In the Company of Wealth: Investigating Money’s Effects on Perceptions of the Self, the Social World, and the Supernatural

by

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ABSTRACT

In the Company of Wealth: Investigating Money’s Effects on Perceptions of the Self, the Social World, and the Supernatural

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In this thesis, I sought to establish whether the mere presence of money differentially affects the perception of competent and autonomous control over life outcomes among people of relatively low and high self-perceived wealth. According to my theoretical perspective regarding the effects of monetary cues, thinking about money should cause people to view themselves in terms of their own relative financial resources. As money is perceived as a resource that enables competent and autonomous control over life outcomes, the presence of money should cause people low in wealth to feel lower in personal control and autonomy and should motivate the preservation or retrieval of a sense of control and autonomy. By contrast, the presence of money should cause the wealthy to feel higher in personal control and autonomy. Three experiments were designed to test hypotheses stemming from this view and to broaden our understanding of how and why money affects cognition and behaviour. In Experiment 1, I tested whether a money prime affected perceived control, autonomy, and need for structure. For people low in self-perceived wealth, money decreased autonomy and control over life outcomes, and increased the need for structure. People high in wealth were not affected by the money prime. In Experiment 2, I examined whether the presence of money had consequences for interactions with others in social environments characterized by low and high structure. In a setting lacking structure, the presence of money caused people of lower socioeconomic status (SES) to prefer less social contact compared to people of higher SES. The interacting effects of money and SES diminished when the environment was structured in nature. In Experiment 3, I tested competing hypotheses regarding whether the presence of money can influence attitudes and beliefs about external sources of control. I found that when people who were lower in wealth were primed with money,
versus not, they reported lesser belief in a controlling god. By contrast, when people of higher wealth were primed with money, versus not, they reported greater belief in a controlling god. I discuss my findings vis-à-vis the current perspective and previous money priming research.
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Introduction

Money is considered by many to be a panacea for life’s woes and a primary route to human happiness (Goldbart, Jaffe, & Difuria, 2004). Myers (2000), for example, states that “the modern American dream seems to have become life, liberty, and the purchase of happiness” (p. 58). Money is valued as a tool (Lea & Webley, 2006)—it helps people solve problems and meet needs (Zhou, Vohs, & Baumeister, 2009). It is also symbolic of traits and abilities—wealthy people are perceived as more in control, competent, and sophisticated compared to those who are financially less well-off (Christopher & Schlenker, 2000; Dittmar, 1992). Whether receiving our conscious attention or not, money is constantly present in our lives, stimulating our senses and slipping into our thoughts (Burgoyne & Lea, 2006).

Despite its symbolic and practical significance (Burgoyne & Lea, 2006; Oleson, 2004), the construct of money has not traditionally received much attention in the psychological literature (Furnham & Argyle, 1998). However, recent research demonstrates that the mere presence of money has a number of intriguing effects on behaviour (e.g., Gino & Pierce, 2009; Mogilner, 2010; Vohs, Mead, & Goode, 2006, 2008; Zhou et al, 2009). For instance, when in the presence of large sums of money, people seem to behave in more socially withdrawn and unethical ways (Gino & Pierce, 2009; Vohs et al., 2006). Beyond recurrent speculation that the observed behaviors are related to money’s association with wealth, little is known about the cognitive and motivational effects of money.

The current research consists of an effort to understand how monetary cues affect specific psychological needs and associated responses to external agents and environments. Through an examination of the literature for perspectives on the role of money in human life, and by conducting preliminary experimentation (Dupuis & Newby-Clark, 2011), I established a tentative set of testable assumptions regarding the mechanisms guiding money’s nonconscious effects. First, I assumed that money is perceived as a resource that enables competent and autonomous control over life outcomes. Second, I posited that thinking about money causes people to view themselves, including their autonomous choices and their capacity for personal control, in terms of their own relative financial resources. Thus, when in the presence of money, people low in wealth should feel lower in personal control and autonomy and, therefore, should be motivated to preserve or regain a sense of control and autonomy. When in the presence of
money, people high in wealth should feel higher in personal control and autonomy. These assumptions guided Experiment 1, in which I tested whether the mere presence of money caused reduced perceived control and autonomy among people who were lower in financial wealth, and enhanced perceived control and autonomy among people who were higher in wealth. I also tested a possible motivational consequence of a threatened capacity to self-determine life outcomes: the desire to maintain simple structure in life.

Experiment 1 served as the foundation for both Experiments 2 and 3, in which I examined novel consequences of monetary cues. In Experiment 2, I tested a specific consequence of money’s effects on the need for structure. I asked whether merely handling money causes people to react differently toward orderly and disorderly social and physical environments depending on their financial status. In Experiment 3, pitting the motivations for autonomy and control against each other, I explored the possibility that money can affect support for sociopolitical institutions and belief in a controlling deity.

In its entirety, this research functions as a formative work, laying the foundation for further exploration of money’s effects on cognition and behaviour. This research broadens our understanding of how and why people are affected by money in the absence of awareness, and has specific relevance for people’s interactions with their surroundings in affluent settings and other financially relevant situations. Numerous questions remain to be answered and a profusion of research is expected to follow.

Overview

To develop the theoretical framework from which I examined money’s effects, I review the relevant literatures on money, control, and priming. I first review the literature on the psychology of money, including the meaning of money and the significance of having, lacking, and wanting money. I then discuss the constructs of personal control and autonomy, followed by a review of research and theory on the relationships between wealth and these constructs. Next, I review the literature on priming effects and nonconsciously guided behaviour before I give an overview of recent theory and findings concerning money priming (e.g., Dupuis & Newby-Clark 2011; Gino and Pierce, 2009; Vohs et al., 2006; Zhou et al., 2009). I then integrate the reviewed literatures to derive support for the current theoretical perspective on money. In this section, I state my perspective as a series of assumptions that guided my investigation.
I then report three studies that examine the current view and add significantly to the literature on money. I first present the rationale and method for Experiment 1, in which I sought evidence that money reduces autonomy and perceived control among people who are relatively low in financial wealth, with the opposite expectation for people who are high in wealth. I next present the results for Experiment 1, in which I report preliminary analyses, primary analyses, and follow-up analyses. Lastly, I discuss the findings along with implications and limitations of Experiment 1. The presentations of Experiments 2 and 3 adopt the same structure. Both experiments build uniquely on Experiment 1. In Experiment 2, I examined whether the mere presence of money causes people of low socioeconomic status (SES) to avoid the use of and express negativity toward a consumer product that reduces life structure. Further, I tested whether framing the product as structure enhancing can suppress money’s effects. In Experiment 3, I pitted against each other money’s possible consequences for autonomy and personal control motives. If money causes people who are low in wealth to desire controllability, they should seek compensatory control through controlling external agents, such as a deity and systems of government (Kay, Whitson, Gaucher, & Galinsky, 2009) Alternatively, if money activates a motive for autonomy, its presence should cause people to reject controlling external agents. To examine these competing expectations, I primed people with money and examined their belief in a controlling god and support for a current government system. To conclude this thesis, in the general discussion I further connect and evaluate the overall findings of this program of research, re-examine and modify the stated theoretical perspective, and discuss the implications, future directions, and limitations of this research.
Literature Review

In the presence of abundant wealth, an individual is likely to note that she lacks resources that others have, even when the possessor of wealth is not clearly identified and is a group or an organization.

Gino & Pierce (2009, p. 143)

To have money is to be virtuous, honest, beautiful and witty. And to be without it is to be ugly and boring and stupid and useless.

Jean Giraudoux (1974, p. 56)

Money

The meaning of money. Traditionally, economic theories tend to define money as “a means of valuation and of payment; as both a unit of account and as a generally acceptable medium of exchange” (Furnham & Argyle, 1998, p. 9; see Lea & Webley, 2006). Snelders, Hussein, Lea, and Webley (1992) conceptualize money as a polymorphous concept. That is, similar to concepts such as ‘thought’ and ‘game’, the concept of money lacks clear definition. However, there are specific physical representations of money that are particularly strong manifestations of the concept. For example, to prime study participants with the concept of money, Vohs and colleagues (2006, 2008) employed various denominations of physical currency, a common and particularly representative form of money (Snelders et al., 1992). Although physical currency remains the most representative manifestation of money, it is becoming increasingly common for transactions to be made without the necessity of cash changing hands (Furnham & Argyle, 1998). Thus, the future may see other embodiments, such as credit cards or bank accounts, become more conventional symbols of money.

Money has meanings and social utility outside of, though generally stemming from, its conceptualization as an economic construct. Monetary concerns constitute an enormous part of life for most people in modern society (Burgoyne & Lea, 2006). According to Oleson (2004):

Few things occupy as central a place in our lives as money. Money plays a special role in our personal and social lives, exerting more power over human lives than any other single commodity. It permeates much of our lives and is an important element in making choices and decisions (p. 83).

Although it has been studied extensively by researchers concerned with whether and why the maintenance of financial wealth is associated with happiness and well-being (e.g., Diener &
Seligman, 2004), the construct of money has otherwise traditionally been somewhat neglected as a topic among psychologists (Burgoyne & Lea, 2006; Furnham & Argyle, 1998). Furnham and Argyle suggest that this is because money is considered by many to be unsuitable for discussion and debate. It is also possible that psychologists have avoided the construct of money as it appears to be the territory of economists (Lindgren, 1991; cited in Furnham & Argyle, 1998). However, money’s pervasiveness is necessarily accompanied by symbolic meanings and related motives and behaviours that may or may not be directly related to purchase and procurement (Rose & Orr, 2007), such as the perception of relative social status and its psychological and social consequences (e.g., Kraus, Piff, & Keltner, 2009). Such meanings are not generally considered by economists.

**Having, lacking, and wanting money.** Much debate in the literature is based on the subject of money’s relevance to happiness and well-being (e.g., Ahuvia, 2008; Diener & Seligman, 2004). Based on a brief review of the literature, Vohs and colleagues (2008) conclude that “life seems to be better when people have money than when people lack money” (p. 208). It is of course true that it would be difficult to carry on as a functioning member of society without some degree of financial security (Kets de Vries, 2007). However, others have been less certain of such a clear and simple relationship between financial status and well-being. Ahuvia (2008), for example, concludes that the link between subjective well-being and income is weak at best. According to Diener and Seligman (2004) there is an intricate relationship between income and well-being. They argue that economic factors are important during a nation’s early economic development, but after people’s basic needs are met, money plays a less prominent role. For example, income and well-being are more highly correlated in poor versus wealthy nations (e.g., Diener & Diener, 1995). However, Diener and Seligman (2004) also state that people may become happier “when they move upward relative to their material desires and relative to others” (p. 7). It seems that possessing objectively more money may not affect happiness after a certain point, but one’s economic position relative to salient others may remain an important factor. Furthermore, the causal direction of the relationship between income and well-being has been debated (Diener & Seligman, 2004). According to longitudinal data, part of the correlation appears to be due to well-being’s impact on future income (Diener, Nickerson, Lucas, & Sandvik, 2002).
Other researchers have examined associations between well-being and value orientations toward money and material wealth. The view that wealth and possessions are of high value to one’s life—a materialistic value orientation (Kasser et al., 2004)—may be psychologically detrimental, particularly so for those who have lower income (Diener & Seligman, 2004). Kasser et al. state that people with materialistic values tend to have lower subjective well-being, lower intrinsic motivation, higher depression and anxiety, and lower self-esteem and relationship quality (see Kasser & Ahuvia, 2002). Kasser and colleagues argue that materialistic values can function to undermine the satisfaction of basic psychological needs such as competence, autonomy, and relatedness to others. However, Srivastava, Locke, and Bartol (2001) posit that the motive for monetary gain has been conceptualized too narrowly. Adding to Kasser and Ryan’s (1993) view that the desire for money is governed by external factors, such as seeking the approval of others, Srivastava and colleagues suggest that people may strive for money in order to meet psychological needs such as autonomy and security. For example, having money may be conceived as allowing for greater freedom in terms of how one spends both work and leisure time. Money may also be viewed as allowing for greater control over one’s ability to provide security and support for one’s family (see also Kraus et al., 2009).

Personal Control and Autonomy

As “the belief in one’s ability to exert control over the environment and to produce desired results is essential for an individual’s general well-being” (Leotti, Iyengar, & Ochsner, 2010, p. 458), both autonomy and personal control are theorized to be psychological needs (Deci & Ryan, 2000; Leotti et al., 2010; Ryan, 1995; Skinner, 1996). Autonomy and personal control are also related in important ways to the maintenance of wealth, the desire for wealth, and perceptions of the wealthy (e.g., Dewitte, 2006; Dittmar, 1992; Gecas, 1989; Kraus et al., 2009; Srivastava et al., 2001). Below, I review these distinct but often conflated constructs before further discussing their relevance to the psychology of money.

**Personal control and compensatory control.** Personal control “involves the self as agent, the self’s actions or behaviors as the means, and an effected change in the social or physical environment as the outcome” (Skinner, 1996, p. 558). Thus, a person’s sense of control (interchangeably referred to as perceived control and personal control) concerns the belief that one has the capacity to successfully produce desirable outcomes and avoid undesirable outcomes.
in one’s environment (Leotti et al., 2010). Control beliefs can refer to one’s perceived degree of control in a specific situation or at a broader aggregate level (Skinner, 1985). Researchers often distinguish between two aspects of personal control (Skinner, 1996). First are means-ends relationships, or the degree to which causes are perceived to lead to desired outcomes. People will generally only feel in control of outcomes and pursue related behaviours if they believe that there is a connection between a particular behaviour and a desired outcome. Means-ends relationships have been referred to, for example, as contingency judgments (Weisz & Stipek, 1982) and response-outcome expectations (Bandura, 1977). Second are agent-means relationships, or the degree to which a person has access to a particular means. People will generally only feel in control of outcomes and pursue behaviours if they believe that they themselves have the capacity to effectively pursue a particular behaviour. Agent-means relationships have been referred to as competence judgments (Weisz & Stipek, 1982) perceived competence (Harter, 1978), and efficacy expectations (Bandura, 1977; see Skinner, 1996).

Maintaining a sense of personal control is considered to be a powerful motivating force in people’s lives, and is an important determinant of physical health and psychological well-being (Bandura, 1997; Langer, 1975; Thompson & Schlehofer, 2008).

Personal control can be further distinguished from what it is not. There is an important distinction between actual control and perceived control. Perceived control concerns beliefs about the availability of control (Skinner, 1996). Personal control may or may not accurately represent actual control. For example, “when people are placed in situations of pure chance, they frequently act as if or believe they have some control over what is actually a random outcome” (Rudski, 2000, p.85). Langer (1975) has referred to this tendency as the illusion of control.

Personal control can also be distinguished from external sources of control such as powerful others (e.g., society and institutions) and the non-human (e.g., gods, chance, fate; Skinner, 1996). It is noteworthy that sources of control that are external to the self do not necessarily take away from one’s personal control. That is, personal control and external sources of control cannot be conceived as opposite ends of a continuum. According to Skinner (1996) “If external agents have legitimate authority, act on the individual's behalf, and are responsive to the self, they can be seen as benevolent sources of control that augment the power of the self” (p. 554). In fact, recent research finds that when personal control is threatened, people may seek control via sources in the external environment (Kay, et al., 2009; Shepherd, Kay, Landau, &
Keefer, 2011; Whitson & Galinsky, 2008). Kay and colleagues (2009) suggest that “the motivation to perceive personal control is considered a subgoal of the larger and more inclusive motivation to defend against perceptions of randomness and chaos within the social environment” (p. 18). Supporting this view, Whitson and Galinsky (2008; Experiment 1) found that participants who were made to feel deficient in control reported a greater personal need for structure. Structure and order are believed to be sought to increase the perception that acting in the social and physical environment will produce predictable and desirable results (see Kay et al., 2009). A number of sources of compensatory control external to the self have been noted by Kay et al. (2009). When people feel a lack of personal control, they may attempt to gain a sense of structure and order in external control providing systems, such as by legitimizing the effectiveness of sociopolitical institutions and by increasing reliance on a controlling god (see Kay et al., 2008; 2010). Recent research also finds that people seek to compensate for lost control through the perception of illusory patterns in the physical and metaphysical environment (Whitson & Galinsky, 2008), and through control-enhancing consumer products (Shepherd et al., 2011). In other words, when feeling low in control, people may seek to attain a sense of structure and order in life without seeking to gain personal control per se.

**Autonomy.** The need for autonomy concerns a desire for one’s behaviour to be self-determined or to originate from one’s true self rather than being regulated by sources external to the self (Deci & Ryan, 2000; Ryan, 1995). It is the freedom to behave in accord with personal desires (Deci & Ryan, 2000). Autonomy has been conceptualized as a basic psychological need. As such, people should generally avoid threats to and seek support for a sense of autonomy (Sheldon & Gunz, 2009). Skinner (1996) argues that autonomy lies outside the domain of control. Personal control consists of a perceived connection between one’s behaviour and its outcomes, whereas autonomy refers to the personal freedom to initiate behaviour (Ryan, 1995). For example, although one can competently pursue, or be in control of, a task such as commuting to and from work, the action of driving itself may be solely externally regulated (i.e., one lives outside of the city of employment and must make the drive), and therefore is likely not self-determined. However, taking the same drive on a weekend to enjoy the Fall colours with one’s family may be pursued with both competence and autonomy. As illustrated in the above examples, the construct of perceived control does not address whether goals and behaviours are self-directed or integrated with one’s conception of the self (Ryan, 1995).
A motive for autonomy can have different outcomes than a motive for control. For example, whereas one may seek to compensate for lost control by putting faith in controlling external forces (Kay et al., 2009), a sense of autonomy can be threatened by external sources of control (Chartrand, Dalton, & Fitzsimons, 2007). Evidence from self-determination theory supports a distinction between interpersonal contexts that are autonomy supportive versus controlling (see Deci & Ryan, 2000; La Guardia & Patrick, 2008). When people are low in satisfaction of the need for autonomy, they are generally motivated to seek autonomy-providing experiences (Sheldon & Gunz, 2009). They may therefore resist external control in the hands of others, institutions, or supernatural forces. For example, reactance, or the motive to “restore behavioral freedoms that are perceived to have been threatened or lost” (Brehm, 2000, p.10), can result from threats to autonomy. Chartrand et al. (2007; Study 1) found that performance was poorer on an anagram task when participants were primed to think about a controlling friend who wanted them to work hard compared to when participants were primed to think about a friend who wanted them to enjoy themselves. To summarize, when autonomy is threatened, people actively seek to recover the freedom to self-direct behaviour. By contrast, when personal control is threatened, people often rely more heavily on controlling others (Kay, et al., 2009; Shepherd et al., 2011).

**Money, Personal Control, and Autonomy**

Money is valued for its instrumentality—much of its value comes from its usefulness as a means to attain desirable ends (Lea & Webley, 2006). Money allows people to acquire the resources necessary for meeting personal goals and ensuring the survival of oneself and one’s family (Dewitte, 2006; Vohs et al., 2006; Zhou et al., 2009). Vohs and colleagues (2008) suggest that “having money protects people from unfortunate and unforeseen perturbations in life, mainly because money allows for control over the outcomes” (p. 208; see Johnson & Krueger, 2006).

As money is instrumental in attaining desired outcomes, maintaining financial wealth should endow a sense of control, or a view that one has the capacity to act upon the environment to attain desired outcomes (e.g., Dewitte, 2006; Gecas, 1989; Kraus et al., 2009; Srivastava et al., 2001). Zhou and colleagues (2009) state that, “money provides a feeling of confidence that problems can be solved and needs can be met” (p. 700). Research finds, for instance, that people
of lower perceived SES tend to have a lower sense of personal control (Kraus et al., 2009). Researchers have also argued that having money enables greater autonomy, or freedom from dependency on others and external sources of control (Dewitte, 2006; Furnham & Argyle, 1998; Johnson & Krueger, 2006; Srivastava, et al., 2001). Srivastava and colleagues, for example, suggest that people may seek wealth in order to better meet the needs of autonomy and security. Maintaining personal wealth may be conceived as allowing for greater freedom to decide how one spends work and leisure time. Furthermore, having money and displaying it in various ways can function to symbolize one’s status and achievements—to indicate to others that one is a competent and successful person (Doyle, 1992; Kets de Vries, 2007; Lea & Webley, 2006; Zhang, 2009). People’s perceptions of the wealthy tell a similar story: Dittmar (1992), for example, observed that the wealthy are perceived as being more in control and more competent than those who are less financially well-off (see Christopher & Schlenker, 2000; Dittmar & Pepper, 1994).

However, most people never attain the status of the financially elite (Goldbart, et al., 2004). What does this mean for their experience of control and autonomy? It is possible that, for people who lack wealth, thoughts about money and wealthy others serve as a reminder that one is not wealthy and therefore, by comparison, is lacking in personal control and freedom from external forces. Before continuing this critical line of thought, I introduce the emerging literature on money priming.

**Priming Effects and the Nonconscious Guidance of Behaviour**

In this section, I briefly review research on nonconsciously guided behaviour. This literature forms the groundwork for recent explorations of money’s nonconscious effects on behaviour (e.g., Gino and Pierce, 2009; Zhou et al., 2009; Vohs et al., 2006). Not long ago, behaviour was viewed mainly as a function of conscious processes considered to be readily reportable by the individual (Bargh & Morsella, 2009). However, there is increasing acknowledgment that nonconscious thought has a crucial role in guiding complex human behaviour (Aarts, 2007). Over the past two decades, research in social cognition has demonstrated that the mind is much more open to environmental influences than was once thought. Beginning with Bargh’s (1990) seminal paper, research in social cognition has challenged how we think about the origins of, and the mechanisms guiding, behaviour (e.g.,
According to Bargh and Morsella (2009) "people are generally unaware of the sources of their behavioral impulses and of how their actions are successfully guided to completion" (p. 2).

Research on priming has revealed that automatic behaviour stemming from activated associations are ubiquitous. Exposure to stimuli causes the activation of related constructs, which can lead to the automatic pursuit of associated behaviours (Bargh & Morsella, 2009). For instance, in an early study, Bargh, Chen, and Burrows (1996) found that priming words related to the elderly can cause behaviour associated with the elderly stereotype of slowness. Compared to control participants, those participants who had been primed with words related to old age walked more slowly down a hallway after the experiment had supposedly ended. Further research has established that the mere presence of environmental stimuli can cause associated behaviours via the nonconscious activation of various constructs, such as cooperation (Bargh et al., 2001) helpfulness (Fitzsimons & Bargh, 2003; Ferguson, 2008), competitiveness (Kay et al., 2004), power (Smith & Bargh, 2008), dieting (Papies, Stroebe, & Aarts, 2008), creativity (Fitzsimons, Chartrand, & Fitzsimons, 2008), and open-mindedness (Hassin, 2008). For instance, Kay and colleagues (2004) demonstrated that the mere presence of business related objects (e.g., a briefcase or an executive portfolio) in one’s environment can cause competitive behaviour and perceptions of ambiguous social situations as more competitive in nature. In fact, people need not even be consciously aware of the presence of stimuli for the stimuli to have an effect on thought and behaviour. For example, Fitzsimons et al. (2008) demonstrated that a subliminal prime of an Apple Inc. logo caused greater creativity compared to a subliminally presented IBM logo.

Importantly, people do not always respond to primes by behaving in harmony with the associations brought to mind by salient stimuli. Rather, behaviour may sometimes contrast with associations. Early research demonstrated that, when primed with a particular stereotyped group, people often respond by behaving in line with the salient stereotype (e.g., Bargh et al., 1996). However, other researchers have subsequently shown that priming can also cause behaviours to contrast with rather than mimic stereotypes (e.g., Dijksterhuis et al., 1998; Schubert & Häfner, 2003). Contrast effects may be likely to occur, for instance, if a self-other comparison is
prompted—as in the case that the primed group is perceived as an outgroup (Schubert & Häfner, 2003).

**Money’s Nonconscious Effects on Behaviour**

Recent priming research has shown that money can have a number of automatic effects on behaviour. Such effects extend beyond those actions directly related to its procurement (Vohs et al., 2006, 2008). Notably, although research has demonstrated that monetary cues affect behaviour, explanations for the observations have generally been quite speculative (e.g., Gino and Pierce, 2009; Vohs et al., 2006; Zhou et al., 2009). Below, I describe the recent findings regarding money’s automatic effects on behaviour and researchers’ speculations regarding why such effects occur. I then discuss the gaps that remain in the understanding of money’s nonconscious effects on behaviour.

**The self-sufficiency theory of money.** In several experiments, Vohs and colleagues (2006) demonstrated that monetary cues (e.g., photographic images of physical currency; reading about an affluent upbringing) cause people to be less helpful toward others, desire less help from others, and prefer less intimacy and more solitary activities—behavioural tendencies that Vohs et al. classified as self-sufficient in nature. In these studies, money’s effects occurred in the absence of participants’ conscious awareness of changes in behaviour or the intent to perform the behaviour. For example, in Vohs et al., (2006; Study 8), participants were exposed to a either a money poster or one of two control posters positioned in front of them as they completed a questionnaire concerning preferred leisure activities. Compared with both control conditions, participants in the money prime condition expressed a preference for activities that they could partake in alone rather than those that they could enjoy with other people. In another experiment (Vohs et al., 2006; Study 2), participants were asked to read aloud about abundant financial resources (high money prime) or meager financial resources (low money prime). Participants were then given an impossible puzzle task and were told that, if needed, they could ask a confederate for help. Those participants in the high money group were found to persist for longer on the task before asking for help. Furthermore, as both conditions were related to finances, this study supported Vohs and colleagues’ argument that the nonconscious effects of money are related to wealth cues rather than general financial cues. In further studies, participants who were primed with money were less likely to provide help to the experimenter or to a confederate (Studies 3, 4, and 5), and
tended to prefer less intimacy (Study 7) and more solitary activities (Studies 8 and 9).

