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Qirui Tian

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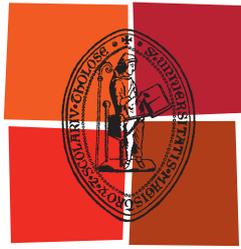
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de Toulouse

THÈSE

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Université Toulouse - Jean Jaurès

Présentée et soutenue par :

Qirui Tian

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Abstract

This doctoral dissertation focuses on mind perception in the field of religion and diet in two different cultural contexts: Chinese and French. In two independent chapters, it investigates the effect of religious belief on mind perception concerning religious targets and the effect of meat-eating behavior on mind perception concerning food animals. Following a brief introduction of mind perception in Chapter 1, Chapter 2 explores cross-cultural differences in religiosity and mind perception and how religious belief affects people's mind perception of gods and Christians using a religious priming paradigm. The main results reveal that on religiosity, Chinese agnostic participants were more similar to Chinese religious participants, but French agnostic participants were more similar to French atheist participants; on mind perception of gods, Chinese agnostic participants were more similar to Chinese religious participants, but French atheist, agnostic and religious participants were different from each other. When God-related concepts are primed, gods are attributed more mind on the agency-dimension in the Chinese sample, but not in the French sample. The Chinese religious participants attributed more mind to gods on the agency-dimension than the Chinese atheist ones. The French religious and agnostic participants attributed more mind to gods on both the agency-dimension and the experience-dimension than French atheist ones. However, the Christian target is attributed less mind by the Chinese atheist participants, and more mind by the Chinese religious participants on the experience dimension, when God-related concepts are primed. In the French sample, religious priming has no effect on mind attribution to the Christian target, but religious participants attribute more mind to the

Christian target than to the Control target, and agnostic participants attribute more mind to the Christian target than to the atheist target. Chapter 3 addresses the question of whether reminders of the meat paradox will influence reduction of willingness to eat meat and/or mind attribution to food animals. The results suggest that when the link between meat and its animal origin is relatively clear and strong, both French and Chinese participants report high willingness to eat meat in a condition that emphasizes meat itself, and low willingness in a condition that emphasizes the slaughter required to produce meat. French participants attribute less mind to a food animal when they realize the link between meat and its animal origin, but Chinese participants do not. When the link is relatively vague and weak, the meat paradox does not have significant effects on the reduction of mind attribution to food animals among Chinese and French participants, but makes Chinese participants report lower willingness to eat meat in a condition that emphasizes the animal origin of meat. Finally, Chapter 4 discusses the theoretical and practical implications of our empirical findings.

Keywords: religiosity, gods, priming, meat paradox, cognitive dissonance, mind perception

Résumé

Cette thèse de doctorat porte sur l'étude de la perception dans le domaine de la religion et de l'alimentation dans deux contextes culturels différents: chinois et français. Dans deux chapitres indépendants, nous avons étudié l'effet de la croyance religieuse sur la perception des cibles religieuses et l'effet du comportement de la consommation de viande sur la perception des animaux. Le chapitre 1 présente une brève introduction à propos de la perception, et le chapitre 2 explore les différences culturelles sur la religiosité et la perception, notamment, la façon dont la croyance religieuse affecte la perception des individus vis-à-vis des dieux et des chrétiens en utilisant un amorçage du paradigme religieux. Les principaux résultats montrent que sur la religiosité, les participants agnostiques chinois étaient plus semblables aux participants religieux chinois, mais les participants agnostiques français étaient plus semblables aux participants athées français. Quant à la perception, les participants agnostiques chinois étaient plus semblables aux participants religieux chinois, mais pour les participants français, les athées, les agnostiques et les religieux étaient différents les uns des autres. Quand des concepts liés aux dieux sont amorcés, la perception des dieux est attribuée davantage à la dimension agence dans l'échantillon chinois, mais non pas dans l'échantillon français. Les participants religieux chinois ont attribué davantage la perception des dieux sur la dimension agence que les athées chinois. Les participants religieux et agnostiques français attribuent davantage la perception des dieux à la fois sur la dimension agence et sur la dimension expérience que les athées français. Cependant, l'objectif chrétien est moins attribué à l'esprit par les participants athées chinois, et plus par les participants

religieux chinois sur la dimension de l'expérience, lorsque les concepts de Dieu connexes sont amorcés. Dans l'échantillon français, l'amorçage religieux n'a aucun effet sur l'attribution de l'esprit à la cible chrétienne, mais les participants religieux attribuent davantage l'esprit à la cible chrétienne que à l'objectif control, et les participants agnostiques attribuent davantage l'esprit à la cible chrétienne qu'à la cible athée. Le chapitre 3 traite la question de savoir si des rappels du paradoxe de la viande vont influencer la réduction de la volonté de manger de la viande et/ou de l'attribution de l'esprit à des animaux. Les résultats suggèrent que lorsque le lien entre la viande et son origine animale est relativement claire et forte, à la fois les participants français et les participants chinois déclarent une grande volonté de manger de la viande dans un état qui met l'accent sur la viande elle-même, et une volonté faible dans un état qui met l'accent sur l'abattage de la production viande. Les participants français accordent moins d'esprit à un animal comme nourriture quand ils ont établi le lien entre la viande et son origine animale, alors que les participants chinois ne le font pas. Lorsque le lien est relativement vague et faible, le paradoxe de la viande n'a pas d'effets significatifs sur la réduction de l'attribution de l'esprit à des animaux chez les participants chinois et français, mais permet de comprendre pourquoi les chinois déclarent une volonté plus faible de manger de la viande dans un état qui met l'accent sur l'origine animale de la viande. Enfin, le chapitre 4 traite des implications théoriques et pratiques de nos résultats empiriques.

Mots-clefs: religiosité, dieux, amorçage, paradoxe de la viande, dissonance cognitive, la perception de l'esprit

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Chapter 1. Introduction

1 Mind perception

1.1 Concept of mind perception

Who and what has a mind? Certainly, it is evident for you that you have a mind, but what about others around you? Intuitively, it seems to be clear that others have minds too; a friend tells you she is happy, a partner controls his anger, a professor develops a new concept. Appearances are just appearances, however. Mental states are highly labile and volatile abstract entities, comprised of continually changing intentions, desires, beliefs and emotions that are often responsible for observable behaviors. Through a process of attribution, we obtain a perception of mind by observing behaviors. As a consequence, the existence of other minds is a matter of perception. We bear witness to the overt actions, which are thought to reflect others' mental states, but we cannot perceive others' mental states directly. That is, mind perception—whether people think a particular entity has a mind—depends mostly on people's subjective judgment. How different people perceive the minds of a single entity can therefore vary tremendously. For example, some people may attribute minds to nonhuman agents, such as animals, whereas other people can deny minds to some human beings and treat them like animals or objects, like the Nazis did to various groups in the Second World War. People's direct assessment of the minds of others has been the focus of a body of research on the perception of mind, which asks individuals to infer the

existence of mental states, internal events, and other features of specific agents (Epley & Waytz, 2010; Epley, Schroeder, & Waytz, 2013; Gervais, 2013). As Epley and Waytz (2010) argued, mind perception is not the same as person perception. Mind perception focuses only on inferences about minds of various agents, including both human and nonhuman, but person perception covers a host of traits, dispositions, and capacities that people might attribute to other people.

1.2 Two dimensions of mind perception

Mind perception was thought to have only one dimension, from inert and mindless to fully functioning and conscious. Recent research, however, demonstrated that people represented other minds in terms of two sets of psychological capacities: agency and experience. Agency includes the capacity of having planning, self-control, memory, emotion recognition, morality, communication and thought. Such abilities focus on intention and action. Experience includes the capacity of feeling hunger, fear, pain, pleasure, rage, desire, of having personality and consciousness, of feeling pride, embarrassment, and joy. Such abilities refer mainly to sensation and feeling. On these two dimensions, different entities are perceived to have varying levels. For instance, adults are perceived as being high on both dimensions, children as high on experience but low on agency, whereas God is perceived as having much agency but little experience, and a person in a vegetative state as being low on both. (Gray, Gray, & Wegner, 2007; Gray & Wegner, 2010). In Gray et al.'s work, agency and experience are revealed as orthogonal dimensions in a factor analysis of mind perception, indicating that the two are separable, even if they are not

necessarily independent.

1.3 Two aspects of the current research topic

To perceive the world is an active process. A fact sometimes overlooked in scientific analyses of human behavior is that we are all mind readers in everyday life. It is not the magical process depicted in science fiction movies, but rather an everyday process that casually and quickly intuits what entities, both human and nonhuman, around us think, want, or feel. Research on mind perception focuses on two questions: (1) does an entity have a mind? (2) If it has a mind, what state would that mind be in? (Epley & Waytz, 2010). It seems that whether an entity has minds hinges on the process of mind perception, which is to ascribe human mental states to the target entity (Gray, Young, & Waytz, 2012). In other words, people do not have direct access to others' minds, so it is not definitely certain for us to say that other agents have minds. We are obliged to make inferences about the existence and contents of other agents' minds based on accessible behavioral information about others' mental states. Such inferences require a transition from observable behaviors to unobservable mental states, which is such a common and routine process that people often treat it as natural, and neglect the transition (Ross & Ward, 1996). Nearly all adults have the capacity to make the transition from observable behaviors to unobservable mental states when reasoning about the minds of others, but having the capacity is not identical with using it. Only when people realize the necessity of making an attribution of mind to other entities, especially nonhuman entities, they will do so. As two of the most ordinary and well-known nonhuman entities that are perceived as animate,

gods and animals will easily trigger mind perception. Because of personal religious faith or personal interest in animals, it is very plausible that people think gods and some kinds of animals have minds. The present research aims to explore how religious belief and meat-eating behavior will trigger or constrain people's mind perception of religious targets and food animals.

Recent social psychological research has provided convergent evidence that mind perception of others is a hallmark of seeing other agents as human (Epley & Waytz, 2010; Epley, Waytz, & Cacioppo, 2007; Waytz, Epley, & Cacioppo, 2010; Waytz, Gray, Epley, & Wegner, 2010). However, mind perception is a highly flexible process that responds to the target's characteristics, and not all humans are perceived as having mental states (Kwan & Fiske, 2008). Compared to themselves and members of their own group, people attributed fewer complex mental states to outgroups (Haslam, Bain, Douge, Lee, & Bastian, 2005), and even altogether denied that other people had mental states, thus dehumanizing them (Haslam, 2006). At other times, on the contrary, people attributed more humanlike mental capacities to animals that move at a humanlike speed than those who move much faster (e.g., a hummingbird) or much slower (e.g., a sloth) than humans (Morewedge, Preston, & Wegner, 2007), and also attributed mental states to inanimate objects (Waytz et al., 2010). All findings indicate that the attributes of the perceived targets may influence individuals' mind perception. Related to religions and animals, gods and food animals are two representative examples, which may be attributed labile mental states. Most people know that religion and food animals

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exist in the world, whether or not he/she has religious beliefs, and eat meat. On the other hand, religion and diet produce salient cultural differences and vary tremendously in different cultures. Accordingly, the question of how people perceive religious targets or food animals is important to investigate cross-culturally. The present research aims to explore how the mind perception of religious targets and food animals occur in the Chinese and French cultures.

As a function of their various religious beliefs, people may attribute more (or less) mind to different religious targets or to gods. In the pioneering work exploring the dimensions of mind perception, individuals who reported stronger religious beliefs attributed more mind to God on the agency-dimension (Gray, Gray, et al., 2007). Different religions usually represent different groups, and minds may also be attributed to groups. For example, members of East Asian cultures, such as Japanese and Hong Kong residents were more likely to attribute minds to groups than North Americans were (Menon, Morris, Chiu, & Hong, 1999). Some groups that were perceived as being bonded together in a coherent unit (e.g., a professional sport team, a family) were more likely to be thought as having a group mind than others with loose organization (e.g., plumbers, people at a bus stop) (Hamilton & Sherman, 1996; Lickel et al., 2000). In addition, some kinds of mental states (e.g., intentions) were attributed more frequently to groups than other kinds (e.g., feelings) (Knobe & Prinz, 2008). Furthermore, there seemed to be a trade-off between the attribution of mind to a group and attribution of mind to members in that group. That is, when people attributed more mind to a group on the group level, they

attributed less mind to the group members on the individual level (Waytz & Young, 2012). If so, it is reasonable to expect that there may be differences when attributing mental states to various religious targets (individuals or groups) as a function of religious affiliation.

One way to explore people's mind perception of animals is to examine how individuals' meat-eating behavior affects their perception of the minds of food animals. Prior research has found that eating meat moderates the process of mind attribution to animals. Meat eaters tend to deny that food animals have minds. When being reminded of the link between meat and animal suffering, meat eaters denied that the animal they ate had minds. If they were expected to eat meat, they also denied the minds of animals they eat (Bastian, Loughnan, Haslam, & Radke, 2012; Loughnan, Haslam, & Bastian, 2010). However, diet, especially meat consumption, may be subject to cultural differences. Although the same meat is eaten, it may lead to different attitudes to animals in different cultures.

2 Overview of the dissertation

Previous research on mind perception has focused almost exclusively on participants from Western cultural contexts, especially North America, leaving a number of questions that need to be explored across other cultures. This dissertation presents five studies---organized into two manuscript-style research chapters---that examine cross-cultural

differences in mind perception in two daily fields of life (religion and diet) across two different cultural contexts.

The first three studies focus on religion, and investigate the effects of religious belief and religious priming on the mind perception of religious targets. The last two studies turn to diet, and examine whether and how people's meat-eating behaviors affect their mind perception of a food animal (the cow). All drew on Chinese and French samples, and the data analyses were performed separately.

Study 1 used a correlational approach to examine whether the more religious beliefs participants had, the more they attributed mind to religious targets, and less to nonreligious targets. It revealed significant positive correlations between personal religiosity and mind attribution to gods in both cultural samples; and significant positive correlations between intrinsic religiosity and mind attribution to religious targets and nonreligious targets in the French sample, and significant positive correlations between personal religiosity and mind attribution to religious targets on the agency-dimension and a non-significant negative correlation between intrinsic religiosity and mind attribution to nonreligious targets in the Chinese sample.

Study 2 examined the effect of religious belief on mind perception of gods in a priming paradigm. It found that Chinese participants, but not French participants, were affected by religious priming and attributed more mind to gods on the agency-dimension. Chinese religious participants attributed

significantly more mind to gods than Chinese atheist ones on the agency dimension. French agnostic and religious participants attributed significantly more mind to gods than French atheist ones on both agency and experience dimensions, which were mediated by the anthropomorphism of gods and extrinsic religiosity.

Study 3 turned to mind perception of individual religious targets with the same priming paradigm used in Study 2. In the Chinese sample, atheist participants in the priming condition attributed less mind to the Christian target than those in the neutral condition, and religious participants in the priming condition attributed more mind to the Christian target than those in the neutral condition, with no significant differences among agnostic participants. In the French sample, the religious participants attributed more mind to the Christian target than to the control target, and agnostic participants attributed more mind to the Christian target than to the atheist target.

Study 4 examined the effect of presenting a strong link between meat and its animal origin in the meat production process on mind perception of cows and willingness to eat meat. It found that French participants showed a tendency to reduce their willingness to eat meat and their mind attribution to food animals when the link between the food and the animal was made clear, but Chinese participants seemed to reduce only their willingness to eat meat.

Study 5 examined the effect of presenting a weak link between meat and

its animal origin in the meat consumption process on mind perception of cows and willingness to eat meat. It found that both Chinese and French participants did not attribute less mind to a food animal when they were reminded of the animal origin of meat, but Chinese participants reported less willingness to eat meat. Chinese participants were more willing to eat meat when the deliciousness of meat was made salient, and French participants, had a similar tendency, albeit not significant.

The final chapter of this dissertation discusses theoretical and practical implications

**Chapter 2. Mind Attribution to
Different Religious Targets among
Chinese and French Participants: A
Religious Priming Paradigm**

3 Introduction

Belief in supernatural agents has always been a powerful force across all cultures in all of recorded human history (Atran & Norenzayan, 2004; Boyer, 2001). One of the most common, though controversial, assumptions about these beliefs is that they can promote moral behavior. An increasing number of studies on religious prosociality demonstrated that religion does indeed foster prosocial behavior (Norenzayan & Shariff, 2008). Two explanations of religious prosociality are the supernatural punishment hypothesis and the supernatural monitoring hypothesis. The supernatural punishment hypothesis predicts that the threat of divine punishment inhibits individuals from crossing ethical boundaries and violating moral norms (Johnson & Krüger, 2004). For example, people's cheating behavior in a math task negatively correlated with their image of supernatural agents as punishers (Shariff & Norenzayan, 2011). The supernatural monitoring hypothesis holds that supernatural agents that can keep watching on any of people's behaviors exist. Everyone tends to act prosocially, because of supernatural monitoring (Gervais & Norenzayan, 2012; Rossano, 2007). For example, people showed more prosocial intentions when they were primed with religion-related words in a lexical decision task (Pichon, Boccato, & Saroglou, 2007).

However, in order to think that they will be punished by gods after they violate moral norms or that they are always being monitored by gods,

people need to first conclude that gods are capable of monitoring one's behavior and implementing punishment. Such a judgment about gods' capacity is not inherently the case, and might vary among individuals due to their different personal images of the gods in their cultures. Though some people do not believe in gods, supernatural beings are believed to exist in many different cultures. Understanding the psychological foundations of this prevalent belief has obvious implications for our understanding of basic psychological functioning and process. Surprisingly little is known, however, about why the majority of people, in various cultures around the world, believe in a higher order controlling power, such as God, and how they construct the image of God or gods. One convenient way, when constructing the image of gods, may be to imagine gods have mind like human beings. The current research focuses on whether and how personal religious beliefs affect people's mind attribution to gods and specific religious individuals respectively in two very different cultures.

3.1 Religious beliefs

Religion has been one of the most fertile areas of theory and research in social science. Many prominent psychologists (e.g., James, Freud, Jung, Allport, Fromm, Maslow, etc.) argued that religion must be taken into account to completely understand a person. The Latin root of the word religion is *religio*, which means a bond between human and some greater-than-human power. According to Wulff, there are at least three historical designations of the term "religion". First, it is a supernatural power to which individuals are motivated or committed; second, it is a

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feeling that people experience when they conceive of a supernatural power; third, it is the ritual(s) carried out in respect to that power (see Hill et al., 2000). Religious belief systems can be comprehensive, ubiquitously including both global beliefs and goals. Clearly, for many people, religion is an important philosophical orientation that affects their understanding of the world, and makes people understand reality or bear suffering (Pargament, 2001). Frequently as an individual's core schema, religion informs beliefs about the self, the world, and their interaction (McIntosh, 1995), and provides possible understanding of both mundane and extraordinary occurrences (Spilka, Hood, Hunsberger, & Gorsuch, 2003). In terms of goals, religion is situated at the center of the life for many people, and provides the ultimate motivation and goals for living as well as prescriptions and guidelines for achieving those goals (Baumeister, 1991; Pargament, 2001). In sum, it seems religion plays an important role in a lot of people's lives. Also, it attracts a large number of researchers in various fields.

