We often can trace the causes of our behavior back to broad life-goals that we have. For example, you currently are participating in a psychology experiment. Why are you doing this? Perhaps to gain interest in the current research. Why are you looking to gain interest in this topic? Maybe because you want to know how the research is applicable to everyday life. Why do you want to know how the research is applicable in everyday life? Perhaps so that you can apply what you learn to your everyday situations. Why do you want to apply what you learn to everyday situations? Maybe so you can react more effectively to these situations.

Now you will complete a small thought exercise which is intended to focus your attention on *why* you do the things you do. For this thought exercise, please consider the following activity: “*improving and maintaining one’s physical health.*”

Start from the bottom box and think of a reason *why* you would obtain this goal. For that response, ask yourself *why* you would fulfill the statement. Continue doing so until you reach the top box.



We would now like you to complete a short drawing task.

Do you have a blank piece of paper and a pen in front of you?

- a) Yes
- b) No

If Yes, participants redirected to:

Thank you! Please have your pen and paper ready and carefully read the following instructions.

If No, participants redirected to:

For the next part of this study you are required to have a blank piece of paper and a pen in front of you. If you have not yet done so, please ensure you have these materials ready. Press “Next” when you have done so.

Thank you! Please have your pen and paper ready and carefully read the following instructions.

Relationships Condition

Participants were reminded of the initials for the 30 relationships they mentioned before.

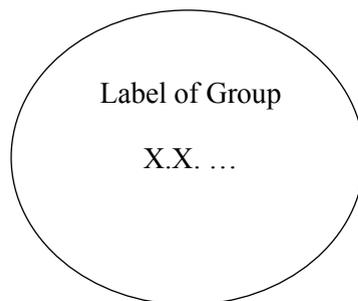
A **social group** is defined as a group of people sharing some common social relation (e.g. people you know from a specific time in your life, or people who have specific characteristics in common, or groups that have "special status" in your mind).

Every person has a unique way of thinking of their social contacts; we all have different social groups in which we fit the people we know. Think about the people you listed before. To refresh your memory these people are listed at the bottom of this page. Using your blank sheet of paper we would like you to categorize these people. Draw circles to represent **distinct social groups** and sort these people into different circles (i.e., different social groups).

Make sure that each person is sorted into a social group and that you **do not include anyone in more than one social group**. There is no limit to the number of people you can or cannot include in each group (i.e., you can include 1 - 30 people in a circle).

Please use the initials to indicate your social contact's membership within a specific social group. At the top of each circle please write the name of each specific social group.

Example:



Please refer to the circles you just drew when answering the following questions.

Please indicate the total number of groups (i.e., circles) that you drew to categorize the people you mentioned before. _____

Indicate the number of people per circle:

Circle 1: _____

Circle 2: _____

Circle 3: _____

Circle 4: _____

Circle 5: _____

Circle 6: _____

Circle 7: _____

Circle 8: _____

Circle 9: _____

Circle 10: _____

Please list your various social groups.

How difficult was it for you to think about these 30 people and group them into distinct groups?

1 (not at all difficult) --- 7 (very difficult)

How often do you think about your various relationships in terms of specific groups?

1 (never) -- 7(always)

Were you able to easily group these people into **distinct groups**?

a) Yes

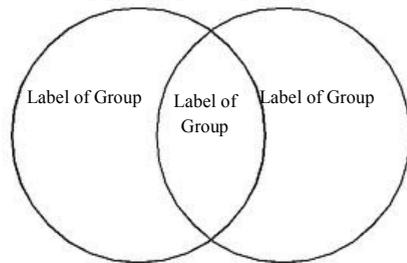
b) No

Would you have preferred to have **less specific** instructions for how to group these people?

a) Yes

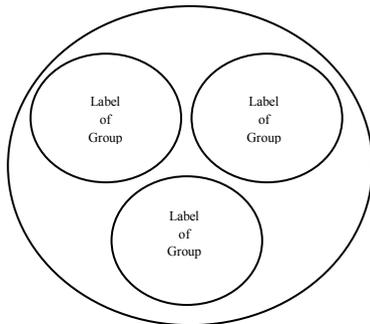
b) No

Would you have preferred to have been able to group these people into **overlapping groups** (see example below)?



- a) Yes
- b) No

Would you have preferred to have been able to group these people into **nested groups** (see example below)?



- a) Yes
- b) No

In the box below, please provide any additional comments you might have about this drawing task, what influenced the way you grouped these people, the difficulty of this task, etc.

Household Objects Condition

Participants assigned to the objects condition were reminded of the 30 objects listed before.