Vohs et al. (2006) speculate that money causes people to believe that they are self-sufficient and to behave in accord with such a view. According to Vohs and colleagues, self-sufficiency is, “an insulated state wherein people put forth effort to attain personal goals and prefer to be separate from others” (p. 1154). This view suggests that merely thinking about money causes people to feel wealthy, which produces the sense that they have the resources necessary for the fulfillment of personal goals and positive life outcomes without having to rely on other people (Vohs et al., 2006). In other words, merely thinking about money confers the sense of personal control and self-determination associated with the actual maintenance of financial wealth.

Zhou et al. (2009) similarly indicate that a self-sufficient orientation comes about because money enhances people’s perceived control over life outcomes. They found that thinking about money leads to a number of buffering effects on social distress, findings that are consistent with the social withdrawal effects observed by Vohs et al. (2006). For example, participants who were given the task of counting money, compared to control participants who counted pieces of paper, felt less distress when socially rejected (Zhou et al., 2009; Study 3). Zhou and colleagues infer that the presence of money causes people to think about its capacity as a social resource and thus affords confidence in one’s ability to independently solve problems and meet needs, thereby decreasing the importance of social approval.

Like Vohs et al. (2006), Zhou and colleagues (2009) speculate that merely thinking about money bestows a sense of independence presumably perceived by participants to be associated with the maintenance of wealth, thus reducing the need for social interaction and social approval. Unfortunately, both Vohs et al. and Zhou et al. do not provide direct support for the contention that priming people with money causes a self-sufficiency orientation. Although it has been shown that people who are primed with money engage in more independent behaviours and seem to be relatively immune to negative social events, social withdrawal does not necessarily signify the activation of a wealth-consistent worldview. In fact, it seems equally likely that the presence of money causes people to feel lacking in wealth. For example, Keltner, Gruenfeld, and Anderson (2003) indicate that social behaviour tends to be inhibited among people who have
lower social power, a construct that is closely related to socioeconomic status (Furnham & Argyle, 1998; Kraus, Côté, & Keltner, 2010).

A more recent set of studies by Liu, Smeesters, and Vohs (2012) suggests that money causes people to perceive social influence as a threat to their autonomy. Liu and colleagues found that people primed with money were threatened by attempts at social influence and this led to reactance, or a tendency to behave in opposition to the social influence. In their first study, participants were asked to indicate their selection of one of two software packages for use in a university course. Participants were or were not primed with money, then they were or were not given a command from the professor of the course (an authority figure) to purchase one of the two products. In accord with research on social influence, participants who were not primed with money indicated a preference for the option that corresponded to the authority’s command. However, the participants who were primed with money opted to choose the software package option that was contrary to the selection demanded by an authority figure. Participants who experienced social influence also perceived greater threat, and threat was found to mediate the relationship between the money prime and choice of product. Presumably, for those who were primed with money, threat to personal freedom experienced as a result of a social influence attempt caused the motivation to exert one’s autonomy through product choice. For those not primed with money, threat was related to greater adherence to the authority’s command.

In another study by Liu et al. (2012), participants who where or were not primed with money were spoken to by a confederate before they reported their liking of a product. For one group, the confederate expressed an unsolicited positive opinion about the product. For the other, the confederate expressed a negative opinion about a product. In a third group, the confederate mentioned that they had tried the product but did not express an opinion. Among people who were not primed with money, the positive opinion expressed by the confederate led to more liking of the product and the negative opinion led to less liking, compared to the neutral information group. In the money prime condition, the reverse was observed. Participants liked the product less when they received the positive opinion and more when they received the negative opinion, thus demonstrating reactance. Threat mediated the effects in the money condition and for both receipt of positive and negative opinion.
Liu and colleagues (2012; study 3) also demonstrated that when the freedom to behave under one’s own volition appears less important, money does not seem to cause reactance to others’ influence attempts. That is, when participants were making a choice for another person and not for the self, a money prime did not cause reactance toward the opinion expressed by a confederate. According to Liu et al. (2012), the preservation of freedom of choice is a key consequence of the presence of money, but only under conditions in which the goal of autonomy is conceived as important (i.e., when one is pursuing goals or meeting needs for self-benefit).

Left unresolved by Liu et al. (2012) is the question of why money causes people to be concerned with maintaining a sense of autonomy. Prior work described above suggests that people feel more autonomous and in control when primed with money (Vohs et al., 2006; Zhou et al., 2009). In Liu et al., people’s sense of freedom seems to be threatened by others’ attempts at social influence. The discrepancy lies here: Vohs and colleagues (2006) report that money causes people to feel self-sufficient (see also Zhou et al., 2009), whereas Liu and colleagues report that people are motivated to become self-sufficient. Either money causes people to believe that they have the personal freedom and competence to determine life outcomes (Vohs et al., 2006; Zhou et al. 2009) or, alternatively, money causes a motivation to attain the personal freedom and competence to determine life outcomes (Liu et al., 2012)—the two are not equivalent. As indicated in an earlier section, the motive to attain autonomy tends to arise when freedom is threatened, not when it is enhanced. However, although Liu and colleagues demonstrate reactance to social influence, they do not demonstrate deficient or enhanced autonomy and do not consider why money might cause a motive to protect a sense of autonomy.

A second perspective: money causes a sense of disadvantage. A contrasting view to the self-sufficiency perspective of Vohs et al. (2006) is offered by Gino and Pierce (2009). They posit that the presence of abundant money causes people to perceive inequity in their environment and leads to a sense of comparative disadvantage. Gino and Pierce argue that the feeling of being at the lesser end of a perceived financial inequality can motivate people to escape their disadvantaged position. They found that, compared to participants primed with meager finances, those primed with a large sum of money displayed an increased tendency to overstate their performance for personal gain. Supporting their position, envy partially mediated the relationship between the presence of abundant money and the overstating of performance. Interestingly, Gino and Pierce found that people do not become more self-focused when they are
primed with money. This is noteworthy given Vohs and colleagues’ (2006) postulation that, when in the presence of money, a self-sufficiency orientation is activated.

Although Gino and Pierce (2009) diverge from the view of Vohs et al. (2006) in their perspective on the mechanism guiding money’s effects, they agree that the desirability of possessing money is core to the cognitive and behavioural consequences for the perceiver of monetary cues. Unfortunately, both views—that the presence of money causes people feel wealthy (e.g., Vohs et al., 2006) and that the presence of money causes people to feel relatively disadvantaged (Gino & Pierce, 2009)—remain tenuously linked to the researchers’ findings. It has not been shown, for example, that wealth related constructs such as freedom and control over life outcomes are activated when people are in the presence of money. One would presume that, if money does in fact cause people to feel wealthy and self-sufficient (see Vohs et al., 2006), it should activate related constructs such as control, competence, and autonomy (see Bargh & Chartrand, 1999; Greenwald & Banaji, 1995). Although there is evidence that actually possessing more money is associated with a heightened sense of freedom and control (e.g., Dittmar, 1992; Kraus et al., 2009), to this point in the literature there remains, to my knowledge, no known evidence that merely perceiving money can activate these constructs cognitively. In a recent study, I tested precisely this possibility (Dupuis & Newby-Clark, 2011).

Money’s effect on attention to the constructs of control and autonomy. In an experiment designed to examine whether the presence of money activates constructs related to autonomous and competent control over life outcomes, I primed people with money and tested for activation and inhibition effects (Dupuis & Newby-Clark, 2011). Seventy-eight undergraduates at the University of Guelph participated in this study. Participants were remunerated with a credit toward their grade in an introductory psychology course. Participants were randomly assigned to one of two conditions. Those in the money prime condition were seated at a desk in front of a poster exhibiting scattered Canadian currency (see Vohs et al., 2006, Experiment 8). Participants in the control condition were seated in front of a poster depicting a flower garden. The posters were positioned on the wall directly above the computer used in the experiment.

Participants read instructions for a lexical decision task. They then completed a series of practice words followed by a short break. Participants were next exposed to 90 non-word letter-
strings (e.g., gube, mudger), 60 neutral words (e.g., metal, steps), and seven words that represent competent and autonomous control over life outcomes (control, mastery, freedom, independent, intelligent, successful, and secure). Letter-strings were presented one at a time and in random order following a three second cue (“***”) in the center of the screen. Participants indicated, as quickly as possible, whether each letter-string was a word or a non-word by pressing the “F” or “J” key. During a subsequent funnel debriefing (see Bargh & Chartrand, 2000), no participants expressed suspicion regarding the poster primes or the content of the lexical decision task.

Contrary to the notion that money activates words related to autonomous control over life outcomes, participants primed with money (versus those who were not) responded more slowly to words associated with autonomous and competent control over life outcomes. This effect, coupled with the absence of effects for nonwords and neutral words, suggests that the money prime inhibited thoughts concerning the capacity to self-direct life outcomes.

Although little can be concluded from this preliminary study, one speculative possibility seems particularly viable and worthy of further investigation. According to Sinclair and Kunda (1999), construct inhibition can occur as a result of the motive to protect or enhance self-worth. They found, for instance, that when participants received praise from a person of a negatively stereotyped group, participants inhibited the associated negative stereotype to maintain a positive view of the source (therefore, maintaining the legitimacy of the praise). Is it possible that wealth cues threaten certain psychological needs that are perceived as associated with wealth? In the described study, money may have activated a contrast—specifically, an upward comparison—between participants and the affluent (insofar as the wealthy are perceived as a dissimilar target group; see Schubert & Häfner, 2003). As the affluent are generally perceived as possessing greater freedom and competence, the non-affluent may inhibit related constructs in order to buffer against a salient and unfavorable social comparison brought on by the presence of money.

This study raises numerous questions and answers few. First, if money is indeed threatening to autonomy and a sense of control, it only makes sense for this to be the case among those people of relatively low financial wealth—personal control and autonomy should not be threatened among those who possess money in abundance (i.e., the wealthy). However, the possible moderator of self-perceived financial wealth was not investigated in Dupuis and Newby-Clark (2011) or any previous money priming research, so little can be said thus far about
the role of participants’ own wealth. Second, this research calls into question prior theory on the cognitive origins of money’s effects. If there is not a simple relationship between the presence of money and the activation of money related constructs, how can Vohs and colleagues’ (2006) self-sufficiency effects be explained? Why does money cause apparent indifference to the social world (e.g., Zhou et al., 2009) and the seeking of freedom from external influence (e.g., Liu et al., 2012)? In the next section, I piece together evidence from prior research on money to develop a coherent and testable perspective concerning money’s consequences for thought and behaviour.

The Current Research

To review, money is perceived as a tool that helps people to attain freedom from external influences and control over resources and life outcomes (Lea & Webley, 2006; Srivastava et al., 2001; Vohs et al., 2006; 2008). By being an important means through which people gain control and autonomy, simply having abundant money should function to confer the perception that one is more free and in control (Dewitte, 2006; Gecas, 1989; Srivastava et al., 2001; Zhou et al., 2009). Likewise, people should perceive the wealthy as more free and in control (e.g., Dittmar, 1992).

Despite some speculation that the presence of money activates a view of oneself that is consistent with the maintenance of financial wealth (Vohs et al., 2006; Zhou et al. 2009), there is no evidence that monetary cues activate thoughts of wealth and cause people to feel greater control over life outcomes. In fact, three separate lines of research reviewed above offer clues that the presence of money instead causes people to feel relatively low in the attainment of specific needs related to wealth. First, Gino and Pierce (2009) argue that the presence of money causes a sense of relative disadvantage and envy. They found that envy was in fact heightened when people were primed with money. Second, in a preliminary study, I found evidence that money inhibits rather than activates words related to autonomous and competent control over life outcomes (Dupuis & Newby-Clark, 2011). Third, Liu and colleagues (2012) found that people who are primed with money are threatened by attempts at social influence and tend to react in opposition to such influence. Liu et al. suggest that people are attuned to threats to their freedom and are motivated to experience greater autonomy. Though not noted by Liu et al., this is a state that should occur in particular when people’s autonomy is in jeopardy.
I believe that money’s effects may be more complex than any one program of research has illustrated thus far. In previous research, a key variable may have been missing from the equation: people’s perceptions of their own financial resources. For all of the value we place on money, few can claim to have it in abundance—most cannot hope to realize the material comforts of the financially elite (Goldbart, et al., 2004). It is possible that the salience of money may serve for some as a reminder that they are not affluent and therefore do not boast the resources and capacities of the wealthy. For example, Spencer and Castano (2007) found that lower SES students exhibited performance decrements on intelligence tests when socioeconomic identity was made salient (see Croizet & Claire, 1998). The mere presence of abundant money or wealth may similarly cause those who lack financial wealth to perceive that they are at a personal disadvantage in terms of resources or capacities associated with financial wealth. Thus, money’s priming effects may differ among people who perceive themselves to be relatively wealthy versus those who perceive themselves to be relatively poor. Specifically, presuming that the financially elite are acknowledged to enjoy greater competence and autonomy, thinking about money may cause those who are low in wealth to feel relatively deficient in their capacity to autonomously and competently control life outcomes. Kraus et al. (2009), for example, state that, “self-perceptions of reduced resources and subordinate rank are associated with a diminished sense of personal control” (p. 993). Furthermore, money’s diminishing effects on control and autonomy should have motivational consequences. As discussed above, when personal control is threatened, people may seek control via sources external to the self, such as by legitimizing sociopolitical institutions and increasing reliance on a controlling higher power (see Kay et al., 2009; 2010; Shepherd, Kay, Landau, & Keefer, 2011; Whitson & Galinsky, 2008). When people are low in the satisfaction of the need for autonomy, they tend to seek autonomy-providing experiences (Sheldon & Gunz, 2009), such as behaving in opposition to others who threaten their personal freedom (Brehm, 1989; Chartrand et al., 2007; Liu et al., 2012). To summarize, the current view can be stated succinctly as a set of three assumptions (see Figure 1):

**Assumption 1.** Money is perceived as a resource that enables competent and autonomous control over life outcomes. Having money is perceived as associated with more control and autonomy. Lacking money is perceived as associated with less control and autonomy.

**Assumption 2.** The effects of monetary cues are conditional on people’s relative wealth. Thinking about money should cause people to perceive themselves, including their
capacity for autonomous choice and control, according to their own financial resources relative to those of others. Thus, when thinking about money, those who feel relatively low in financial wealth should perceive that they have less freedom and personal control, and those who feel relatively affluent should perceive that they have greater freedom and personal control.

**Assumption 3.** If, when primed with money, people who are low in wealth are made to feel lower in autonomy and control, they will also be motivated to preserve or recapture a sense that they are autonomous individuals and/or exist in an orderly and controllable world.

![Figure 1](image.png)

*Figure 1.* Hypothesized model describing money’s conditional effects on perceived control and autonomy.

The three following experiments function together to empirically examine and develop this perspective, to extend the boundaries of money priming research, and ultimately to expand our understanding of the psychology of money. In Experiment 1, I tested whether the presence of money affects perceived control and autonomy, and whether findings were divergent for those who are high versus low in self-perceived financial wealth. I also tested personal need for
structure, a possible motivational consequence of money for those who are low in wealth. Experiment 1 functions as the foundation upon which Experiments 2 and 3 are built.

In Experiment 2, I examined whether priming high and low SES people with money would cause divergent reactions to a consumer product (the iPhone), which was framed as either reducing or enhancing life structure. I also expected that people of lower SES who were primed with money would avoid social contact in a low structure context (i.e., when the iPhone was framed as reducing life structure) and that this effect would be diminished among participants in a high structure context (i.e., when the iPhone was framed as enhancing life structure). Of primary interest was whether imposing structure on the product—thus creating a more orderly social context—would suppress money’s effects on interpersonal engagement.

Finally, in Experiment 3, I was interested in examining two competing hypotheses based on the findings in Experiment 1: whether the presence of money causes people to (1) seek compensatory control through controlling external systems versus (2) protect autonomy by reducing reliance on controlling external forces. To test these competing views, I primed participants with money and asked for responses regarding support for the Canadian government and belief a controlling god, two known sources of external control (see Kay et al., 2009).

In each of the three experiments, I tested consequences of the current model in different ways, using different money primes (i.e., a money desktop background, a money poster, and the physical manipulation of simulated currency) and different measures of perceived wealth (perceived wealth compared to other people in general, perceived wealth compared to other university students, and perceived SES). In its entirety, this research adds significantly to our understanding of the psychology of money, and specifically lays the groundwork for a broader understanding of how and why money affects us in the absence of our awareness.
Experiment 1: Does the Presence of Money Affect Personal Control and Autonomy?

Money is a guarantee that we may have what we want in the future. Though we need nothing at the moment it insures the possibility of satisfying a new desire when it arises.

Aristotle

Money frees you from doing things you dislike. Since I dislike doing nearly everything, money is handy.

Groucho Marx

Direct tests of money’s effects on perceived control and autonomy have been absent in previous research (e.g., Liu et al., 2012; Vohs et al., 2006; Zhou et al., 2008). Experiment 1 was therefore designed to be the first test of whether money functions to bolster or threaten autonomy and personal control. That is, I tested the effects of the mere presence of money on the constructs of interest by providing participants with a money prime or not and directly measuring how in control and autonomous they felt.

Zhou and colleagues (2009) suggest that the presence of money makes people feel as though they have the psychological resources of the wealthy. In other words, the mere presence of money causes people to view themselves as more confident and in control. However no research has yet to determine whether monetary cues have this priming effect. The present and more nuanced perspective on money priming offers that being in the presence of money functions differently for different people. A preliminary study suggests that money may be threatening to constructs related to autonomous and competent control over the environment (Dupuis & Newby-Clark, 2011). However, it makes little sense for the wealthy to be threatened by money in this way. I believe that the presence of money may threaten personal control and autonomy only among those people who are relatively low in self-perceived financial wealth. By contrast, it is possible that those who are financially well-off experience a boost in perceived control and autonomy as a result of a money prime, as they should be reminded of their own financial status. In this study, I therefore examined whether self-perceived wealth functions as a moderator of money’s effects. I hypothesized that the presence of money causes lower autonomy and personal control among those who are low in financial wealth, and that the presence of money causes higher autonomy and personal control among those who are high in wealth. This is
the first study to examine whether money priming effects occur as a function of people’s self-perceived financial resources.

Furthermore, this study is the first to test whether people who are primed with money are motivated to seek greater structure and order in their lives. Provided that money causes the perception of lower capacity for autonomous control over life outcomes among those low in wealth, money should also cause these people to report a greater personal need for structure, or a preference for a simplified, more manageable structure to their lives (Neuberg & Newsom, 1993; Whitson & Galinsky, 2008). According to Neuberg and Newsom (1993), people can cope with a complex social world in two ways. First, people can engage in avoidance strategies to limit their exposure to complex and vast amounts of information. Second, people can attempt “to structure the world into a simplified, more manageable form” (Neuberg & Newsom, 1993, p. 113). Structure and order are sought to increase the perception that social and physical environments are less complex, nonrandom, and can be acted upon to produce desired and predictable results (see Kay et al., 2009). Seeking structure and order facilitates the capacity to make decisions and behave according to personal desires by reducing the psychological difficulty met in chaotic and unpredictable environments. I therefore hypothesized that, among those who were relatively low in financial wealth, the presence of money would cause a greater personal need for structure, and that this effect would be mediated by perceived control and autonomy.

**Hypothesis 1.** Self-perceived wealth will moderate the effects of money on personal control. Participants who are low in financial wealth and who are primed with money, compared to those who are not, will express lower personal control (Hypothesis 1a). Participants who are high in wealth and who are primed with money, compared to those who are not, will express higher personal control (Hypothesis 1b).

**Hypothesis 2.** Self-perceived wealth will moderate the effects of money on autonomy. Participants who are low in financial wealth and who are primed with money, compared to those who are not, will express lower autonomy (Hypothesis 2a). Participants who are high in wealth and who are primed with money, compared to those who are not, will express higher autonomy (Hypothesis 2b).
**Hypothesis 3.** Self-perceived wealth will moderate the effects of money on personal need for structure. Only participants who are low in financial wealth and who are primed with money, compared to those who are not, will express a higher personal need for structure.

**Hypothesis 4.** Personal control (Hypothesis 4a) and autonomy (Hypothesis 4b) will mediate money’s effect on need for structure. That is, money’s effects on need for structure will occur indirectly through money’s effects on autonomy and personal control. Mediations will be conditional on participants’ self-perceived wealth (moderated mediation).

**Method**

**Experiment 1 overview.** Experiment 1 examined whether personal control is reduced and need for structure increased by the mere presence of money in one’s environment. This study used a single between subjects factor with two conditions (money prime vs. control prime). All participants indicated their responses on self-perceived wealth, a continuous moderator variable. Subsequently, a series of dependent measures, including perceived control over life outcomes, competence, autonomy, and personal need for structure were measured.

**Participants.** One-hundred and nineteen students at the University of Guelph participated in this study on a volunteer basis (see results section for further demographic information). Given an alpha level of $p = .05$ and medium effect sizes, this sample size should provide a high probability (> .90) of rejecting the null hypothesis if the null hypothesis is false. Students in public locations on the University of Guelph campus (e.g., library, university centre) were approached by the researcher and were asked to participate in a brief computerized questionnaire (see script in Appendix A). An equal number of male and female participants were recruited by the researcher.

**Materials and procedure.**

**Instructions and informed consent.** Participants were seated in a public location on the university campus, but free from potentially distracting stimuli (e.g., loud sounds, other people). The study was described to participants as “a study of emotions and needs”. Participants were provided with a consent form (Appendix B), were verbally informed that all questionnaire responses would be confidential, and were informed of their rights as participants. Instructions
for completion of the questionnaire were verbally conveyed by the experimenter. Participants were subsequently asked to begin the survey by clicking a button in the survey window. The questionnaire consisted of five pages. After the completion of each page, participants were instructed to press a button labeled “next page” to proceed.

**Money and control prime.** Participants were primed with a money image or a control image while completing the questionnaire on an Apple MacBook computer. Participants were not informed that they were being primed until after their participation in the study was complete. In the money prime condition, the computer’s desktop background depicted scattered Canadian currency. In the control condition, the desktop background depicted garden scenery. The window in which participants completed the questionnaire covered only a portion of the area of the computer’s desktop. Specifically, the questionnaire window appeared in the bottom-center of the screen, with three inches of space between the top of the window and the edge of the screen and two inches of space on either side. Thus, primes were visible while participants completed the questionnaire (Appendix C). The size and placement of the window was constant for all participants.

**Demographics and measure of financial wealth.** Participants completed a series of demographics questions (Appendix D), among which participants were asked, “How would you describe your own current economic status?” Participants responded on a 7-point rating scale (1 = much less money than most, 7 = much more money than most). This single item functioned as a measure of self-perceived financial wealth.

**Perceived control and autonomy.** Within an established measure of affect, the 60-item Positive and Negative Affect Schedule (PANAS-X; Watson & Clark, 1991; Appendix E), I embedded eight additional words and phrases to measure participants current sense of autonomous and competent control over life outcomes: in control, powerful, free, independent, successful, confident, intelligent, and secure (α = .89). For each item, participants were asked to indicate, using a 5-point rating scale, “to what extent you feel this way right now” (1 = very slightly or not at all, 5 = extremely). Participants next responded to the Basic Need Satisfaction in Life Scale (Gagné, 2003; Appendix F), which was used to measure autonomy and competence. The autonomy subscale (6 items; α = .70) and competence subscale (7 items; α = .74) were of primary importance in this study, but the relatedness subscale (7 items; α = .74) was
also included. For autonomy, example items include, “I feel like I am free to decide for myself how to live my life” and “In my daily life, I frequently have to do what I am told” (reverse-coded). For competence, example items include, “Often, I do not feel very competent” and “I often do not feel very capable.” Participants responded on a 7-point rating scale (1 = not at all true, 7 = very true).

**Personal need for structure.** To test whether the presence of money leads to a desire for a simplified, more manageably structured life, participants completed the 12-item Personal Need for Structure Scale (α = .90; Thompson, Naccarato, & Parker, 1989; cited in Neuberg & Newsom, 1993; Appendix G). Examples of items include “I enjoy having a clear and structured mode of life” and “I don’t like situations that are uncertain”. Participants responded on a 6-point rating scale (1 = strongly disagree, 6 = strongly agree).

**Funnel debriefing.** Participants underwent a funnel debriefing to examine whether they had any suspicions regarding the true nature of the experiment (Appendix H; see Bargh & Chartrand, 2000). Funnel debriefing indicated that four participants had vague suspicions about a connection between the primes and the measures. These participants were not included in the analyses. Participants were then fully debriefed and thanked for their participation.