There are countless definitions of religion in different fields of inquiry. Some of its key components include highly committed, ritualized practices, and beliefs centered on the supernatural and divine. In the present research, we define it as an overarching system of beliefs and practices involving the supernatural and sacred (Barrett, 2000; Sasaki & Kim, 2011). Such a definition tries to break the limitation of traditionally orthodox religion, and includes any ideas and behaviors relating to the supernatural. For individuals, it may be constructed by him/herself and has little to do with traditional religion, or it may be established closely

with conventional religious beliefs, rituals, and institutions (Pargament, 2002). In other words, not only does it include believers identified with traditional religion, but it also includes “unchurched believers” who do not identify with the established religious tradition. At least 10% of the population in the post-industrialized nations regard themselves as not traditionally religious, although most people around the world have some religious affiliation (Ipsos/Reuters, 2011). Whatever kind it is, religious belief usually violates commonsense expectations of ordinary things, beings, and processes. For instance, religious entities are described as invisible beings, yet also exist in space, are intangible and yet are capable of operating physical objects (Boyer, 1994). In other words, supernatural entities are perceived as having significant differences to human beings. The other fact is that religious entities are all created or constructed by human beings. So interesting questions are whether ordinary individuals would perceive various religious entities to be like human beings and whether there will be differences between religious individuals and nonreligious individuals on this issue. For example, whether individuals think that religious entities can breathe, feel pain or joy, have memory, and other mental states, which are usually thought to be the main characteristics of human beings.

Specifically, in the present research, we chose one of the integral components in most religions ----belief in gods---- as the research focus, and investigate what people’s mind attribution to gods looks like. More than 90% people in the world agree that God, or a similar spiritual force exists or may exist. People’s specific beliefs in gods are various, but all

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cultures and religions depict it as a powerful supernatural force (Atran & Norenzayan, 2004). Furthermore, regardless of whether people believe in gods or not, most people were raised in an environment where belief in God or gods was ubiquitous in their daily life, and so beliefs in gods, as a cultural ingredient, may be expected to influence almost everyone. Such influence is not identical with religiosity, although beliefs in gods and religiosity certainly overlap (Laurin, Kay, & Fitzsimons, 2012). It suggests that an individual may be affected by culturally shared beliefs in gods, although he/she may not be religious. Another fact that may also show the potential influence of belief in gods is that among those who did not regard themselves as religious, roughly half actually held some supernatural beliefs but classified themselves as nonreligious in order to distinguish themselves from traditionally religious groups, and the remaining 50% were atheist and agnostic on average (Baker & Smith, 2009; Vernon, 1968). Furthermore, the classification of participants into the categories of atheist and agnostic reflects the distinct philosophical skepticism about religious and supernatural beliefs more accurately than using only one classification as “not religious” (Vail, Arndt, & Abdollahi, 2012). It implies that agnostics may be more skeptical about supernatural beliefs. Given the vacillating nature of agnostics’ belief in gods, religious priming, as it has become an increasingly common tool for evaluating the causal effect of religious cognition (Gervais & Norenzayan, 2012), provides a convenient way to activate people’s belief in gods.

3.2 Religious priming

Priming methods provide a fairly simple way to manipulate some aspects

of religion and examine their effects on psychological process and behaviors. Prior research showed that religious priming can affect individuals' self-evaluation concerns (Baldwin, Carrell, & Lopez, 1990), decrease self-attribution of authorship for events (Dijksterhuis, Preston, Wegner, & Aarts, 2008), activate prosocial concepts and behavior (Pichon et al., 2007; Shariff & Norenzayan, 2007), elicit honesty (Randolph-Seng & Nielsen, 2007), and increase costly punishment of unfair behavior by individuals who recently contributed to a religious organization (McKay, Efferson, Whitehouse, & Fehr, 2011). On the other hand, religious priming can also facilitate aggressive behaviors (Bushman, Ridge, Das, Key, & Busath, 2007) and arouse racial prejudice against African Americans (Johnson, Rowatt, & LaBouff, 2010). However, the scope of religious priming needs to be considered. As the existing research has shown, the effects of religious priming are not consistent. While some studies showed different effects of religious priming in believers and atheists (Dijksterhuis et al., 2008), other studies showed similar effects of religious priming in believers and non-believers (Laurin et al., 2012), and others had mixed effects across different studies (Gervais & Norenzayan, 2012; Shariff & Norenzayan, 2007).

3.3 Two perspectives on explaining the inconsistency of religious priming

With respect to the inconsistent results in studies of religious priming, cultural and personal perspectives provide two possible sources of explanation (Cohen, Malka, Rozin, & Cherfas, 2005).

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3.3.1 Cultural perspective on religion

The cultural perspective invites consideration of the role of religious culture to explain the inconsistency between religious and nonreligious people in religious priming. Although the religious group to which individuals belong is often referred to as their “religious affiliation”, “religious culture” may be a more apt term. Specifically, a person’s religion, like his or her country or region of origin, represents an important cultural influence on his/her values and personality processes (Cohen, Malka, et al., 2005). From a psychological perspective, culture is a meaning system, differently shaping individuals’ psychological processes across countries (Kitayama, 2002). Generally speaking, religion maintains a deep and paradoxical relationship with culture, both of which are psychologically rooted and socially transmitted belief-systems (Atran & Norenzayan, 2004), although they have some overlap. There are several viewpoints concerning the relationship between them (Saroglou & Cohen, 2011). First, as a part of culture, religion often consists of cultural entities. Judaism for Israelis, Christianity in North America, Islam in the Arab world, Buddhism in Asia, and Catholicism in Latin America are some clear examples. Second, as a socially sustained system of transmitted beliefs, values, norms, symbols and practices, religion constitutes culture and is a form of culture. Third, religion, in its social dimension, includes cultural aspects (e.g., integration of local practices and tradition) and maintains a relation with cultural groups such that individuals’ religious expressions are meaningful. Furthermore, religion has its own

psychological dynamics, notably that it connects individuals with a transcendent reality. Fourth, religion and culture have a bi-directional influence relationship. On the one hand, culture can influence religion. If such influence is universal, one religion may function in similar ways in different cultural contexts. If such influence is specific, it usually implies that religion has different influences in different cultural contexts. Religion can shape culture, on the other hand. For example, contemporary Christians' and Buddhists' differences in their ideal affective states correspond to the differences of the texts of Christianity and Buddhism (Tsai, Miao, & Seppala, 2007), and these differences are identical with the ones between Westerner and Easterners (Tsai, Knutson, & Fung, 2006). Last, religion and culture interact with each other in influencing human cognitions, emotions, and behaviors. In a word, religion can influence culture, and vice versa, and so it is meaningful to explore the role of religions in different cultures plays in people's psychological process. We tend to accept that religion is part of culture and also a specific form of culture, but they have a bi-directional relationship.

Everyone, as a normal individual, exists in some culture(s) and participates in society with others, who very possibly are members of a religious group. It is inevitable that an individual is affected by his/her cultures and may absorb the shared cultural associations of the dominant religion. Therefore, religion, as part of culture, plays a role in people's development, whether he/she has religious faith or not. In other words, it is very possible that not only does religion affect religious people, but it also influences people who may not have religious faith. For example, in

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one study, it was proposed that religious representations would be accessible for both people who had religious faith and people who had been raised in religious tradition (Li et al., 2012).

According to cultural models theory, Snibbe and Markus argued that "cultural models are sets of assumptions that are widely (though not universally) shared by a group of people, existing both in individual minds and in public artifacts, institutions, and practices. At the individual level, these cultural models provide implicit blueprints of how to think, feel and act. When people act according to these blueprints, they reproduce the public models, thereby perpetuating the cultural context from which both were derived" (Snibbe & Markus, 2005). A group of people, who have the same religious faith, can be meaningfully treated as sharing the same cultural model, and are different from other people who have another religious belief in a different culture (Cohen & Hill, 2007). Furthermore, scholars have acknowledged the powerful role that religion plays in shaping people's thoughts and behaviors. However, religions usually differ from each other---within and between social, cultural, and historical contexts---- and the effects of religions on people's thoughts and behaviors should also differ in different religious contexts (Snibbe & Markus, 2002). For example, on the affect valuation, Christians valued high arousal positive emotion (e.g. excitement) more than did Buddhists, and Buddhist valued low arousal positive emotion (e.g. calm) more than did Christians (Tsai, Miao et al., 2007).

3.3.2 Personal perspective on religion

The personal perspective focuses on measuring the religiosity of individuals. The inconsistency of religious priming may also be due to individual differences in religiosity. As a multidimensional phenomenon, religiosity is distinct from religious affiliation, such as whether a person is Christian, Muslim, or Jewish (Cohen, Hall, Koenig, & Meador, 2005). Normally, religiosity is defined in terms of an individual's religious orientation. The distinction between intrinsic and extrinsic religious orientation, initially developed by Allport and Ross (1967), is perhaps the most widely used concept in the scientific study of religion. Individuals with intrinsic religious orientation see religion predominantly as an "end" and have a life based on their religious doctrines, and individuals with extrinsic religious orientation use their religion as a "means" to achieve various purposes (Allport & Ross 1967).

In efforts to develop measurements based on Allport's concept, it has been suggested that religiosity is best to be described in terms of three factors. While intrinsic religiosity appears to form one single construct, extrinsic religiosity has been suggested to consist of two distinct aspects: a personal one and a social one. Personal extrinsic religiosity refers to overcoming and controlling psychological troubles and distress, and social extrinsic religiosity refers to the attainment of social benefits (Gorsuch & McPherson, 1989; Kirkpatrick & Hond Jr, 1990). In a study of the intrinsic and extrinsic religiosity in Protestants and Catholics, Protestants scored higher in intrinsic religiosity than Catholics, whereas Catholics scored higher in extrinsic religiosity; also, although intrinsic

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religiosity and extrinsic religiosity had a negative correlation in the sample of Protestants, they correlated positively, though not significantly, in the sample of Catholics (Cohen, Pierce et al., 2005). Furthermore, researchers found that intrinsic and extrinsic religiosity were correlated in very different patterns among religious groups. For Protestants, they were negatively correlated, and there was no correlation for Catholics, whereas for Jews, the correlation was positive (Cohen & Hill, 2007).

From the above correlational results, it seems that although religion is common in every culture, there are large differences both in the content and apparent strength of religious beliefs among people. Some people devotedly believe in God, but others absolutely deny the existence of God, and still others are not certain what they believe. These three varying strengths of religious beliefs generally distinguish three categories of people who are religious believing or nonbelieving: believers, atheists, and agnostics. In an American sample, Baker and Smith (2009) found that atheists, who definitively denied the existence of God, had extremely low levels of religiosity and spirituality, and identified much less with religious traditions than agnostics; in contrast, agnostics did not show a decisively oppositional stance to the existence of God, and were more likely to identify themselves as spiritual compared with atheists (for an overview see Streib & Klein, 2013). Even so, people implicitly held some residual beliefs in religious supernatural entities, even when no religious belief was reported (Jong, Halberstadt, & Bluemke, 2012). According to the extent that people believe in God, people's religious beliefs can be categorized into high religiousness, moderate religiousness, and low

religiousness. Such a categorization implies that the accessibility of religious beliefs may be different (Cohen, Shariff, & Hill, 2008). The varying importance of religious beliefs among people is a good base from which to explore the complex nature of religious beliefs (Hill, 1994). The present research will categorize participants into three groups (atheists, agnostics, and religious believers) in order to compare the differences among them, and expect that personal religiosity may play a mediating role on the difference among them.

3.3.3 Summary

Combining the two perspectives above, the present research will explore the role of religion in shaping people's mind attribution to (non)religious targets with a religious priming paradigm in two different cultures. Since there is no consistent conclusion about the range of applicability of religious priming, we make respective predictions according to two different possibilities of religious priming. With the first possibility that religious priming is applicable to both religious people and nonreligious people, we expect that religious people and nonreligious people will have no difference in the priming condition, but religious people, because of their personal religious belief, will be different from nonreligious people in the neutral condition. With the second possibility that religious priming is applicable only to religious people, religious people in the priming condition will be different from those in the neutral condition, but nonreligious people in both priming and neutral condition will be similar.

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3.4 Mind perception and religious belief

As Gervais (2013) wrote at the beginning of a review about mind perception and belief in gods, mind perception and belief in gods are both hallmarks of human beings. Religions have a major impact on most people's lives, maybe because religious practices are an important activity in their lives or because religious traditions and history penetrate deeply, at least strongly influence, the culture in which people live. Most people first learn religious knowledge through cultural tradition, or personal exploration of faith, and then may become a religious believer. Following the framework suggested by Norenzayan and Gervais (2013), for a person to believe in a certain religion, he must satisfy four basic conditions: (1) he must be able to form an intuitive mental representation of supernatural agents; (2) he must be motivated to treat supernatural agents as real and relevant sources of meaning, comfort, control; (3) he must receive cultural inputs and form the belief that one or more deities are believed in and committed to as real and important; (4) he must not analyze this commitment with further cognitive processing. For a person to be religious, these four conditions, especially the first two, may imply the tendency that to be religious is usually accompanied with personifying God or gods. In other words, when people are religious, they tend to perceive the mind of gods intuitively, and treat gods as human-like entities to make this intuitive process more effective and reasonable. Given the variety of religious beliefs in the world, it is, therefore, interesting to investigate specifically how religions affect the personification of God or

gods. Mind perception provides a convenient way to address this issue.

3.4.1 Two causes and consequences of mind perception

Mind attribution to other entities involves two different minds, the mind of the person perceiving and the mind of the entity being perceived. This produces two distinct sets of causes of differences in mind perception—one stems from the mind of the person perceiving, and the other stem from the entity being perceived. This also produces two different sets of consequences—one for the person perceiving, and the other for the entity being perceived (Waytz, Gray, et al., 2010). This 2×2 structure shows a necessity to explore the relation between religious belief and mind attribution to religious targets.

From the perspective of a perceiver, two basic goals can be achieved through mind perception: the first is to develop a social connection with other entities, and the second is to understand or predict another's behavior (Waytz, Gray, et al., 2010). Specific to religious believers, the first goal can satisfy the need to keep a close relation with gods; the second goal also gives people a feeling of explaining others' behaviors, which might be helpful for the relation between oneself and other religious members or groups. As a consequence of perceiving, the connection between people and gods seem to be valid and meaningful, and gods are thought to have a mind.

From the perspective of the perceived, both gods and religious believers can be targets of perception. When gods are perceived to have a mind,

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sense is made of the relationship between gods and the believer. Turning to religious believers, the process of mind perception might influence the perceived similarity or difference between the perceiver and the perceived, and then strengthen (or weaken) the relationship between them. As a consequence of mind perception, the perceived target is likely to be thought to be like (or not like) a human being.

3.4.2 The bi-directional relations between mind perception and religious belief

People's capacities to perceive other minds will cognitively underpin their belief in supernatural agents. Cognitive neuroscience research found that for Christians, the activation of brain regions during the process of praying to God were identified with that of mind perception, implying that praying to God is an inter-subjective experience similar to 'normal' interpersonal interaction (Schjoedt, Stødkilde-Jørgensen, Geertz, & Roepstorff, 2009). Also, when people thought about God's mental states, brain regions underlying mind perception were activated (Kapogiannis et al., 2009). In developmental psychology, research showed that children's reasoning about God was constrained by the same biases that influence reasoning about human minds. Children, who had just begun to explicitly attribute false beliefs to other humans, could also attribute false belief to God; only older children were able to explicitly realize the difference between humans and God, and hold a "theologically correct" idea that an omniscient God in theology cannot have false beliefs (Lane, Wellman, & Evans, 2010). However, there is difference between explicit and implicit representation. Adults, who explicitly acknowledged the omniscience of

God, implicitly represented the omniscient God as having essentially anthropomorphic mental limitations (Barrett & Keil, 1996). People have an egocentric bias when reasoning about other humans' beliefs (e.g., Krueger & Clement, 1994), and religious believers showed more egocentric representation of God that they were more likely to represent God's mind according to their own minds, but less likely to represent other humans' minds on the basis of their own minds (Epley, Converse, Delbosc, Monteleone, & Cacioppo, 2009).

Many religions are centered on a God (or gods) that has been thought to have beliefs and intentions according to their doctrines. Within these religious systems, however, how do people know what their gods' wills are? For this, one convenient way may be to imagine gods as a person but with endless supernatural powers. In fact, the true power of gods arises from people's depiction of gods as agents, and the effect of concepts of gods on behavior is directed by what one imagines to be the mind of gods (Preston & Ritter, 2013). For example, when confronted with events that were difficult to deal with or explain, people often attributed them to God's omnipotence (Gilbert, Brown, Pinel, & Wilson, 2000). Moreover, empirical investigations of the compensatory control model (Kay, Gaucher, Napier, Callan, & Laurin, 2008) also demonstrated that people across cultures tended to view God as a crucial contributing factor to the events that occurred in their lives, especially when they needed an immediate explanation (Kay et al., 2008; Kay, Shepherd, Blatz, Chua, & Galinsky, 2010; Laurin, Kay, & Moscovitch, 2008). Research has also shown that because Christians believe in God, they are more likely to attribute

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improbable events to fate and to believe that events that happened would always take place no matter what preceded them (Norenzayan & Lee, 2010), and when people stressed different attributes of God, they formed different images of God. When God was thought to be omnipresent and omnipotent, he was less likely to be seen as the master of events; when God was thought to be the kindly father, he was more likely to be seen as the master of the world; when God was thought to be the stern father, he was more likely to be invoked as the explanation of good actions (Lalljee, Brown, & Hilton, 1990).

3.4.3 Anthropomorphism

Some research has examined the relation between religious belief and mind attribution to religious targets, such as gods. Furthermore, the research about the anthropomorphism of gods provides indirect evidence for mind attribution to gods.

Anthropomorphism refers to a process of inductive inference whereby people attribute human, especially human-only, mental states, such as intention, emotion, motivation, to nonhuman agents (Waytz, Morewedge, et al., 2010). It included two different kinds. One was to attribute humanlike physical feature (e.g. hand, face) to nonhumans, the other was to attribute a human mind to nonhumans (e.g. intention, conscious awareness, secondary emotion). Anthropomorphism therefore does not focus purely on behavioral or dispositional inferences about a nonhuman agent but requires attributing human physical form or human mind to nonhuman agents. For instance, regarding a horse as fast does not

necessarily denote anthropomorphic reasoning, but regarding a horse as loyal does. The former is just a description of an observable behavior, whereas the latter refers to a distinctively mental state. The essence of anthropomorphism is therefore to attribute capacities that people tend to think of as distinctly human to nonhuman agents.

Research on anthropomorphism shows that people perceive mental states in a variety of human and nonhuman entities, such as alarm clocks, dead relatives, groups, financial markets, and bacteria (Epley, et al., 2007; Gray et al., 2007). With reference to anthropomorphism of religious beliefs, gods are an ideal example. When evaluating the images of God, Satan, and self with Adjective Check List, participants described God as “gender neutral, favorable, and strong, but not active, and high on the nurturing parent ego state” (Bassett & Williams, 2003). Furthermore, participants who imagined God as more giving, forgiving, accepting and serious, were more likely to view themselves as generous, sincere, and easily forgivable (Roberts, 1989). However, representations of gods are both similar and different from representations of human beings, because gods are usually conceived as supra-human by people. Seeing gods as suprahuman means emphasizing the differences between humans and gods, whereas seeing them as humans means focusing on the similarities between humans and gods (Demoulin, Saroglou, & Van Pachterbeke, 2008). People are inclined to “create” gods in their own image, but also to “create” gods as being better and higher than themselves. For example, supernatural beings were judged to be similar to humans in primary and secondary emotions, but to be superior in cognitive and perceptual capacities, including intentions,

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thoughts, and perceptions (Haslam, Kashima, Loughnan, Shi, & Suitner, 2008). However, when judging the emotion of God in another study, people tended to attribute the same extent of secondary emotion to God and humans, and attributed less primary emotion to God than they did to humans (Demoulin et al., 2008).

Not only does anthropomorphism of gods commonly exist, but it can affect individuals' psychological processes anytime and anywhere. People with anthropomorphic representations of God were more likely to believe God to be judgmental than those with less anthropomorphic representations (Morewedge & Clear, 2008). People also think that god(s) would help them when they are in a desperate situation. Belief in God can help individuals to defend against the distress associated with randomness. When people felt that personal control was low or threatened, they were more likely to believe in the existence of God who had control (Kay, Moscovitch, & Laurin, 2010).