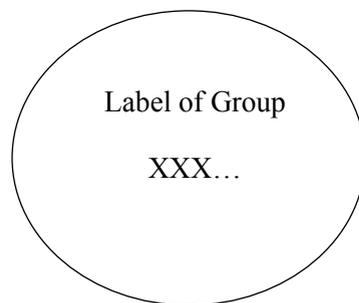
Household objects are defined as goods or products that you will find in one's home. They can be grouped into a variety of different groups based on various characteristics.

Every person has a unique way of thinking about their household objects; we all have different groups in which we fit the objects we own. Think about the household objects you listed before. To refresh your memory these objects are listed at the bottom of this page. Draw circles to represent **distinct groups** and sort these household objects into different circles (i.e., different groups).

Make sure that each household object is sorted into a group and that you **do not include any household objects in more than one group**. There is no limit to the number of household objects you can or cannot include in each group (i.e., you can include 1 - 30 household objects in a circle).

Please use the name of the household objects to indicate its membership within a specific group. At the top of each circle please write the name of each specific group.

Example:



Please refer to the circles you just drew when answering the following questions.

Please indicate the total number of groups (i.e., circles) that you drew to categorize the household objects you mentioned before _____

Indicate the number of objects per circle:

Circle 1: _____

Circle 2: _____

Circle 3: _____

Circle 4: _____

Circle 5: _____

Circle 6: _____

Circle 7: _____

Circle 8: _____

Circle 9: _____

Circle 10: _____

Please list your various groups for household objects.

How difficult was it for you to think about these 30 household objects and group them into **distinct groups**?

1 (not at all difficult) --- 7 (very difficult)

How often do you think about your various relationships in terms of specific groups?

1 (never) -- 7(always)

Were you able to easily group these household objects into **distinct groups**?

c) Yes

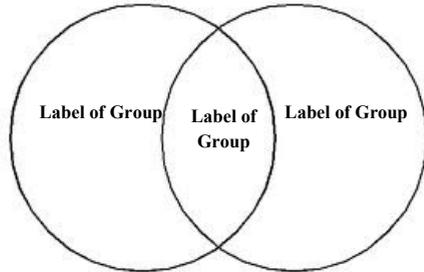
d) No

Would you have preferred to have **less specific** instructions for how to group these objects?

c) Yes

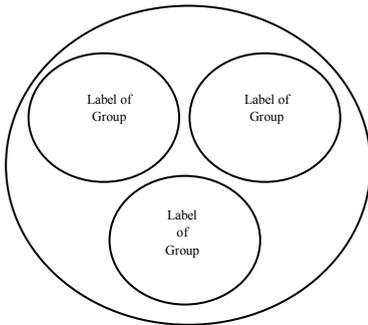
d) No

Would you have preferred to have been able to group these objects into **overlapping groups** (see example below)?



- a) Yes
- b) No

Would you have preferred to have been able to group these objects into **nested groups** (see example below)?



- a) Yes
- b) No

In the box below, please provide any additional comments you might have about this drawing task, what influenced the way you grouped the household items, the difficulty of this task, etc.

Behavioural Identification Form

Finally we are interested in your thoughts about the following behaviors. People differ in their preferences for these behaviors. Your task is to choose the identification, *a* or *b*, that best describes the behavior for you. *Simply circle the identification statement that you pick. Please circle only one alternative for each pair.* Of course, there are no right or wrong answers. Remember, choose the description that *you personally believe* is more appropriate in each pair.

1. Making a list
 - a) Getting organized
 - b) Writing things down
2. Reading
 - a) Following lines of print
 - b) Gaining knowledge
3. Washing clothes
 - a) Removing odors from clothes
 - b) Putting clothes into the machine
4. Picking an apple
 - a) Getting something to eat
 - b) Pulling an apple off a branch
5. Painting a room
 - a) Applying brush strokes
 - b) Making the room look fresh
6. Paying the rent
 - a) Maintaining a place to live
 - b) Writing a check
7. Locking a door
 - a) Putting a key in the lock
 - b) Securing the house
8. Voting
 - a) Influencing the election
 - b) Marking a ballot
9. Taking a test
 - a) Answering questions
 - b) Showing one's knowledge
10. Greeting someone
 - a) Saying hello
 - b) Showing friendliness
11. Eating
 - a) Getting nutrition
 - b) Chewing and swallowing
12. Growing a garden
 - a) Planting seeds
 - b) Getting fresh vegetables
13. Pushing a doorbell
 - a) Moving a finger
 - b) Seeing if someone's home