In addition, over the course of participation, seven participants re-sized the window in which the questionnaire was administered. As this changed the appearance of the prime stimulus, these participants were removed from the data set. Four participants spoke on a cell phone or interacted with a friend in person while completing the questionnaire, and four additional participants were noted to have difficulty with English as a second language. These participants were not included in the analyses. One-hundred participants remained in the final data set.

**Results**

**Preliminary analyses.**

**Missing data and exploratory data analysis.** No item had more than 2% of its values missing. Exploratory data analysis was implemented for all variables. No serious outliers were observed in the data. For each analysis, assumptions for Ordinary Least Squares (OLS) regression were tested (see Field, 2005). Within each model, errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors.
Demographics. Participants were 100 students (51 female; $M_{age} = 22.11$, $SD = 4.64$) at the University of Guelph. Seventy-seven percent of participants were born in Canada.

Primary Analyses.

Hypothesis 1 and 2: Does the presence of money affect personal control and autonomy? To test whether the money prime affected personal control and autonomy, and whether these effects were moderated by self-perceived financial wealth, I conducted three moderated multiple regressions (hypotheses 1 and 2). These analyses were conducted with (1) current sense of control over life outcomes, (2) competence, or (3) autonomy as dependent variables. In the first moderated multiple regression, the dichotomous independent variable, priming condition, was contrast-coded (money condition = 1; control condition = -1), and the continuous moderator variable, self-perceived financial wealth, was centered around zero (Aiken & West, 1991; the presence of money did not affect self-perceived wealth, $t < 1$). The dependent variable was sense of control over life outcomes. The analyses were conducted using PROCESS, a versatile add-on analysis tool for SPSS (Hayes, 2012). PROCESS computes the product term and analyzes the interaction and conditional effects in a single analysis, which avoids errors stemming from manual manipulation of the data to probe a significant interaction. In addition to significance testing, I conducted bias corrected and accelerated 95% confidence intervals (CIs) using 5000 bootstrapped samples. All assumptions for Ordinary Least Squares (OLS) regression were met (see Field, 2005). There was no multicollinearity between the predictors in the model, and errors were normal, independent, and homoscedastic. Main effects were not observed for the money prime or self-perceived wealth (see Table 1). There was, however, an interaction between self-perceived wealth and money on current sense of control, $B = -.15, p = .006, \Delta R^2 = .07, 95\% CI = .04, .27$. As the confidence interval did not include zero, evidence was provided for moderation. The pick a point approach to probing a significant moderation was conducted for conditional effects of the money prime at one standard deviation above and below the mean of self-perceived financial wealth (Aiken & West, 1991). In accordance with Hypothesis 1a, among participants who were relatively low in self-perceived wealth (i.e., one standard deviation below the mean), the presence of money predicted a lower sense of control, $B = -.29, p = .008, 95\% CI = -.50, -.08$ (see Figure 2). Contrary to hypothesis 1b, the presence of money did not predict sense of control at a relatively high level of self-perceived wealth, $B = .13, p = .21, CI = -.08, .35$. 
Table 1  
*Moderation of the Relationship between Money Prime and Control by Self-perceived Wealth*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B (SE)</th>
<th>95% CI</th>
<th>t</th>
<th>R² change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>-0.08 (0.08)</td>
<td>-0.23, 0.07</td>
<td>-1.04</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>0.03 (0.06)</td>
<td>-0.08, 0.14</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>Money Prime × Wealth</td>
<td>0.15 (0.06)</td>
<td>0.04, 0.27</td>
<td>2.79**</td>
<td>.07**</td>
</tr>
</tbody>
</table>

*Conditional Effects of Money Prime on Personal Control at +/-1 SD Self-perceived Wealth*

<table>
<thead>
<tr>
<th></th>
<th>B (SE)</th>
<th>95% CI</th>
<th>t</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+1 SD</td>
<td>0.13 (0.11)</td>
<td>-0.08, 0.35</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>-1 SD</td>
<td>-0.29 (0.11)</td>
<td>-0.50, -0.08</td>
<td>-2.71**</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05, **p < .01 (two-tailed).

*Figure 2.* Predicted scores on personal control as a function of money prime and self-perceived wealth. Visualized at 1 SD below (low wealth) and above (high wealth) the mean on self-perceived wealth.

Using the Johnson-Neyman technique for determining regions of significance, I found that money predicted sense of control for participants scoring less than .39 standard deviations below the mean, $B = -.16$, $p = .05$, 95% CI = -.32, .00, and greater than 1.88 standard deviations
above the mean, $B = .32, p = .05, 95\% CI = .00, .64$, on self-perceived wealth. For participants scoring under .39 standard deviations below the mean on self-perceived financial wealth, the presence of money predicted lower scores on sense of control. For participants scoring higher than 1.88 standard deviations above the mean on self-perceived financial wealth, the presence of money predicted higher scores on sense of control.

A second moderated multiple regression was conducted with competence (feeling capable of effectively controlling life outcomes) as the dependent variable. The dichotomous independent variable, priming condition, was contrast-coded (money condition = 1; control condition = -1), and the continuous moderator variable, self-perceived financial wealth, was centered around zero. All assumptions for Ordinary Least Squares (OLS) regression were met (see Field, 2005). There was no multicollinearity between the predictors in the model, and errors were normal, independent, and homoscedastic. Main effects were not observed for the money prime or self-perceived wealth (see Table 2). Contrary to hypothesis 1, self-perceived financial wealth did not moderate the effect of money on competence, $B = .09, p = .20, 95\% CI = -.05, .23$.

Table 2

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>$B (SE)$</th>
<th>$95% CI$</th>
<th>$t$</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>-0.12 (0.10)</td>
<td>-0.31, 0.08</td>
<td>-1.19</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>0.14 (0.07)</td>
<td>-0.002, 0.28</td>
<td>1.96*</td>
<td></td>
</tr>
<tr>
<td>Money Prime × Wealth</td>
<td>0.09 (0.07)</td>
<td>-0.05, 0.23</td>
<td>1.29</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p = .05, *p < .05, **p < .01 (two-tailed).

To examine hypothesis 2, a third moderated multiple regression was conducted with autonomy as the dependent variable. The dichotomous independent variable, priming condition, was contrast-coded (money condition = 1; control condition = -1), and the continuous moderator variable, self-perceived financial wealth, was centered around zero. All assumptions for Ordinary Least Squares (OLS) regression were met (see Field, 2005). There was no multicollinearity between the predictors in the model, and errors were normal, independent, and homoscedastic. Main effects were not observed for the money prime or self-perceived wealth (see Table 3). In
accord with hypothesis 2, self-perceived financial wealth moderated the effect of money on autonomy, $B = .14, p = .04, \Delta R^2 = .04, 95\% CI = .01, .27$. As the confidence interval did not include zero, evidence was provided for moderation. Consistent with hypothesis 2a, among participants who reported lower self-perceived wealth (one SD below the mean) the presence of money predicted lower scores on autonomy, $B = -.32, p = .01, CI = -.57, -.06$ (see Figure 3). Money condition did not predict autonomy at a high level of self-perceived wealth (one SD above the mean), $B = .06, p = .66, CI = -.20, .31$.

Table 3

*Moderation of the Relationship between Money Prime and Autonomy by Self-perceived Wealth*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>$B$ ($SE$)</th>
<th>$95% CI$</th>
<th>$t$</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>-0.13 (0.09)</td>
<td>-0.31, 0.05</td>
<td>-1.45</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>0.02 (0.07)</td>
<td>-0.31, 0.05</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Money Prime × Wealth</td>
<td>0.14 (0.07)</td>
<td>0.01, 0.27</td>
<td>2.06*</td>
<td>.04*</td>
</tr>
</tbody>
</table>

*Conditional Effects of Money Prime on Autonomy at +/-1 SD Self-perceived Wealth*

<table>
<thead>
<tr>
<th></th>
<th>$B$ ($SE$)</th>
<th>$95% CI$</th>
<th>$t$</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+1 SD</td>
<td>0.06 (0.13)</td>
<td>-0.20, 0.31</td>
<td>.45</td>
<td></td>
</tr>
<tr>
<td>-1 SD</td>
<td>-0.32 (0.13)</td>
<td>-0.57, -0.06</td>
<td>-2.48*</td>
<td></td>
</tr>
</tbody>
</table>

*p < .05 (two-tailed).*
Figure 3. Predicted scores on autonomy as a function money prime and self-perceived wealth. Visualized at 1 SD below (low wealth) and above (high wealth) the mean on self-perceived wealth.

Using the Johnson-Neyman technique for determining regions of significance, I found that money affected autonomy for participants scoring under .30 standard deviations below the mean, $B = -.19, p = .05, 95\% \text{ CI} = -.37, .00$, and did not reach significance at any level of high self-perceived wealth. For participants scoring less than .30 standard deviations below the mean on self-perceived financial wealth, the presence of money predicted lower scores on autonomy.

**Hypothesis 3: Does the presence of money affect personal need for structure?** To test whether the presence of money leads to an increase in personal need for structure among those who are low in self-perceived financial wealth, I conducted a moderated multiple regression. Contrast-coded priming condition (money vs. garden image), mean-centered scores on self-perceived wealth, and the product of the two were entered into a regression analysis predicting personal need for structure. All assumptions for Ordinary Least Squares (OLS) regression were met (see Field, 2005). There was no multicollinearity between the predictors in the model, and errors were normal, independent, and homoscedastic. Main effects were not observed for the money prime or self-perceived wealth (see Table 4). Consistent with hypothesis 3, self-perceived wealth moderated money’s effect on need for structure, $B = -.19, p = .005, \Delta R^2 = .08, 95\% \text{ CI} = -$
As the confidence interval did not include zero, evidence was provided for moderation. Among those who reported lower self-perceived wealth (one standard deviation below the mean), the presence of money predicted a significantly higher need for structure, $B = .45, p = .001, \text{CI} = .19, .71$ (see Figure 4). Money did not predict need for structure at a high level of self-perceived wealth, $B = -.09, p = .52, \text{CI} = -.35, .18$.

Table 4

*Moderation of the Relationship between Money Prime and Personal Need for Structure by Self-Perceived Wealth*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>$B$ (SE)</th>
<th>95% CI</th>
<th>$t$</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>-0.18 (0.09)</td>
<td>0.00, 0.36</td>
<td>1.96*</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>-0.02 (0.07)</td>
<td>-0.16, 0.11</td>
<td>-.36</td>
<td></td>
</tr>
<tr>
<td>Money Prime × Wealth</td>
<td>-0.19 (0.07)</td>
<td>-0.33, 0.06</td>
<td>-2.85**</td>
<td>.08**</td>
</tr>
</tbody>
</table>

*Conditional Effects of Money Prime on Need for Structure at +/-1 SD Self-perceived Wealth*

<table>
<thead>
<tr>
<th></th>
<th>$B$ (SE)</th>
<th>95% CI</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>+1 SD</td>
<td>-0.09 (0.13)</td>
<td>-0.35, 0.18</td>
<td>-.65</td>
</tr>
<tr>
<td>-1 SD</td>
<td>0.45 (0.13)</td>
<td>0.19, 0.71</td>
<td>3.40***</td>
</tr>
</tbody>
</table>

*p = .05, *p < .05, **p < .01, ***p = .001 (two-tailed).*
Figure 4. Predicted scores on personal need for structure as a function of money prime and self-perceived wealth. Visualized at 1 SD below (low wealth) and above (high wealth) the mean on self-perceived wealth.

Using the Johnson-Neyman technique for determining regions of significance, I found that money condition predicted need for structure for participants scoring under .01 standard deviations below the mean on self-perceived wealth, \( B = .18, p = .05, \) 95% CI = .00, .37, and over 2.66 standard deviations above the mean on self-perceived wealth, \( B = -.52, p = .05, \) 95% CI = -1.05, .00. For participants scoring under .01 standard deviations below the mean on self-perceived financial wealth, the presence of money predicted lower scores on need for structure. For participants scoring over 2.66 standard deviations above the mean on self-perceived wealth, the presence of money predicted higher scores on need for structure.

**Hypothesis 4: Does personal control mediate money’s effect on need for structure?** To test whether money affected personal need for structure indirectly through sense of control and autonomy, and whether this indirect effect is conditional on participants’ self-perceived financial wealth, I conducted two moderated mediation analyses, with (1) current sense of control and (2) autonomy as mediators in the respective analyses. To avoid limitations of traditional approaches to testing moderated mediation (Hayes, 2009), I employed statistical methodology and syntax presented in Hayes (2012). In the first moderated mediation, effects-coded priming condition
was entered as the independent variable, personal need for structure was entered as the
dependent variable, mean-centered current sense of control was entered as the mediator, and self-
perceived wealth was entered as the moderator of both the relationship between (1) priming
condition and personal need for structure (to test for a moderated direct effect), and (2) priming
condition and sense of control (to test for a moderated indirect effect). The 95% confidence
interval for the conditional indirect effect were derived using bias corrected and accelerated
bootstrapping (based on 5000 bootstrapped samples).

First, self-perceived financial wealth was expected to moderate an indirect effect of
money on personal need for structure through personal control (Figure 5). The interaction
between the presence of money and self-perceived financial wealth on sense of control was
significant, $B = -.15, p = .006, \Delta R^2 = .07$. However, when controlling for the effects of money
prime, self-perceived wealth, and their interaction on personal need for structure, sense of control
did not uniquely predict personal need for structure, $B = -.01, p = .94$. Furthermore, the indirect
effect of money prime on personal need for structure through sense of control was not
significant, indirect effect = .00, 95% CI = -.05, .03. Thus, contrary to Hypothesis 4a, the
presence of money did not indirectly affect personal need for structure through sense of control.

![Figure 5. Moderated mediation model for the conditional indirect relationship between the
money prime and personal need for structure through personal control (conditional on self-
perceived wealth).](image)

In the second moderated mediation, self-perceived financial wealth was expected to
moderate an indirect effect of money on personal need for structure through autonomy (Figure
6). The interaction between the presence of money and self-perceived financial wealth on
autonomy was significant, $B = .14$, $p = .04$, $\Delta R^2 = .04$. When controlling for money prime, self-perceived wealth, and their interaction, autonomy uniquely predicted personal need for structure, $B = -.24$, $p = .02$. Lower scores on autonomy predicted higher need for structure. Furthermore, the indirect effect of money prime on personal need for structure through autonomy was significant, indirect effect = -.03, 95% CI = -.091, -.003. As the 95% confidence interval did not include zero, evidence was provided for moderated mediation. The direct interaction between money prime and self-perceived financial wealth on personal need for structure remained significant when controlling for the indirect effect through autonomy, $B = -.16$, $p = .02$. As criteria for moderated mediation were met, I further examined the range of values of self-perceived wealth at which the presence of money predicted personal need for structure. Bias corrected and accelerated bootstrap confidence intervals (based on 5000 bootstrapped samples) were calculated at the 10th, 25th, 50th, 75th, and 90th percentiles of scores on self-perceived wealth for indirect effects. Confidence intervals indicated that autonomy mediated the relationship between the money prime and personal need for structure, but only among people of lower to medium self-perceived wealth (10th, 25th, and 50th percentiles; Table 5).

![Moderated mediation model](image)

*Figure 6. Moderated mediation model for the conditional indirect relationship between the money prime and personal need for structure through autonomy (conditional on self-perceived wealth).*
Table 5

*Conditional Direct and Indirect Effects of Money Prime on Need for Structure*

<table>
<thead>
<tr>
<th>Wealth Percentile</th>
<th>Effect (SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conditional Direct Effects of Money on Need for Structure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>0.50 (0.18)</td>
<td>2.84**</td>
<td></td>
</tr>
<tr>
<td>25th</td>
<td>0.34 (0.12)</td>
<td>2.76**</td>
<td></td>
</tr>
<tr>
<td>50th</td>
<td>0.18 (0.09)</td>
<td>1.94+</td>
<td></td>
</tr>
<tr>
<td>75th</td>
<td>0.02 (0.11)</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>90th</td>
<td>-0.14 (0.15)</td>
<td>-.94</td>
<td></td>
</tr>
<tr>
<td><strong>Conditional Indirect Effects of Money on Need for Structure through Autonomy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>0.10 (0.06)</td>
<td></td>
<td>0.02, 0.25‡</td>
</tr>
<tr>
<td>25th</td>
<td>0.07 (0.04)</td>
<td></td>
<td>0.01, 0.18‡</td>
</tr>
<tr>
<td>50th</td>
<td>0.04 (0.03)</td>
<td></td>
<td>0.0004, 0.11‡</td>
</tr>
<tr>
<td>75th</td>
<td>0.00 (0.03)</td>
<td></td>
<td>-0.05, 0.07</td>
</tr>
<tr>
<td>90th</td>
<td>-0.03 (0.04)</td>
<td></td>
<td>-0.14, 0.03</td>
</tr>
</tbody>
</table>

‡p = .05, *p < .05, **p < .01 (two-tailed). ‡significant indirect effect.

**Follow-up analyses.** To rule out possible effects on affect, I conducted moderated multiple regression to examine whether the presence of money affected the positive and negative affect subscales of the PANAS-X. Effects-coded money prime condition, Centered self-perceived wealth, and the product of the two were entered into a moderated multiple regression predicting positive affect. An equivalent analysis was conducted on negative affect. The money prime did not predict positive affect, $B = -.03, p = .67, 95\% CI = -.18, .11$. Self-perceived wealth did not predict positive affect, $B = -.04, p = .43, 95\% CI = -.06, .15$. I also found no interaction between money and perceived wealth on positive affect, $B = .08, p = .14, 95\% CI = -.031, .19$. Furthermore, the money prime did not directly predict negative affect, $B = .06, p = .24, 95\% CI =$
Self-perceived wealth did not predict negative affect, $B = -.06, p = .11, 95\% \text{ CI} = -.14, .01$. I also found no interaction between money and perceived wealth on negative affect, $B = .04, p = .36, 95\% \text{ CI} = -.04, .12$.

**Discussion**

Experiment 1 was the first known study to examine whether the mere presence of money can affect perceived control, autonomy, and personal need for structure. This was also the first study to examine if self-perceived financial wealth determines whether and how effects of money occur. Experiment 1 provided initial evidence that the mere presence of money causes people who are lower in self-perceived financial wealth to feel lower in autonomy and control over life outcomes. Consistent with hypothesis 1a, people who were relatively low in self-perceived wealth and who were primed with money, compared to those who were not primed with money, reported lower scores on a general measure of control over life outcomes. People who were relatively high in wealth were not significantly affected by the money prime; however participants who reported perceiving themselves as very wealthy (those scoring above 1.88 SDs from the mean on self-perceived wealth) reported significantly higher control over life outcomes (Hypothesis 1b). Contrary to hypothesis 1, a more specific test of competence, or the aspect of personal control that concerns perceived efficacy of one’s actions (Ryan, 1995), did not reveal a significant interaction between money and SES.

In accordance with hypothesis 2a, people who were relatively low in self-perceived wealth and who were primed with money, compared to those who were not primed with money, reported lower autonomy. Hypothesis 2b was not supported—the autonomy of those who were high in wealth was not affected by the money prime. Furthermore, consistent with hypothesis 3, among participants who reported lower self-perceived wealth, the presence of money caused a significantly higher need for structure. This conditional effect was found to be mediated by money’s conditional effect on autonomy. That is, autonomy mediated money’s effect on need for structure, but only among those people of relatively low self-perceived wealth. Below, I discuss interpretations of the findings, implications for further research, and limitations of Experiment 1.

The findings from this experiment align with my general view that money primes differentially affect people who are high and low in self-perceived wealth. Gino and Pierce (2009) loosely referred to the possibility that relative wealth might have some role in the effects
of money primes; however, this is the first experiment to investigate a moderating role of perceived wealth on money priming effects. Gino and Pierce found evidence that monetary cues cause a greater sense of envy. They argue that this is due to the perception of financial inequity in the social environment. Their research suggests people sense that they are at an economic disadvantage; however, they did not address whether participants’ own financial wealth had a role in their observations. My findings suggest that the presence of money in the environment does in fact cause some people—those who do not view themselves as wealthy—to sense a personal disadvantage, and that this disadvantage may manifest as a reduced capacity to self-determine behaviours and life outcomes.

My general measure of perceived control over life outcomes was adapted from an earlier study concerning money’s effects on reaction times toward wealth related words (Dupuis & Newby-Clark, 2011). The items target constructs that are related to personal control, some of which do not measure personal control per se (e.g., Ryan & Deci, 2000; Skinner, 1996; cf. Leotti et al., 2010); rather, they measure constructs that are associated with control, such as power and intelligence. This measure nevertheless functions as a first indication that money can threaten control related constructs among those who believe that they lack personal wealth. I found that people who are lower in self-perceived wealth felt less in control of self-determining life outcomes when they were primed with money versus when they are not. The same did not hold for people who were higher in self-perceived wealth. In fact, for those who were very high in self-perceived wealth, the opposite occurred—the presence of money led to a greater sense of control over life outcomes. These findings agree with previous research on chronic perceptions of lower social status. Previous research has shown that when people perceive that they are at a relative disadvantage in terms of social status, they perceive themselves to be lower in personal control (Kraus et al., 2009). Objective indicies of social status, such as family wealth and education, also tend to have small to moderate positive correlations with personal control (Gallo, Bogart, Vranceneau, & Matthews, 2005; Lachman & Weaver, 1998).

To further examine the specificity of money’s effects, I used established measures of competence and autonomy. These constructs are believed to be critical to the pursuit of self-determined goals (Ryan, 1995). Competence concerns one’s capacity to effectively manipulate the environment and to attain desired outcomes from it (Deci & Ryan, 2000). I opted to examine this aspect of personal control (i.e., agent-means aspect of control; see Skinner, 1996) because
the current theoretical perspective suggests that money impacts personal abilities and deficiencies related to lacking wealth, and not beliefs about the general controllability of outcomes, or the contingency between means and ends (see Literature Review section). Based on the current perspective, the presence of money should cause people of low wealth to feel less capable of manipulating the environment to get what they want. Contrary to my expectations, I found no money priming effects on participants’ sense of competence. However, I did find that money affected people’s sense of autonomy—the view that one’s behaviours are self-directed. People who were lower in self-perceived wealth believed that they had less autonomy when they were primed with money.

Why did money have a conditional effect on autonomy but not competence? The two constructs are generally considered to be distinct. Skinner (1996), for example, includes competence as an aspect of personal control and considers autonomy or the freedom to self-direct behaviour to lie outside of the construct of control proper. Competence beliefs or judgments concern the degree to which one has access to the means of controlling life outcomes. Autonomy involves the view that actions originate from the self, or that one has the freedom to initiate behaviour according to personal desires (Ryan, 1995). Autonomy, therefore, contrasts with externally-regulated behaviours (e.g., behaviours guided by reward and punishment), which may remain competently or effectively pursued, but may not necessarily be congruent with personal desires.

In short, money’s effects may specifically target the sense of freedom to behave according to self-direction. Having money may be conceived as allowing for greater freedom in one’s life and not having money may be conceived as a constraint on freedom. To consider an extreme example, whereas the very rich may have access to private islands and trips to Paris on a whim, the very poor are often limited to the boundaries of their own community, regardless of any yearnings to travel abroad. The wealthy entrepreneur may have the freedom to choose how to spend a work day, or even whether to get out of bed at all on a particular day. By comparison, those in jobs that offer a low upper limit on income, such as mail carriers and bus drivers, must complete specific tasks and follow specific schedules each day. Going to work depends not on one’s own choice, but externally controlled features of the job such as whether there are children to be driven to school or mail to be delivered on that particular day. People lacking financial resources may believe that their freedom to act according to desires is constrained by external
demands. This view is consistent with research on social power (a construct that is closely related to financial wealth), which finds that people who are low in power tend to feel more constrained by forces in the environment (e.g., Keltner et al., 2003).

Additional support for money’s effects on autonomy comes from the recent findings of Liu et al. (2012), who observed that people who were primed with money were threatened by others’ attempts to exert social influence. This threat led to reactance, or a tendency to behave in opposition to the social influence. Liu and colleagues imply that these effects stem from money’s activation of a motive to preserve threatened autonomy. However, they do not offer a clear rationale or direct evidence for money’s effects on autonomy. The current research finds the first direct evidence that autonomy may be affected by the presence of money, though specifically among those lacking financial resources. It remains unclear why Liu et al.’s effects were not conditional on participants perceived wealth (this issue will receive further commentary in the general discussion).

I also garnered the first evidence for money’s influence on the need to have order and structure in one’s life. Among participants who reported lower self-perceived wealth, the presence of money caused a significantly higher need for structure. Further, the moderated mediation analysis showed that money’s effects on autonomy among the non-affluent were partly responsible for money’s effects on need for structure. Structure and order are believed to be sought to increase the perception that acting in the social and physical environment will produce predictable and desirable results (see Kay et al., 2009). Structured environments may also help to foster a sense of autonomy by liberating one from the constraints on freedom of choice inherent in a chaotic and unpredictable environment. A structured and orderly environment can be desirable because it facilitates the capacity to make choices that are known to result in personally desirable outcomes. For example, choice is facilitated when people have relatively fewer options to choose from or when the array of choices is less psychologically demanding (Iyengar & Lepper, 2000). People are found to be more satisfied with their choices and are more intrinsically motivated when they have made decisions based on more manageable choice-sets. Disorderly or complex environments reduce the capacity for coherent choice. Greater structure and order in the environment may facilitate the ability to make decisions and behave in accord with personal desires by reducing the psychological difficulty in coping with too much information. For those people who are low in financial resources, the presence of
money seems to serve as a reminder that one is subject to environmental constraints on behaving according to personal goals. Thus, environments that lack structure should be threatening to people who are low in financial wealth.