In a word, anthropomorphism of gods is a common tendency among most people, and has its effect on people's psychological processes and behaviors. The current study will examine whether people's tendency to anthropomorphize gods would mediate the effect of religion belief on mind attribution to gods.

4 Overview of the present research

The present research tries to explore the effect of religious beliefs on individuals' mind attribution to various religious targets in different cultural contexts. In order to examine whether there is cross-cultural consistency of mind attribution to religious targets, and because of the fact that psychology in general has conducted relatively little research in non-western cultural contexts (Henrich, Heine, & Norenzayan, 2010), I investigated the impact of religious beliefs on mind perception in China and France in three studies.

Study 1 was a correlational study. It was expected that there would be positive correlations between religious belief and mind attribution to god/religious people, and negative correlation between religious beliefs and mind attribution to nonreligious people.

Study 2 used a priming paradigm to explore the causal relation between religious beliefs and mind attribution to gods. It examined whether priming individuals' religious beliefs would make them attribute more mind to god. The personal religiosity and degree of anthropomorphism of gods may have a mediating effect.

Study 3 turned to religious persons. It investigated the hypothesis that priming individuals' religious beliefs could increase mind attribution to religious persons, but decrease mind attribution to nonreligious persons.

5 Study 1. Cross-cultural differences in religiosity and mind attribution to different targets

Study 1 aims at exploring the possible relations between religious beliefs and mind attribution to different religious targets in two different cultural contexts. It makes the following correlational hypotheses that the stronger religious beliefs individuals have, the more they attribute mind to gods and to religious people, and the less they attribute mind to nonreligious people. Furthermore, it also explores the possible cross-cultural differences in religiosity and mind attribution to different religious targets between the Chinese and the French, but it does not make specific predictions, due to the variety of religiosity in the current samples.

5.1 Hypotheses

Hypothesis 1. The correlations between personal religiosity and mind attribution to gods will be positive.

Hypothesis 2. The correlations between personal religiosity and mind attribution to religious persons will be positive,

Hypothesis 3. The correlations between personal religiosity and mind attribution to nonreligious persons will be negative.

5.2 Study 1a The Chinese sample

5.2.1 Method

5.2.1.1 Participants.

A total of 100 university students from the Eastern part of China participated in the study, of which 9 were excluded because they did not complete the questionnaire, leaving 91 participants (73 female, 18 male, $M_{\text{age}}=20.23$, $SD_{\text{age}}=.86$) in the final sample. Concerning self-reported religious belief, 31 self-identified as atheists, 29 as agnostics, 23 as believers of folk religion, 2 as Buddhists, 2 as Christians, 1 as Muslim. 3 did not report a self-identification. I categorized them into three groups: atheist, agnostic and religious.

5.2.1.2 Procedure and materials

Participants completed a questionnaire including two separate measurements in a quiet classroom. One was the mind perception measurement in three parts with different targets, which included 12 items to measure individuals' mind attribution to gods (Part 1), a person with religious belief (Part 2), and a person without religious belief (Part 3) respectively. Specifically, participants answered 12 questions, which took the form "to what extent do you think God/gods (religious person/nonreligious person) is/are capable of X on a 7-point scale from 1 (definitely not capable) to 7 (definitely capable), with 4 (not sure) as the midpoint. Substituting for the "X" were words from the two dimensions of mind perception (agency and experience). In 12 questions, six were

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agency-related capacities: self-control, acting morally, planning, communication, memory, and thought; the other six were experience-related capacities: feeling pleasure, feeling desire, feeling pain, feeling rage, feeling joy and feeling fear.

The other measurement was intrinsic-extrinsic religiosity (Part 4), which measured religious belief on a 7-point Likert scale from 1 (definitely disagree) to 7 (definitely agree)¹. It included 14 items; 8 items were used to measure intrinsic religiosity, 6 items were used to measure extrinsic religiosity. Due to the possible religious diversity in the sample, some items were adapted to be more inclusive. For example, in the original scale, “church” is the only word to describe a religious venue, so we included the words “temple” and “mosque”, and treated church in France and temple in China as the main religious venue.

After completing the two scales, participants completed the demographic information and two questions about their opinion of the existence of gods (Part 5). One question asked directly to what extent do you think gods exist on a 5-point scale (belief in gods 1), and the other question (belief in gods 2), adapted from Baker and Smith (2009), asked to choose which one statement comes closest to one’s own personal beliefs about gods from the listed five situations of god’s existence, which was scored on a 5-point scale ranging from no belief in god to absolute belief in god (1. “I don’t

¹ Because of individual differences in religious belief in China, especially the fact that most college students received atheist education, we added 0 to represent “no concern” about the items in Chinese sample. When analyzing the data, we recoded the 0 into 1 or 7 (on the reversed score items), which implied that 0 represented that participants completely disagree with the item.

believe in anything beyond the physical world”; 2. “I believe in a higher power or cosmic force”; 3. “ I sometimes believe in God”; 4. “I believe in God, but with doubts”; 5. “I have no doubts that God exists.”).

5.2.2 Results²

5.2.2.1 Preliminary analysis

Analysis showed that the correlations between religious belief and belief in gods were all significant (see Table 5.1).

Table 5.1. Correlations between religious belief and belief in gods in the Chinese sample of Study 1

	Extrinsic religiosity	Belief in gods 1	Belief in gods 2	Belief in god
Intrinsic religiosity	.70**	.41**	.30**	.43**
Extrinsic religiosity	1	.33**	.30**	.37**
Belief in gods 1		1	.50**	.91**
Belief in gods 2			1	.81**

5.2.2.2 Correlation analyses³

Correlation analyses between religious belief and mind attribution to different targets seemed to show a graduated pattern. That is, participants’ religious beliefs, including intrinsic and extrinsic religiosity, had significant positive correlations with mind attribution to gods, and had significant positive correlations with mind attribution to religious targets on the agency dimension. There was no significant correlation between

² Factor analyses were performed to explore the structures of measurements in the present research (see Annex 1).

³ Because we made a priori directional predictions regarding religious beliefs and mind perception, we always report one-tailed tests of the correlational hypothesis throughout the thesis.

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individuals' intrinsic and extrinsic religiosity and mind attribution to nonreligious targets (see Tables 5.2, 5.3, 5.4).

Table 5.2. Correlations between religious belief and mind attribution to gods in the Chinese sample of Study 1

	Agency	Experience	Mind Perception
Intrinsic religiosity	.23*	.29**	.27**
Extrinsic religiosity	.22*	.22*	.24*

***.* Correlation is significant at the 0.01 level (1-tailed).

*.** Correlation is significant at the 0.05 level (1-tailed).

Table 5.3. Correlations between religious belief and mind attribution to religious target in the Chinese sample of Study 1

	Agency	Experience	Mind Perception
Intrinsic religiosity	.20*	.09	.15
Extrinsic religiosity	.24*	.15	.21*

*.** Correlation is significant at the 0.05 level (1-tailed).

Table 5.4. Correlations between religious belief and mind attribution to nonreligious target in the Chinese sample of Study 1

	Agency	Experience	Mind Perception
Intrinsic religiosity	-.09	-.13	-.12
Extrinsic religiosity	.01	-.02	-.01

5.3 Study 1b The French sample

5.3.1 Method

5.3.1.1 Participants

I distributed 100 questionnaires to students in a French university. Ninety one participants returned the questionnaires. After deleting the participants who did not complete the questionnaire or who responded carelessly, 84 participants (71 female, 10 male, 3 did not report. $M_{age}=25.44$, $SD_{age}=8.16$) were included in the final sample. Concerning self-reported religious belief, 32 self-identified as atheists, 21 as agnostics, 4 as Buddhists, 9 as Christians, 1 as Muslim, 8 as other kinds of believers, 9 did not report. I categorized 4 Buddhists, 9 Christians, 1 Muslim, and 8 others as religious (22).

5.3.1.2 Procedure and materials

The procedure and materials were identical to those in Study 1a.

5.3.2 Results

5.3.2.1 Preliminary analysis

Analysis showed that the correlations between religious belief and belief in gods were all significant (Table 5.5)

Table 5.5. Correlations between religious belief and belief in gods in the French sample of Study 1

	Extrinsic religiosity	Belief in god1	Belief in god 2	Belief in god
Intrinsic religiosity	.89**	.61**	.51**	.62**

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Extrinsic religiosity	1	.53**	.59**	.60**
Belief in god1		1	.66**	.91**
Belief in god2			1	.91**

5.3.2.2 Correlation analyses

The correlational analyses in the French sample also showed a graduated change in pattern from mind attribution to gods to those of nonreligious targets. It revealed a strong correlational relation between religious beliefs and mind attribution to gods, but the correlations between religious beliefs and mind attribution to religious targets or nonreligious targets were only significant between intrinsic religiosity and mind perception (see Tables 5.6, 5.7, 5.8).

Table 5.6. Correlations between religious belief and mind attribution to gods in the French sample of Study 1

	Agency	Experience	Mind Perception
Intrinsic religiosity	.66**	.66**	.67**
Extrinsic religiosity	.56**	.56**	.57**

***.* Correlation is significant at the 0.01 level (1-tailed).

Table 5.7. Correlations between religious belief and mind attribution to religious targets in the French sample of Study 1

	Agency	Experience	Mind Perception
Intrinsic religiosity	.23*	.18*	.21*
Extrinsic religiosity	.14	.05	.10

**.* Correlation is significant at the 0.05 level (1-tailed).

Table 5.8. Correlations between religious belief and mind attribution to

nonreligious targets in the French sample of Study 1

	Agency	Experience	Mind Perception
Intrinsic religiosity	.17	.21*	.19*
Extrinsic religiosity	.08	.10	.09

*. *Correlation is significant at the 0.05 level (1-tailed).*

5.4 Cross-cultural comparison analyses

Although it was just an exploratory factor analysis that showed very similar structures between the French and Chinese samples on the measurement of religiosity and mind perception (see Annex 1), but not confirmatory analysis which is a much better practice before running cross-cultural comparisons, we still examined possible cultural differences between the Chinese and French samples on religiosity and mind attribution to different perceived targets, and also tried to explore with which group (atheist or religious) agnostic participants are more similar. A series of ANOVAs with culture (China vs. France) and self-reported religion (Atheist vs. agnostic vs. believer) as independent variables were conducted⁴.

5.4.1 Differences in intrinsic religiosity

An ANOVA on intrinsic religiosity revealed that the main effect of culture was not significant, $F(1, 152)=.94$, but the main effect of self-reported religion was significant, $F(2, 152)=23.46$, $p<.001$, $\eta_p^2=.24$, and it was

⁴ Because of the difference in factor analysis of intrinsic religiosity, I did not include item R3, which belonged to the Chinese sample but not the French sample, so the base point of cultural comparability was the same.

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qualified by a significant interaction, $F(2, 152)=5.56, p=.005, \eta_p^2=.07$. A simple effect analysis revealed that Chinese atheists and agnostics had significantly higher intrinsic religiosity than French atheists, $F(1, 154)=3.14, p=.08$ and agnostics $F(1, 154)=3.92, p=.05$, whereas the religious persons in the two cultures were similar, $F(1, 154)=1.54, p=.22$. On the other hand, self-reported religion had a significant effect on intrinsic religiosity in both Chinese culture $F(2, 153)=5.69, p=.004$ and

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French culture $F(2, 153)=22.99, p<.001$. Separate one way ANOVAs with HSD post hoc tests showed that in the Chinese sample, atheist participants were significant lower in intrinsic religiosity than agnostic participants, $p=.004$, and religious participants, $p=.004$, but the latter two showed no difference, $p=1.00$. However, in the French sample, atheist participants were similar to agnostic ones, $p=.13$, but significantly lower in intrinsic religiosity than religious participants $p<.001$, and agnostic participants were significantly lower in intrinsic religiosity than religious ones, $p=.003$. (see Table 5.9)

Table 5.9. Descriptive statistics on intrinsic religiosity of participants with different religious beliefs in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	11.55(4.55)	15.97(5.88)	15.96(4.89)
French	8.72(6.27)	12.42(5.20)	17.51(6.53)

5.4.2 Differences in extrinsic religiosity

An ANOVA on extrinsic religiosity revealed significant main effects of culture $F(1, 151)=36.15, p<.001, \eta_p^2=.19$, and of self-reported religion $F(2, 151)=14.80, p<.001, \eta_p^2=.16$, further qualified by a significant interaction, $F(2, 151)=4.05, p=.02, \eta_p^2=.07$. A simple effect analysis revealed that Chinese atheist and agnostic participants had much higher extrinsic religiosity than French atheists, $F(1, 153)=14.76, p<.001$ and agnostics $F(1, 153)=23.45, p<.001$, whereas the religious participants in the two cultures were not significantly different, $F(1, 153)=2.89, p=.09$.

On the other hand, self-reported religion had a significant effect on extrinsic religiosity in both Chinese culture $F(2, 152)=3.79, p=.03$ and French culture $F(2, 153)=13.18, p<.001$. Separate one way ANOVAs with HSD post hoc tests showed that in the Chinese sample, atheist participants were significantly lower in extrinsic religiosity than agnostic participants, $p=.007$, or religious participants, $p=.02$, but the latter two showed no significant difference, $p=.97$. However, in the French sample, atheist participants were not significantly different from agnostics, $p=.59$, but were significantly lower than religious participants $p<.001$, and agnostic participants were significantly lower than religious ones, $p=.007$ (see Table 5.10).

Table 5.10. Descriptive statistics on extrinsic religiosity of participants with different religious beliefs in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	17.26(7.17)	22.24(6.84)	21.86(3.77)
French	9.97(7.96)	12.11(5.41)	19.55(8.02)

5.4.3 Differences in mind attribution to gods

An ANOVA on the agency dimension of mind attribution to gods revealed that the main effect of culture was not significant, $F(1, 153)=2.00, p=.16, \eta_p^2=.01$, but that the main effect of self-reported religion was significant, $F(2, 153)=25.84, p<.001, \eta_p^2=.25$. Furthermore, these effects were qualified by a significant interaction, $F(2, 153)=7.67, p=.001, \eta_p^2=.09$. A simple effect analysis revealed that Chinese atheist and agnostic participants attributed much more mind to gods on the dimension of

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agency than French atheists, $F(1, 155)=9.25, p=.003$ and agnostics $F(1, 155)=3.24, p=.08$, however, the religious persons in the two cultures made similar mind attributions to gods, $F(1, 155)=1.69, p=.20$. Self-reported religion significantly predicted mind attribution to gods in both Chinese culture $F(2, 154)=5.19, p=.007$ and French culture $F(2, 154)=28.91, p<.001$. Separate one way ANOVAs with HSD post hoc tests showed that in the Chinese sample, atheist participants attributed less mind on the agency-dimension to gods than did agnostic participants, $p=.002$, or religious participants, $p=.06$, but the latter two showed no significant difference, $p=.45$. However, in the French sample, atheist participants attributed less mind on the agency dimension to gods than agnostics, $p=.001$, and religious participants, $p<.001$, and also agnostic participants attributed less mind on the agency dimension to gods than religious ones, $p=.07$ (see Table 5.11).

Table 5.11. Descriptive statistics on agency dimension of mind attribution to gods among participants with different religious beliefs in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	21.48(10.26)	29.03(6.55)	26.39(7.22)
French	13.66(10.20)	24.84(11.37)	32.15(8.55)

An ANOVA on the experience dimension of mind attribution to gods revealed significant main effects of culture $F(1, 153)=5.07, p=.03, \eta_p^2=.03$, and of self-reported religion $F(2, 153)=29.21, p<.001, \eta_p^2=.28$, and further qualified by a significant interaction, $F(2, 153)=5.72, p=.004, \eta_p^2=.07$. A simple effect analysis revealed that Chinese atheist and agnostic

participants attributed more mind to god on the experience-dimension than the French atheist participants, $F(1, 155)=10.61, p=.001$ and agnostic participants $F(1, 155)=3.69, p=.06$, whereas the religious participants in the two cultures were similar, $F(1, 155)=.17, p=.68$. Self-reported religion had significant effects on the experience-dimension of mind attribution to gods in both Chinese culture $F(2, 154)=5.94, p=.003$ and French culture $F(2, 154)=29.78, p<.001$. Separate one way ANOVAs with HSD post hoc tests showed that in the Chinese sample, atheist participants attributed less mind to gods on the experience-dimension than both agnostic participants, $p=.004$, and religious participants, $p=.01$, but the latter two showed no significant difference, $p=.94$. However, in the French sample, atheist participants attributed less mind to gods on the experience-dimension than did agnostics, $p<.001$, and religious participants, $p<.001$, and also agnostic participants attributed less mind to gods on the experience-dimension than religious ones, $p=.049$ (see Table 5.12).

Table 5.12. Descriptive statistics on experience-dimension of mind attribution to gods among participants with different religious beliefs in

the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	20.81(9.74)	28.24(6.61)	27.46(9.34)
French	12.44(7.76)	23.58(11.54)	30.70(9.04)

5.4.4 Differences in mind attribution to religious targets

An ANOVA on the agency dimension of mind attribution to religious targets revealed that the main effect of culture was significant, $F(1,$

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153)=4.64, $p=.03$, $\eta_p^2=.03$, such that French participants ($M=29.01$, $SD=7.75$) attributed more mind to the religious targets than did Chinese ones on the agency-dimension ($M=27.24$, $SD=4.28$). The main effect of self-reported religion was significant, $F(2, 153)=3.11$, $p=.047$, $\eta_p^2=.04$. A post hoc test (HSD) showed no significant differences among atheists ($M=26.70$, $SD=7.09$), agnostics ($M=28.85$, $SD=5.51$) and religious participants ($M=28.96$, $SD=5.03$). The interaction effect was not significant, $p=.81$ (see Table 5.13).

Table 5.13. Descriptive statistics on agency-dimension of mind attribution to religious targets among participants with different religious beliefs in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	26.06(4.99)	27.83(2.77)	27.93(4.59)
French	27.31(8.70)	30.42(7.94)	30.40(5.38)

ANOVAs on the experience dimension of mind attribution to religious targets revealed that only the main effect of culture was significant, $F(1, 153)=4.84$, $p=.03$, $\eta_p^2=.03$, such that French participants ($M=29.49$, $SD=7.74$) attributed more mind to the religious targets than Chinese ones ($M=27.36$, $SD=4.73$). No other significant effects were found.

Table 5.14. Descriptive statistics on experience-dimension of mind attribution to religious targets among participants with different religious beliefs in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	26.94(5.25)	27.83(3.48)	27.36(5.33)

French	28.88(8.21)	30.05(8.34)	29.95(6.64)
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5.4.5 Differences in mind attribution to nonreligious targets

ANOVAs on the agency and experience dimensions revealed no significant effects (see Tables 5.15 and 5.16).

Table 5.15. Descriptive statistics on agency-dimension of mind attribution to nonreligious targets among participants with different religious beliefs

in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	28.26(4.62)	28.83(2.41)	29.39(3.87)
French	25.78(11.40)	27.47(11.18)	28.65(9.06)

Table 5.16. Descriptive statistics on experience-dimension of mind attribution to nonreligious target among participants with different

religious beliefs in the two cultures

Culture	Religious belief		
	Atheist	Agnostic	Religious
Chinese	28.71(4.86)	30.31(2.50)	29.68(3.57)
French	26.75(11.74)	27.89(11.28)	28.70(9.53)

5.5 Discussion

Through the correlational analyses between religious beliefs and mind attribution to different targets, there seemed to be a graduated pattern from positive correlation to negative correlation in the Chinese sample, and from high positive correlation to relatively low correlation in the

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French sample. With the reducing religiosity of the targets from gods to the nonreligious person, the correlations between religious beliefs and

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mind perception transformed from positive to negative in the Chinese sample. If participants' religious beliefs were stronger, they attributed more mind to gods, but less mind to the nonreligious perceived target. In addition, participants' religious beliefs only showed significant correlations with the agency-dimension of mind attribution to religious targets. In the French sample, participants with stronger religious belief, both intrinsic and extrinsic, attributed much more mind to gods. Participants with stronger intrinsic religious belief also attributed more mind to the perceived targets, whether these were religious or nonreligious.