This first experiment reveals some important outcomes of the mere presence of money, however there are important limitations to this study. First, the measure of self-perceived wealth may have inadvertently primed all participants with money to some degree. Participants were given the measure of self-perceived wealth toward the beginning of the questionnaire package; thus, all participants thought about their personal finances to some degree regardless of whether they were given the money desktop background. This may have caused the effects to be smaller than might have been expected if these questions were not included. That effects were observed regardless of this possible issue is encouraging. Nevertheless, in future studies, perceived wealth should not be measured during the experiment—instead, it should be measured during a pretesting phase. This practice will prevent participants in the control condition from being exposed to thoughts of money of any sort. This change was put into effect in Experiments 2 and 3. Second, the measure of subjective wealth I used was created specifically for the purposes of Experiment 1. I used a more established measure in Experiment 2. Third, for convenience, this study was conducted in various public locations, which resulted in the presence of numerous unwanted stimuli. I opted to move Experiments 2 and 3 to a more secure laboratory setting. Lastly, the monetary cue used in this experiment involved a means of priming that was unique to this study, whereby participants viewed the prime as a desktop background on the laptop computer carried by the experimenter. It is possible that this prime was qualitatively different from previous money primes, as participants may have believed the desktop background represented a conspicuous display by the experimenter (e.g., indicating that the experimenter highly valued or was highly interested in money and wealth). In later experiments, to avoid the possibility that participants implicitly compared themselves to the experimenter, I implemented a money prime that was either a part of the experiment itself (Experiment 2) or an incidental feature of the room in which the experiment took place (Experiment 3).

To summarize, this study made two main contributions to the understanding of the nonconscious effects of money. First, the mere presence of money appeared to affect people differently depending on whether they felt relatively low versus high in wealth. Second, for people who perceived that they were lower in financial wealth, the presence of money appeared
to cause lower autonomy and control over life outcomes, and a higher need for structure.
Numerous possible lines of research can be pursued to follow up on these findings. Particularly interesting is the possibility of motivational consequences for money’s effects on need for structure. Experiment 2 was designed to further investigate the relationship between money and the need for structure by examining whether the presence of money can affect the negotiation of well-structured and poorly-structured social contexts.

**Experiment 2: Does Handling Money Affect Orientations toward Structure Providing and Structure Reducing Products and Social Situations?**

In Experiment 2, I aimed to extend the empirical evidence that thinking about money can affect the need for structure. In Experiment 1, I found evidence that the presence of money causes people of lower self-perceived wealth to prefer a more simplified and manageable life. In Experiment 2, I asked whether monetary cues cause people to react differently toward structured and unstructured social environments. That is, I asked whether money can cause people to avoid unstructured and apparently chaotic social contexts, and whether such an effect can be diminished or reversed when structure is imposed on the environment. In this experiment, I measured participants subjective SES, primed them with money, and prompted them to think about a consumer product, the iPhone, as a device that either adds or removes life structure and order. I then asked participants a series of questions concerning their orientation toward the iPhone and preferences regarding engagement with other people using the product.

I chose to conduct Experiment 2 using a specific social context to build evidence for money’s effects on the desire for simple structure. Findings regarding need for structure in Experiment 1 are a starting point, as they suggest a number of possible cognitive and social effects of money. People who are higher in need for structure should “be particularly likely to arrange their social interactions in ways that enable them to avoid complexity and retain their simple structure” (Neuberg & Newsom, 1993, p. 127). Thus, the presence of money might cause people of low wealth to be negatively predisposed to, and exhibit avoidance of, situations that are lacking in structure.

The iPhone provides a unique and as yet unexplored context within which to examine the effects of money. Smartphones such as the iPhone have been characterized both as providing greater structure and order to life (e.g., organization of future life events; easy access to friends
and family) and as increasing complexity and reducing order in life (e.g., increasing contact with the full complexity of social networks; greater difficulty managing private information).

Following the need for structure findings of Experiment 1, priming participants of low perceived wealth with money should cause them to view owning and using the iPhone as detrimental if it is framed as reducing life structure. By contrast, money should cause people of high perceived wealth to perceive owning and using the iPhone as beneficial if it is framed as increasing life structure (see also Shepherd et al., 2011; study 2).

Furthermore, the effects on need for structure observed in Experiment 1 point to an interesting possible contributing factor to Vohs and colleagues’ (2006) self-sufficiency effects. Recall that Vohs et al. found that people behave with a preference toward private rather than social activities. Might people avoid interactions with others only when the environment is perceived as unstructured or disorderly? Many of Vohs et al.’s studies involved social environments that were relatively novel and involved interactions for which outcomes could not be predicted. As people who are higher in need for structure are found to be responsive to situations in which routine is expected and rules and outcomes are known (Neuberg & Newsom, 1993), money primes may have caused an aversion to uncertain social involvement. In this experiment, I aimed to examine whether the need for structure might help explain Vohs and colleagues’ intriguing findings. Thus, a key dependent measure concerned desire for social engagement via the iPhone. Specifically, does a money prime cause people to avoid social engagement with others via the iPhone when it is suggested to reduce life structure? Is this effect diminished when the iPhone is framed as helping people to maintain a structured and orderly life?

The use of smartphone specific social engagement provided an intriguing domain for studying money’s effects for several reasons. First, although researchers have investigated money’s effects on social engagement, no prior research has examined whether money affects social engagement via modern technologies such as social networking tools and other internet based communication. Second, as demonstrated in Shepherd et al. (2011), framing of the iPhone can be easily manipulated to affect the degree to which it is perceived as a structure and order providing device. Framing the device as creating order and disorder should bestow some degree of order versus disorder on all iPhone relevant activities, regardless of whether they are social (e.g., texting, email) or individual (e.g., listening to music). This allows for relatively clear
boundaries on the structured environment. For example, framing the iPhone as a structure providing device should not change one’s view of the order apparent in the natural world or in face to face communication. Third, I wanted to extend the exploration of money priming to a consumer relevant domain (see Liu et al., 2012 for another recent application). The presence of money coupled with the consumption relevant nature of the dependent variables creates a situation that is comparable to a common use of money, the purchasing of goods and services. If merely perceiving or handling money has effects on how people are oriented to consumer products, there may be several implications for real world situations. Furthermore, the iPhone 4S was scheduled to be released during the course of this study (October 14, 2012). This provided a unique opportunity to measure responses to a product that few people were in possession of and for which consumer anticipation was mounting.

Experiment 2 expands on Experiment 1 in further important ways. First, this experiment is unique in this program of research in its use of a considerably different money priming methodology—rather than merely being exposed to visual monetary cues (Experiment 1), participants directly handled simulated currency. In this experiment, money was primed using an apparent dexterity task, in which participants sorted Canadian bills into categories while engaging in a simple counting task. This task was similar to a task implemented by Zhou et al. (2009) and is discussed further in the methods section. Second, In this experiment, instead of using the measure of perceived wealth used in Experiment 1, I used an established measure of subjective SES, the MacArthur Scale of Subjective Social Class – Youth Version (Goodman et al., 2001). Third, in this study, the measure of SES was included in a pre-testing phase rather than during the experiment itself. This was done to remove any possible problems with the money prime affecting the responses on the SES measure, or the SES measure impacting responses on the dependent variables.

Design. To examine the outcomes of interest, I used a 2 (money vs. no money) × 2 (iPhone as structure-providing vs. structure-reducing) design, wherein participants were primed with money or not and were given either an article about either the structure-enhancing or structure-reducing nature of the iPhone. Three dependent variables were of primary interest: (1) the effect of hypothetical ownership of the iPhone on confidence in the self; (2) the desire for engagement with the iPhone; and (3) the desire for social engagement with others via the iPhone.
Three-way interactions were expected between money condition (money vs. no money), participants’ self-perceived SES, and iPhone framing condition (structure-providing vs. structure-reducing), such that people who are lower in perceived SES and who are primed with money, compared to those who are not, would have a more negative orientation toward the iPhone and iPhone related activities when its structure-reducing nature is salient, and a more positive orientation toward the iPhone and iPhone related activities when its structure-enhancing nature was salient.

**Hypothesis 1.** I expected a three-way interaction between money condition, self-perceived SES, and iPhone framing condition on confidence in the self. When the iPhone is framed as a device that reduces structure in one’s life, participants of low SES who are primed with money, versus those who are not primed with money, will indicate that they would feel less confident in the self if they owned the iPhone. This effect should be diminished among participants high in SES. The effect of money on confidence in the self among people low in SES is expected to be diminished or reversed when the iPhone is framed as a device that enhances life structure.

**Hypothesis 2.** I expected a three-way interaction between money condition, participants’ perceived SES, and iPhone framing condition on engagement with the iPhone 4S. When the iPhone is framed as a device that reduces structure in one’s life, participants of low SES who are primed with money, versus those who are not primed with money, will indicate a reduced desire for engagement with the iPhone. This effect should be diminished among participants high in SES. The effect of money on desire for greater engagement with the iPhone among people low in SES is expected to diminish or reverse when the iPhone is framed as a device that enhances structure in one’s life.

**Hypothesis 3.** I expected a three-way interaction between money condition, participants’ perceived SES, and iPhone framing condition on engagement with others via the iPhone 4S. When the iPhone is framed as a device that reduces structure in one’s life, participants of low SES who are primed with money, versus those who are not, will indicate a reduced desire for contact with others via the iPhone. This effect should be diminished or reversed among participants high in SES. The effect of money on desire for greater contact with others via the iPhone among people low in SES is expected to
diminish or reverse when the iPhone is framed as a device that enhances structure in one’s life.

Method

Participants and design. A total of 190 university students from the psychology participant pool at the University of Guelph participated in this study (see results section for further demographic information). Participants were remunerated with credit to their grade in an introductory psychology course. Given an alpha level of $p = .05$ and medium effect sizes, this sample size should provide a high probability (> .90) of rejecting the null hypothesis if it is false. This experiment used a 2 (priming manipulation: money vs. control) × 2 (iPhone framing manipulation: structure-providing vs. structure-reducing) between-participants design.

Materials and procedure.

Prescreening data collection: Socioeconomic status and financial wealth. Prior to participation in the current study, participants completed a question concerning socioeconomic status (SES) as part of a larger participant pool prescreening questionnaire. Subjective SES was measured using an adaptation of the MacArthur Scale of Subjective Social Class – Youth Version (Goodman et al., 2001; Appendix I). This measure asks participants to envision a 9-point scale as representing how Canadian society is set up. They are told, “To the left are families that are the worst off, have the least education, least money, and least respected jobs or no job. To the right are families that are the best off, have the most education, most money, and most respected jobs.” They are then asked to think about their own family and to indicate where they think their family would be situated on the scale. Participants respond to this single item on a 9-point scale (1 = “worst off, least education, least money, and least respected jobs or no job”, 9 = “best off, most education, most money, and most respected jobs”). The original version of the scale is represented visually as a vertical ladder with the top rung representing high SES and the bottom rung representing low SES (Goodman et al., 2001). However, as it was not feasible to include the ladder image in the online prescreening form, in the current adaptation of the scale, I opted to remove the ladder image in favour of a simple diagonal scale. The youth version of the scale measures familial SES compared to other families instead of one’s own SES as measured in the adult version of the scale. The youth version was used because first year university students (the majority of participants in this sample) tend not to be completely independent of
their families, do not generally have full time employment, and have not yet completed their own education. This measure has been used by Kraus et al. (2009), for example, as a measure of subjective SES among undergraduate students in research examining the relationship between SES and perceived control.

**Participant recruitment.** On the psychology participant pool website, the study was described to participants as, “A Study of Manual Dexterity, Memory, and Modern Technology”. Participants were further informed that, if they agreed to participate in this study, they would complete a manual dexterity and memory task in addition to a computerized questionnaire package that would take approximately 30 minutes in total. They were told that the study was to take place in a psychology lab and were provided with location details. Participants were blind to the experimental nature, the specific conditions, and the hypotheses of the study.

**Informed consent and familiarity with modern technology.** Upon being welcomed into the lab, participants were seated at a table and were asked to read and sign an informed consent form (Appendix J). Participants next completed a set of 12 questions concerning their familiarity with, interest in, and impression of modern technology (Appendix K). These questions were attached to the back of the consent form. Questions concerning the iPhone were adapted from Shepherd et al. (2011). Participants were asked to respond on a 9-point scale to the questions, “How familiar are you with the iPhone?”, “How interested are you in the iPhone?” (1 = Not at all, 9 = Very), and “What is your overall impression of the iPhone?” (1 = Very negative, 9 = Very positive). Participants were asked similar questions concerning Blackberry products, the Kindle e-book reader, and the Apple iPad, in order to disguise the study’s focus on the iPhone. Data concerning impression of the iPhone was collected to provide a check on the effectiveness of randomization of participants into conditions.

**Money and control primes.** Participants were next given a money prime or control prime (Appendix L). In the current study, instead of merely having money be present in the environment in the money prime condition, participants handled simulated money before completing further tasks. Participants in both conditions were informed that the task was an established measure of manual dexterity and memory. In front of money primed participants was a stack of 50 shuffled pieces of paper shaped like and printed with images of $50, $20, and $10 Canadian bills. The experimenter explained and gave a cover story for the task. Participants were
told that this was an established measure of manual dexterity and memory and that the task uses Canadian money because it is familiar to most people and can be easily distinguished into different values. Participants were then asked to complete two simultaneous tasks. First, they were asked to sort the bills into three piles as quickly as possible without making any errors. Second, as participants sorted the bills they were to count the $50 bills. The experimenter timed participants and recorded their times and count of the $50 bills. Participants in the control condition completed the same task with the exception that instead of money images, they received red, green, and purple sheets of paper. Sheets of paper in the control condition were matched for colour, shape, and size with the bills in the money prime condition. Participants were told that the task uses these specific colours because most people are found to easily distinguish them from one another.

This money prime was similar to a task used in Zhou et al. (2009; Experiment 3) in which participants in the money group counted out 80 $100 bills versus 80 pieces of paper. In the current study I introduced different values of currency and timed the task to disguise the money prime as a psychological measure to reduce possibility of participant suspicion.

**Questionnaire package.** Participants were next directed to a computer screen on an adjacent table. Participants were given one of two different computerized questionnaire packages. The questionnaire packages included, in order: (1) either (a) a fictional news article framing the iPhone as a device that enhances structure in people’s lives, or (b) a fictional news article framing the iPhone as a device that reduces structure in people’s lives; (2) a series of questions concerning feelings and behaviours related to the iPhone 4S; (3) demographics questions; and (4) additional questions concerning the fictional articles presented earlier in the questionnaire.

**iPhone framing manipulation.** Participants first received either a brief article discussing the ways the iPhone helps people to enhance structure and reduce disorder in their lives (Appendix M) or an article describing how the iPhone reduces structure and creates disorder (Appendix N). The articles were matched as closely as possible for content. Instructions on the page preceding the article read, “On the next page is a recent article from a Canadian news website. Please carefully read this article. After you are finished this questionnaire package, the
experimenter will ask you questions about the content and themes in this article. Please click 'next' when you would like to proceed to the article.”

**Article A: iPhone as structure providing.** On the following page, half of participants received an article describing the iPhone as enhancing structure in people’s lives. The article presented evidence from a fictional study revealing that, “people who were asked to use the iPhone for a month tended to think about and explain the world in a more structured and orderly way, compared with people who did not use the phone.” A leading researcher offers the view that, “smartphones like the iPhone structure the ways we keep in touch with others and lead to a more organized way of viewing the social world.” Furthermore, anecdotal evidence is provided from an interview with a university student. She states that, “When I finally got a cell phone, my life changed—I am now better able to organize my schoolwork and balance my social life.”

**Article B: iPhone as structure reducing.** The other half of participants received an article describing the iPhone as reducing structure in people’s lives. The article presented evidence from a fictional study revealing that, “people who were asked to use the iPhone for a month tended to think about and explain the world in a more complicated and disorganized way, compared with people who did not use a phone.” A leading researcher offers the view that, “Phone users’ awareness of others is spread over an overwhelming number of people who have different motives and express themselves differently, leading to an unstructured way of viewing the social world.” Furthermore, anecdotal evidence is provided from an interview with a university student. She states that life is, “bit more complicated—It takes more effort to keep engaged with all of the people in my life and to keep relationships organized.”

*iPhone ownership and positive feelings about the self.* Participants were then asked how owning the iPhone 4S would make them feel by rating on a 9-point scale (1 = Strongly Disagree, 9 = Strongly Agree) the following words and phrases: stable, good about myself, inspired, secure, ready to take on the world, creative, like the kind of person who can get things done (Shepherd et al., 2011). Scores on these items were averaged to form a seven-item composite of confidence in the self as a result of owning the iPhone 4S ($\alpha = .94$).

**Engagement with the iPhone.** Participants next completed a measure of iPhone engagement adopted from Shepherd et al. (2011). Participants were asked to rate on a 9-point scale (1 = Not at all, 9 = Very much) the extent to which they would engage in a series of
behaviours if they owned the iPhone 4S: “Spend time setting all of the options to meet my specific specifications and needs”; “Use it to get important things done throughout the day, like send emails, look up information online, etc.”; and “Load all of my music on it and create custom playlists”. Scores on these items were averaged to form a three-item composite measure of engagement with the iPhone. It is noteworthy that the reliability for this measure was relatively poor ($\alpha = .58$).

**Interpersonal engagement using the iPhone.** Participants next completed a measure of engagement with friends, family, and acquaintances via the iPhone. On a 9-point scale (1 = Not at all, 9 = Very much), participants were asked to rate the extent to which they would engage in a series of interpersonal behaviours using the iPhone 4S: “call friends and family”, “use social networking sites like facebook to keep in touch with friends and family”, “use social networking sites like facebook to keep informed or learn more about people you know”, “use social networking sites like facebook to view pictures or videos of people you know”, “send instant messages”, and “send emails”. Scores on these items were averaged to form a six-item composite measure of engagement with others via the iPhone ($\alpha = .81$).

Participants were also asked three questions concerning their engagement with others in the absence of the iPhone. On a 9-point scale (1 = Not at all, 9 = Very much), participants were asked to rate the extent to which they would engage in a series of interpersonal behaviours: “meet up with friends or family”, “meet new people”, and “attend events with other people (e.g., concerts, parties).” Scores on these items were averaged to form a three-item composite measure of engagement with others without the iPhone ($\alpha = .77$).

**Positive and Negative Affect.** Participants next completed a modified version of the PANAS-X (see Experiment 1; Watson & Clark, 1991). Instead of being asked to “indicate to what extent you feel this way right now,” participants were asked to indicate “how owning the new version of the iPhone (iPhone 4S) would make you feel.” Participants responded on a 9-point scale (1 = Not at all, 9 = Very much). Of primary interest were the 10-item positive affect scale ($\alpha = .93$) and the 10-item negative affect subscale ($\alpha = .91$).

**Demographics.** Participants received a series of demographics questions (e.g., age, gender; Appendix O), questions concerning ownership of an iPhone (“Do you own an iPhone”) and iPhone 4S (“Do you own an iPhone 4S”). Participants were also asked two questions
concerning perceptions of the article as emphasizing the iPhone as structure enhancing versus structure reducing. Participants were asked, “To what extent did the article present the iPhone as a device that adds structure to life?” (-4 = reduces structure, 4 = enhances structure), and “To what extent did the article present the iPhone as a device that leads to a disorderly or complicated life?” (-4 = reduces disorder, 4 = enhances disorder).

**Funnel and Oral Debriefing.** Funnel debriefing (see Experiment 1) revealed that four participants were somewhat suspicious of the money priming task and two participants were suspicious of the article manipulation. These six cases were excluded from all analyses. Lastly, participants were fully debriefed as to the true nature of the study and were thanked for their participation.

**Results**

**Preliminary analyses.**

**Missing data and exploratory data analysis.** No item had more than 2% of its values missing. Of the 184 participants, three had missing data on key variables. These participants were removed listwise from the data set. Exploratory data analysis was implemented for all variables. One case was removed due to a serious outlier on SES. No other outliers were observed and distributions were approximately normal.

**Demographics.** Of the remaining 180 participants in the data set, 104 were female and 76 were male (M_age = 18.59, SD = 1.20). One-hundred and fifty-eight participants were born in Canada (88.30%).

**Randomization check.** To check whether randomization of participants was successful, I applied a Multivariate Analysis of Variance (MANOVA) with subjective SES, familiarity with the iPhone, and overall impression of the iPhone as dependent variables and included priming condition (money vs. control) and structure manipulation as between-subjects independent variables. There were no significant effects for priming condition, Wilk’s λ = 1.00, F(4,173) = .15, p = .96, η_p^2 = .00, article manipulation, Wilk’s λ = .98, F(4,173) = .86, p = .49, η_p^2 = .02, or the interaction of the two conditions, Wilk’s λ = .98, F(4,173) = 0.92, p = .45, η_p^2 = .02. Further, no significant univariate effects were observed. As participants in different conditions did not
differ in subjective SES, or in familiarity, interest in, and impression of the iPhone, there was no evidence that randomization was unsuccessful.

**Structure manipulation check.** To check whether the article manipulation successfully framed the iPhone as structure enhancing versus structure reducing, I tested participants’ perceptions of bias in the structure enhancing and structure reducing articles. The dependent measure was a composite of two items asking whether the article presented the iPhone as (1) providing structure to life and (2) adding disorder and complication to life ($r = -.78, p < .001$). As expected, participants who received the structure article were significantly more likely to perceive the article as framing the iPhone as a structure enhancing ($M = 2.98, SD = 1.89$) device compared to participants who received the structure reducing article ($M = -2.08, SD = 1.78$), $t(179) = 22.57, p < .001$. Furthermore, perceptions of bias in both articles differed significantly from 0, which was the neutral value.

**Primary analyses.**

**Hypothesis 1: Does money affect whether the iPhone is a source of confidence?** To examine hypothesis 1, a three-way moderated multiple regression was conducted (Figure 7). Contrast-coded priming condition (money vs. control image), contrast-coded article condition (structure providing vs. structure reducing), mean-centered scores on SES, the three two-way product variables (money prime × SES; money prime × article condition; SES × article condition), and the three-way product variable (money prime × SES × article condition) were entered into a regression analysis predicting the iPhone’s impact on confidence in the self (Aiken & West, 1991). All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors in the model. No significant main effects or two-way interactions were observed (Table 6). The expected three-way moderation was not observed, $B = -.19, p = .18$, $\Delta R^2 = .01$, 95% CI = -.47, .09. Furthermore, no two-way interactions or main effects were observed.
Table 6
Moderation of the Relationship between Money Prime and the iPhone as a Source of Confidence by iPhone Framing Article and Self-perceived SES

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B (SE)</th>
<th>95% CI</th>
<th>t</th>
<th>R² change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>0.04 (0.14)</td>
<td>-0.24, 0.31</td>
<td>.28</td>
<td></td>
</tr>
<tr>
<td>Article Condition</td>
<td>0.12 (0.14)</td>
<td>-0.15, 0.40</td>
<td>.89</td>
<td></td>
</tr>
<tr>
<td>Perceived SES</td>
<td>0.19 (0.14)</td>
<td>0.08, 0.47</td>
<td>1.39</td>
<td></td>
</tr>
<tr>
<td>Money × Article</td>
<td>0.08 (0.14)</td>
<td>-0.19, 0.35</td>
<td>.58</td>
<td></td>
</tr>
<tr>
<td>Money × SES</td>
<td>0.05 (0.14)</td>
<td>-0.22, 0.33</td>
<td>.37</td>
<td></td>
</tr>
<tr>
<td>Article × SES</td>
<td>-0.19 (0.14)</td>
<td>-0.47, 0.08</td>
<td>-.17</td>
<td></td>
</tr>
<tr>
<td>Money × Article × SES</td>
<td>-0.19 (0.14)</td>
<td>-0.47, 0.09</td>
<td>-.18</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01 (two-tailed).

**Hypothesis 2: Does money affect engagement with the iPhone?** To examine hypothesis 2, a three-way moderated multiple regression was conducted (Figure 7). Contrast-coded priming condition (money vs. control image), contrast-coded article condition (structure providing vs.
structure reducing), mean-centered scores on subjective SES, the three two-way product variables (money prime × subjective SES; money prime × article condition; subjective SES × article condition), and the three way product variable (money prime × subjective SES × article condition) were entered into a regression analysis predicting engagement with the iPhone (Aiken & West, 1991). All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors in the model. Perceived SES significantly predicted desire to engage with the iPhone, $B = .33, p = .006, 95\% CI = .10, .59$. This effect was qualified by a two-way interaction between money prime and SES, $B = .27, p = .02, 95\% CI = .04, .50$ (Table 7). No other main effects or two-way interactions were observed. The two-way interaction between money prime and SES was not qualified by the predicted three-way interaction, $B = -.12, p = .30, \Delta R^2 = .01, 95\% CI = -.35, .11$.

Table 7

Moderation of the Relationship between Money Prime and Engagement with the iPhone by iPhone Framing Article and Self-perceived SES

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>$B (SE)$</th>
<th>95% CI</th>
<th>$t$</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>0.04 (0.12)</td>
<td>-0.19, 0.27</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Article Condition</td>
<td>0.01 (0.12)</td>
<td>-0.22, 0.24</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Perceived SES</td>
<td>0.33 (0.12)</td>
<td>0.10, 0.56</td>
<td>2.81*</td>
<td></td>
</tr>
<tr>
<td>Money × Article</td>
<td>0.19 (0.12)</td>
<td>-0.04, 0.42</td>
<td>1.67</td>
<td></td>
</tr>
<tr>
<td>Money × SES</td>
<td>0.27 (0.12)</td>
<td>0.04, 0.50</td>
<td>2.28*</td>
<td></td>
</tr>
<tr>
<td>Article × SES</td>
<td>-0.08 (0.12)</td>
<td>-0.01, 0.27</td>
<td>-.65</td>
<td></td>
</tr>
<tr>
<td>Money × Article × SES</td>
<td>-0.12 (0.12)</td>
<td>-0.35, 0.11</td>
<td>-1.04</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01 (two-tailed).

To probe this 2-way interaction, moderated multiple regression was conducted with money prime as the independent variable, self-perceived wealth as the moderator, and engagement with the iPhone as the dependent variable (Figure 8). Contrast-coded priming
condition (money vs. control image), mean-centered scores on subjective SES, and the product of the two were entered into a regression analysis predicting engagement with the iPhone (Aiken & West, 1991). I also controlled for article condition. All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic and there was no multicollinearity between the predictors in the model. This analysis confirmed that subjective SES moderated a money prime effect on engagement with the iPhone, $B = .28, p = .02, \Delta R^2 = .03, 95\% CI = .05, .51$. As the 95% confidence interval did not include zero, evidence was provided for moderation. Using the Johnson-Neyman technique for determining regions of significance, I found that money affected engagement with the iPhone for participants scoring under 1.84 standard deviations below the mean, $B = -.48, p = .05, 95\% CI = -.97, .00$, and over 1.08 standard deviations above the mean, $B = .34, p = .05, 95\% CI = .00, .68$, on subjective SES. For participants scoring less than 1.84 standard deviations below the mean on SES, the presence of money caused a decrease in engagement with the iPhone. For participants scoring greater than 1.08 standard deviations above the mean on SES, the presence of money predicted an increase in engagement with the iPhone.

![Figure 8. Engagement with the iPhone as a function of money prime and self-perceived SES. Visualized at 2 SDs below (low SES) and above (high SES) the mean on SES.](image)

**Hypothesis 3: Does money affect desire for engagement with others via the iPhone?** To examine hypothesis 3, a three-way moderated multiple regression was conducted (Figure 7). Contrast-coded priming condition (money vs. control image), contrast-coded article condition
(structure providing vs. structure reducing), mean-centered scores on SES, the three two-way interaction variables (money prime × subjective SES; money prime × article condition; subjective SES × article condition), and the three way interaction variable (money prime × subjective SES × article condition) were entered into a regression analysis predicting engagement with others via the iPhone (Aiken & West, 1991). All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors in the model. Perceived SES predicted engagement with others via the iPhone, \( B = .34, p < .01, 95\% \text{ CI} = .11, .56 \) (Table 8). No other main effects or two-way interactions were observed. However, the significant effect of SES was qualified by the predicted three-way moderation, \( B = -.24, p = .04, \Delta R^2 = .02, 95\% \text{ CI} = -.47, -.01 \) (Figure 9). As the 95% confidence interval did not include zero, evidence for moderation was observed. Probing this interaction, I found that subjective SES interacted with the money prime among participants for whom the iPhone was framed as a structure reducing device, \( B = .36, p = .03, 95\% \text{ CI} = .03, .69 \) (Figure 9a), but did not interact with the money prime among participants for whom the iPhone was framed as a structure enhancing device, \( B = .12, p = .46, 95\% \text{ CI} = -.43, .19 \) (Figure 9b). Thus, money only interacted with SES to affect the desire to engage with others via the iPhone when the iPhone was framed as a structure reducing device.
Table 8

*Moderation of the Relationship between Money Prime and Social Engagement via the iPhone by iPhone Framing Article and Self-perceived SES*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B (SE)</th>
<th>95% CI</th>
<th>t</th>
<th>(R^2) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>0.08 (0.11)</td>
<td>-0.14, 0.31</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>Article Condition</td>
<td>0.05 (0.11)</td>
<td>-0.17, 0.28</td>
<td>.47</td>
<td></td>
</tr>
<tr>
<td>Perceived SES</td>
<td>0.34 (0.12)</td>
<td>0.11, 0.56</td>
<td>2.93**</td>
<td></td>
</tr>
<tr>
<td>Money (\times) Article</td>
<td>0.01 (0.11)</td>
<td>-0.21, 0.24</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>Money (\times) SES</td>
<td>0.12 (0.12)</td>
<td>0.10, 0.35</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td>Article (\times) SES</td>
<td>-0.07 (0.12)</td>
<td>-0.30, 0.15</td>
<td>-.65</td>
<td></td>
</tr>
<tr>
<td>Money (\times) Article (\times) SES</td>
<td>-0.24 (0.12)</td>
<td>-0.47, -0.01</td>
<td>-2.09*</td>
<td>.02*</td>
</tr>
</tbody>
</table>

*Conditional 2-way interactions between Money Prime and SES*

| Low Structure              | 0.36 (0.17) | 0.03, 0.69  | 2.16* |                |
| High Structure             | -0.12 (0.16) | -0.43, 0.19 | -.74  |                |

\*p < .05, \**p < .01 (two-tailed).
Examining the conditional 2-way interaction observed among participants for whom the iPhone was framed as a structure reducing device, I found that when people who are high and low in SES (+/- 1 SD) are primed with money, they differed in the degree to which they wished to engage socially with others via the iPhone, $B = .77, p = .001, 95\% \text{ CI} = .30, .124$. When the iPhone was framed as a structure reducing device and people of high and low SES were primed with money, those who were high in SES preferred greater engagement with others compared to those who are low in SES. This difference was not present between participants of high and low SES when they were not primed with money, $B = .05, p = .84, 95\% \text{ CI} = -.41, .51$.

Furthermore, whereas people of high versus low SES (+/- 1 SD) who were primed with money differed in the degree to which they wished to engage with others via the iPhone in the structure reducing condition, $B = .77, p = .001, 95\% \text{ CI} = .30, .124$, people of high versus low SES who were primed with money did not differ from each other in the structure enhancing condition, $B = .14, p = .61, 95\% \text{ CI} = -.32, .61$ (compare solid lines in Figure 9). However, this conditional two-way interaction between SES and structure condition did not reach significance, $B = -.31, p = .06, 95\% \text{ CI} = -.65, .02$. 

Figure 9. Social engagement via the iPhone as a function of money prime, perceived SES, and iPhone as structure providing versus structure reducing. Visualized at 1 SD above and below the mean on SES.
Follow-up analyses. I have demonstrated that the framing of one’s social environment can affect whether money has an effect on desired social interaction within that environment. However, I have yet to examine whether a similar effect is present outside of the relevant social environment. A lack of an effect would demonstrate the specificity of the effect to the unstructured social circumstance. That is, money prime, SES, and iPhone structure framing should not interact to affect social interactions that do not involve the iPhone. A three-way moderated multiple regression was conducted. Contrast-coded priming condition (money vs. control image), contrast-coded article condition (structure providing vs. structure reducing), mean-centered scores on SES, the three two-way interaction variables (money prime × subjective SES; money prime × article condition; subjective SES × article condition), and the three-way interaction variable (money prime × subjective SES × article condition) were entered into a regression analysis predicting social engagement in the absence of the iPhone. All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors in the model. Article condition predicted desire to interact with others in the absence of the iPhone, $B = -.28, p = .03$, 95% CI = -.53, -.02. People who were given the iPhone reduces structure article ($M = 6.12, SD = 1.79$) desired more interaction without the iPhone compared to people who received the iPhone enhances structure article ($M = 5.57, SD = 1.59$). No two-way interactions were observed between any of the independent variables. The three-way interaction between money prime, subjective SES, and article condition was not observed, $B = -.07, p = .54, \Delta R^2 = .00$, 95% CI = -.30, .16.

Were positive and negative affect associated with owning the iPhone 4S affected by the experimental manipulation? To examine this possibility, two three-way moderated multiple regression was conducted. Contrast-coded priming condition (money vs. control image), contrast-coded article condition (structure providing vs. structure reducing), mean-centered scores on subjective SES, the three two-way interaction variables (money prime × subjective SES; money prime × article condition; subjective SES × article condition), and the three-way interaction variable (money prime × subjective SES × article condition) were entered into a regression analysis predicting either positive or negative affect associated with owning the iPhone 4S (Aiken & West, 1991). For positive affect, no two-way interactions or main effects were observed. The three-way interaction was also not observed, $B = -.17, p = .13, \Delta R^2 = .01$, 95% CI = -.25, .01.
95% CI = -.39, .05. Furthermore, for positive affect, no two-way interactions or main effects were observed. The three-way interaction was also not observed, $B = .02$, $p = .85$, $\Delta R^2 = .00$, 95% CI = -.15, .18.

**Discussion**

In Experiment 2, I simultaneously followed up on money’s effects on need for structure observed in Experiment 1, examined the relevance of money priming within the financially relevant domain of consumer behaviour, and tested an explanation of the previously observed effects of money on disengagement from the social world (e.g., Vohs et al., 2006). Based on the findings in Experiment 1, I expected people of relatively low SES who were primed with money to have a negative orientation toward a product when it is noted to reduce order in one’s life, and to avoid social situations as they are characterized by complexity and disorder. To examine whether the lack of structure is critical to reducing social engagement, I also included a condition in which the iPhone was noted to increase the orderly nature of living. I expected that money’s effects on those who were low in wealth would be diminished when the iPhone was noted to provide structure and order compared to when it noted to reduce structure and order.

Experiment 2 provided evidence that money’s consequences for social engagement depend on whether the social environment is perceived as reducing versus increasing life structure. In accord with hypothesis 3, I observed a three-way interaction between money prime, SES, and iPhone structure condition. Participants’ SES and the presence of money only interacted to affect engagement with others via the iPhone when the iPhone was noted to reduce life structure. Perceived SES, the money prime, and their interaction had no effects on engagement with others when the iPhone was presented as enhancing life structure. When the iPhone was noted to reduce life structure and people were primed with money, those who were low in SES, compared to those who were high in SES, desired less social contact via the iPhone. By contrast, when the iPhone was noted to reduce life structure and participants were not primed with money, people of high and low SES did not differ in the desire to interact with others via the iPhone. Furthermore, money prime, SES, and iPhone structure condition did not interact to affect social engagement with others outside of the iPhone context. This makes sense: when people escape the specific context of the disorderly social environment, the threat to structure is removed and they can engage with others freely.
Vohs and colleagues (2006) found direct effects of money on outcomes related to social engagement with others. For example, the presence of money led to a reduced desire to partake in leisure activities with others and a reduced tendency to help others when they were in need. The current study builds on this previous research by finding evidence of personal and environmental conditions that function to augment and mitigate money’s effects on withdrawal from the social world.

First, as in Experiment 1, I demonstrated that people’s relative financial situation was a critical factor in determining how people react to their social environment. When the social context lacks structure and people are primed with money, those who are high and low in SES appear to differ in their desire to interact with others. Compared to those who were relatively low in SES, those who are high in SES desired greater social contact when in the presence of money. As Vohs and colleagues (2006) did not measure SES or wealth in their studies it is impossible to establish whether their participants were generally high or low in perceived SES. Future research is therefore necessary to determine whether their specific effects are conditional on participants’ SES. This study offers the first indication that this might be the case.

Second, the presence of money does not seem to affect the desire to interact with others when the social environment is structured and orderly in nature. Many of Vohs and colleagues’ findings occurred in social environments that were relatively novel and involved interactions for which expected outcomes could not be deciphered. For example, in one experiment, participants were primed with money or not and were given an impossible puzzle task. Those primed with money worked for longer without asking for help from the experimenter. It is possible that help was avoided for longer because participants were avoiding the uncertainty surrounding what it meant to ask for assistance in this novel scenario. Furthermore, because the task and situation in general were novel and uncertain for participants, the entire situation may have been somewhat threatening. That is, participants may have had trouble determining what they could expect of the situation. However, as the current findings concern a context that is quite different from those used by Vohs and colleagues, I can only speculate on the relations between the respective findings. Future research might seek to more closely replicate the findings of Vohs et al. while manipulating the structure of the situation.
Contrary to hypothesis 2, I did not see a three-way interaction between money prime, SES, and iPhone structure condition on participants’ engagement with the iPhone itself. However, a two-way interaction showed that the money prime did interact with SES to affect engagement with the iPhone. When primed with money, versus not, those participants who were lower in SES desired to use the iPhone 4S less. By contrast, when participants were primed with money, compared to when they were not, those who were high in SES desired greater engagement with the iPhone 4S. According to this interaction, people who are lower in SES may disengage from the material world as well as the social world when primed with money. However, as this interaction was not conditional on whether the iPhone was framed as reducing life structure, an interpretation of this effect is difficult.

It is possible that those low in SES exhibited a preference to avoid the iPhone 4S, regardless of whether it was presented as structure enhancing or reducing, because the product itself was new and its operation relatively unfamiliar. Furthermore, the iPhone and smartphones in general may be conceived as highly complex products in that their uses are extremely varied. People who are lower in SES may avoid the iPhone when primed with money in order to avoid its inherent complexity. Future research might examine whether monetary cues can cause people to approach or avoid (1) brand new products because their functioning is uncertain, and (2) complex products because their functions offer an overload of options or choice (see Iyengar & Lepper, 2000). Moreover, the structure framing may not have interacted with the other independent measures to affect use of the iPhone because the framing was oriented in particular to the iPhone’s structuring of the social world, not the private world.

No findings supported money’s effects on owning the iPhone as a source of, or a detriment to, confidence in the self (Hypothesis 1). Notably, in Experiment 1, I failed to demonstrate that money affects people’s level of competence or their personal sense of efficacy. In Experiment 2, I failed to demonstrate that people primed with money suffer lower confidence in an environment that lacks structure or experience heightened confidence when the environment is highly structured. This contrasts with the effects of Shepherd et al. (2011) who found that when people’s control was threatened, they experienced greater confidence in the self when the iPhone was framed as helping to structure one’s life. Thus, personal control per se may not be affected by the mere presence of money. This tentative conclusion will receive further attention in Experiment 3 and in the General Discussion.
**Implications.** Experiment 2 suggests intriguing consequences for the real world. First, there are some money relevant activities that are inherently unstructured. The stock market serves as an example of an apparently chaotic environment in which money is perpetually salient. That is, money and disorder are forever coupled. Does the salience of the stock market cause people to become more or less socially active depending on relative SES? Does losing versus gaining large sums of money in the stock market (a natural manipulation of relative financial wealth) have different impacts on interpersonal behaviour? Exposure to news stories related to global and national economic crises might also simultaneously prime money and disorder. Particularly among those low in wealth, the apparent chaos in these financially relevant domains may result in the motivation to simplify or altogether avoid the social world.

Research has found that, under conditions of greater problem complexity, people avoid thinking and learning about urgent social issues (Shepherd & Kay, 2012). For example, people avoided learning more about an urgent oil shortage when the problem was perceived as more versus less complex. As people of lower wealth appear to avoid complexity and chaos when money is salient, the avoidance of complex economic issues (e.g., management of personal finances; global and national economic crises) may be more extreme among those who are lower in self-perceived wealth. Among the relatively poor, the counterintuitive avoidance of monetary issues that require more attention (i.e., those that are more complex or difficult to understand) could hinder learning about important financial matters. This can possibly lead to a cycle of financial woes. Thus, a promising future line of research may examine how people who are high and low in wealth respond to economic issues of high versus low complexity.

Consumer environments may also serve as reminders of money. It may be possible that people of lower SES are attracted to familiar stores because there is a comfort in the structure and predictability that they entail. Numerous well-known chains, such as the Gap, Foot Locker, and Walmart offer a brand and/or shopping environment that is the similar, if not identical, at every location—shoppers know what to expect from the environments and from their interactions with store clerks. Does the expectation of structure in the consumer realm appeal to those of lower SES? By contrast, might the expectation of novelty and uncertainty in a shopping environment (e.g., independent boutiques, farmer’s markets) appeal to those of higher SES?
This may apply similarly to products and services. When large sums of money are salient—for instance, when products and services are relatively costly (e.g., motor vehicles; vacations)—does the importance of structure and certainty cause those of lower SES to prefer tried and true products and those products that are made familiar through heavy advertising? Furthermore, when made to think about money, people of lower SES compared to those of higher SES may see more use for practical products, which may be perceived as simplifying or ordering life (e.g., mini-van vs. sports car). By contrast, when primed with money, people higher in SES may prefer purchases that are less certain and orderly such as vacations to remote parts of the world, or products that currently have elements of novelty or the unknown (e.g., the iPad, e-book readers, self-parking vehicles). Still, more investigation is needed, as the current study mainly supports the effects of structure and order on responses to specifically social aspect of the iPhone.

Broadly speaking, this study adds further evidence that people’s own financial status is important to money’s automatic and nonconscious effects. Experiment 3 takes this idea in another direction while returning to the question of money’s effects on autonomy and personal control. In Experiment 3, I made predictions about money’s effects on belief in and support for specific sources of external control, the Canadian government and a controlling god.

**Experiment 3: Does the Mere Presence of Money Affect Belief in a Higher Power and Support for the Government?**

But remember the Lord your God, for it is he who gives you the ability to produce wealth.

*Deuteronomy 8:18*

Experiment 3 was designed to examine whether money activates a motive to gain compensatory control or, alternatively, a motive to preserve autonomy among those low in self-perceived financial wealth. To do so, I examined whether the presence of money is causally related to defence of, or alternatively, defence against, controlling external agents. Recent research finds that temporarily induced deficiencies in personal control cause people to seek compensatory control through external sources such as institutions, politics, and the religious or spiritual world (Kay, Gaucher, McGregor, & Nash, 2010; Kay et al., 2009). If the presence of money causes a reduced sense of control, it is similarly possible that the mere presence of money
causes the activation of compensatory control processes. However, if money causes people who are lower in wealth to feel deficient in autonomy when primed with money, they may be motivated to protect or attain the freedom to self-determine behaviour (see also Liu et al., 2012). If the autonomy view is correct, money may causes people to avoid or dismiss specific sources of external control—particularly those that can be perceived as restricting one’s autonomy (e.g., a controlling god or an authoritarian government; e.g., Soenens et al., 2012). To simultaneously examine these two possible consequences of monetary cues, I devised an experiment that pits against each other alternate expectations stemming from (1) a compensatory control viewpoint versus (2) an autonomy motive perspective. This study also extends the money priming literature by seeking the first evidence of a causal relationship between the presence of money and the endorsement of sociopolitical systems and religious belief. Expectations for the two competing views are presented below.

**Compensatory control in external systems.** According to Kay, Gaucher, Napier, Callan and Laurin (2008), loss of personal control is causally related to the defense of external systems that can function as sources of perceived structure and order (see Kay et al., 2009). Kay et al. (2008) found that experimentally inducing a lack of control led to the heightened reporting of a belief in a controlling god and greater endorsement of controlling sociopolitical institutions. For example, those participants who were made to feel lacking in control, compared to those who were made to feel in control, reported greater belief in a god when referred to as a controller, but not when the god was referred to only as a creator. Perceiving the existence of a controlling god “can provide confidence that events, good or bad, do not just happen by ‘chance’ or ‘fortune’ but are controlled or willed, even if not by the self” (Kay et al., 2010, p. 38). Other external systems can similarly function as sources of confidence that events are nonrandom or based on chance. For example, experimentally lowered personal control causes greater support for the government and resistance to changing the government (Kay et al., 2008). By contrast, Shepherd and Kay (2009; cited in Kay et al., 2010) demonstrated that increasing people’s personal control led to greater criticism of the government.

Kay et al. (2009) state that the effect of lacking personal control on the desire for greater structure, perception of illusory patterns in the environment (e.g., Whitson & Galinsky, 2008), and the defense of external control providing systems (e.g., Kay et al., 2008) stem from the same need to believe that the world is an orderly and structured place. According to Kay et al. (2008),
the belief in structured external systems serves not to maintain a sense of personal control, but a broader need to perceive things as under control in a general sense. That is, external systems or forces can provide a sense of structure and order to life where personal control is lacking (Kay, Shepherd, Blatz, Chua, & Galinsky, 2010). These sources of control are conceived as interchangeable—when personal control is threatened, people rely on external sources of control and vice versa (Kay et al. 2010). Furthermore, when one external source of control is threatened, people tend to bolster other external sources of control. For example, people who were made to feel less confident that there was a god or other higher power controlling things on Earth subsequently had greater confidence in the Canadian government (Kay et al., 2009).

Compensatory control hypotheses. If money functions as a threat to personal control, it should activate the motive to pursue compensatory control strategies (see Kay et al., 2009). According to this view, among those who are low in perceived wealth, money should heighten support for government systems and belief in a controlling god. Some evidence for money’s relationship with religious belief comes from archival research demonstrating that, during economic downturns, the rate of conversion into highly ordered religious groups increased, the rate of conversion into religious groups characterized by low levels of order decreased, and there was a general increase in interest in the topic of supernatural imposition of order, as measured by number of books published on the topic (Sales, 1972, 1973). Kay and colleagues (2008) suggest that Sales’ findings stem from a lack of perceived control induced by economic difficulties. Kay et al.’s own research shows that experimentally inducing a lack of control can lead to increases in belief in a controlling god; however, they do not show that comparable effects can stem from an economically relevant source.

First, I hypothesize that, among those who are lower in self-perceived wealth, the mere presence of money will result in greater support for external systems that provide society with greater structure, as measured by endorsement of the current government system. Second, I hypothesize that participants of lower perceived wealth who are primed with money will express greater belief in a controlling god. Confirmation of these hypothesis would support the view that thinking about money threatens personal control and can result in compensatory control processes.
Importantly, measuring two distinct sources of external control allowed me to test a hydraulic model of compensatory control (Kay et al., 2010). According to a hydraulic model of compensatory control, an intervening opportunity to attain compensatory control (e.g., support for the government) should cause future opportunities in other domains (e.g., belief in religious figures) to become superfluous. Therefore, people who are primed with money, and who are immediately given information about the capacity for the current government to intervene, are not expected to subsequently exhibit greater belief in a controlling god. That is, their need to seek compensatory control through belief in god should be sated after being given an opportunity to affirm confidence in the Canadian government, an alternate external source of control.

*Compensatory Control Hypothesis 1.* Among participants who are lower in self-perceived wealth, those who are primed with money, compared to those who are not, will exhibit greater confidence in the current Canadian government. This relationship was expected to be weaker or reversed for those who are high in wealth.

*Compensatory Control Hypothesis 2.* Among participants who are lower in self-perceived wealth, those who are primed with money, compared to those who are not, will express greater belief in a controlling god. This relationship was expected to be diminished or reversed among those who are high in wealth. However, among low wealth participants who are primed with money and who are given an intervening opportunity to defend the current government, subsequent reports of belief in a controlling god should be diminished.

**Autonomy and external control.** According to Experiment 1, the presence of money reduces autonomy among those low in self-perceived wealth. Liu and colleagues (2012) found additional evidence that autonomy is threatened by the presence of money. They demonstrated that a money prime caused participants to engage in reactance to instances of social influence, whereas participants who were not primed with money complied with instances of social influence. Thus, money appears to cause people to behave in line with a motive to gain autonomy.

Autonomy is conceived as a basic psychological need (Deci & Ryan, 2000). As such, people should avoid threats to and seek support for a sense of autonomy when motivated to do so (Sheldon & Gunz, 2009). When in direct opposition to one’s ability to behave with self direction,
sources of external control can be threatening to autonomy (Chartrand et al., 2007; Ryan, 1995). For example, if another’s attempt at social influence is perceived as impinging on one’s autonomy, one may feel threatened, prompting psychological reactance—a response that can oppose the intentions of the influence agent (Brehm, 2000; Liu et al., 2012). Reactance “is a motivational state defined conceptually as an impulse to restore behavioral freedoms that are perceived to have been threatened or lost” (Brehm, 2000, p.10). Reactance to controlling others has been observed in close relationships. For example, Chartrand et al., (2007; Study 1) found that when participants were primed with the name of a controlling friend who wished for them to work hard, they did more poorly on an anagram task compared to when they were primed with a controlling friend who wanted them to have fun.