Cross-cultural comparison analysis showed that Chinese atheist and agnostic participants showed much more religiosity, and also attributed more mind to gods than French ones, but the religious participants in the two cultures are similar. Corresponding with the differences between cultures, the self-reported religious beliefs showed different tendencies within cultures. Chinese agnostic participants were similar to Chinese religious ones on the measurement of religiosity, but French agnostic participants were similar to French atheist participants. On the measurement of mind attribution to gods, Chinese agnostic participants were similar to Chinese religious ones, but French participants were different from each other, increasing progressively from atheist to agnostic to religious participants. This suggested that agnostics, as a group that has ambivalent attitude to the existence of god, might show cultural differences such that in one culture they are more religious, in another culture they look more like atheists.

In both the Chinese and French samples, regression analyses showed that belief in gods significantly predicted mind attribution to gods. When belief in gods was included as a covariate, the partial correlations between religious beliefs and mind attribution to gods were no longer significant in the Chinese sample, and became smaller, although still significant, in the French sample. Such results implied that people's mind attribution to gods may be closely related to their belief in gods. If so, what would happen when god-related concepts are activated by a priming method? The question of whether people will also attribute more mind to gods in a condition where they have been aroused by god-related concepts will be addressed in Study 2, which uses a priming paradigm.

6 Study 2: Effects of religious priming and religious belief on mind attribution to gods

Study 1 used a correlational design to show that people whose religious beliefs were stronger attributed more minds to gods. This raises the question of whether manipulating the accessibility of people's religious concepts would similarly affect their mind attribution to gods. I investigate this question in Study 2 by attempting to influence the activation of participants' concepts concerning gods through exposure of god-related concepts using a priming paradigm.

Given the inconsistent results that some findings showed that religious priming can arouse the religious beliefs of both believers and nonbelievers, whereas other findings revealed that religious priming is only applicable to the religious believers, we assess priming effects in three different groups (believers, agnostics, atheists). This allows us to assess whether priming affects only occur in religious group or whether they can be detected in agnostics and atheists as well. Specifically, the following hypotheses will be examined.

6.1 Hypotheses

Hypothesis 1. Religious participants will attribute more mind to gods than agnostic and atheist ones, and agnostic participants will tend to attribute more mind to gods than atheist ones.

Hypothesis 2. Participants in the priming condition will attribute more mind to god than those in the neutral condition. This may interact with self-reported religion.

Hypothesis 2a. If religious priming is applicable to only religious believers, I expect an interaction of religious priming and self-reported religion such that the priming manipulation will have a significant effect in the group of religious believers, but not in the group of non-believers.

Hypothesis 2b. If religious priming is applicable to both religious believers and nonbelievers, I expect that the priming manipulation will have an effect independent of self-reported religion.

Hypothesis 3. Effects of priming and/or self-reported religion on mind attribution to gods will be mediated by religiosity and/or anthropomorphism of gods.

6.2 Study 2a The Chinese sample

6.2.1 Method

The study had a 2×3 between-subject design. The first (manipulated) independent variable was priming conditions (priming and neutral), the other (measured) independent variable was personal religious beliefs (atheist vs. agnostic vs. believer).

6.2.1.1 Participants

A total of 120 university students participated in the study, and 113 students returned the questionnaire. After excluding the participants who

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did not complete the questionnaire and others who realized the aim of the study or whose major was not psychology, 97 participants (82 female, 15 male, $M_{age}=20.83$, $SD_{age}=1.34$, one did not report the age) were left in the final sample. 49 were in the priming condition, 48 in the neutral condition. Self-reported religious belief showed 24 atheists, 35 agnostics, 28 believers in folk religion, 5 Buddhists, 2 Christians, 1 Muslim, and 2 others. Excepting the atheists and agnostics, the others were categorized as religious believers (38).

6.2.1.2 Experimental manipulation of religious priming

The scrambled sentence paradigm (Srull & Wyer, 1979) was used in the current study to manipulate participants' belief in gods. The scrambled sentence task requires participants to use some scrambled words to form a complete sentence. The task has been used extensively across different research areas (Bargh, Chen, & Burrows, 1996; Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Fitzsimons & Shah, 2008; Meier & Robinson, 2004; Randolph-Seng & Nielsen, 2007; Shariff & Norenzayan, 2007; Toburen & Meier, 2010) and has been shown to be an effective method to investigate how a cognitive representation primed in one situation by scrambled sentences affects individuals' thoughts and behavior in a seemingly unrelated situation.

Specific to religious priming, the basic premise is that after reading god-related words (as opposed to non-God-related words), individuals' god-related representations or concepts in their minds will be activated, which might generalize into a basic religious belief, and then such

activation will affect their following thought or behavior. The scrambled sentence task used by Shariff and Norenzayan (2007) to examine the effect of religious priming on prosocial behavior was used in the current research. In this task, participants were asked to use four of five words to form a grammatically correct sentence in 10 trials. In the neutral prime condition, none of the scrambled words contained God-related concepts. In the religious prime condition, half of the sentences included a God-related concept (spirit, divine, God, sacred, prophets). For example, participants were asked to unscramble “dessert divine was fork the” into a complete four-word sentence, with the correct sentence being “the dessert was divine” (Toburen & Meier, 2010).

Given the cultural differences in religion between Westerners and Chinese and language differences between English and French/Chinese, the scrambled sentence task was not translated directly, but some adaptations were made on both religious concepts in the priming condition and some words in the neutral condition. The most obvious adaptation was the God-related concepts in the Chinese sample. In terms of the three relatively distinct kinds of concept (religious agents that described some person or being with religious or divine attributes, such as god, angel; spiritual/abstract concepts related to individual relationship to the sacred, such as faith, belief; and institutional/concrete concepts related to institutional aspect of religious practice, such as baptism, shrine, scripture) used in religious priming studies (Ritter & Preston, 2013), the religious priming in the Chinese sample was concentrated on religious agents, such as gods, deities, and divinities.

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6.2.1.3 Procedure and materials

Participants independently completed a questionnaire in a quiet classroom. First, they finished the scrambled sentence task. Second, they answered the questions about mind attribution to gods as in Part 1 of Study 1. Third, they completed the intrinsic-extrinsic religiosity scale as in Study 1. Fourth, they completed a measure of the anthropomorphic god concept (Morewedge & Clear, 2008). Participants reported the extent to which they considered 11 human-like personality traits to be descriptive of God (i.e. caring, comforting, controlling, distant (reverse scored), forgiving, judging, loving, impersonal (reversed scored), responsive, unavailable (reversed scored), and wrathful) on 9-point Likert scales from 1 (not at all) to 9 (very much). Finally, demographic information was collected, and participants were probed for suspicion concerning our priming manipulation by a funneled procedure such that they were first asked about whether they thought any of the tasks were connected (and if so, which tasks), followed by whether they thought any of the finished tasks influenced the other tasks, and then whether they had done a similar scrambled sentence task before. Two questions about their opinion of the existence of gods as in Study 1 were also tested.

6.2.2 Results

6.2.2.1 Preliminary analysis

With respect to the debriefing questions, 41 (42%) participants responded “yes” to the question of “do you think the different tasks were related in the questionnaire”, although they did not give an exact report of what was

the relation between religious priming and mind perception. An independent t-test of the effect of this debriefing question on all possible dependent variables showed only one significant effect of affirming a relation between the tasks on the agency-dimension, $t(95)=3.40$, $p=.001$. Participants who answered “yes” ($M=33.61$, $SD=4.71$) attributed more mind to gods on the agency-dimension than those who answered “no” ($M=29.63$, $SD=6.33$). Due to the fact that participants who suspected a link between the questions did not realize the aim of the study, we included them in the following analyses. On the other two debriefing questions, less than 10 percent of participants answered “yes”, so they were eliminated.

Given the possibility that religious priming might affect participants’ self-reported religious beliefs, a Chi-square test was performed to examine whether there would be significantly more self-reported religious participants in the priming condition than that in the neutral condition. It revealed non-significant differences among atheist, agnostic and religious participants, $\chi^2(2, n=97)=1.02$, $p=.60$, $\phi=.10$. This result implied that religious priming did not affect participants’ self-reported religious beliefs.

6.2.2.2 Correlation analyses

To confirm the correlational results in Study 1, the correlations between religious belief and mind attribution to gods were analyzed. All of them were significantly positive, in line with the results of Study 1 (see Table 6.1). Also, the correlations between religious belief and belief in gods

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were significantly positive, except between extrinsic religiosity and one of the belief in god measures (see Table 6.2).

Table 6.1. Correlations between religious belief and mind attribution to gods in the Chinese sample of Study 2

	Agency	Experience
Intrinsic religiosity	.18*	.27**
Extrinsic religiosity	.34**	.34**

***. Correlation is significant at the 0.01 level (1-tailed).*

**. Correlation is significant at the 0.05 level (1-tailed).*

Table 6.2. Correlations between religious belief and belief in gods in the Chinese sample of Study 2

	Extrinsic religiosity	Belief in gods1	Belief in gods 2	Belief in gods
Intrinsic religiosity	.36**	.52**	.22*	.46**
Extrinsic religiosity	1	.35**	.08	.27**
Belief in gods1		1	.46**	.90**
Belief in gods2			1	.80**

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

6.2.2.3 Religious differences among atheist, agnostic and religious participants

A one way ANOVA with self-reported religion as independent variable and several religion-related variables as dependent variables (intrinsic religiosity, extrinsic religiosity, anthropomorphism of god, belief in god) revealed significant differences among atheist, agnostic and religious participants in intrinsic religiosity $F(2, 94)=9.66, p<.001$, and belief in gods, $F(2, 94)=19.13, p<.001$.

Post-hoc tests (HSD) showed that the atheist participants were significantly lower in intrinsic religiosity than agnostic and religious participants ($p=.004$ and $p<.001$), whereas the latter two showed no difference ($p=.55$). The atheist participants were significantly lower than the agnostic and religious participants in belief in god ($ps<.001$) (see Table 6.3).

Table 6.3. Descriptive statistics of intrinsic religiosity and belief in gods in the Chinese sample of Study 2

		Mean	SD
Intrinsic religiosity	Atheist	15.46	4.49
	Agnostic	20.34	5.41
	Religious	21.71	6.28
Belief in gods	Atheist	2.58	.93
	Agnostic	3.69	.52
	Religious	3.80	.93

6.2.2.4 Relationships between religious belief and belief in gods on mind attribution to gods

Regression analysis of religiosity on mind attribution to gods showed that participants' extrinsic religiosity significantly predicted their mind attribution to gods: agency dimension: $\beta=.37$, $t=3.67$, $p<.001$ and experience dimension: $\beta=.28$, $t=2.68$, $p=.009$, however, their intrinsic religiosity was not a significant predictor ($ps>.05$).

Regression analysis of belief in gods on mind attribution to gods showed that participants' belief in the existence of gods significantly predicted

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their mind attribution to gods: agency dimension: $\beta=.40$, $t=3.80$, $p<.001$ and experience dimension: $\beta=.26$, $t=2.31$, $p=.02$. However, participants' choice of a description that was closest to their own belief in the existence of gods (belief in god 2) did not significantly predict mind attribution to gods ($p>.05$).

6.2.2.5 Effects of priming and self-reported religion on mind perception⁵

The agency index was submitted to 2 (priming condition: priming vs. neutral) \times 3 (self-reported religion: atheist vs. agnostic vs. believer) between-subject ANOVA. A main effect of religious priming was revealed such that participants in the priming condition attributed more mind to gods on the agency dimension than those in the neutral condition, $F(1,91)=5.80$, $p=.02$, $\eta_p^2=.06$. Also, self-reported religion had a marginally significant main effect, $F(2,91)=2.79$, $p=.07$, $\eta_p^2=.06$. A post-hoc test (HSD) showed that the religious participants attributed more mind to gods than atheist ones ($p=.02$), and agnostic participants were not different from atheist participants ($p=.18$) or religious participants ($p=.61$). No significant interaction effect was found (see Table 6.4).

The experience index was also submitted to 2 (priming condition: priming vs. neutral) \times 3 (self-reported religion: atheist vs. agnostic vs. believer)

⁵ According to the regression analysis of religious belief, extrinsic religiosity should be included as a covariate, but the results were nearly the same whether it was included or not. So, the results without including covariates were reported. The data analyses in the French sample were treated in the same way.

between-subject ANOVA. No significant effect was found (see Table 6.5).

Table 6.4. Descriptive statistics on agency-dimension of mind perception of gods in the Chinese sample of Study 2

	Priming condition	Neutral condition	Total
Atheist	31.30(5.64)	26.93(7.83)	28.75(7.21)
Agnostic	32.32(4.45)	30.50(5.61)	31.49(5.02)
Religious	33.95(5.05)	31.44(6.08)	32.76(5.63)
Total	32.78(4.96)	29.81(6.64)	31.31(6.01)

Table 6.5. Descriptive statistics on experience-dimension of mind perception of gods in the Chinese sample of Study 2

	Priming condition	Neutral condition	Total
Atheist	30.00(6.62)	26.79(7.24)	28.12(7.03)
Agnostic	27.84(5.79)	29.69(5.16)	28.69(5.51)
Religious	30.10(6.62)	30.61(7.90)	30.34(7.16)
Total	29.20(6.27)	29.19(6.94)	29.20(6.58)

6.2.2.6 Mediating effect of Anthropomorphism and religiosity

The eleven items of personality adjectives that measured the anthropomorphic concepts of gods yielded a Cronbach's alpha of 0.75.

We conducted mediation analyses to investigate whether anthropomorphism of gods and/or religiosity could explain the relationship between religious priming and mind attribution to gods. Following the protocol of Preacher and Hayes (2004), a bootstrapping procedure with 5000 bootstrap samples and 95% confidence intervals was performed. A Sobel test indicated that there was no significant indirect

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effect, $z = -.61$, $p = .54$. This was confirmed by a bootstrapped 95% confidence interval that included zero (-0.85, 0.27) (see Figure 6.1).

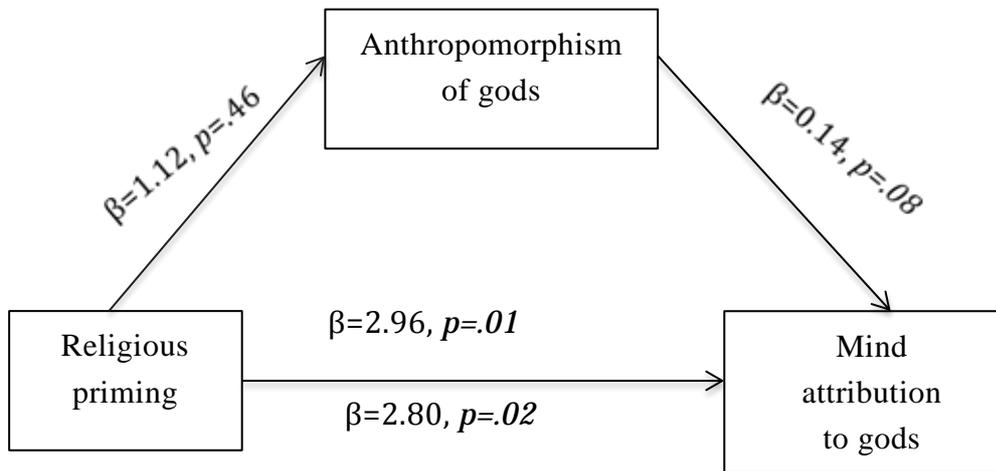


Figure 6.1. Mediation model for the effect of religious priming on mind attribution to gods via anthropomorphism of gods in Study 2a

The possible mediating effect of religiosity on the mind attribution to gods on the agency dimension was examined with the same way above. Sobel tests indicated that there were no significant indirect effects of intrinsic ($z = .93$, $p = .35$) and extrinsic religiosity ($z = .37$, $p = .72$). These were confirmed by a bootstrapped 95% confidence interval that included zero (-0.64, 1.18) and (-0.11, 0.83) respectively (see Figure 6.2).

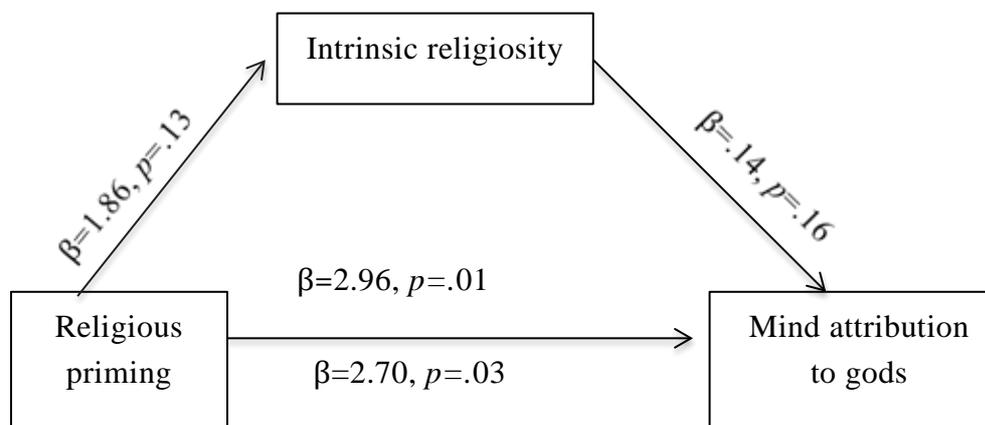


Figure 6.2. Mediation model for the effect of religious priming on mind attribution to gods via intrinsic religiosity in Study 2a

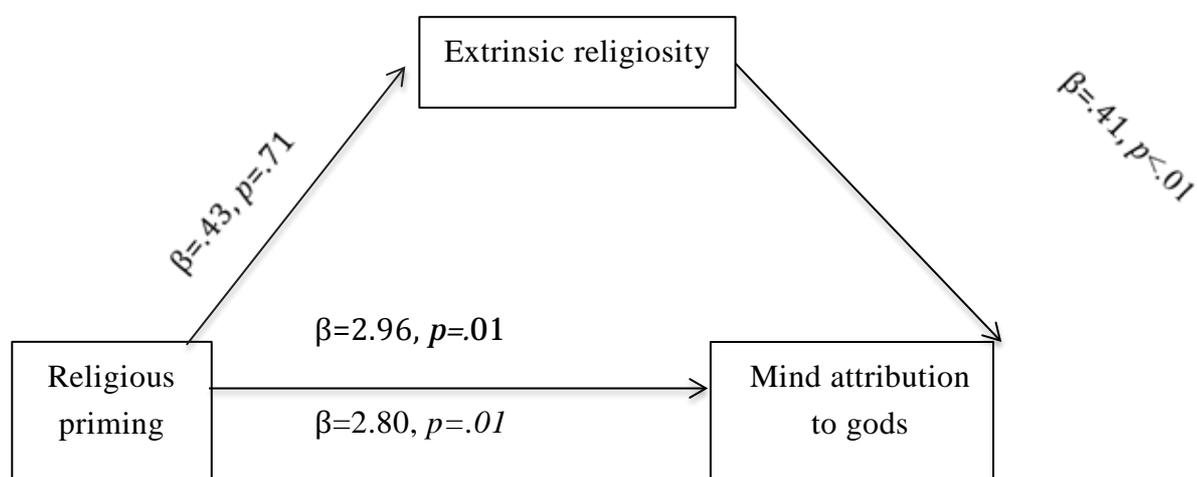


Figure 6.3. Mediation model for the effect of religious priming on mind attribution to gods via extrinsic religiosity in Study 2a

Therefore, the religious priming effect on mind attribution to gods among Chinese participants was not mediated by anthropomorphism of gods or by intrinsic/extrinsic religiosity.