Can other controlling agents, such as a controlling god, function as sources of threat to autonomy? Considering that the opposite of autonomy “concerns feeling compelled or controlled in one’s behaviour” (La Guardia & Patrick, 2008, p. 202), it would not be surprising to find that, when autonomy is threatened, people avoid belief in a controlling god and express low support for excessively controlling or authoritarian governments. Soenens et al. (2012) state that a controlling god may be conceived similarly to a controlling relationship partner. Such a god might impose views, rely on pressuring tactics (e.g., punishments and rewards), and respond in a critical and evaluative manner. This conception of a higher power may be resisted by people who are motivated to gain the freedom to act on personal choice and not be controlled by external forces. Furthermore, Laurin, Kay, and Fitzsimons (2012) found that thoughts about God can undermine the motive to pursue goals on one’s own. Laurin and colleagues suggest that this occurs because God is conceived by many as a controlling being. If thinking about god undermines active goal pursuit, it stands to reason that, when one is motivated to protect or gain a sense of autonomy, the idea of a controlling god should be resisted.

**Autonomy hypothesis.** If money causes people to protect or attain a sense of autonomy, people who are lower in self-perceived wealth and who are primed with money should resist belief in a controlling god. Money’s effects among those who are higher in wealth are expected to be diminished by comparison.

No autonomy hypotheses were made for government support. Whether or not the Canadian government supports the autonomy of its citizens can be considered quite ambiguous
and depends on the life domain of interest. For current purposes, it may suffice to say that, as it is not particularly authoritarian it is likely not a prominent threat to the autonomy of Canadian citizens and, therefore, support for the government should not be affected by the presence of money in this particular instance.

Method

Participants and design. A total of 169 university students from the psychology participant pool at the University of Guelph participated in this study (see results section for further demographic information). Given an alpha level of \( p = .05 \) and medium effect sizes, this sample size should provide a high probability (> .90) of rejecting the null hypothesis if it is false. Participants were remunerated with credit to their grade in an introductory psychology course. This experiment used a 2 (priming manipulation: money vs. control) \times 2 \) (article manipulation: government control vs. meaningful culture) between-participants design. I first primed participants with money or not. I then provided participants with either information concerning the capacity for the current government to control crime in Canadian society (to prime the Canadian government’s capacity for societal control) or an alternative filler article. Participants given the government control article were then asked questions about their confidence in the Canadian government. I then provided all participants with the opportunity to express their belief in an intervening god.

Materials and procedure.

Prescreening data collection: Self-perceived financial wealth. Prior to participation in the current study, participants completed a question concerning financial wealth as part of a larger participant pool prescreening questionnaire. Participants were asked to rate their own financial wealth relative to other university students: “How would you describe your own current economic status compared to other university students?” Participants responded on a 9-point scale (1 = “much less money than most”, 9 = “much more money than most”). Importantly, this measure was taken well before the experiment took place and as part of a separate questionnaire package to remove the possibilities of (a) the money prime affecting ratings on self-perceived wealth, or (b) the measure of self-perceived wealth affecting any dependent measures at the time of the experiment. With the latter concern in mind, the questionnaire was carefully constructed so as to remove any reference to finances. Furthermore, the current measure of self-perceived
wealth differed from the one used in Experiment 1 in that it asked participants to self-rate relative to other university students rather than people in general.

**Participant recruitment.** On the psychology participant pool website, the study was described to participants as “A Study of Self, Beliefs, and Political Views.” Participants were further informed that, if they agreed to participate in this study, they would complete a series of computerized tasks and questionnaires that would take approximately 30 minutes in total. They were told that the study was to take place in a psychology lab and were provided with location details and asked to choose a timeslot if they chose to participate. Participants were blind to the experimental nature, the specific conditions, and the hypotheses of the study.

**Money and control primes.** Participants were welcomed into the lab and were seated in front of either a money prime image (Appendix P) or a control image (Appendix Q) in the form of a poster positioned on the wall. Participants in the money prime condition were seated at a desk in front of a poster exhibiting Canadian currency (10, 20, & 50 dollar bills). Control participants were seated in front of an abstract image unrelated to money but incorporating similar shapes and coloration to that of the money poster. The posters were positioned on the wall directly above the computer screen used for the administration of the questionnaire packing for this experiment, so that the primes were visible throughout completion of the questionnaire package.

**Informed consent and questionnaire package.** Upon being seated, participants were asked to read and sign an informed consent form (Appendix R). They were then asked to turn their attention to the computer in front of them.

Participants were given one of two slightly different questionnaire packages. Participants received the following, in order: (1) a scrambled sentence task; (2) either (a) an article emphasizing the controlling nature of the Canadian government followed by a measure of support for the current government, or (b) an article discussing Canadian culture followed by a measure of identification with Canadian culture; (4) a measure of belief in the existence of a controlling god; (5) an established measure of affect (PANAS-X; Watson & Clark, 1991); and (6) a demographics form.
**Scrambled sentence task.** Participants first completed an irrelevant scrambled sentence task in which they were asked to form four word sentences from sets of five scrambled words on the computer screen (Appendix S; see Bargh & Chartrand, 2000). The task consisted of 30 scrambled sentences (e.g., “*him was worried she always*” becomes “*she was always worried*”). The purpose of this task was to provide participants a chance to be exposed to the money prime before they read the article and filled out the questionnaires.

**Controlling government and government support.** Half of all participants read a supposed news article emphasizing the Canadian government’s capacity for keeping the country’s crime rate under control (Appendix T; adapted from Kay et al., 2010; Study 3). The article was designed to frame the Canadian government in general (as opposed to any particular party) as capable of effectively managing criminal activity (e.g., “Overall, the reports seem to come to a general consensus: that our government, as a whole, is able to control Canada’s crime rate during times when other countries are facing great difficulty maintaining the safety of their citizens”). The purpose of this article was to enhance participants’ sense that the current government is capable of effective control over aspects of Canadian society. Kay and colleagues used a similar article to emphasize the government’s capacity for control; however, their version of the article emphasized the government’s capacity for maintaining the stability of the economy. I selected crime because it is a domain in which the government can exert influence, but does not directly concern financial matters.

Participants who received the government control article then responded to five items adapted from Kay et al. (2010; Experiment 2) to measure defense of the sociopolitical system ($\alpha = .90$). Items included, “In general, the Canadian political system currently operates as it should,” “Most of the current government’s policies serve the greater good,” “I’m satisfied with the way things are in Canada,” “I feel that the current federal government, all in all, is doing a good job,” and “I am becoming increasingly displeased with our current system of government and its ability to run the country.” Participants responded on a 7-point scale (1 = “strongly disagree” to 7 = “strongly agree”).

**National identity filler task.** The half of participants who did not receive the government article and government satisfaction questions received a supposed news article concerning Canadian national identity (Appendix U; see Kay et al. 2010; Study 3). The purpose of this
article was to provide a control task for participants who did not receive the government control article. The story and survey data presented in this article suggest that Canadians receive meaning and a personal sense of identity from the broader Canadian national identity. This group of participants then responded to five questions concerning defense of the Canadian identity. Items included, “In general, Canadian culture gives me a positive sense of identity,” “A positive sense of national identity is good for the country,” “I’m satisfied with the way things are in Canada,” “I feel that the Canadian identity, all in all, is in good shape”, and “I am becoming increasingly displeased with our national identity.” Participants responded on a 7-point scale (1 = “strongly disagree” to 7 = “strongly agree”).

Belief in the existence of a controlling god. All participants responded to three items adopted from Kay et al. (2010) to measure belief in god while emphasizing god as controller ($\alpha = .94$). These items included “To what extent do you think it is feasible that God, or some type of nonhuman entity, is in control of the events in the universe?” “To what extent do you think that the events that occur in this world unfold according to God’s, or some type of nonhuman entity’s, plan?” and “To what extent do you think the idea that God is directing everyone’s lives is a bit silly.” Participants responded on a 7-point scale (1 = “strongly disagree” to 7 = “strongly agree”).

Positive and negative affect and demographics. Next, participants responded to the 60-item PANAS-X (see Experiment 1; Watson & Clark, 1991). Lastly, participants responded to a series of demographics questions (e.g., age, gender, etc; see Experiment 2).

Funnel and oral debriefing. Participants next received funnel debriefing to examine whether they had any suspicions regarding the true nature of the experiment. Funnel debriefing (see Experiment 1) revealed that one participant was suspicious of the money prime and its relation to the questions in the survey. One participant indicated difficulty understanding questions due to a language barrier. These two cases were excluded from all analyses. Participants were then fully debriefed as to the true nature of the study and were thanked for their participation.
Results

Preliminary analyses.

Missing data and exploratory data analysis. Of the 167 participants, 10 did not complete the prescreening questionnaire. For these cases, I had no data on self-perceived financial wealth. These cases were therefore removed listwise from the data set. No outliers were observed in the data. For each analysis, assumptions for Ordinary Least Squares (OLS) regression were tested (see Field, 2005). Within each model, errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors.

Demographics. Of the 157 participants with complete and useable data, 113 were female, 23 were male, and one participant did not indicate gender ($M_{age} = 18.62, SD = 2.12$). Eighty-nine percent of participants were born in Canada.

Primary analyses.

Does money increase confidence in the Canadian government? According to compensatory control hypothesis 1, participants who reported lower self-perceived wealth and who received the money prime, compared to those who did not receive the money prime, should exhibit greater satisfaction with the current Canadian government. The analysis in this section was conducted with only those participants who received the government control article and the government satisfaction questions ($n = 81$).

Moderated multiple regression was conducted to analyze whether the money prime affected support for the then current Canadian government, and whether effects differed among participants who self-rated as low versus high in financial wealth. Contrast-coded priming condition (money vs. control image), mean-centered scores on self-perceived wealth, and the product of the two were entered into a regression analysis predicting government support (Aiken & West, 1991). All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors in the model. Main effects on support for the current government were not observed for the money prime or for self-perceived wealth (see Table 9). Furthermore, self-perceived wealth did not significantly moderate a money prime effect on support for the then current government, $B = .30, p = .22, \Delta R^2 = .02, 95\% CI = -.18, .78$. 
Table 9
Moderation of the Relationship between Money Prime and Confidence in the Government by Self-perceived Wealth

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>B (SE)</th>
<th>95% CI</th>
<th>t</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>-0.10 (0.19)</td>
<td>-0.46, 0.28</td>
<td>-.48</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>-0.11 (0.19)</td>
<td>-0.50, 0.27</td>
<td>-.60</td>
<td></td>
</tr>
<tr>
<td>Money × Wealth</td>
<td>0.24 (0.19)</td>
<td>-0.15, 0.62</td>
<td>1.23</td>
<td>.02</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01 (two-tailed).

*Does money increase or decrease belief in a controlling god?* According to compensatory control hypothesis 2, participants who were low in self-perceived wealth and who received the money prime were expected to indicate greater belief in a controlling god by comparison with participants who were low in self-perceived wealth and who did not receive the money prime. This effect was expected to be present only among participants who did not receive the intervening government control article. In accord with the alternative autonomy hypothesis, if money activates a motive for autonomy, people of low self-perceived wealth who were primed with money, versus not, were expected to report lower belief in a controlling god.

Three-way moderated multiple regression was conducted (Figure 10). Contrast-coded priming condition (money = 1, control image = -1), contrast-coded article condition (government control = 1, meaningful culture = -1), mean-centered scores on self-perceived wealth, the three two-way product variables (money prime × self-perceived wealth; money prime × article condition; self-perceived wealth × article condition), and the three-way product variable money prime × self-perceived wealth × article condition) were entered into a regression analysis predicting the dependent variable of belief in a controlling god (Aiken & West, 1991). All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic, and there was no multicollinearity between the predictors in the model. No main effects on belief in a controlling god were observed for money prime, self-perceived wealth, or article condition (Table 10). Contrary to the compensatory control hypothesis, self-perceived wealth and article condition did not interact to influence the effect of...
the money prime, \( B = .05, p = .82, \Delta R^2 = .00, \) 95% CI = -.39, .48. However, a two-way interaction between money prime and self-perceived wealth was observed, \( B = .48, p = .03, \) 95% CI = .05, .92.

![Figure 10](image)

*Figure 10.* Illustration of three-way moderated multiple regressions employed to examine compensatory control hypothesis 2 and the alternative autonomy hypothesis in Experiment 3.

**Table 10**

*Moderation of the Relationship between Money Prime and Belief in a Controlling God by Self-perceived Wealth and Government Control Article*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>( B (SE) )</th>
<th>95% CI</th>
<th>( t )</th>
<th>( R^2 ) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>0.04 (0.20)</td>
<td>-0.38, 0.43</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>Article Condition</td>
<td>-0.12 (0.20)</td>
<td>-0.52, 0.29</td>
<td>-.58</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>0.26 (0.22)</td>
<td>0.17, 0.70</td>
<td>.23</td>
<td></td>
</tr>
<tr>
<td>Money ( \times ) Article</td>
<td>0.03 (0.20)</td>
<td>-0.34, 0.46</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>Money ( \times ) Wealth</td>
<td>0.48 (0.22)</td>
<td>0.05, 0.92</td>
<td>2.20*</td>
<td></td>
</tr>
<tr>
<td>Article ( \times ) Wealth</td>
<td>-0.42 (0.22)</td>
<td>-0.02, 0.85</td>
<td>1.90</td>
<td></td>
</tr>
<tr>
<td>Money ( \times ) Article ( \times ) Wealth</td>
<td>0.05 (0.22)</td>
<td>-0.39, 0.48</td>
<td>.22</td>
<td>.00</td>
</tr>
</tbody>
</table>

*\( *p < .05, **p < .01 \) (two-tailed).
To analyze this 2-way interaction, moderated multiple regression was conducted with money prime as the independent variable, self-perceived wealth as the moderator, and belief in a controlling god as the dependent variable. Contrast-coded priming condition (money vs. control image), mean-centered scores on self-perceived wealth, and the product of the two were entered into a regression analysis predicting belief in a controlling god (Aiken & West, 1991). All assumptions for Ordinary Least Squares (OLS) regression were met. Errors were normal, independent, and homoscedastic and there was no multicollinearity between the predictors in the model. This analysis confirmed that self-perceived wealth moderated a money prime effect on belief in a controlling god, $B = .48, p = .02, \Delta R^2 = .04, 95\% \text{ CI} = .08, .88$ (Table 11). As the 95% confidence interval did not include zero, the interaction was significant. Using the Johnson-Neyman technique for determining regions of significance, I found that money affected belief in a controlling god for participants scoring under 1.58 standard deviations below the mean, $B = -.75, p = .05, 95\% \text{ CI} = -1.49, .00$, and over 1.42 standard deviations above the mean, $B = .69, p = .05, 95\% \text{ CI} = .00, 1.38$, on self-perceived wealth. In line with my autonomy hypothesis, for participants scoring less than 1.58 standard deviations below the mean on self-perceived financial wealth, the presence of money caused lower scores on belief in a controlling god (Figure 11). Consistent with the autonomy motive hypothesis, and in contrast to compensatory control hypothesis 2, when people who were lower in self-perceived wealth were primed with money, versus not, their belief in a controlling god was reduced. For participants scoring greater than 1.42 standard deviations above the mean on self-perceived wealth, the presence of money caused higher scores on belief in a controlling god. That is, when people of higher self-perceived wealth were primed with money, versus not, their reported belief in a controlling god was enhanced.
Table 11

Moderation of the Relationship between Money Prime and Belief in a Controlling God by Self-perceived Wealth

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>$B$ (SE)</th>
<th>95% CI</th>
<th>$t$</th>
<th>$R^2$ change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>0.01(0.20)</td>
<td>-0.38, 0.40</td>
<td>.06</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>0.10 (0.20)</td>
<td>-0.30, 0.50</td>
<td>.49</td>
<td></td>
</tr>
<tr>
<td>Money × Wealth</td>
<td>0.48 (0.24)</td>
<td>0.08, 0.88</td>
<td>2.39*</td>
<td>.04*</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01 (two-tailed).

Figure 11. Belief in a controlling god as a function of money prime and self-perceived wealth. Visualized at 2 SDs below (low wealth) and above (high wealth) the mean on self-perceived wealth.

Follow-up analyses. Given the intriguing effects I observed on belief in a controlling god, I further examined the data for similar effects on support for the current Canadian government. Only one of the five government support items was negatively worded. This item read, “I am becoming increasingly displeased with our current system of government and its ability to run the country.” As this item directly addresses dissatisfaction with the government’s ability to run the country, it may have been more likely than the positively worded items to cue thoughts about the government’s ineffectiveness. To explore whether responses to this item in
particular were affected by the money prime, contrast-coded priming condition (money vs. control image), mean-centered scores on self-perceived wealth, and the product of the two were entered into a regression analysis predicting dissatisfaction with the current Canadian government (this analysis was conducted only with those participants who received the government control article and government support questions; \( n = 81 \)). Self-perceived wealth moderated a money prime effect on dissatisfaction with the Canadian government, \( B = -.47, p = .04, \Delta R^2 = .05, 95\% CI = -.92, -.02 \) (Table 12). Using the Johnson-Neyman technique to probe this interaction, I found that participants who scored less than .96 standard deviations below the mean on self-perceived wealth were affected by the money prime, \( B = .62, p = .05, 95\% CI = .00, 1.24 \). Among participants who were lower in self-perceived wealth, the money prime predicted greater dissatisfaction with the Canadian government (Figure 12). Dissatisfaction with the Canadian government was not affected by the money prime among participants rating high on self-perceived wealth.

Table 12

*Moderation of the Relationship between Money Prime and Dissatisfaction with the Canadian Government by Self-perceived Wealth*

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>( B (SE) )</th>
<th>95% CI</th>
<th>( t )</th>
<th>( R^2 ) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Prime</td>
<td>0.29 (0.22)</td>
<td>-0.16, 0.74</td>
<td>.78</td>
<td></td>
</tr>
<tr>
<td>Perceived Wealth</td>
<td>0.10 (0.23)</td>
<td>-0.27, 0.61</td>
<td>1.29</td>
<td></td>
</tr>
<tr>
<td>Money × Wealth</td>
<td>-0.47 (0.23)</td>
<td>-0.92, -0.02</td>
<td>-2.06*</td>
<td>0.05*</td>
</tr>
</tbody>
</table>

\*p < .05, \**p < .01 (two-tailed).
To examine possible effects on affect, I conducted moderated multiple regression to examine whether the presence of money affected positive and negative affect. Effects-coded money prime condition, mean-centered self-perceived wealth, and the product of the two were entered into a moderated multiple regression predicting positive affect. An equivalent analysis was done to predict negative affect. There were no significant effects for money prime, $B = -0.07, p = 0.27, 95\% \text{ CI} = -0.19, 0.05$, or for self-perceived financial wealth, $B = 0.01, p = 0.74, 95\% \text{ CI} = -0.07, 0.10$, on positive affect. Furthermore, I found no interaction between money and perceived wealth on positive affect, $B = 0.00, p = 0.96, \Delta R^2 = 0.00, 95\% \text{ CI} = -0.08, 0.08$. Furthermore, there were no effects for money prime, $B = -0.08, p = 0.09, 95\% \text{ CI} = -0.17, 0.01$, or for self-perceived wealth, $B = 0.00, p = 0.93, 95\% \text{ CI} = -0.09, 0.03$, on negative affect. There was also no interaction between money prime and self-perceived wealth on negative affect, $B = -0.03, p = 0.32, \Delta R^2 = 0.01, 95\% \text{ CI} = -0.09, 0.03$.

**Discussion**

This was the first experiment to examine whether the mere presence of money can affect the endorsement of external sources of control. This study once again used a different measure of participants’ self-perceived wealth, this time asking for a comparison between their own financial resources compared to those of other university students. This study also used a third
distinct money prime, a poster containing an image of various denominations of Canadian currency (vs. an abstract image).

In Experiment 3, I asked whether money causes people to seek a sense of controllability or, alternatively, a sense of autonomy by accepting versus rejecting external sources of control. This study provided additional support for the view that money may threaten autonomy among those who are lower in self-perceived wealth. People of lower self-perceived wealth believed in a controlling god to a lesser extent when they were primed with money compared to when they were not. By contrast, people of higher wealth believed in a controlling god to a greater extent when they were primed with money compared to when they were not. No effects were consistent with the compensatory control hypotheses. That is, I found no evidence that money causes people who are lower in wealth to support or believe in agents in the external environment that can help to provide a sense that the world is under control.

Personal control and autonomy are often conceived as related but distinct constructs (Ryan, 1995; Skinner, 1996). In this experiment, I acknowledged that a threat to control can prompt people to endorse controlling external forces as means toward seeing the world as an orderly and structured place (Kay et al., 2009). By contrast, a threat to autonomy can cause people to reject controlling external forces in order to maintain the freedom to self-determine behaviour (Brehm, 1989; Chartrand et al., 2007). Such a direct contrast between the expectations for motives to maintain control and autonomy should not apply to all instances of external control. Here, a distinction can be drawn between (1) those external sources of control that impose their will (i.e., those that are controlling) and (2) those that increase structure and order to improve one’s own capacity for control. Viewing external sources of control in this way, the former category can be conceived as threatening to autonomy. Controlling external agents may include controlling friends, a controlling god, and authoritarian institutions or governments. Approaching external sources of control in this way allowed me to pit motives for control and autonomy against each other to clearly test which of the two might be activated by the presence of money. In accordance with the view that money threatens autonomy among those who are low in perceived wealth—thus motivating the attainment of greater freedom to self-direct behaviour—I obtained evidence that the presence of money causes people to reject belief in a controlling god. This finding is also directly opposed to a compensatory control view, whereby
money should lead to a deficiency in personal control among those who are low in wealth and a resultant motive to gain control via belief in a controlling god (e.g., Kay et al., 2010).

Interestingly, a divergent effect was observed among those who were high in self-perceived wealth. For these participants, the presence of money led to a greater belief in a controlling god compared to when money was not present. There is little reason to believe that this effect was due to compensatory control processes, as it has not been demonstrated that people who are high in wealth feel lower in personal control when primed with money (see Experiment 1). Furthermore, Experiment 1 failed to demonstrate increased autonomy among those who were high in wealth, but it is possible that the lack of a significant effect in Experiment 1 was due to the explicit nature of the measure of autonomy coupled with a sample size that may have been too low to detect a small effect. If people who are higher in self-perceived wealth do in fact feel greater autonomy when primed with money, they should not be motivated to reject the existence of a controlling god.

There remains a possible alternative explanation for money’s effects on belief in a controlling god. When money is salient and people of lower wealth are presented with the possibility of a controlling god, they might believe that a controlling god must wish for them to suffer (i.e., desires that they be poor). As a consequence, they may consider the idea of no controlling god to be preferable to a god who is working against them. By contrast, those who are wealthy may see a controlling god as acting benevolently and in their favor (i.e., desires that they be rich). They may therefore see the existence of a god who is on their side to be preferable than the nonexistence of a controlling god. Although the autonomy explanation is consistent with the current perspective of money’s effects, this alternative explanation is not inconsistent with the current perspective, and could possibly function alongside the autonomy perspective. Further research is necessary to examine this possibility.

Regardless of the origins of the effects observed in Experiment 3, these effects remain intriguing as the first indication that merely perceiving money in one’s environment can function to affect religious belief. Further research should test whether monetary cues can cause the opposite effect on an autonomy providing god. Such an experiment might conceptualize a higher power as controlling for one group of participants and autonomy providing for another group. Whereas a controlling god may be conceived as exerting an influence, responding critically, and
relying on punishments and rewards to guide behaviour, an autonomy supportive god might be conceived as open to different ways of being religious, empathizing with the perspective of the individual, and permitting free will (Soenens et al., 2012). A reversal of money’s effects on a belief in a higher power among participants evaluating the existence of an autonomy providing god would add important evidence for the role of autonomy in money’s effects.

Although no money or perceived wealth effects were observed for the overall measure of defence of the Canadian government, an interaction was observed in a follow-up analysis on the single negatively worded item on this measure. According to this analysis, when people of lower wealth are primed with money, versus not, they become more dissatisfied with the current system of government and its ability to run the country. Although this analysis was conducted on a single item, the finding is notable as it correspond to the expectation that, when primed with money, people who are low in wealth may react negatively to controlling external forces. Further research might look into the effects of money on other controlling agents in the external environment. For example, for people who live in countries in which governments are more authoritarian, money may cause more negative reactions to specific leaders and/or the government as a whole. In addition, the presence of money should cause people of low wealth to display reactance to the wishes of controlling friends and acquaintances or other influential people in the environment (see also Liu et al., 2012).

**General Discussion**

Money is ubiquitous. It functions not only as a tool to help people attain desirable goods and services (Lea & Webley, 2006), but also to instill a sense of freedom and control over life outcomes (Dewitte, 2006; Dittmar, 1992; Gecas, 1989; Kraus et al., 2009; Srivastava et al., 2001; Zhou et al., 2009). Although there has been some speculation among other researchers (Gino & Pierce, 2009; Liu et al., 2012; Vohs et al., 2006; 2008; Zhou et al. 2009), it is not clear whether and under what conditions monetary cues, such as the mere presence of money, cause people to experience temporary changes in their personal control and autonomy. My research began with the development of a model for how money affects these constructs and subsequent motivation. I hypothesized that money primes differentially affect those who are relatively high and low in financial wealth. I expected that, when primed with money, people low in financial resources would perceive that they have less autonomy and personal control, and people high in financial
resources would perceive that they have greater autonomy and personal control. I also expected that money’s threats to autonomy and control among people low in financial resources should motivate the protection or attainment of a sense of freedom and the perception of an orderly and controllable world.

In a series of three studies, I tested my hypotheses while expanding upon the known domains in which the mere presence of money can affect how people think and behave in the absence of their awareness. In Experiment 1, I examined whether money affects control, autonomy, and the need for structure, and whether such effects are conditional on people’s perceived wealth. I showed that when people low in self-perceived wealth were primed with money, they felt lower in autonomy, lower in a general sense of control over life outcomes, and desired greater structure in their lives, compared to those who were not primed with money. In Experiment 2, I tested a specific instance of money’s effects on the desire for simple structure. I examined whether the mere presence of money has consequences for interactions with others in social environments characterized by low versus high structure. I found that, in a situation lacking structure, the presence of money made people of lower SES desire less social contact compared to people of higher SES. The interacting effects of money and SES diminished when the social setting was highly structured. In Experiment 3, I tested competing hypotheses regarding whether the presence of money can cause changes in people’s beliefs about, and endorsement of, external sources of control. I found that when people who were lower in wealth were primed with money, versus when they were not, they reported less belief in a controlling god. By contrast, when people who were higher in wealth were primed with money, versus not, they reported greater belief in a controlling god. Below, I summarize my findings vis-à-vis my theoretical analysis and suggest revisions to my perspective on money’s nonconscious effects. I then discuss and recommend future directions to address unanswered questions and limitations of the current research.

Important components of the current theoretical perspective were supported by the findings of the reported experiments. However, some expectations for money’s effects received modest or no support. Although little can be concluded from the insignificance of some effects, both supported and unsupported findings offer clues that help to refine a theory of money’s effects on behaviour. I offer four key observations. First, evidence indicates that those who perceive that they are low versus high in wealth appear to be differentially affected by monetary
cues. This was consistent across studies and was robust to various measures of perceived wealth and money primes. Second, monetary cues seem to have important effects on autonomy, or the capacity to self-determine behaviour. Third, support was lacking for the expectation that money affects personal control. Fourth, I found evidence for novel motivational consequences of money, including consequences for interactions in the social environment and belief in the supernatural. Based on these general observations, the tentative model presented earlier can be revised. Before discussing modifications, I discuss each of the above mentioned observations in turn.

**Divergent effects among people who are high and low in wealth.** Overall, the evidence supports a consistent distinction between money’s effects on those who are lower and those who are higher in perceived wealth. To my knowledge, this is the first research to demonstrate that money priming effects systematically differ as a function of people’s economic resources. Experiment 1 demonstrated that people of low self-perceived wealth who were primed with money felt lower in autonomy and the general sense of control over life outcomes, and had a higher need for structure compared to those who were not primed with money. These effects were not observed among people who were higher in self-perceived wealth. Experiment 2 showed that when the social environment was lacking structure and people were primed with money, those who were lower in perceived SES desired less social interaction compared to those who were higher in perceived SES. There was no significant difference between those who were high and low in SES among people who were not primed with money. Experiment 3 showed that when people who were lower in self-perceived wealth were primed with money, versus not, they expressed a less belief in a controlling god. By contrast, when people who were higher in self-perceived wealth were primed with money, versus not, they expressed a greater belief in a controlling god.

Previous research on money priming has focused on money as a construct that functions similarly for people regardless of their economic standing (e.g., Liu et al., 2012; Vohs et al., 2006, 2008; Zhou et al., 2009). Although I can shed little light on the reasons for others’ observations of unconditional effects, I can speculate on two possible interrelated influences on the effects of money primes. First, some of the money primes used in previous research may have more directly cued personal wealth per se. For example, in Vohs et al. (2006; Study 2), participants were primed specifically to think of themselves as wealthy versus poor: “Participants
in the high-money condition read about growing up having abundant financial resources, whereas low money participants read about growing up having meager resources” (Vohs et al., 2006, p. 1154). In another set of studies by Gino and Pierce (2009), the money prime was of substantial size and conspicuousness, which could have functioned to make most university student participants feel financially inferior. In their studies, the experimenters set out piles of $5000 to $7000 in real American dollar bills. In short, little attention has been devoted in the literature to the differences between diverse money priming methodologies; however, it is possible that different primes have different effects depending on (1) whether people are primed to feel wealthy and (2) the relative size of money primes.

Second, it is not clear in previous research whether the people in the various experiments are themselves high or low in wealth. If the majority of participants were relatively low in wealth, it is possible that previously observed behavioural effects are related to my findings of reduced autonomy and/or an enhanced need to maintain structure. However, little can be said about the origins of money priming effects if the nature of the sample’s financial status is not known. I see two solutions to this problem for future research. As was done in the current studies, the first solution involves asking participants how wealthy they perceive themselves to be. Yet, to avoid interference with the money priming methodology, this will usually require that financial wealth be measured at a time prior to, and be perceived by participants as unassociated with, the priming manipulation. This can, however, make for arduous experimental procedures (i.e., measurement at multiple times). A simpler methodology might be to prime people to think of themselves as wealthy and poor more directly as in Vohs et al. (2006; Study 2), or to induce temporary economic threat versus stability. Threat may be manipulated, for example, by informing participants of an impending financial crisis that will directly affect them.

**Findings for autonomy.** Based on the current perspective regarding money’s effects, one of the key differences between those who are high and low in wealth should be that money only functions as a threat to autonomy for those who are relatively low in financial wealth. As a consequence of threatened autonomy, people should be motivated to seek autonomy-providing experiences (Sheldon & Gunz, 2009). In two studies I found evidence for this perspective. In Experiment 1, I found the first confirmatory evidence of this view—among those lower in wealth, the presence of money is linked to lower autonomy. Consistent with this view, in Experiment 3, a money prime led those of lower wealth to report less belief in a controlling god.
As controlling external forces can undermine autonomy (Chartrand et al., 2007; Deci & Ryan, 2000), I believe that the latter finding was due to an enhanced motive to preserve personal freedom or self-determination. Although this effect is consistent with the expectations for threatened autonomy, I have not provided direct evidence of a causal relation between reduced autonomy and a reduced belief in a controlling god. However, some supportive evidence comes from Liu et al. (2012), who demonstrated that priming people with money causes reactance in the face of controlling external forces. They found that, when people were given a command by an authority figure, they felt greater threat. When not primed with money, threat led to behaviour in line with the authority’s command. However, when participants were primed with money, threat led to behaviour that contrasted with the authority’s command. That is, only when money was present did participants to react against external control.

Generally, merely perceiving money may cause those people of lower wealth to feel that their freedom to pursue personally desirable goals is threatened and that their choices are constrained by external forces. As autonomy is conceived as a psychological need (Deci & Ryan, 2000), people should react to threatened autonomy by seeking to regain or preserve a sense of freedom to behave according to self-direction (Sheldon & Gunz, 2009). I believe that this is why money led those of lower wealth to indicate less belief in a controlling god. According to Laurin et al. (2012) thoughts about a higher power can undermine the pursuit of goal-directed behaviour. If this perspective is true, the salience of money should cause people who have less financial resources, to react negatively toward social influence in numerous domains, such as relationships, consumption practices, and scholarly pursuits. The domains of consumption and higher education may be perpetually tied up with monetary concerns among those who are less financially well-off. For example, money may cause people to display reactance toward more blatant advertising strategies. Further, university courses in which the instructor places rigid constraints on assignment deadlines and topic choices may be responded to more poorly by students of less affluent family upbringing.

Lack of findings for personal control. The speculative views of Vohs et al. (2006) and Zhou et al. (2009) suggest that money’s effects are related to a sense of control. Across two studies, I failed to find evidence that the presence of money has an effect on personal control. In experiment 1, the presence of money had no effect on participants’ self-ratings of competence. In experiment 3, money’s effects were not in line with my compensatory control hypotheses. In
fact, the effects on belief in a controlling god were opposite to those that would have been expected if money functioned as a threat to personal control. In my theorizing about money’s effects, I noted that money should affect both control and autonomy because of the perceived association between having money and the attainment of both personal control and autonomy (e.g., Dittmar, 1992; Johnson & Krueger, 2006; Stivastava et al., 2001). In particular, I expected that because autonomy and control are psychological needs (Deci & Ryan, 2000; Leotti et al., 2010), only these constructs—and not other wealth-related constructs such as sophistication (see Christopher & Schlenker, 2000)—should be affected by the presence of money. In Experiment 1, I did in fact find that competence is higher overall among those who are higher in self-perceived wealth. This is consistent with a view that having money provides a greater sense of control (e.g., Johnson & Krueger, 2006; Kraus et al. 2009). However, the finding that competence was not affected by the money prime is contrary to the view that the mere presence of money causes people to perceive themselves, including their capacity for autonomous choice and control, according to their own financial resources. In other words, having money is associated with competence, but the mere presence of money does not prime competence, so priming does not seem to be a function of affecting wealth-related constructs in general.

Why, then, did money affect autonomy but not personal control? My speculation in Experiment 1 seems promising. When the construct of money is salient, people lacking financial resources may believe that their freedom to act according to personal desires is constrained by external demands. Having money may in fact provide freedom from dependency on others and external sources of control (Dewitte, 2006; Johnson & Krueger, 2006; Srivastava, et al., 2001). Furthermore, one’s sense of autonomy is subject to environmental threats and constraints, such as controlling others (e.g., Chartrand et al., 2007) or institutional and societal systems (see Shepherd & Kay, 2012). Having money can help people to surmount certain constraints on autonomy. For example, the wealthy can afford to travel whenever and wherever they choose. The wealthy also have greater overall freedom to attain a desired level of education. For the very wealthy, having a job can sometimes be more a matter of personal choice than necessity. Thus, having money may be viewed as causally related to greater freedom to make personally desirable choices.

By contrast, money’s relationship with personal control may not be viewed as causal (i.e., people may not view the maintenance of financial wealth as enhancing personal control). Recall
that personal control “involves the self as agent, the self’s actions or behaviors as the means, and an effected change in the social or physical environment as the outcome” (Skinner, 1996, p. 558). The maintenance of financial wealth does seem to be representative of a high level of competence (the agent-means aspect of control), particularly because the attainment of wealth is a highly valued goal in modern society (Kasser & Ryan, 1993). Although it may represent high competence (Doyle, 1992; Kets de Vries, 2007; Lea & Webley, 2006; Zhang, 2009), having money may not be desirable because it facilitates competence—people may view the relationship as going in the opposite direction. Having competence may be perceived as causing greater monetary success in the future. Furthermore, there is little reason to believe that people see a relationship between money and the means-ends aspect of personal control, or the connections between actions and outcomes. Thus, greater wealth may be perceived as causing greater freedom, but not necessarily as causing greater personal control. By implication, not having wealth should be perceived as reducing freedom, but not reducing control.

Interestingly, without explicitly stating so in later publications (e.g., Liu et al., 2012), the theorizing of Vohs and colleagues also seems to shift toward an emphasis on autonomy and away from an emphasis on control. Their earlier research speculates that people who are primed with money feel more efficacious and do not need help to attain personal goals (Vohs et al., 2006; Zhou et al., 2009), whereas later research adopts a view that the presence of money causes people to become more concerned with maintaining autonomy (Liu et al., 2012). In short, in a similar fashion to my own research, Vohs and colleagues seem to be honing in on the mechanism guiding money’s effects. However, they do not discuss why the presence of money might threaten autonomy, nor do they directly state or demonstrate that autonomy is affected.

**Motivational consequences.** I found the first evidence that money causes people of lower wealth to reject controlling external agents (Experiment 3) and to prefer greater structure (Experiments 1 and 2). By contrast, the evidence indicates that people who have substantial wealth accept controlling external agents and are relatively more open to unstructured environments. For those who are lower in wealth, money seems to cause complexity and disorder in the social environment to seem more threatening. Complex and disorderly environments are difficult to navigate and so should be seen to inhibit the ability to make decisions and behave in accord with personal desires (see Discussion for Experiment 1).
Similarly, controlling external forces may be threatening because they reduce one’s freedom to make self-directed decisions and behave according to personal desires.

For those who are low in financial wealth, the mere presence of money should cause the avoidance of autonomy threatening others, such as controlling friends and relationship partners (see Chartrand et al., 2007), and autonomy threatening situations, such as consumer environments characterized by an overabundance of choice and ambiguous product differences (see Iyengar & Lepper, 2000). The mere presence of money may also lead to cognitive tendencies to reduce the complexity of environments and social interactions—for example, by perceiving patterns and associations where there is considerable ambiguity and disarray (see Heine, Proulx, & Vohs, 2006; Whitson & Galinsky, 2009), rationalizing difficult to explain events, and stereotyping other people and outgroups (see Neuberg & Newsom, 1993).

**Summary and model changes.** Regardless of the correctness of my tentative perspective of money’s effects, it proved to be practical in that it led to a number of intriguing findings related to money that have not yet been observed. In addition to pushing the margins of money priming effects, these studies functioned to test parts of the current perspective. Given an overall view of the findings observed in these three studies, the perspective itself may be re-evaluated to some degree. In particular, given the evidence, the effects of money can be refocused more specifically on autonomy and its motivational consequences. Of note, although money’s effects on the explicit measure of autonomy in Experiment 1 were not significant among those high in wealth, to permit further inquiry I maintain the possibility that the presence of money enhances the autonomy of the wealthy. In particular, the activation of a greater sense of autonomy might be more prominent among the very wealthy. Below is a revised set of assumptions regarding money’s effects.

**Assumption 1.** Money is perceived as a resource that enables the freedom to self-determine life outcomes. Having money is perceived to be associated with more autonomy. Lacking money is perceived to be associated with less autonomy.

**Assumption 2.** The effects of monetary cues are conditional on people’s relative wealth. Thinking about money should cause people to perceive themselves, including their capacity for autonomous choice, according to their own financial resources relative to those of others. Thus, when thinking about money, those who feel relatively low in
financial resources should perceive that they have less freedom to self-determine life outcomes. Those who feel relatively affluent should perceive that they have greater freedom to self-determine life outcomes.

**Assumption 3.** If, when primed with money, people who are low in wealth are made to feel lower in autonomy, they will also be motivated to preserve or recapture a sense that they are autonomous individuals in a world that facilitates self-determination.

**Future Directions and Limitations**

As this research was, as far as I am aware, the first to demonstrate different effects of money among people who are high and low in wealth, a number of questions remain. Furthermore, because of the breadth of this research, further inquiry into the observations from each of the three experiments can be extended in numerous directions. Suggested directions are discussed below.

There are a number of ways to further investigate the current effects. For instance, various methodologies can be implemented to test the effects of monetary cues. First, to develop the current view that the salience of money causes those low in wealth to feel lower in autonomy, researchers can directly prime people to feel wealthy or poor and measure autonomy and its motivational consequences. Vohs et al. (2006; Study 2) primed participants to think of themselves as wealthy or poor by having them read about being raised with abundant versus meager financial resources. As discussed above, this may be a good way to test the nuanced effects of money without necessarily having to measure the moderators of self-perceived wealth or SES.

Second, as people no longer generally use cash for large purchases, and large sums of money are generally not represented in cash form, priming people with this particular medium may not be the best possible representation of wealth. Would larger effects be observed if people were primed with banks, mansions, corporations, or specific very wealthy people?

Third, further research can be conducted using objective SES and financial wealth as moderators instead of perceived SES and perceived financial wealth. However, previous research indicates that subjective assessments of SES may function as better predictors of social-cognitive tendencies (Kraus et al., 2009). According to Kraus et al. subjective SES, compared to objective
SES, provides a better estimate of people’s sense of societal position compared to others. If people of lower objective SES do not realize that they are lower on the societal hierarchy, there is no reason for them to feel lower in constructs associated with the maintenance of wealth. Therefore, subjective SES may be a stronger moderator of money’s effects.

It is also quite possible that more direct measures of wealth, as opposed to SES (which takes into account income, education, and career prestige), are stronger moderators of money’s effects. Future research may seek to get at the critical moderating factor. Do money’s effects depend most on an evaluation of one’s own financial standing relative to other people in general or one’s peers or colleagues in particular? For university students, is one’s own financial standing more important than the wealth of one’s family? As I have found effects for each type of moderator, specificity cannot be determined at this point. Effects likely depend on one’s independence from parents. For example, the financial wealth of one’s family may be of great importance to high school students, but less so for university graduates. For university student samples, as in the current studies, there may be more ambiguity regarding the importance of personal and family wealth. Some students are more dependent on their families while others are more independent. This ambiguity may be a possible reason for the relatively small nature of my effects and for the observations of significant effects related to both personal financial wealth (Experiments 1 and 3) and family SES (Experiment 2).

It is also possible to examine reverse manifestations of the current effects. For example, if autonomy is directly threatened (see Sheldon & Gunz, 2009), people may place greater value on money and engage in behaviours intended to increase their personal wealth. Dubois, Rucker, & Galinsky (2010) found that when people are primed to feel low in power, they accentuate the size of objects representing money, such as coins and poker chips. Dubois and colleagues suggest that valuation of money increases because of a motivation to compensate for low power. If money is valued for its capacity to facilitate self-determined outcomes, simply reducing autonomy may be another cause of the accentuation bias.

There is still much to explore regarding money’s effects on interactions with others. The current research coupled with that of Liu et al. (2012) suggests that threats to autonomy could function to reverse some of Vohs and colleagues’ (2006) effects (specifically among those people who are lower in wealth). Recall that Vohs et al. (2006) found that money primes cause people to
work for longer on tasks without asking for assistance from either the experimenter or a confederate. What would happen if the experimenter or confederate commanded participants to work independently? Would this threat to autonomy cause participants who are primed with money to react in opposition and seek help from another? Furthermore, I observed that adding greater structure to a social situation can mitigate social withdrawal effects (Experiment 2). An intriguing possible factor contributing to Vohs et al.’s effects is the lack of structure and certainty that appears to be inherent in many of their studies. For example, participants were told that they could ask the experimenter or a confederate for help on difficult and unsolvable tasks if they needed to (studies 1 and 2), but did not seem to be offered any certainty regarding the situational outcomes if they happened to do so. What would this mean for the assessment of their performance on the task? How would the experimenter or confederate respond? Further, the experimenters and confederates were effectively strangers, adding a further level of ambiguity to the interactions. Although the current research finds that both lower autonomy and the need for structure result from money priming, more research needs to be conducted to examine how each construct relates to the other and to behavioural outcomes.

Whether the effects of money are similar across cultures has yet to be explored. The current experiments and those of Vohs et al. (2006) were conducted in Canada, the research of Gino and Pierce (2009) was conducted in the United States, and the research of Zhou et al. (2009) was conducted in China. As compatible findings have not been replicated across culture, it is not clear whether the disparate effects observed in these separate programs of research are due to cultural context or whether they stem from the same psychological processes. In short, cross-cultural research should be conducted to examine whether the nonconscious effects of money are similar across different cultures. I can tentatively speculate, however, that for those cultures in which possession of money is societally valued and commonly acknowledged as facilitating autonomous choice, similar effects should be observed. Nevertheless, money can only be understood as a function of societal and cultural context (Baker & Jimerson, 1992)—attitudes toward and beliefs about money differ as a function of culture and society. For example, cross-cultural differences in the degree to which money is seen as something that should be spent or saved, and the degree to which it should be accumulated, may have important consequences for money related behaviour (e.g., Dell’Orto & Doyle, 2001; Dutta-Bergman & Doyle, 2001). Perceptions of money may also differ with money related changes in society, such as the switch
to the Euro in countries such as Italy (Lotto, Rubaltelli, Rumiati, & Savadori, 2006). Further research should seek to understand predominant mental representations of money and associations with relevant constructs in different cultural contexts to better understand the cognitions and behaviours that may stem from thoughts of money.

Furthermore, the literature on money priming has been limited in its lack of focus on gender and age differences in money’s effects. Differences in money’s meanings between men and women and between the young and old have been investigated, but an understanding of demographic differences has not been incorporated in the money literature. Money is used different by people of different ages (Furnham & Argyle, 1998). For example, people between the ages of 30-65 are most likely to give to charity (compared to both young adults and the elderly). Women in both the U.S. and Britain have been found to give somewhat more to charity compared to men (Jencks, 1987; cited in Furnham & Argyle, 1998). Given that money is used somewhat differently among men and women, it would not be surprising to find that some of the behaviours cued by money primes differ among men and women. Additionally, further money priming research needs to be conducted among older and more economically diverse community samples. As the current data were limited to university students, who are not always financially independent of their parents and who are often of a relatively higher SES, it is difficult to generalize findings to the general population.

Some additional limitations to my program of research warrant discussion. Although in Experiment 1, I demonstrated money’s effects on autonomy and need for structure, and a partial mediating role of autonomy in the relationship between money and need for structure, I did not demonstrate a mediational link between a threat to autonomy and the effects observed in Experiments 2 and 3. Conspicuous measures of autonomy were left out of Experiments 2 and 3 to keep participants from becoming consciously aware of the investigated constructs. Liu et al. (2012) worked around this problem to some extent by (1) using an inconspicuous implicit measure of general threat (studies 1 and 2) and (2) using an explicit measure of threat to autonomy (study 2). However, whether their observed changes in general threat stem specifically from threatened autonomy cannot be determined. Further, the explicit measure of threat to autonomy used in their second study was provided to participants only after their main dependent measure was given. Though the timing of their explicit measure may have been problematic, they found similar meditational effects for each threat measure. Further research should attempt
to integrate measures of threat to determine if, for example, money’s effects on belief in a controlling god indeed stem from an increased motive for autonomy.

Another possible limitation of the current research concerns the breadth of the effects investigated. My concurrent goals to examine a novel perspective on money’s effects, to understand previous behavioural effects of money, and to expand money priming research into new territory may have been somewhat overambitious for a program of three studies, and possibly inhibited my understanding of any one particular observation. The pursuit of minor adjustments to experiments may have functioned to increased clarity, but this would have necessitated sacrificing the pursuit of certain intriguing questions. Thus, this possible limitation may also be conceived as an advantage of the current program of research—if not entirely correct, the current perspective was useful insofar as it led to the detection of some novel and intriguing effects of money and thus opened them up for further investigation. I leave it to future research to further investigate my contentions.

Conclusion

Money is valued in large part because it is a tool used to meet needs and desires (Lea & Webley, 2006). Money serves to facilitate the pursuit of personally desirable or self-determined objectives (Dewitte, 2006; Vohs et al., 2006; Zhou et al., 2009). It also provides a sense of order and predictability to life (Johnson & Krueger, 2006; Vohs et al., 2008). Because it is a means to the attainment of valued material and psychological resources, it may come to symbolize related constructs such as freedom and order. However, for all of money’s value, few people can realize the financial status of wealthy (Goldbart, et al., 2004). For those who are not wealthy, the mere presence of money may therefore serve as a reminder that one lacks the resources and capabilities of the affluent. The reported research consisted of an effort to understand how monetary cues differentially affect specific psychological needs and responses to external environments among people who are low versus high in self-perceived wealth. Experiment 1 was the first to demonstrate that, for people of lower wealth, the mere presence of money can reduce autonomy and increase the need for structure in one’s life. Novel consequences of money, such as the avoidance of unstructured and disorderly social situations (Experiment 2), and reduced belief in a controlling deity (Experiment 3), were also observed among the non-affluent. The three experiments reported in this thesis function as a foundation for further inquiry into money’s
effects on cognition and behaviour. This research broadens our understanding of how money affects people in the absence of awareness, and has specific relevance for thought and behaviour in affluent settings and other financially relevant domains.
References


Dupuis, D. R. & Newby-Clark I. R. (2011). In the company of wealth: The mere presence of money decreases perceived control and increases the need for structure. Unpublished Manuscript, University of Guelph, Guelph, ON.


Appendices
Appendix A: Recruiting Script for Experiment 1

NOTE: Only approach students and/or citizens in public places. Ensure that they are not hurried or otherwise occupied.

“Hi, my name is ________. I am a research assistant for PhD candidate Darcy Dupuis Professor Ian Newby-Clark of the psychology department at the University of Guelph in the Psychology department.”

[Allow time for them to ask questions and establish your identity; show your letter from Newby-Clark necessary]

On the professor’s behalf, I am conducting a study. This study has received ethics clearance from the Research Ethics Board at the University of Guelph. I wonder if you would like to participate. It would involve your answering some survey questions. The whole thing should take about 5-7 minutes.

[If NO: Okay, thank you for your time.]

If YES:

That’s great. I need to tell you that your responses will be completely confidential. There will be no way for anyone to link your answers back to you.

I am going to give you the consent form, the survey instructions, and the survey. I will assume that you consented to participate in the study once you read and have signed the consent form. If you decide to withdraw from the study, you have the right to do so. You simply need to tell me that you no longer wish to participate. If this is the case, I will delete the survey data you have provided.

Do you have any questions before you begin?
Appendix B: Consent Form for Experiment 1

COLLEGE OF SOCIAL AND APPLIED HUMAN SCIENCES
Department of Psychology

CONSENT TO PARTICIPATE IN RESEARCH

Study of Emotions and Needs

You are asked to participate in a research study conducted by Darcy Dupuis, from the Psychology Department at the University of Guelph. The results will be contributed to his PhD Dissertation.