6.2.3 Discussion

It is perhaps understandable that the religious priming made participants attribute more mind to gods on the agency-dimension but not on the experience-dimension. The result that extrinsic religiosity, but not intrinsic religiosity, significantly predicted mind attribution to gods and the feature of two dimensions of mind perception would explain it.

We may infer that for the Chinese participants, most of whom have no clear religious faith, religion usually plays an instrumental role in their

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lives, and they do not include religion as an internal part of themselves. When situated in a temporary religious condition coming from the religious priming, they unintentionally paid more attention to extrinsic religiosity. Extrinsic religiosity usually aims to achieve some external purposes, and the agency dimension of mind perception may be thought to be useful in achieving external purposes. Agency refers to the capacity to act. If gods are thought to have more mind on the dimension of agency, it usually implies that gods are more capable of satisfying people's needs, especially for those whose religious beliefs are for instrumental purposes. For example, when people think that gods are capable of communication and memory, they will have a psychological certainty that gods can learn their wishes through their prayer and memorize them, and then help them one day to attain their wishes. However, experience, as a capacity to feel, plays little role in helping to realize people's wishes.

Religious participants attributed more mind to gods on the agency-dimension than the atheist participants, and agnostic participants were not significantly different from both religious and atheist participants, although the Chinese agnostic participants in Study 1 were found to be more similar to the religious participants on religiosity and mind attribution to gods on the agency-dimension.

6.3 Study 2b The French sample

6.3.1 Method

6.3.1.1 Participants

A total of 100 university students from a French University voluntarily participated in the study in the library. 96 students returned the questionnaire. After deleting the participants who did not completely or carefully finish, 80 participants (57 female, 23 male, $M_{age}=22.42$, $SD_{age}=3.12$, three did not report their age) remained in the final sample, including 40 in the priming condition and 40 in the neutral condition. Self-reported religious belief showed 33 as atheists, 21 as agnostics, 1 as Buddhist, 9 as Christians, 4 as Muslims, 9 as others, and 3 did not self-report. I categorized 1 Buddhist, 9 Christian, 4 Muslim, and 9 others as belonging to the religious group (23).

6.3.1.2 Procedure and materials

The procedure and materials were identical to those in Study 2a.

6.3.2 Results

6.3.2.1 Preliminary analysis

With respect to the debriefing questions, 24 (30%) participants answered “yes” to the question of “do you think the different tasks were related in the questionnaire”. An independent t-test with all possible dependent variables showed no significant effect on any dependent variables. 10

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participants (12.5%) answered “yes” on the question of “do you think any part in the questionnaire you have finished has affected the way you finished the following tasks”. An independent t-test with all possible dependent variables showed no significant effect. Only 4 participants answered “yes” to the question “before answering this questionnaire, did you complete similar task to Part 1 in the questionnaire”, so it was not taken into account.

Given the possibility that religious priming might affect participants’ self-reported religious beliefs, a Chi-square test was performed to examine whether there would be significantly more self-reported religious participants in the priming condition than that in the neutral condition. It revealed non-significant differences among atheist, agnostic and religious participants, $\chi^2(2, n=80)=.08, p=.96, \phi=.30$. Such a result implied that religious priming did not affect participants’ self-reported religious beliefs.

6.3.2.2 Correlation analyses

As in Study 1, the correlations between religious belief and mind attribution to gods were significant, except a marginally significant correlation ($p=.07$) between intrinsic religiosity and experience (see Table 6.6). Also, the correlations between religious belief and belief in god were significantly positive (see Table 6.7).

Table 6.6. Correlations between religious belief and mind attribution to gods in the French sample of Study 2

	Agency	Experience
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Intrinsic religiosity	.30**	.17
Extrinsic religiosity	.62**	.49**

***. Correlation is significant at the 0.01 level (1-tailed).*

Table 6.7. Correlations between religious belief and belief in god in the French sample of Study 2

	Extrinsic religiosity	Belief in gods1	Belief in gods 2	Belief in gods
Intrinsic religiosity	.36**	.54**	.38**	.51**
Extrinsic religiosity	1	.49**	.56**	.58**
Belief in gods1		1	.62**	.90**
Belief in gods2			1	.90**

***. Correlation is significant at the 0.01 level (2-tailed).*

6.3.2.3 Religious differences among atheists, agnostics, and religious persons

A one way ANOVA with self-reported religion as independent variable and several religion-related variables as dependent variables (intrinsic religiosity, extrinsic religiosity, anthropomorphism of god, belief in god) revealed significant differences among atheist, agnostic and religious participants in intrinsic religiosity $F(2,75)=10.88$, $p<.001$, extrinsic religiosity $F(2,75)=5.15$, $p=.008$, anthropomorphism of gods $F(2,75)=11.66$, $p<.001$, and belief in gods $F(2,75)=69.49$, $p<.001$.

Post-hoc tests (HSD) showed that the religious participants were higher in intrinsic religiosity than the atheist ($p<.001$) and agnostic participants ($p=.001$), while the latter two were not significantly different from each other ($p=.99$). Religious participants were higher in extrinsic religiosity than the atheist ($p=.008$) and agnostic participants ($p=.07$), while the latter two were not significantly different ($p=.86$). Religious participants

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were higher than the atheist and agnostic participants in belief in gods ($p < .001$), and the agnostic participants were also higher than the atheist participants ($p < .001$). The atheist participants anthropomorphized gods less than religious ($p < .001$) and agnostic participants ($p = .03$), and there was no significant difference between religious and agnostic participants ($p = .17$) (see Table 6.8).

Table 6.8. Descriptive statistics of intrinsic/extrinsic religiosity, belief in gods and anthropomorphism of gods in the French sample of Study 2

		Mean	SD
Intrinsic religiosity	Atheist	22.13	6.00
	Agnostic	22.05	5.56
	Religious	31.08	11.17
Extrinsic religiosity	Atheist	12.56	7.76
	Agnostic	13.65	4.68
	Religious	18.46	8.03
Belief in gods	Atheist	1.56	.53
	Agnostic	2.45	.69
	Religious	3.60	.75
Anthropomorphism	Atheist	42.55	15.65
	Religious	60.77	13.65

6.3.2.4 Relationships between religious belief and belief in gods on mind attribution to gods

Regression analysis of religious belief on mind attribution to gods showed

that participants' extrinsic religiosity significantly predicted their mind attribution to god: agency dimension: $\beta=.59$, $t(75)=6.15$, $p<.001$ and experience dimension: $\beta=.49$, $t(75)=4.51$, $p<.001$. However, their intrinsic religiosity did not significantly predict these ($ps>.05$).

Regression analysis of belief in gods on mind attribution to gods showed that participants' belief in the existence of gods significantly predicted their mind attribution to gods: agency dimension: $\beta=.48$, $t(75)=4.00$, $p<.001$ and experience dimension: $\beta=.48$, $t(75)=3.68$, $p<.001$. However, Participants' choice of a description that was closest to their own belief in the existence of gods (belief in god 2) did not significantly predict mind attribution to gods ($ps>.05$).

6.3.2.5 Effects of priming and self-reported religion on mind perception

The agency index was submitted to a 2 (priming condition: priming vs. neutral) \times 3 (self-reported religion: atheist vs. agnostic vs. believer) between-subject ANOVA. Self-reported religion showed a significant main effect, $F(2,74)=11.64$, $p<.001$, $\eta_p^2 =.24$. Post-hoc tests (HSD) showed that the religious and agnostic participants attributed more mind to gods on the agency-dimension than atheist ones ($p<.001$ and $p=.002$ respectively), whereas there was no significant difference between religious and agnostic participants ($p=.74$). There was no significant effect of religious priming and interaction with self-reported religion (see Table 6.9).

Table 6.9. Descriptive statistics on agency-dimension of mind perception

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of gods in the French sample of Study 2

	Priming condition	Neutral condition	Total
Atheist	18.44(9.47)	15.47(11.28)	16.91(10.39)
Agnostic	27.09(9.06)	26.40(9.25)	26.76(8.93)
Religious	30.15(11.58)	27.77(9.48)	28.96(10.44)
Total	24.63(11.15)	22.20(11.58)	23.41(11.36)

The experience index was also submitted to a 2 (priming condition: priming vs. neutral) \times 3 (self-reported religion: atheist vs. agnostic vs. believer) between-subject ANOVA. Self-reported religion had a significant main effect, $F(2,74)=7.50$, $p=.001$, $\eta_p^2=.17$. A post-hoc test (HSD) showed that the religious and agnostic participants attributed more mind to gods on the experience-dimension than atheist ones ($p=.002$ and $p=.01$ respectively), whereas there was no significant difference between religious and agnostic participants ($p=.89$). The priming effect was not significant and there was no significant interaction with self-reported religion (see Table 6.10).

Table 6.10. Descriptive statistics on experience-dimension of mind
perception of gods in the French sample of Study 2

	Priming condition	Neutral condition	Total
Atheist	18.63(9.91)	14.53(9.78)	16.52(9.91)
Agnostic	24.09(9.14)	25.50(9.98)	24.76(5.51)
Religious	27.92(13.39)	24.31(8.49)	26.12(11.14)
Total	23.15(11.43)	20.45(10.55)	21.80(11.01)

6.3.2.6 Mediating effect of anthropomorphism and religiosity

The eleven items of personality adjectives that measured the

anthropomorphic concepts of gods yielded a Cronbach's alpha of 0.76.

We conducted mediation analyses to investigate whether anthropomorphism of gods and/or religiosity could explain the relationship between self-reported religion and mind attribution to gods, following the protocol of Hayes and Preacher (2014), which is used to analyze mediation effects when the independent variable is multilevel. With the atheist as the reference group, two dummy codes were created to represent the three kinds of religious belief. Specifically, Dummy 1 tested the effect of the atheist (coded 0) versus agnostic (coded 1) condition, with the religious believer coded 0. Dummy 2 tested for the residual difference between the atheist (coded 0) and the religious believer (coded 1) conditions, with the agnostic coded 0. They were shown in the figures below. We employed a bootstrapping procedure for multi-categorical variables with 5000 bootstrap samples and 95% confidence intervals (Hayes & Preacher, 2014). The analyses revealed that the anthropomorphism of gods and extrinsic religiosity mediated the relationship between self-reported religion and mind attribution to gods (see Figures 6.4, 6.5, 6.6 and 6.7). The indirect effects of anthropomorphism of gods on the agency-dimension and experience-dimension were significant for the religious participants (agency: CI=(3.72, 12.35); experience: CI=(3.53, 12.24)) and agnostic participants (agency: CI=(1.02, 8.65); experience: CI=(1.06, 8.62)), indicating that for religious and agnostic participants stronger anthropomorphic concepts of gods predicted more mind attribution to gods. The indirect effects of extrinsic religiosity on the agency-dimension

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and experience-dimension were significant for the religious believer (agency: CI=(1.60, 8.88); experience: CI=(1.24 – 7.70)), indicating that for religious participants higher extrinsic religiosity predicted more mind attribution to gods.

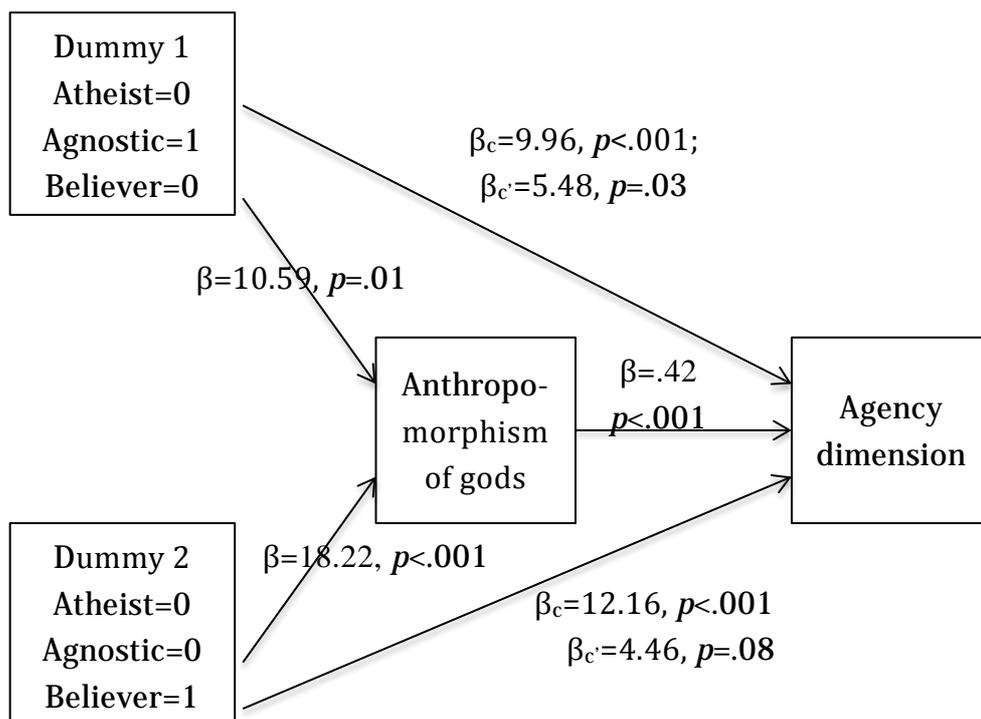


Figure 6.4. Mediation model for the effect of self-reported religion on agency-dimension of mind attribution to gods via anthropomorphism of gods in Study 2b

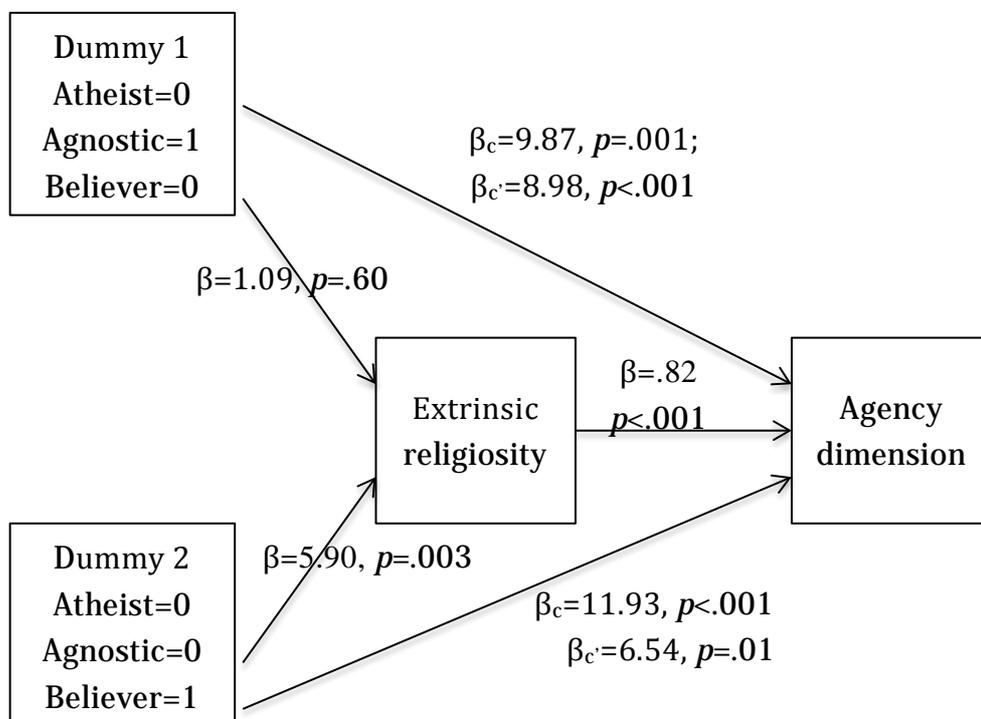


Figure 6.5. Mediation model for the effect of self-reported religion on agency-dimension of mind attribution to gods via extrinsic religiosity in Study 2b

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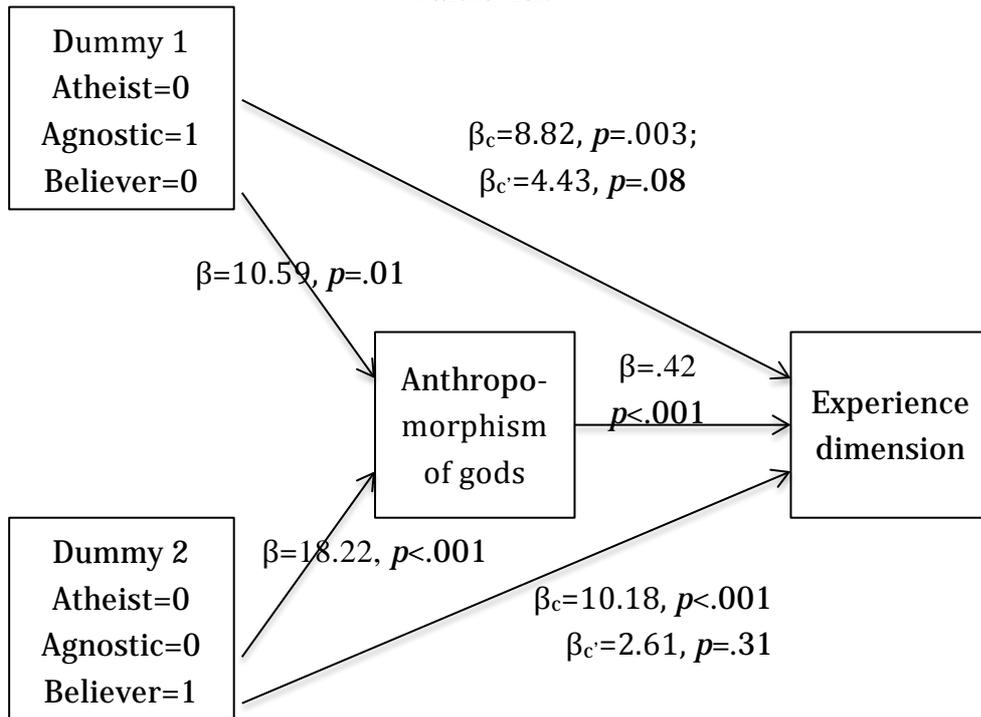


Figure 6.6. Mediation model for the effect of self-reported religion on experience-dimension of mind attribution to gods via anthropomorphism of gods in Study 2b

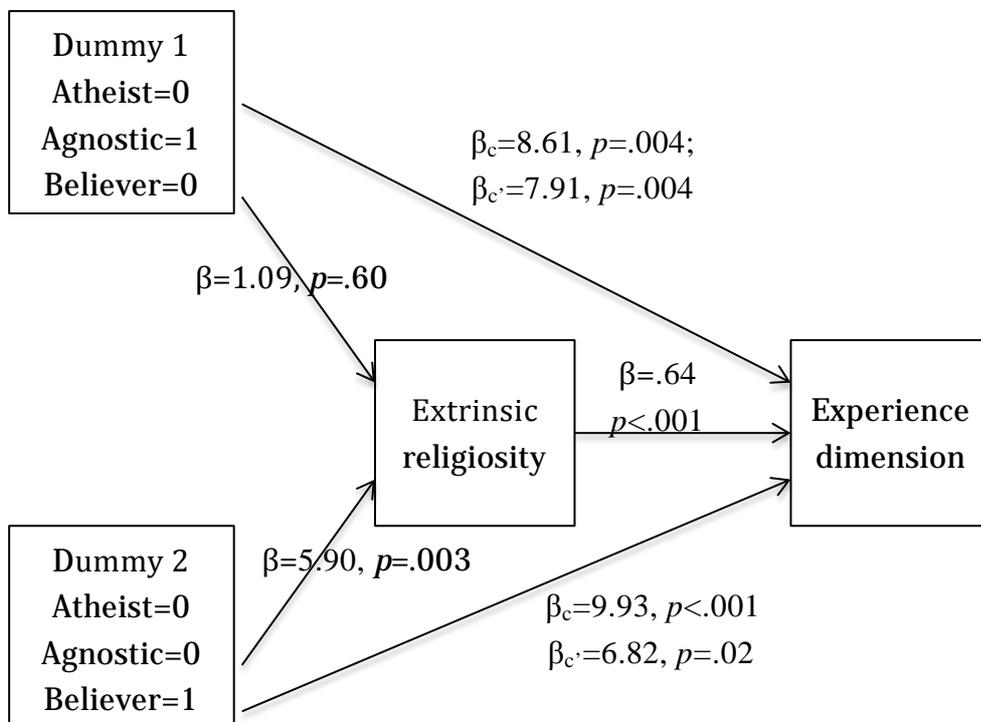


Figure 6.7. Mediation model for the effect of self-reported religion on experience-dimension of mind attribution to gods via extrinsic religiosity in Study 2b

6.3.3 Discussion

Although no significant religious priming effect was revealed in the French sample, there was some tendency for participants in the priming condition to attribute more mind to gods than those in the neutral condition on both the agency-dimension (24.63 vs. 22.20) and the experience-dimension (23.15 vs. 20.45).