If you have any questions or concerns about the research, please feel free to contact:
Dr. Ian Newby-Clark (519) 824-4120 x. 53517
Darcy Dupuis (519) 824-4120 x. 58754

PURPOSE OF THE STUDY

This is a brief study designed to learn about how certain feelings or emotional states may relate to life needs.

PROCEDURES

If you agree to participate in this study you will answer questions regarding present and past feelings and motivations in the form of a computer administered questionnaire. You will then complete a brief puzzle task as part of some separate research were are working on. Required tasks should take about 40-50 minutes to complete. You will not be contacted for any follow-up sessions or anything else that is related to this study. Research findings will be available in August of 2011. To see the findings, you will need to contact Darcy Dupuis.

POTENTIAL RISKS AND DISCOMFORTS

There is no risk or potential discomfort associated with the task. You are free to withdraw from this study at any time for any reason.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

Your participation in this study will have benefits for the university and scientific community by helping to develop advances in our understanding of psychological processes.

CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study.

Your name will not appear anywhere in relation to your responses on the task. Your name will be collected on this consent form for the sole purpose of ensuring that you have consented to participate in this study. Your name will not be associated in any way with the answers you provide. The data will be retained electronically by the researcher.
and no one else will have access to this data. Any demographic data that you have provided will not be reported on an individual basis. Instead, these data will be grouped together and trends will be examined, rendering you entirely unidentifiable.

**PARTICIPATION AND WITHDRAWAL**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. The investigator may withdraw you from this research if circumstances arise that warrant doing so.

**RIGHTS OF RESEARCH PARTICIPANTS**

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board. If you have questions regarding your rights as a research participant, contact:

Research Ethics Coordinator
University of Guelph
437 University Centre
Guelph, ON  N1G 2W1

Telephone: (519) 824-4120, ext. 56606
E-mail: sauld@uoguelph.ca
Fax: (519) 821-5236

**SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE**

I have read the information provided for the study “Study of Emotions and Needs” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

____________________________________
Name of Participant (please print)

____________________________________
Signature of Participant  Date
Appendix C: Money and Control Primes for Experiment 1

1. Gender
   - Male
   - Female

2. Age:

3. Year of Study

4. What is your program of study? (e.g. Psychology, English, etc):

5. Where you born in Canada?:
   - Yes
   - No

6. Economic status
Appendix D: Demographics

Instructions: Please fill in the information below, so that we may obtain some general information on the people participating in this study (This information will not be associated with your name in any way).

1. Gender: Male ( ) Female ( )

2. Age? ___.

3. Year of Study ___.

4. What is your program of study? (e.g. Psychology, English, etc): ______________.

5. Where you born in Canada?: Yes ( ) No ( )

6. Extent of personal Spiritual or Religious involvement (please note: this is a subjective assessment of how central your spiritual or religious beliefs are in your life, and may or may not refer to involvement in an organized religion):

   1  not at all involved  2  3  4 average  5  6  7 extremely involved

7. How would you describe your family’s economic status?

   1 much less money than most  2  3  4 average  5  6  7 much more money than most

8. How would you describe your own current economic status?

   1 much less money than most  2  3  4 average  5  6  7 much more money than most

9. Estimate your current total income per year ______________.
10. How much money do you wish to be earning per year, ten years from now? 
_____________________.

11. How would you describe your ethnic background? (e.g., Scottish-Canadian, Italian-Canadian): ________________________.
Appendix E: Positive and Negative Affect Schedule

This page consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now. Use the following scale to record your answers.

<table>
<thead>
<tr>
<th>1 very slightly or not at all</th>
<th>2 a little</th>
<th>3 moderately</th>
<th>4 quite a bit</th>
<th>5 extremely</th>
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</thead>
<tbody>
<tr>
<td>cheerful</td>
<td>sad</td>
<td>active</td>
<td>angry at self</td>
<td></td>
</tr>
<tr>
<td>disgusted</td>
<td>calm</td>
<td>guilty</td>
<td>enthusiastic</td>
<td></td>
</tr>
<tr>
<td>attentive</td>
<td>afraid</td>
<td>joyful</td>
<td>downhearted</td>
<td></td>
</tr>
<tr>
<td>bashful</td>
<td>tired</td>
<td>nervous</td>
<td>sheepish</td>
<td></td>
</tr>
<tr>
<td>sluggish</td>
<td>amazed</td>
<td>lonely</td>
<td>distressed</td>
<td></td>
</tr>
<tr>
<td>daring</td>
<td>shaky</td>
<td>sleepy</td>
<td>blameworthy</td>
<td></td>
</tr>
<tr>
<td>surprised</td>
<td>happy</td>
<td>excited</td>
<td>determined</td>
<td></td>
</tr>
<tr>
<td>strong</td>
<td>timid</td>
<td>hostile</td>
<td>frightened</td>
<td></td>
</tr>
<tr>
<td>scornful</td>
<td>alone</td>
<td>proud</td>
<td>astonished</td>
<td></td>
</tr>
<tr>
<td>relaxed</td>
<td>alert</td>
<td>jittery</td>
<td>interested</td>
<td></td>
</tr>
<tr>
<td>irritable</td>
<td>upset</td>
<td>lively</td>
<td>loathing</td>
<td></td>
</tr>
<tr>
<td>delighted</td>
<td>angry</td>
<td>ashamed</td>
<td>confident</td>
<td></td>
</tr>
<tr>
<td>inspired</td>
<td>bold</td>
<td>at ease</td>
<td>energetic</td>
<td></td>
</tr>
<tr>
<td>fearless</td>
<td>blue</td>
<td>scared</td>
<td>concentrating</td>
<td></td>
</tr>
<tr>
<td>disgusted with self</td>
<td>shy</td>
<td>drowsy</td>
<td>dissatisfied</td>
<td>with self</td>
</tr>
</tbody>
</table>
Appendix F: Basic Need Satisfaction in Life Scale

Please read each of the following items carefully, thinking about how it relates to your life, and then indicate how true it is for you. Use the following scale to respond:

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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all true</td>
<td>somewhat true</td>
<td>very true</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I feel like I am free to decide for myself how to live my life.
2. I really like the people I interact with.
3. Often, I do not feel very competent.
4. I feel pressured in my life.
5. People I know tell me I am good at what I do.
6. I get along with people I come into contact with.
7. I pretty much keep to myself and don't have a lot of social contacts.
8. I generally feel free to express my ideas and opinions.
9. I consider the people I regularly interact with to be my friends.
10. I have been able to learn interesting new skills recently.
11. In my daily life, I frequently have to do what I am told.
12. People in my life care about me.
13. Most days I feel a sense of accomplishment from what I do.
14. People I interact with on a daily basis tend to take my feelings into consideration.
15. In my life I do not get much of a chance to show how capable I am.
16. There are not many people that I am close to.
17. I feel like I can pretty much be myself in my daily situations.
18. The people I interact with regularly do not seem to like me much.
19. I often do not feel very capable.

20. There is not much opportunity for me to decide for myself how to do things in my daily life.

21. People are generally pretty friendly towards me.
Appendix G: Personal Need For Structure

Please read each of the following statements and decide how much you agree with each according to your attitudes, beliefs, and experience. It is important for you to realize that there are no "right" or "wrong" answers to these questions. People are different, and we are interested in how you feel. Please respond according to the following 6-point scale:

- 1 = strongly disagree
- 2 = moderately disagree
- 3 = slight disagree
- 4 = slightly agree
- 5 = moderately agree
- 6 = strongly agree

1. ____ It upsets me to go into a situation without knowing what I can expect from it.
2. ____ I’m not bothered by things that interrupt my daily routine.
3. ____ I enjoy having a clear and structured mode of life.
4. ____ I like to have a place for everything and everything in its place.
5. ____ I enjoy being spontaneous.
6. ____ I find that a well-ordered life with regular hours makes my life tedious.
7. ____ I don't like situations that are uncertain.
8. ____ I hate to change my plans at the last minute.
9. ____ I hate to be with people who are unpredictable.
10. ____ I find that a consistent routine enables me to enjoy life more.
11. ____ I enjoy the exhilaration of being in unpredictable situations.
12. ____ I become uncomfortable when the rules in a situation are not clear.
Appendix H: Funneled Debriefing procedure

The experimenter proceeds to ask the participant the following questions and records the answers given:

1. What do you think the purpose of this study was?
2. What do you think we were trying to study?
3. Did anything affect your responses on the questionnaire?
   (If yes) How exactly did it affect you?
4. Did you notice anything unusual about task you completed?
5. Did you notice any particular patterns or themes in the questions included in the task?
   (If yes) What were they?
Appendix I: Adaptation of the MacArthur Scale of Subjective Social Class – Youth Version

Imagine that the following scale represents how Canadian society is set up. To the left are families that are the worst off, have the least education, least money, and least respected jobs or no job. To the right are families that are the best off, have the most education, most money, and most respected jobs. Now think about your family. Please tell us where you think your family would be on this scale.

1 worst off, least education, least money, and least respected jobs or no job
2
3
4
5
6
7
8
9 best off, most education, most money, and most respected jobs
Appendix J: Consent Form for Experiment 2

Manual Dexterity, Memory, and Modern Technology

You are asked to participate in a research study conducted by Darcy Dupuis and Ian Newby-Clark, from the Psychology Department at the University of Guelph.

If you have any questions or concerns about the research, please feel free to contact:
Dr. Ian Newby-Clark (519) 824-4120 x. 53517
Darcy Dupuis (ddupuis@uoguelph.ca)

PURPOSE OF THE STUDY

This study is designed to learn more about the relationships among use of modern technology and people’s manual dexterity and memory.

PROCEDURES

If you agree to participate in this study, you will complete a manual dexterity and memory task and answer a series of questions on a computerized survey. This study will take approximately half an hour. Research findings will be available in August of 2012. To see the findings, you will need to contact Darcy Dupuis.

POTENTIAL RISKS AND DISCOMFORTS

There is no risk or potential discomfort associated with the task. You are free to withdraw from this study at any time for any reason. You are also free to skip any questions you do not wish to answer.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

Your participation in this study will have benefits for the university and scientific community by helping to develop advances in our understanding of psychological processes.

PAYMENT FOR PARTICIPATION

If you are participating in this study as part of a course in psychology, you will receive compensation in the form 0.5 credits to your grade.
CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study. Your name will not appear anywhere in relation to your responses on the task. Your name will be collected on this consent form for the sole purpose of ensuring that you have consented to participate in this study. Your name will not be associated in any way with the answers you provide. The data will be retained by the researcher and no one else will have access to this data. Any demographic data that you have provided will not be reported on an individual basis. Instead, these data will be grouped together and trends will be examined, rendering you entirely unidentifiable.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. The investigator may withdraw you from this research if circumstances arise that warrant doing so.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board. If you have questions regarding your rights as a research participant, contact:

Research Ethics Coordinator
University of Guelph
437 University Centre
Guelph, ON  N1G 2W1

Telephone: (519) 824-4120, ext. 56606
E-mail: sauld@uoguelph.ca
Fax: (519) 821-5236

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I have read the information provided for the study “Manual Dexterity, Memory, and Modern Technology” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

______________________________
Name of Participant (please print)

______________________________  ____________
Signature of Participant  Date
Appendix K: Familiarity with Modern Technology

**Your Familiarity With Modern Technology**

Using the following 9-point scale please answer the below questions by writing in your response next to the item number:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>somewhat</td>
<td>neutral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very</td>
</tr>
</tbody>
</table>

1. ____ How familiar are you with the iPhone?
2. ____ How interested are you in the iPhone?
3. ____ How familiar are you with the Kindle e-book reader?
4. ____ How interested are you in the Kindle e-book reader?
5. ____ How familiar are you with Blackberry products?
6. ____ How interested are you in Blackberry products?
7. ____ How familiar are you with the iPad?
8. ____ How interested are you in the iPad?

Using the following 9-point scale please answer the below questions by writing in your response next to the item number:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very negative</td>
<td>neutral</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very positive</td>
</tr>
</tbody>
</table>

9. ____ What is your overall impression of the iPhone?
10. ____ What is your overall impression of the Kindle e-book reader?
11. ____ What is your overall impression of the Blackberry products?
12. ____ What is your overall impression of the iPad?
Appendix L: Money and Control Prime for Experiment 2
Appendix M: Structure Enhancing Article

Twenty years ago, it would have been impossible to foresee that in 2011, you could store an entire music collection, keep track of what your friends are up to, and look up useful information in an instant, all on a device the size of a deck of cards. Nowadays, many people find it impossible to contemplate living without the structured and orderly lives provided by their iPhones.

Smartphones help us to comprehend large networks of friends and give order to our relationships. In fact, recent research supports the claim that life is more structured for those of us who use smartphones. A study by Dr. Stephen Gerry at the Institute for Technology and Society showed that people who were asked to use the iPhone for a month tended to think about and explain the world in a more structured and orderly way, compared with people who did not use the phone. Gerry suggests that smartphones like the iPhone structure the ways we keep in touch with others and lead to a more organized way of viewing the social world.

According to Gerry, “before smartphones came along, people spent a great deal of time and brainpower trying to organize their lives. Now we can fit our social lives and appointments neatly into our back pocket.” Furthermore, Dr. Gerry believes that the iPhone’s simple to use interface allows people to easily integrate the phone into their lives. “When you purchase an iPhone, you organize it to suite your way of living and in turn your iPhone helps you organize your life,” notes Gerry.

Gerry’s thoughts are echoed by iPhone users. Mere weeks after purchasing an iPhone 4, Gillian, a university student in Toronto states that, “When I finally got a cell phone, my life changed—I am now better able to organize my schoolwork and balance my social life.” When asked what about her iPhone makes her life more structured, Gillian responded, “I couldn’t say any one think in particular—I’m just better able to keep organized and make plans instead of living a disorganized existence.”

But, might smartphones overly structure our lives? Some believe that having the internet and social contacts at our fingertips makes life too predictable. There seems to be little room for uncertainty these days—Wikipedia and other stores of information are just a click away. Similar thoughts are expressed by Dr. Gerry, who remains uninterested in acquiring an iPhone, “Not knowing what my friends and family have been up to since I last saw them adds mystery to my life. I also like the unstructured nature of my days. Yes, without a phone, my life may be disorganized, but I’m happy that I don’t have an app to change that.”
Appendix N: Structure Reducing Article

Twenty years ago, it would have been impossible to foresee that in 2011, you could store an entire music collection, have constant contact with enormous social networks, and have access to a virtually infinite and perhaps overwhelming stream of information, all on a device the size of a deck of cards. Nowadays, many people find it impossible to contemplate living without access to the full complexity of the frenzied social world provided by their iPhones.

Smartphones expose us to complex networks of friends, acquaintances, and relationships we might not otherwise have in our lives. In fact, recent research supports the claim that life is more complex for those of us who use smartphones. A study by Dr. Stephen Gerry at the Institute for Technology and Society showed that people who were asked to use the iPhone for a month tended to think about and explain the world in a more complicated and disorganized way, compared with people who did not use a phone. Gerry suggests that iPhone users’ awareness of others is spread over an overwhelming number of people who have different motives and express themselves differently, leading to an unstructured way of viewing the social world.

According to Gerry, “before smartphones came along, people’s lives were simpler and more organized. People felt a responsibility to keep in touch only with select others. Now we can fit an entire social network in our back pocket.” Dr. Gerry believes that constant interaction with the complexity and practical limitlessness of the internet causes people to see the world as more complicated or chaotic. “When you purchase an iPhone, you open up a world of possibility that differs substantially from the physical world. Keeping two different worlds organized seems to be quite demanding,” suggests Gerry.

Gerry’s thoughts are echoed by iPhone users. Mere weeks after purchasing an iPhone 4, Gillian, a university student in Toronto states that, “When I finally got a cell phone, my life changed—I still have the friends I see at school, but I’m now able to keep in touch with a massive number of friends and acquaintances I would never have spoken to more than once or twice.” When asked if this made her life more disorganized, Gillian responded, “I don’t know, maybe a bit more complicated—It takes more effort to keep engaged with all of the people in my life and to keep relationships organized.”

Do smartphones overly complicate our lives? It seems that having the internet and social contacts at our fingertips makes life overwhelming. People are stretched in different directions by having so many people and social media outlets to keep up with. Dr. Gerry, remains uninterested in acquiring an iPhone, “I enjoy my simple and structured life, and not being pulled every which way by unnecessary social obligations. My life is organized and I’m happy that I don’t have an app to change that.”
Appendix O: Demographics and Additional Questions

Instructions: Please fill in the information below, so that we may obtain some general information on the people participating in this study (This information will not be associated with your name in any way).

1. Gender: Male ( ) Female ( )
2. Age ___.
3. Year of Study ___.
4. Where you born in Canada?: Yes ( ) No ( )
5. Do you own an iPhone? Yes ( ) No ( )
6. Do you own an iPhone 4S? Yes ( ) No ( )

Please recall the article you previously read about smartphones. Use the rating scales below to answer the following questions.

To what extent did the article present the iPhone as a positive product?

<table>
<thead>
<tr>
<th>-3 very negative</th>
<th>-2</th>
<th>-1</th>
<th>0 neutral</th>
<th>1</th>
<th>2</th>
<th>3 very positive</th>
</tr>
</thead>
</table>

To what extent did the article present the iPhone as a device that adds structure to life?

<table>
<thead>
<tr>
<th>-3 reduces structure</th>
<th>-2</th>
<th>-1</th>
<th>0 neutral</th>
<th>1</th>
<th>2</th>
<th>3 enhances structure</th>
</tr>
</thead>
</table>

To what extent did the article present the iPhone as a device that leads to a disorderly or complicated life?

<table>
<thead>
<tr>
<th>-3 reduces disorder</th>
<th>-2</th>
<th>-1</th>
<th>0 neutral</th>
<th>1</th>
<th>2</th>
<th>3 enhances disorder</th>
</tr>
</thead>
</table>
Appendix P: Money Prime for Experiment 3
Appendix Q: Control Prime for Experiment 3

<p>| | | | | | |</p>
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Appendix R: Consent Form for Experiment 3

COLLEGE OF SOCIAL AND APPLIED HUMAN SCIENCES
Department of Psychology

CONSENT TO PARTICIPATE IN RESEARCH

Self, Beliefs, and Political Views

You are asked to participate in a research study conducted by Darcy Dupuis and Ian Newby-Clark, from the Psychology Department at the University of Guelph.

If you have any questions or concerns about the research, please feel free to contact:
Dr. Ian Newby-Clark (519) 824-4120 x. 53517
Darcy Dupuis (ddupuis@uoguelph.ca)

PURPOSE OF THE STUDY

This is a brief study designed to learn more about your political attitudes and other feelings and beliefs.

PROCEDURES

If you agree to participate in this study, you will complete a brief survey package in which you will do set of tasks and answer questions about yourself and your attitudes and beliefs. Research findings will be available in August of 2012. To see the findings, you will need to contact Darcy Dupuis.

POTENTIAL RISKS AND DISCOMFORTS

There is no risk or potential discomfort associated with the task. You are free to withdraw from this study at any time for any reason.
You are also free to skip any questions you do not wish to answer.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

Your participation in this study will have benefits for the university and scientific community by helping to develop advances in our understanding of psychological processes.

PAYMENT FOR PARTICIPATION

If you are participating in this study as part of a course in psychology, you will receive compensation in the form of 0.5 credits to your grade.
CONFIDENTIALITY

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study. Your name will not appear anywhere in relation to your responses on the task. Your name will be collected on this consent form for the sole purpose of ensuring that you have consented to participate in this study. Your name will not be associated in any way with the answers you provide. The data will be retained by the researcher and no one else will have access to this data. Any demographic data that you have provided will not be reported on an individual basis. Instead, these data will be grouped together and trends will be examined, rendering you entirely unidentifiable.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. The investigator may withdraw you from this research if circumstances arise that warrant doing so.

RIGHTS OF RESEARCH PARTICIPANTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. This study has been reviewed and received ethics clearance through the University of Guelph Research Ethics Board. If you have questions regarding your rights as a research participant, contact:

Research Ethics Coordinator
University of Guelph
437 University Centre
Guelph, ON N1G 2W1
Telephone: (519) 824-4120, ext. 56606
E-mail: sauld@uoguelph.ca
Fax: (519) 821-5236

SIGNATURE OF RESEARCH PARTICIPANT/LEGAL REPRESENTATIVE

I have read the information provided for the study “The Self, Beliefs, and Political Views” as described herein. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

_________________________ 
Name of Participant (please print)

_________________________ ____________
Signature of Participant Date

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Appendix S: Scrambled Sentence Task

Instructions: For each of the words below, make a grammatical four word sentence and write it down in the space provided

For example:

Flew eagle the plane around
The eagle flew around

1. him was worried she always
2. is where she fitting going?
3. ball the throw toss silently
4. he observes occasionally people watches
5. sky the seamless grey was
6. ate she it selfishly all
7. wrap prepare gift the neatly
8. the push wash frequently clothes
9. last cold night was hat
10. me broom want the get
11. ring suggest he the bought
12. off computer is colours the
13. well he chemicals baseball plays
14. surrounding they major were us
15. wait misguided bus for the
16. a reflect close destination fairly
17. contains a audience in captive
18. use mobile your phone car
19. was the fast closer frog
20. of the history strategic study
21. low her allocated excitement was
22. economic members interesting new ties
23. the power man metallic in
24. from guard goalies the net
25. the spherical is they shape
26. the she significance steps considered
27. granted he great stole ideas
28. over the eclipse shortly was
29. a rate crime designated declining
30. him a decline leave piece
Appendix T: Government Control Article

Crime prevention, without a doubt, was one of the dominant topics in Canadian politics over the past few months, with politicians focusing a great deal on how to keep our country safe for citizens. Fortunately, our parliamentary system has had good success in keeping criminal activity under control, as stated in a series of reports published over the past decade. Overall, the reports seem to come to a general consensus: that our government, as a whole, is able to control Canada’s crime rate during times when other countries are facing great difficulty maintaining the safety of their citizens. Studies have shown, for example, that criminal activity in Canada is historically much lower than that in the United States, a geographical neighbour with many cultural similarities. “When you actually think about the various criticisms that individual political parties face, it might be surprising to see that our system of government, overall, is effective in keeping crime rates low,” says Dr. Stephen Gerry, a leading criminologist at the Institute for Politics and Society. “The government plays a huge role in making the average Canadian safe from violent crime, property crime, and other types of crime.” The major theme of the reports is that, compared to other nations, our government’s actions are effective in maintaining national stability. In other words, the crime prevention measures implemented by the Canadian government have a predictable influence on trends in crime rate, and in the grand scheme of things, the impact of policies is mostly for the better. “Take a look at the crime rate in the United States, for example,” says analyst George Forwell, who is coauthor of one of the recently published reports. “government mandated crime prevention strategies in the U.S. have generally had little effect on crime, while here in Canada, our system of government has been able to implement policies that show a direct relation to decreased crime and a greater sense of safety among citizens. In short, our political system has been overwhelmingly effective.” Additional proof comes from recent data comparing crime rates across provinces. “Simply put, the data indicates that public safety is at its highest and crime is at its lowest in provinces like Ontario, where law enforcement tends to most closely follow the policies enacted by Canada’s federal government,” Forwell adds. “The bottom line is that when it comes to your safety in terms of protection from violent crime and property crime, our government largely has these things in check in comparison to other nations. It’s a stability that is unparalleled elsewhere.” Stephen Gerry adds, “I get together every day with fellow colleagues to discuss key issues related to the crime, and truth be told, we sleep well at night knowing that our country’s people are generally very safe.”
Appendix U: Canadian Identity Article

When people think of Canada, what comes to mind? A recent poll reveals the answer: a proud national identity. The national poll, conducted by sociologists and anthropologists from three Canadian universities reveals that when Canadians were interviewed about their country, a whopping 74% said it provides them with “a meaningful identity.” Other common responses included, “a deep connection with others” at 67%, and “being a part of something significant,” at 65%. “This is fantastic,” says Dr. Joseph Fulton, a sociologist who led the recent research project. “More and more people are seeing our country as offering something substantial and meaningful to their lives. Our research shows that even though we do not realize it all of the time, being Canadian has this influence on just about all of us. Most respondents who said ‘a meaningful identity’ when they were asked about being Canadian were pleased that a real sense of purpose and connectedness with people can be derived from their country and its history,” Fulton adds. “Most of the people we interviewed see Canada as teeming with significance; a place where a real sense of personal self-worth can be derived.” Indeed, the Canadians we asked responded similarly. Judy Michaels of Ontario says, “Being Canadian means feeling like you are a part of something. I feel that way today as much as I ever did. It makes it very easy to have a good sense of belonging, a sense of who you are, and where you come from.” She adds, “I’ve seen other countries where so many people can’t define themselves or gain a sense of importance through their country, but I think it is easy here.” “I feel like I live a meaningful life, and a lot of that comes from being Canadian. I have a great appreciation for my country and what I am a part of in the world,” adds 21-year-old Kyle Wicks of Vancouver. Full results of this study can be found in November’s National Heritage Journal.