In line with the results in the Chinese sample, regression analyses showed that extrinsic but not intrinsic religiosity significantly predicted mind attribution to gods. One possible explanation of the importance of the extrinsic religiosity in the French sample may be the reduction of religious cultural influence due to France's becoming a strongly secular country, resulting in a weakened role played by religion in people's lives. However, religion, as a cultural representation, still permeates various aspects of life. For example, lots of public holidays stem from religious festivals; magnificent cathedrals are quintessential buildings in most cities. These religious symbols may easily make people realize that religion can have some practical values for them. For example, to enjoy life on religious holidays, or to soothe a broken heart in a quiet church, which corresponds well to extrinsic religiosity.

It is not surprising that French religious participants, like Chinese participants, attributed more mind to gods than atheist ones. The cultural difference emerged with agnostic participants as French agnostic participants also attributed more mind to gods than the atheist ones, but Chinese agnostic participants did not. The results of mediating effects

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may explain the difference. The anthropomorphism of gods played a mediating role on the effect of self-reported religious belief on mind attribution to gods for religious and agnostic participants. French participants, who dwell in a historically religious country, may be familiar with the image of gods due to the cultural representation of religion. Because of such familiarity with gods, they may easily have anthropomorphic images of gods, corresponding to the result that their belief in the existence of gods was significantly correlated with mind attribution to gods. When gods are considered as anthropomorphic, they may be naturally attributed mind. In addition, extrinsic religiosity also played a mediating role on the effect of self-reported religious belief on mind attribution to gods for religious participants. As extrinsic religiosity usually points to external purposes, it seems that attributing mind to gods becomes necessary in order to ensure that gods would give help in achieving external purposes, especially for religious believers.

7 Study 3 Effects of religious priming and religious belief on mind attribution to specific individuals

People whose religious beliefs were stronger attributed more mind to gods. Will they attribute more mind to people in general? Or just to a specific religious individual? Will activation of people's god-related concepts also affect their mind attribution to religious believers? We examined these questions in Study 3 with the same independent variables (religious priming conditions and self-reported religious belief) as in Study 2, and introducing a new independent variable: targets of mind perception (atheist vs. Christian vs. control target). The reason that we chose atheists and Christians as research targets was based on the different religious situations in the two cultures. China is an officially atheist country, and atheism is taught at school, while France is a secular country where religion is tolerated and Christianity is the mainstream religion. Consequently, it is plausible to assume that the average Chinese person has been brought up in an atheist tradition, whereas the average French person has been brought up in a Catholic tradition, whether as a practicing Catholic or through at least having been exposed to the Catholic tradition through being a spectator of religious activities. We use these assumptions to derive hypotheses about the perception of religious and non-religious targets in the different cultures below. In addition, the current number of Chinese Christians estimated by different individuals or organizations ranges from 20 million to 130 million. It seems to be impossible to get a precise figure, but the number of Chinese Christians is growing quickly,

despite the fact that Chinese Christian is still a minority group in China and the majority is not acquainted with them. Therefore, we chose an atheist and a Christian as the research targets.

The study used a $2 \times 3 \times 3$ between-subject design, which varies priming condition (priming vs. neutral), personal religious belief (atheist vs. agnostic vs. believer) and targets of mind perception (atheist vs. Christian vs. control).

7.1 Hypotheses

Hypothesis 1. Religious participants will attribute more mind to the perceived targets than the agnostic and atheist ones, and agnostic participants may attribute more mind to the perceived targets than atheist ones.

Hypothesis 2. The religious target (Christian) will be attributed more mind than the atheist target and control target in the French sample, and will be attributed less mind than the atheist target and control target in the Chinese sample. To the atheist target and control target, mind attribution may be similar in both cultures.

Hypothesis 3. The interaction effect between self-reported religion and targets of mind perception will be significant. That is, religious participants will attribute more mind to religious targets than to non-religious ones; atheist and agnostic participants will attribute more mind to non-religious targets than to religious ones.

Hypothesis 4. Participants in the priming condition will attribute more mind to the perceived targets than those in the neutral condition.

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This may interact with self-reported religion and targets of mind perception.

Hypothesis 4a. If religious priming is only applicable to religious people, I expect a three-way interaction such that religious priming will make religious participants attribute less mind to the atheist target and more mind to the Christian and control targets, and will have no effect on mind attribution to perceived targets of the nonreligious participants.

Hypothesis 4b. If religious priming is applicable to both religious people and nonreligious people, I expect a three-way interaction such that religious priming will make religious and agnostic participants attribute less mind to the atheist target and more mind to the Christian target; and will make atheist participants attribute less mind to the Christian target, but not less to the atheist target; will have no effect on mind attribution to the control target.

7.2 Study 3a The Chinese sample

7.2.1 Method

7.2.1.1 Participants.

A total of 240 participants took part in the study voluntarily and completed a pencil-and-paper questionnaire in quiet classrooms in groups of 20 to 30 participants. After excluding those who did not answer completely, 223 (203 female, 20 male, $M_{age}=20.04$, $SD_{age}=1.25$) participants were included in the final sample with 111 in the priming condition and 112 in the neutral condition. Concerning self-reported religious belief, 71 described themselves as atheists, 68 as agnostics, 55 as

believers of folk religion, 15 as Buddhists, 7 as Christians, 7 as others. Those did not describe themselves as atheists or agnostics were categorized as religious participants.

7.2.1.2 Procedure and materials

The procedure and materials mirrored those of Study 2, but with two exceptions. One was that there was no measurement of the anthropomorphic god-concept. The other was that the target of mind perception was not gods any more, but a fictitious specific religious individual or nonreligious individual, who was depicted in detail in a vignette. The targets of mind perception included an atheist, a Christian, and a control target. Adapting from Kozak, Marsh, and Wegner (2006), the description of the control target consisted the basic information used in all conditions, to which differentiating information about religious orientation was added to the description of atheist and Christian targets (see Annexes 6, 7, 8).

7.2.2 Results

7.2.2.1 Preliminary analysis

In response to the debriefing questions, 25 (11.2%) participants answered “yes” to the question of “do you think the different tasks were related in the questionnaire” (Question 1). An independent t-test of responses to the Question 1 on all possible dependent variables showed significant effects of response on intrinsic religiosity ($p=.02$), and the experience-dimension of mind perception ($p=.048$), and a marginally significant effect on one measurement of belief in gods ($p=.07$) (see Table 7.1). Given the limited

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number of the sample, and the fact that few participants realized the true aim of the study, I did not exclude these data from the following analyses.

Table 7.1. Descriptive statistics of debriefing Question 1 on intrinsic religiosity, experience-dimension and belief in gods in the Chinese sample of Study 3

Dependent variables	Yes or No	
	Yes	No
Intrinsic religiosity	21.76(5.64)	18.47(6.68)
Experience	26.80 (4.24)	24.83(4.70)
Belief in gods	3.82(1.02)	3.41(1.13)

On the other two debriefing questions, less than 10 percent of participants answered yes, so they were not analyzed further.

Given the possibility that religious priming might affect participants' self-reported religious beliefs, a Chi-square test was performed to examine whether there would be significantly more self-reported religious participants in the priming condition than that in the neutral condition. It revealed non-significant differences among atheist, agnostic and religious participants, $\chi^2(2, n=223)=.36, p=.84, \phi=.04$. This result implied that religious priming did not affect participants' self-reported religious beliefs.

7.2.2.2 Correlation analyses

In line with the results of Study 1, I found significantly positive correlations between religious belief and mind attribution to a religious target (see Table 7.2), and between religious belief and belief in gods (see Table 7.3). However, the (marginally) significant positive correlations

between religious belief and mind attribution to the atheist target on the experience-dimension, as well as the (marginally) significant positive correlations between religious belief and mind attribution to the control target, were different from the results in Study 1 that showed a close-to-zero correlation (see Table 7.2).

Table 7.2. Correlations between religious belief and mind attribution to different targets in the Chinese sample of Study 3

Religiosity	Religious target		Atheist target		Control target	
	Agency	Experience	Agency	Experience	Agency	Experience
Intrinsic_R	.28*	.21*	.03	.17	.16	.20*
Extrinsic_R	.27**	.17	-.03	.21*	.21	.07

***. Correlation is significant at the 0.01 level (1-tailed).*

**. Correlation is significant at the 0.05 level (1-tailed).*

Table 7.3. Correlations between religious belief and belief in gods in the Chinese sample of Study 3

	Extrinsic religiosity	Belief in gods1	Belief in gods 2	Belief in gods
Intrinsic religiosity	.24**	.45**	.31**	.45**
Extrinsic religiosity	1	.15*	.06	.14*
Belief in gods1		1	.51**	.90**
Belief in gods2			1	.83**

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

7.2.2.3 Religious difference among atheist, agnostic, and religious participants

The various self-reported religious beliefs were categorized into three

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kinds of personal religiosity: atheist (71), agnostic (68), and religious (84). A one way ANOVA with self-reported religion as independent variable on religion-related dependent variables (intrinsic religiosity, extrinsic religiosity, belief in god) revealed significant differences among atheist, agnostic and religious people in intrinsic religiosity $F(2,220)=20.15$, $p<.001$, and belief in god $F(2,220)=55.05$, $p<.001$, but not in extrinsic religiosity, $p=.14$. A post-hoc test (HSD) showed that in intrinsic religiosity, the religious participants were higher than the atheist ($p<.001$) and agnostic ones ($p=.03$), and that the agnostics were higher than the atheists ($p=.001$). In belief in gods, the religious participants were higher than the atheist ($p<.001$) and agnostic participants ($p=.06$), and the agnostic participants were higher than the atheist ($p<.001$) (see Table 7.4).

Table 7.4. Descriptive statistics of intrinsic/extrinsic religiosity, and belief in gods in the Chinese sample of Study 3

		Mean	SD
Intrinsic religiosity	Atheist	15.35	4.91
	Agnostic	19.04	6.42
	Religious	21.61	6.76
Extrinsic religiosity	Atheist	18.35	6.23
	Agnostic	20.13	5.07
	Religious	19.82	5.82
Belief in gods	Atheist	2.54	1.04
	Agnostic	3.70	.70
	Religious	4.04	.96

7.2.2.4 Relationships between religious belief and belief in gods on mind attribution to perceived targets

Regression analysis of religious belief on mind attribution to targets showed that participants' extrinsic religiosity predicted mind attribution to perceived targets at a marginal level of significance: agency-dimension: $\beta=.13$, $t=1.84$, $p=.07$ and experience-dimension: $\beta=.12$, $t=1.82$, $p=.07$, and their intrinsic religiosity significantly predicted mind attribution to targets on the agency-dimension, $\beta=.13$, $t=1.99$, $p=.05$ and experience-dimension, $\beta=.16$, $t=2.35$, $p=.02$.

Specific to the three perceived targets respectively, regression analysis indicated significant effect of that intrinsic religiosity significantly predicted mind attribution to the Christian target on the agency dimension, $\beta=.23$, $t=2.03$, $p=.046$, and that extrinsic religiosity did so at a marginal level of significance, $\beta=.22$, $t=1.91$, $p=.06$. Regression analyses revealed that religiosity did not significantly predict mind attribution to the atheist target and control target on the agency dimension. On the experience dimension, regression analysis revealed that religiosity did not significantly predict mind attribution to any perceived target.

Regression analysis of belief in gods on mind attribution to targets showed that belief in gods did not significantly predict the mind attribution of agency-dimension and experience-dimension. Specific to the three perceived targets respectively, participants' belief in the existence of gods only significantly predicted the experience-dimension of mind attribution

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to the control target, $\beta=.36$, $t=2.77$, $p=.007$.

7.2.2.5 Effects of priming and self-reported religion on mind perception⁶

A 2 (prime: priming vs. neutral) \times 3(self-reported religion: atheist vs. agnostic vs. believer) \times 3(targets of mind perception: atheist vs. Christian vs. control) ANOVA with agency-dimension as dependent variables showed that the main effect of target was significant, $F(2, 203)=5.54$, $p=.005$, $\eta_p^2=.051$. A post hoc test (HSD) showed that the Christian target was attributed less mind on the agency dimension than the atheist target $p=.004$ and the control target $p=.02$, and between the atheist target and the control target it had no significant difference, $p=.83$. No other significant main effects or interactions were found (see Table 7.5).

A 2(prime: priming vs. neutral) \times 3(self-reported religion: atheist vs. agnostic vs. believer) \times 3(targets of mind perception: atheist vs. Christian vs. control) ANOVA with the experience-dimension as dependent variables revealed one significant main effect and one significant interaction effect. That is, the main effect of target was significant, $F(2, 205)=6.75$, $p=.001$, $\eta_p^2=.062$. A post hoc test (HSD) showed that the Christian target was attributed less mind on the experience dimension than the atheist target $p<.001$, and the control target $p=.02$, the latter two had

⁶ According to the regression analysis of religious belief and belief in gods, intrinsic religiosity and extrinsic religiosity should be included as covariates. However, the results were nearly the same whether they were included or not. So, the results without including covariates were reported.

no significant difference, $p=.37$. The three way interaction effect was significant, $F(4, 205)=3.50$, $p=.009$, $\eta_p^2=.064$.

To unpack the significant three way interaction effect, a simple effect analysis on the experience dimension revealed that in the priming conditions, self-reported religious beliefs and targets of mind perception had a significant interaction effect, $F(4,214)=2.41$, $p=.05$; in the neutral condition, self-reported religious beliefs and targets of mind perception also had a significant interaction effect, $F(4,214)=2.55$, $p=.04$.

A further simple effect analysis revealed differences of priming effects between self-reported religious beliefs and targets of mind perception. Specifically, atheist participants in the priming condition attributed less mind on the experience dimension to the Christian target than those in the neutral condition, $F(1,213)=8.55$, $p=.004$; agnostic participants in the priming condition were not significantly different from those in the neutral condition, $p=.69$; religious participants in the priming condition attributed more mind on the experience dimension to the Christian target than those in the neutral condition, $F(1,213)=3.53$, $p=.06$.

Atheist and agnostic participants in the priming condition were not significantly different from those in the neutral condition on mind attribution to the atheist target ($p=.35$ and $.94$ respectively), but religious participants in the priming condition attributed more mind on the experience dimension to the atheist target than those in the neutral condition, $F(1,213)=2.85$, $p=.09$.

Atheist and religious participants in the priming condition were not significantly different from those in the neutral condition on the mind attribution to the control target ($p=.22$ and $.44$ respectively); agnostic participants in the priming condition attributed more mind on the experience to the control target than those in the neutral condition, $F(1,213)=2.89, p=.09$ (see Table 7.6).

Table 7.5. Descriptive statistics of agency-dimension of mind attribution to different perceived targets in the Chinese sample of Study 3

Targets	Self-reported religion	Priming condition		Total*
		Prime	Neutral	
Religious target	Atheist	25.00(5.24)	27.08(6.20)	26.35(5.21)
	Agnostic	26.67(3.32)	27.07(4.74)	28.01(4.28)
	Religious	26.22(6.16)	26.36(5.82)	
Atheist target	Atheist	29.67(2.02)	27.54(5.29)	28.61(3.80)
	Agnostic	28.33(4.33)	28.56(3.17)	27.51(3.84)
	Religious	29.63(3.12)	27.87(4.07)	
Control target	Atheist	29.56(2.19)	28.78(2.82)	28.22(3.33)
	Agnostic	28.55(3.01)	26.17(3.66)	27.66(4.67)
	Religious	28.82(2.79)	27.81(4.21)	
Total		28.07(3.99)	27.43(4.52)	

* In the two lines of $M(SD)$, the first line is M and SD of targets, and the second line is M and SD of religious participants, agnostic participants and atheist participants successively from top to bottom.

Table 7.6. Descriptive statistics of experience-dimension of mind attribution to different targets in the Chinese sample of Study 3

Targets	Self-reported religion	Priming condition		Total*
		Prime	Neutral	
Religious target	Atheist	20.81(5.24)	25.25(6.20)	23.42(5.11)
	Agnostic	24.89(4.31)	24.40(4.64)	25.37(4.37)
	Religious	24.89(5.11)	21.45(4.55)	
Atheist target	Atheist	27.75(2.49)	25.92(4.54)	26.32(4.11)
	Agnostic	25.92(4.70)	26.00(4.56)	25.57(4.59)
	Religious	27.50(4.15)	24.80(3.95)	
Control target	Atheist	24.33(4.44)	21.67(3.87)	25.36(4.36)
	Agnostic	28.00(3.32)	24.67(5.55)	24.23(5.05)
	Religious	25.41(3.98)	26.69(3.28)	
Total		25.44(470)	24.70(4.65)	

* In the two lines of $M(SD)$, the first line is M and SD of targets, and the second line is M and SD of religious participants, agnostic participants and atheist participants successively from top to bottom.

7.2.3 Discussion

With respect to mind perception, the Christian target was attributed less mind on both the agency and the experience dimensions than the atheist and control targets. A three-way interaction effect of the variables of religious priming condition, self-reported religion and targets of mind perception on the experience dimension further revealed participants' mind attribution to the Christian target. As expected, atheist participants in the priming condition attributed less mind to the Christian target than those in the neutral condition. Although atheist participants deny the existence of gods, it seems that they were also affected by religious priming. Atheist participants might sense a contradiction between their atheist convictions and religious priming, and attributing less mind to the

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Christian target might be a way to weaken the contradiction, and on the other hand, to strengthen their atheist convictions. Such a result confirmed the possibility that religious priming can be applicable to nonreligious people.

Agnostic participants both in the priming condition and in the neutral condition made similar mind attributions to the Christian target. With respect to their religious faith, agnostics are in an intermediate position between atheist and religious people. As in Study 1, results showed that they were more similar to religious participants, and it seems that they should be easily affected by the religious prime. However, the result that agnostic participants in the priming condition did not attribute more (less) mind to the Christian target (the atheist target) than those in the neutral condition confirmed the supposition that religious priming is only applicable to religious people. Also, agnostic participants were not different from atheist and religious participants in mind attribution to gods in Study 2. This may suggest that the effect of religious priming on the participants of Chinese agnostics is limited. Compared with the contradictory feeling that may be aroused in atheist participants between activated religious constructs and their atheist conviction, agnostic participants might experience less contradiction and have an ambivalent feeling to the religious priming.

Religious participants in the priming condition attributed more mind to the Christian target than they did in the neutral condition. This result revealed the positive effect of religious priming on mind attribution to the Christian

target. Furthermore, the fact that most of the religious participants were not Christians revealed the generalizability of religious priming. Even to the atheist target, religious participants in the priming condition also attributed more mind than those in the neutral condition, which contradicted the hypothesis that religious participants in the priming condition would attribute less mind to the atheist target than those in the neutral condition. Such a result may reflect the status quo of religious beliefs of most Chinese people, and will be discussed further in the general discussion.

7.3 Study 3b The French sample

7.3.1 Method

7.3.1.1 Participants

A total of 240 participants took part in the study voluntarily and completed a pencil-and-paper questionnaire in a university library or in a classroom. After excluding those who did not answer completely or carefully, 223 (169 female, 53 male, one not reported, $M_{\text{age}}=22.63$, $SD_{\text{age}}=5.99$) participants remained in the following analyses. In the different priming condition, 112 were in the priming condition, 111 in the neutral condition. In the different conditions of targets of mind perception, 77 were in the atheist condition, 75 were in the Christian condition, 71 were in the control condition. Concerning self-reported religious belief, 88 as atheists, 55 as agnostics, 5 as Buddhists, 39 as Christians, 10 as Muslims, 18 as others, 8 did not report. 5 Buddhists, 39 Christians, 10 Muslims, and 18 others were categorized as religious.

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7.3.1.2 Procedure and materials

The procedure and materials were identical to those in Study 3a.

7.3.2 Results

7.3.2.1 Preliminary analysis

With respect to the debriefing questions, 90 (40.4%) participants answered “yes” to the question of “do you think the different tasks were related in the questionnaire” (Question 1). An independent t-test with all possible dependent variables showed no significant effect of Question 1 on any of dependent variables $ps > .05$. So I did not exclude them in the following analyses.

On the other two debriefing questions, less than 10 percent of participants answered yes, so I did not analyze these further.

Given the possibility that religious priming might affect participants' self-reported religious beliefs, a Chi-square test was performed to examine whether there would be significantly more religious participants in the priming condition than that in the neutral condition. It revealed non-significant differences among atheist, agnostic and religious participants, $\chi^2(2, n=215)=1.78, p=.41, \phi=.09$. Such a result implied that religious priming did not affect participants' self-reported religious beliefs.

7.3.2.2 Correlation analyses

The correlational analyses showed positive correlations between religious belief and mind attribution to the religious target, which was consistent with the results in Study 1 (see Table 7.7). However, the correlation between religious belief and mind attribution to the atheist target on the agency dimension was negative and marginally significant, as well as the correlation between religious belief and mind attribution to the control target (see Table 7.7), which confirmed the correlational hypothesis that the more religious beliefs people have, the less mind they attribute to the nonreligious targets. This result was different from that of Study 1 where the correlation between religious belief and mind attribution to nonreligious perceived targets was positive. In addition, the correlations between religious belief and belief in gods were all significantly positive (see Table 7.8).

Table 7.7. Correlations between religious belief and mind attribution to different targets in the French sample of Study 3

Religiosity	Religious target		Atheist target		Control target	
	Agency	Exper- -ience	Agency	Exper- -ience	Agency	Exper- -ience
Intrinsic_R	.20*	.11	-.16	-.02	-.16	-.17
Extrinsic_R	.17	.09	-.16	-.04	-.18	-.18

*. Correlation is significant at the 0.05 level (1-tailed).

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Table 7.8. Correlations between religious belief and belief in gods in the

French sample of Study 3

	Extrinsic religiosity	Belief in gods1	Belief in gods 2	Belief in gods
Intrinsic religiosity	.80**	.77**	.67**	.77**
Extrinsic religiosity	1	.64**	.52**	.62**
Belief in gods1		1	.76**	.94**
Belief in gods2			1	.94**

***.* Correlation is significant at the 0.01 level (2-tailed).

7.3.2.3 Religious differences among atheist, agnostic, and religious participants

The various self-reported religious beliefs were categorized into three levels of personal religion: atheist (88), agnostic (55), and religious (72). A one way ANOVA with self-reported religion as independent variable on religion-related dependent variables (intrinsic religiosity, extrinsic religiosity, belief in god) revealed significant differences among atheist, agnostic and religious participants in intrinsic religiosity, extrinsic religiosity and belief in god, $ps < .001$. Post-hoc tests (HSD) showed that the religious participants were higher than the atheist and agnostic ones in intrinsic and extrinsic religiosity ($ps < .001$), and that the agnostics were higher than the atheists ($p < .001$). The religious participants were higher than the atheist and agnostic participants in belief in gods ($ps < .001$), and the agnostic participants were higher than the atheists ($p < .001$) (see Table 7.9).

Table 7.9. Descriptive statistics of intrinsic/extrinsic religiosity and belief in gods in the French sample of Study 3

		Mean	SD
Intrinsic religiosity	Atheist	7.68	3.79
	Agnostic	12.16	5.02
	Religious	21.50	7.83
Extrinsic religiosity	Atheist	9.21	5.17
	Agnostic	13.53	5.30
	Religious	18.64	6.57
Belief in gods	Atheist	1.41	.52
	Agnostic	2.56	.62
	Religious	3.71	1.10

7.3.2.4 Relationships between religious belief and belief in gods on mind attribution to perceived targets

Regression analysis showed that religious beliefs did not significantly predict mind attribution to perceived targets. With respect to the three respective targets, there also was no significant relationship.

Regression analysis showed that belief in gods did not significantly predict mind attribution to perceived targets. With respect to the three respective targets, belief in gods also did not predict any significant effects, except on the agency-dimension where participants' belief in the existence of gods significantly predicted their mind attribution to the atheist target on the agency-dimension, $\beta = -.35$, $t = -2.41$, $p = .02$, and to the Christian target, $\beta = .40$, $t = -2.24$, $p = .03$. Participants' choice of a description that was closest to their own belief in the existence of gods

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showed marginally significant effect on agency-dimension of mind attribution to the atheist target $\beta=.28$, $t=1.95$, $p=.06$.

7.3.2.5 Effects of priming and self-reported religion on mind perception

The agency index was submitted to a 2 (prime: priming vs. neutral) \times 3 (self-reported religion: atheist vs. agnostic vs. believer) \times 3 (religious targets: atheist vs. Christian vs. control) between-subject ANOVA. There were no significant effects of religious priming and self-reported religion on agency-dimension of mind attribution to different targets (see Table 7.10).

Table 7.10. Descriptive statistics on agency-dimension of mind attribution to different perceived targets in the French sample of Study 3

Targets	Self-reported religion	Priming condition		Total*
		Prime	Neutral	
Religious target	Atheist	26.78(1.99)	28.00(3.93)	28.23(3.39)
	Agnostic	28.89(3.92)	28.63(3.78)	28.14(3.13)
	Religious	28.47(3.18)	28.54(3.38)	
Atheist target	Atheist	27.59(2.29)	28.80(3.38)	27.47(3.36)
	Agnostic	27.60(3.89)	25.48(4.00)	27.73(3.99)
	Religious	26.83(2.76)	29.40(1.14)	
Control target	Atheist	29.06(2.88)	29.46(3.10)	28.71(3.29)
	Agnostic	28.60(5.32)	28.75(3.28)	28.36(3.16)
	Religious	27.15(3.05)	29.08(3.52)	
Total		27.90(3.18)	28.35(3.56)	

* In the two lines of $M(SD)$, the first line is M and SD of targets, and the second line is M and SD of religious participants, agnostic participants and atheist participants successively from top to bottom.

The experience index was also submitted to a 2 (prime: priming vs.

neutral) \times 3 (self-reported religion: atheist vs. agnostic vs. believer) \times 3 (religious targets: atheist vs. Christian vs. control) between-subject ANOVA. The main effect of targets of mind perception was marginally significant on the experience-dimension, $F(2,195)=2.95$, $p=.06$, $\eta_p^2=.029$. Post-hoc tests (HSD) showed that the Christian target was attributed more mind on the dimension of experience than the atheist target, $p=.06$, and the control target, $p=.008$, and the latter two showed no difference, $p=.73$. The expected three-way interaction effect was not significant (see Table 7.11).

Table 7.11. Descriptive statistics on experience-dimension of mind attribution to different perceived targets in the French sample of Study 3

Targets	Self-reported religion	Priming condition		Total*
		Prime	Neutral	
Religious target	Atheist	27.67(5.43)	29.31(3.57)	29.33(3.83)
	Agnostic	31.00(4.18)	30.13(2.85)	
	Religious	28.36(4.09)	29.92(3.04)	
Atheist target	Atheist	27.52(5.43)	29.80(4.23)	27.72(4.53)
	Agnostic	27.20(4.78)	25.07(3.33)	
	Religious	27.58(3.45)	31.40(3.21)	
Control target	Atheist	26.22(5.17)	28.38(3.99)	27.19(4.44)
	Agnostic	30.80(3.70)	27.75(2.82)	
	Religious	25.31(3.92)	27.46(4.74)	
Total		27.58(4.70)	28.56(3.95)	

* *In the two lines of $M(SD)$, the first line is M and SD of targets, and the second line is M and SD of religious participants, agnostic participants and atheist participants successively from top to bottom.*

However, there were significant two-way interaction effects. The interaction effect between priming condition and self-reported religion was significant on the experience-dimension, $F(2,195)=4.85$, $p=.009$, η_p^2

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=.047. A simple effect analysis revealed that the atheist participants in the priming condition attributed less mind to perceived targets than those in the neutral condition, $F(1, 209)=5.79, p=.02$. The agnostic participants in the priming condition attributed more mind to perceived targets than those in the neutral condition, $F(1, 209)=3.97, p=.048$. The religious participants in the priming condition attributed less mind to perceived targets than those in the neutral condition, $F(1, 209)=3.98, p=.047$ (see Table 7.12).

Table 7.12. Descriptive statistics of the interaction effect between self-reported religion and priming condition on experience-dimension in the French sample of Study 3

Self-reported religion	Priming condition	
	Prime	Neutral
Atheist	27.02(5.19)	29.20(3.88)
Agnostic	29.38(4.58)	27.06(3.68)
Religious	27.10(3.97)	29.13(4.05)

The interaction effect between targets of mind perception and self-reported religion was significant on the experience-dimension, $F(2,195)=3.46, p=.009, \eta_p^2=.066$. A simple effect analysis showed that among the atheist participants, the effect of target on the experience-dimension was not significant, $F(2,206)=1.33, p=.27$. Among the agnostic participants, the targets had a significant effect on the experience-dimension, $F(2,206)=6.43, p=.002$. A post-hoc test (HSD) showed that the Christian target was attributed more mind than the atheist target ($p=.001$), and the control target was thought to have more mind than the atheist target ($p=.06$). Between Christian and control targets there was no difference ($p=.45$). Among the religious participants, the effect of

targets of mind perception was significant on the experience-dimension, $F(2,206)=3.14$, $p=.045$. A post-hoc test (HSD) showed that the Christian target was attributed more mind than the control target ($p=.04$); there were no differences between the atheist target and the control target ($p=.15$) and the Christian target ($p=.94$) (see Table 7.13).

Table 7.13. Descriptive statistics of the interaction effect between self-reported religion and targets of mind perception on experience-dimension in the French sample of Study 3

Self-reported religion	Targets of mind perception		
	Atheist	Christian	Control
Atheist	28.59(4.96)	28.72(4.17)	27.13(4.77)
Agnostic	25.92(4.02)	30.59(3.54)	28.92(3.40)
Religious	28.71(3.74)	29.11(3.64)	26.38(4.40)

7.3.3 Discussion

Concerning mind perception, the Christian target was attributed more mind on the experience-dimension than the atheist and control targets. It was further qualified by the interaction effect between self-reported religion and targets of mind perception. In the religious subsample, the Christian target was attributed more mind than the control target. Religious participants, because of their religiosity, might feel more similarities to the Christian target. When attributing mind to the Christian target, it is possible that they made the attribution from their own experience. Since religious people (Christian) use more positive emotion words and less negative emotion words than atheists on Twitter (Ritter, Preston, & Hernandez, 2013), it implies that religious people may think

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themselves to be more easily able to experience emotions such as pleasure and joy. Therefore, they attributed more mind to the Christian target on the experience-dimension. In the agnostic subsample, the Christian target was attributed more mind than the atheist target. Although French agnostic participants seemed to be more similar to the atheist participants in Study 1 on the measurement of religiosity, they, like the religious participants, attributed more mind to the Christian target in this study. This may suggest the volatility of agnostic participants in mind attribution to the perceived targets, especially when they dwell in a country that has its own history of religious culture. In the atheist subsample, the three perceived targets were attributed similar mind. For atheist participants, the atheist, religious and control targets might not be so different when religion has little meaning for them. So they made similar mind attributions to the three kinds of perceived target.

Another two-way interaction effect between priming condition and self-reported religion revealed that atheist and religious participants in the religious priming condition attributed less mind to the perceived targets than those in the neutral condition, but agnostic participants in the religious priming condition attributed more mind to the perceived targets than those in the neutral condition. Because the perceived targets included three specific targets (atheist, Christian, and control), it is impossible to distinguish which specific target was attributed more (or less) mind through this interaction effect. The research question that I have focused on is to compare the mind attribution to different perceived targets, so this interaction effect appears to have little meaning and will not be discussed

further.

8 General discussion

The present research aimed to explore how people's religious beliefs, either long-term beliefs due to personal religiosity or temporarily accessible beliefs stemming from religious priming, affected their mind attribution to gods and different religious targets in Chinese and French cultures through three studies. In a correlational study, Study 1 revealed positive correlations between personal religiosity and mind attribution to gods in both cultural samples, which was further confirmed by a similar pattern of correlations in Study 2. In Study 1, significantly positive correlations were observed between intrinsic religiosity and mind attribution to the religious and nonreligious targets in the French sample. In the Chinese sample of Study 1, there was also a significant positive correlation between personal religiosity and mind attribution on agency-dimension to the religious target, but not to the nonreligious target. However, in Study 3, the positive correlations between personal religiosity and agency-dimension of mind attribution to the Christian target were (marginally) significant, and the negative correlations between personal religiosity and agency-dimension of mind attribution to the atheist target and mind attribution to the control target were marginally significant in the French sample, whereas in the Chinese sample, there were positive correlations between personal religiosity and mind attribution to all three (Christian/atheist/control) targets, which were all marginally significant (except for the correlation between personal religiosity and mind attribution on the agency-dimension to the atheist

target).

Using a priming paradigm, Study 2 found that Chinese, but not French participants, were affected by the religious priming and attributed more mind to gods on the agency dimension. Chinese religious participants attributed significantly more mind to gods than Chinese atheist ones on the agency dimension. French agnostic and religious participants attributed significantly more mind to gods on both agency and experience dimensions than French atheist ones, an effect which was mediated by anthropomorphism of gods and extrinsic religiosity. With the same priming paradigm, Study 3 turned to individual religious targets. In the Chinese sample, the Christian target was attributed significantly less mind than the atheist and control targets. Specifically, on the experience-dimension, the atheist participants in the priming condition attributed less mind to the Christian target than those in the neutral condition, and the religious participants in the priming condition attributed more mind to the Christian target than those in the neutral condition. In the French sample, the Christian target was attributed significantly more mind on the experience-dimension than that of atheist and control targets, which was further revealed by the findings that the religious participants attributed more mind to the Christian target than they attributed to the control target, and the agnostic participants attributed more mind to the Christian target than they attributed to the atheist target.

8.1 The role of likability and similarity in mind perception

As Boyer (2001) declared, “the mind concept is such a rich source of inferences that we use it spontaneously even in cases where some of its usual assumptions are challenged” (*p*₇₀). Humanlike minds seem to appear almost everywhere, from pets that seem loving and thoughtful to computers described as “irritable” one moment and “well-behaved” the next. As an important cultural agent, gods are usually thought to be humanlike too. Powerful supernatural agents resemble humans in many ways, but they are believed to transcend physical, biological, and psychological limitations, and as a result they can defy death, ignorance, and deception (Atran & Norenzayan, 2004). In the process of mind perception, positive feelings with respect to a perceived target may lead to more mind attribution. A likable target was attributed more mind than an unlikable one (Kozak et al., 2006). The mental states of likable people were more likely to be considered than those of unlikable ones (McPherson-Frantz & Janoff-Bulman, 2000). People may be more willing to see both humans and nonhumans that they like as having mental states. Gods, as the central symbol of religious beliefs, usually are likable for believers, so both Chinese and French religious participants attributed more mind to gods than atheist participants. Furthermore, this result showed different mediating process such that the effect of self-reported religion on mind attribution to gods was mediated by anthropomorphism of gods and extrinsic religiosity in the French sample, but not in the

Chinese sample⁷. It implied that when attributing mind to gods, French participants thought about their anthropomorphic images of gods and also whether gods would be helpful for them (extrinsic religiosity) first, and then decided whether attributing mind to gods, whereas Chinese participants seemed to lack such a process.

With respect to the Christian target in Study 3, likability may be changing with cultures. France is a historically religious country, so a Christian target may be more likable in the French sample, but China is an officially nonreligious country, and a Christian target may be more unlikable in the Chinese sample. Besides the liking for the Christian target, the potential similarity between oneself and the Christian target may have also affected attribution of mind. Research has revealed that perceived similarity made people use their own mental states as a guide to infer others' beliefs, attitudes and preferences (Ames, 2004a, 2004b; Mitchell, Macrae, & Banaji, 2006), thereby enabling people to attribute more mind to others who are similar, and less mental states to others who are distant. For instance, research on the attribution of secondary emotions to in-group and out-group targets found that people attributed secondary emotions more to in-group members than to out-group members (Leyens et al., 2000). Participants with high collective identification were more likely to have higher mind perception thresholds for the out-group, and to have more lenient mind perception thresholds for the in-group (Hackel, Looser, & Van Bavel, 2013). Generally, Christians constitute an out-group for most Chinese, but an in-group for the French. Chinese participants may

⁷ The mediation model for the effect of self-reported religion on mind perception in the Chinese sample were not shown in results, as the main effect of self-reported religion on mind perception was just marginally significant, and so no mediation effect was revealed.

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feel distant from the Christian target, whereas French participants might see themselves as similar to the Christian. This would explain why the Christian target, compared with other perceived targets, was attributed more mind in the French sample, and less mind in the Chinese sample, although primary emotions, which was measured on the experience dimension in the present research, were perceived to be distributed equally between in-group and out-group in another study (Cortes, Demoulin, Rodriguez, Rodriguez, Leyens, 2005).

8.2 Atheists vs. Agnostics vs. Believers

According to whether they have religious faith, people can be divided into two groups: a religious group and a nonreligious group. The religious group includes various individuals who believe in gods and/or have religious practices, whereas the nonreligious group is opposite in that it contains individuals who do not believe in gods and have no religious practices. In most research, the nonreligious group usually includes two kinds of people: atheist and agnostic. However, agnostics, as a group that is skeptical about the existence of gods, view the existence or nonexistence of supernatural beings as simply beyond human reason or empirical verification and may possess an ambivalent attitude to the existence of gods. For example, when reminded of their mortality, agnostics increased their religiosity, belief in a higher power, and their faith in gods, including Jesus, Buddha, and Allah (Vail et al., 2012). In the present research, study 1, which used a correlational approach, revealed that agnostic participants, together with religious participants, were significantly higher than atheist participants on mind perception in the

Chinese sample, and in the French sample, agnostic participants made significantly lower mind attributions than religious ones, but significantly higher ones than atheist participants. When aroused by God-related concepts in Study 2, French agnostic participants were not significantly different from French religious participants on mind attribution to gods, and Chinese agnostic participants were not significantly different from Chinese atheist and religious participants, but they were closer to religious participants on mind attribution to gods. It seems that agnostic participants become more “religious” when they need to make an attribution of mind to gods. Theoretically, agnosticism may be defensible, but it is challenged in practice as everyone has to ultimately make a decision of either believing or not believing in gods. One cannot simultaneously believe and not-believe (see Vail et al., 2012). It can be said that when situated in a religious context, agnostics tended to settle on the side of religion and the supernatural agents when they attributed mind to gods.

When turning to the perceived targets of specific individuals in Study 3, it showed another situation. Chinese agnostic participants in priming and neutral conditions made similar mind attributions to the atheist and Christian targets, which might reflect the unresolved status of agnostics between being religious and not being religious. However, they attributed more mind to the control target in the priming condition than those in the neutral condition, which implied that religious priming aroused their swaying religiosity and made them biased toward a target who was neither religious nor nonreligious in the priming condition. In the French sample,

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agnostic participants were influenced more by religious priming than those in the neutral condition, and they attributed less mind to the atheist target than they did to the Christian and control targets, which implied that French agnostic participants might be biased toward being religious.

The atheist participants seemed to show the least interest in gods, since they do not believe the existence of gods and seldom rely on religiosity and supernatural belief when confronted with intractable situations. Therefore, whether gods have a mind or not is not a serious question for them, and they may tend to deny that gods have mind. On the other hand, a specific religious target, unlike gods, exists in reality and is visible. Turning to specific targets in Study 3, religious priming had a negative effect on mind attribution of Chinese atheist participants to the Christian target in that they attributed less mind to the Christian target in the priming condition than those in the neutral condition, which implied their dislike of religion. In the French sample, a two-way significant interaction effect between religious priming and self-reported religion showed a negative effect of religious priming on the mind attribution of French atheist participants to a mixed target, including an atheist, a Christian and a control. Although this interaction effect, as discussed hereinbefore, implied little practical meaning, for the perceived target included an atheist, a Christian and a control, it at least showed that French atheist participants were affected negatively by religious priming.

It was not surprising that religious participants in this research attributed the most mind to gods in the three sub-groups of both samples, although

they were from a group of various religious beliefs. However, turning to the specifically perceived targets, a surprising result that contradicted our hypotheses is that Chinese religious participants in the priming condition attributed more (but not less) mind to the atheist target than those in the neutral condition. A possible explanation is that the majority of Chinese religious participants self-reported as believers of folk religion. However, believers of folk religion in China may not have strong religious beliefs, and even, to some extent, identify themselves as atheist. Folk religion in China can be said to be a syncretistic blend of mainly Buddhist, Taoism, Confucianism and folk beliefs and practices. Although many Chinese believe that deities and ancestors exist, most religious expressions are exemplified by household rituals and less frequent acts, such as temple visits, annual festivals, or holiday rites and activities. It seems that Chinese religiosity is not always salient but temporarily prominent at a special place, such as a temple, or a special time, such as festivals with traditional rituals. The fact that atheist education is dominant in the Chinese educational system may also weaken the temporary prominence of religiosity, and strengthen the Chinese identification with atheism. This could explain why Chinese religious participants in the priming condition attributed more mind to the atheist target than those in the neutral condition.

8.3 Agency vs. Experience

According to the theory of dehumanization, dehumanization involves the denial of two distinct senses of humanness: characteristics that are uniquely human and those that constitute human nature. Dehumanization

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occurs whenever people ascribe lesser degrees of humanness to others or out-groups as compared to the self or in-group (Haslam, 2006). In cross-cultural research on people's beliefs about two forms of humanness, participants were asked to list up to seven characteristics that came to mind when they thought about humans and then to rate each characteristic on either human uniqueness or human nature. Chinese participants placed more emphasis on human uniqueness than Italians and Australians, but the latter two placed more emphasis on human nature than the Chinese (Bain, Vaes, Kashima, Haslam, & Guan, 2012). Another cross-cultural study on perceptions of humanness in Chinese and Australians revealed that Australian participants denied human nature to the Chinese but attributed greater human uniqueness to them, whereas Chinese participants denied Australians' human uniqueness, but attributed more human nature to them (Bain, Park, Kwok, & Haslam, 2009). Through these results, a general cultural difference may be that Chinese tend to emphasize human uniqueness more, and Australians pay more attention to human nature when they were asked to think about humanness. In addition, human uniqueness corresponds broadly to the dimension of agency, and human nature to the dimension of experience (Haslam, Bastian, Laham, & Loughnan, 2012). Accordingly, when attributing mind to gods in the current research, Chinese participants judged that gods had more mind on the agency-dimension when their god-related concepts were aroused, in line with the tendency that they emphasized human uniqueness more. French participants, who might share similar cultural features with Australians or Italians, did not attribute more mind to gods on the experience-dimension when their god-related concepts were aroused.

Besides effects of religious priming, effects of personal religiosity also correspond with the general cultural difference of human uniqueness and human nature that Chinese religious participants attributed more mind on the agency-dimension to gods than did atheist participants, but French religious participants attributed more mind to gods on both dimensions of mind perception. Since the results in the French sample were not consistent with the results of perceived humanness found in the Australian and Italian samples, and the correspondence between dimensions of mind perception and humanness was not accurate but generalized, this explanation should be accepted with caution.

A similar result across the two cultures was that interaction effects appeared, either two-way or three-way, on the experience dimension, but not on the agency dimension when making attribution of mind to specifically religious targets in Study 3. A possible explanation comes from the characteristics of the two dimensions of mind perception. The measurement of the experience-dimension, mainly through primary emotions in this research, can be relatively easy to perceive by reading the descriptive vignette of the perceived targets. However, the agency-dimension is usually based on complicated cognitive capacities, which may be impossible to perceive just through superficial information. For example, to judge whether a person described in a vignette is capable of self-control is more difficult to judge than whether he/she is capable of feeling joy. So to attribute mind on the agency-dimension may be more difficult than to attribute mind on the experience-dimension, when attribution are made just through the information from the descriptive

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vignette of the perceived targets. Therefore, when participants made attribution of mind to the perceived targets, they were more likely to make clear judgments on the experience-dimension, but not on the agency-dimension.

On the experience dimension of mind attribution to the perceived targets, some results confirmed the possibility that religious priming is applicable to both religious people and nonreligious people, and some results were consistent with the possibility that religious priming is only applicable to religious people in the Chinese sample. In the French sample, significant results of a two-way interaction effect between religious priming and self-reported religious belief showed that all participants with different religious beliefs were affected by the religious priming. On the other hand, there were no significant interaction effects in both cultural samples on mind attribution to gods in Study 2, which have examined the possibility that religious priming is applicable to both religious and nonreligious people. Thus, more research is still needed to confirm the range of religious priming.

8.4 Limitations and future direction

This research has shed light on how people in different cultural contexts attribute mind to different religious targets, but the limitations of the present studies must also be considered.

First, it is important to acknowledge that god-related concepts used as priming materials in the scrambled sentence task were not equivalent at

the lexical level between the two cultural samples, but were adapted according to cultural differences in both religion and language between French and Chinese. Such adaptation was intended to ensure that the representative symbols of religion be shown in each culture and to arouse belief in gods/religious beliefs that corresponded to each cultural context. With this concern in mind, we did not compare cultural differences directly, but focused on within-cultural analyses.

Secondly, measuring religiosity at the end of the experiment, especially in Studies 2 and 3 that included religious priming, was not optimal, as there may have been effects of the experimental conditions on these measures. However, measuring religious beliefs prior to the experiment has been proved to function as priming religion (Ginges, Hansen, & Norenzayan, 2009). Moreover, if the experimental conditions had altered participants' scores on these measures, a minimal expected change would be that religious priming, compared to the neutral condition, would significantly change participants' scores on religiosity. This was not the case in any of the two studies ($p > .05$). In future research, though, it will be important to vary the order of presentation of religious priming and religiosity measurement.

Thirdly, only university students were sampled in both cultures. As people with high levels of education are more likely to be nonreligious (Hayes, 2000; Sherkat, 2008), student samples may limit the number of religious participants and thus weaken the relevance of the research sample for a cross-cultural study of religion. However, the number of religious

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participants in all studies of two samples was not noticeably smaller than those of atheist or agnostic participants. In addition, participants with various religious beliefs were classified as one religious group, but in Study 3 the religious perceived target was just Christian. As such, their attribution of mind to the Christian target might be affected by religious discrimination or stereotypes. Although the failure to find many significant results on the agency-dimension of mind perception tends to exclude the influence of discrimination, future research may examine the relation between religious discrimination or stereotypes and mind perception to specific religious targets or gods in another religion.

Fourthly, it is worth noting that the observed correlations in Study 1 may have been inflated because participants completed the measures within the same session; however, it is unlikely this could account for the overall observed pattern of associations.

8.5 Conclusion

With the aim of exploring the relation between religious belief and mind perception in different cultural contexts, the present research revealed that mind attribution to gods and religious targets is closely related to personal religiosity in two cultures. On the mind attribution to gods, Chinese religious participants seem to focus on the dimension of agency, and French religious participants pay attention to the dimensions of both agency and experience. Finally, Chinese participants tend to attribute less mind to a specific Christian target, and French participants attribute more mind to it.

**Chapter 3. Facing the meat paradox in
different cultural contexts: responses
among Chinese and French participants**

9 Introduction

As basic human needs, diet and sleep take up a large part of most people's time. Compared with sleep, diet is much more varied, especially because most people are omnivores, enjoying considerable nutritional flexibility. Of the various foods, one of the most well known is meat. By its very nature, however, people's meat-eating behavior always requires killing, butchering, and consuming a living organism, and contradicts a widespread tendency that people often show love or care to animals. Due to this dilemma, the "meat paradox" appears --- many people enjoy eating meat but few want to kill another sentient creature (Loughnan et al., 2010). There is broad cross-cultural evidence that humans experience discomfort at the killing of animals to obtain meat (Simoons, 1994, cited in Ruby, 2012). Confronted with the meat paradox, individuals may easily experience a kind of cognitive dissonance between the idea of eating meat and caring for animals.

People have several ways of coping with cognitive dissonance due to the meat paradox. Similar to *repression*, one common strategy is to psychologically distance themselves from the idea of killing animals, keeping animal slaughter out of sight and mind, and obscuring the link between meat and living animals (Plous, 1993). In modern life, this strategy seems to be effortless, because of the fact that the abattoir usually is far away from most people and out of their sight, and people would not voluntarily think about the animal origin of meat when they enjoy the

delicious food. A second strategy, defined as *denial of mind*, is to deny that commonly eaten animals have human-like mental states. In line with this reasoning, animals' perceived edibility was negatively correlated with the perception that animals have minds, and when reminded of the link between meat and animals, individuals tended to dementalize food animals (Bastian et al., 2012). The more participants denied animals' capacity for suffering and believed that animals were lower in a hierarchy to humans, the greater they reported meat consumption (Rothgerber, 2013). Based on *changing behavior*, a third strategy is to refuse to eat meat and to become a vegetarian, which is used by quite a few individuals. Data from the European Vegetarian and Animal News Alliance (2013) showed that in China, about 4% of the 1.3 billion population are vegetarians or vegans. In Western society, the estimated percentage of vegetarians are as follows: Australia (5%), Austria (3%), Belgium (2%), Canada (4%), France (2%), Germany (8-9%), Holland (4.5%), Italy (6.7%), New Zealand (1-2%), Norway (4%), Spain (2%), Sweden (4%), Switzerland (5%), UK (3%), and US (4%). Although the data may not be entirely accurate, they clearly show that vegetarians are in a minority around the world. A variant of the third strategy for most people to resolve the potential cognitive dissonance from the meat paradox may be to express their willingness to reduce their meat consumption in the future, even if they do not stop it altogether.

In sum, it seems there are at least two effective ways for non-vegetarians to deal with the potential cognitive dissonance from the meat paradox. One is to reduce the attribution of mind to food animals, and the other is

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to reduce the willingness to eat meat in the future. Both of them are methods for reducing cognitive dissonance. According to Festinger (1957), people can reduce cognitive dissonance by changing one's attitude or changing one's behavior. To reduce the attribution of mind to food animals changes the attitude to food animals by denying them human-like characteristics, and to reduce the willingness to eat meat in the future can be said to potentially change the future meat-eating behavior. The present research focuses on these two ways to examine whether reduction of mind perception of food animals and reduction of willingness to eat meat are effective ways for non-vegetarians to deal with the potential cognitive dissonance from the meat paradox and how they function in the meat production and meat consumption process in different cultural contexts.

9.1 Reduction of willingness to eat meat

For most non-vegetarians, expressing their reduced willingness to eat meat in the future may be a strategy to protect their current meat-eating behavior when they become aware of the animal origin of meat. For example, in a study of UK consumers, if people had to kill the animals that they would eat, most people would rather refuse to eat meat altogether (Richardson, Shepherd, & Elliman, 1993). Relatedly, people are especially unwilling to eat animal products that are readily reminiscent of the living animal, and avoid eating animal parts associated with intelligence or personality, such as the eyes and brain (Plous, 1993).

9.2 Reduction of mind perception of animals

Although showing reduced willingness to eat meat in the future or even

becoming a vegetarian may help people cope with the discomfort from the meat paradox, meat is still an integral part of the diet of most people in the world. It seems to be a natural process for meat eaters to consume meat, and they seldom think of where the meat comes from. In other words, they usually lose sight of the animal origins of various meats when they enjoy the delicious dish. However, when people are reminded of the suffering of food animals in the slaughter process, they tend to deny that the animal is capable of experiencing mental states (Bastian, Loughnan, et al., 2012). Indeed, mind perception of animals may be more subjective rather than objective. When people made comparisons between humans and animals in different directions, they found more similarities between humans and animals in the direction of comparing animals to humans, and perceived more differences when comparing in the direction of humans to animals (Bastian, Costello, Loughnan, & Hodson, 2012). In an implicit test, which involved asking participants to classify pictures of meat or vegetables as either positive or negative stimuli under time pressure, both omnivores and vegetarians exhibited an implicit pro-vegetable bias to the vegetable pictures. However, when exposed to the pictures of meat, the vegetarians showed an anti-meat bias and the omnivores showed a small pro-meat effect (Barnes-Holmes, Murtagh, Barnes-Holmes, & Stewart, 2010). It seems that, despite their meat consumption, meat eaters also prefer vegetables to meat at the implicit level, as measured by the response latency in judging whether meat or vegetable is positive. This is consistent with the influence of the meat paradox.

Specific to the meat paradox, researchers have found that people often

mentally separate the meat on their plate from its animal origins in order to enjoy the pork chops or steaks without thinking about pigs or cows (Hoogland, de Boer, & Boersema, 2005). This process is even easier with minced meat, which has obscured its association with living animals (Holm & Mohl, 2000). Even more surprising, just categorizing an animal as a food source was enough to lower people's perception of animals' capacity for suffering (Bratanova, Loughnan, & Bastian, 2011). Similarly, reading a book about the omnivore's dilemma could temporarily change the attitude to food production and consumption (Hormes, Rozin, Green, & Fincher, 2013). Additional evidence from research comparing vegetarians and omnivores demonstrated that omnivores attributed significantly fewer mental states, especially secondary emotional states, to food animals than did the vegetarians (Bilewicz, Imhoff, & Drogosz, 2011).

Altogether, people, especially omnivores, may feel uncomfortable when meat-related reminders make them aware of their contribution to the deaths of animals. Denying or restricting the mental states attributed to food animals is a way to alleviate this discomfort. When meat eaters are made to become aware of the link between meat and animals by a clear reminder, such as slaughter, or are cognizant of the link by being shown an obscure reminder, such as minced meat, they tend to attribute less mind to food animals in both conditions.

9.3 One way is enough

In the literature on cognitive dissonance research, many researchers have

presented participants with two methods of dissonance reduction. Three different modes of presentation of methods of dissonance reduction are available: presenting both ways simultaneously, presenting both ways successively in one order, and presenting both ways in reverse order. This approach allows observation of which way is mostly preferred, especially when the two ways are presented in different orders. Varying the order of presentation of the two ways of reduction allows for testing whether people use one or two ways of dissonance reduction (Gosling, Denizeau, & Oberlé, 2006). I hypothesized that just using one way is enough to resolve the potential cognitive dissonance from the meat paradox. Namely, it is likely that people will reduce their willingness to eat meat but continue to attribute mind to food animals, or will reduce the attribution of mind to the food animal but maintain their willingness to eat meat. To examine this prediction, two orders of measurement of willingness to eat beef and mind perception of cows were included in the present research. These were measurement of willingness to eat meat first and then the measurement of mind perception of cows (willingness-first), or measurement of mind perception of cows first, and then the measurement of willingness to eat meat (mind perception-first). In the willingness-first order of presentation, it is expected that if participants have already reduced their willingness to eat meat, they will maintain a normal level of mind attribution to cows and even increase it. If they also reduce their mind perception of cows, the earlier reduction of the willingness to eat meat seems to be superfluous. In the other mind perception-first order, it is expected that if participants have already reduced their mind attribution to cows, they will not reduce their willingness to eat meat. If they also

Two links between meat and animals and two stages of the meat-eating¹²¹ behavior

reduce their willingness to eat meat, the earlier reduction on the mind attribution to cows seems to be unnecessary. If they do not, the earlier reduction of the mind perception of cows is supported.

9.4 Two links between meat and animals and two stages of the meat-eating behavior

Two kinds of relation between meat and animals can be differentiated with respect to the meat paradox. One is a strong link. When the animal origin of meat is emphasized through external reminders, such as a description of slaughter or a picture of an animal, I expect that the meat eater will be more strongly motivated to reduce dissonance, e.g., by denying the mental states of the animal. The other is a weak link where the animal origin of meat is hidden by various processing procedures. One of the examples is a dish. After meat is cooked in various kinds of cuisine, its animal origin becomes obscure, and its deliciousness entices people to focus on enjoyment of the food. Indeed, people, when presented with a delicacy, often mentally separate meat from animals (Hoogland, et al., 2005). When the animal origin of meat becomes salient in a dish, I expect that meat eaters will experience cognitive dissonance.

With respect to meat-eating behavior, two different stages exist: meat production and meat consumption. The former involves transformation from animals to meat, and the latter transformation from meat to food. The strong link, because it usually shows the animal origin of meat clearly, corresponds to the meat production process, which usually involves the process of slaughter. The weak link, because it often obscures the origin

of meat from living animals and focuses on the food preparation process (e.g. cooking), corresponds to the meat consumption process, which often happens in the kitchen or at the table.

Thinking about meat-eating behavior in daily life, it seems that the awareness of the strong link between meat and animal is unusual, because people naturally prefer not to think about the suffering of food animals when they enjoy a delicious dish of meat, and the abattoir is also usually out of sight. The weak link is more common, because people get the dietary habit of paying attention to enjoying the delicious food. Regardless of whether the link is strong (focusing on slaughter) or weak (focusing on the tastiness of the food), both of them can play a role in reminding people of the meat paradox. The present research aims to explore how the meat paradox affects meat eaters' willingness to eat meat and their attribution of mind to the food animal when participants are reminded of the animal origin of meat in the meat production process and meat consumption process in different cultural contexts. Or in other words, we wish to know whether reduction of willingness to eat meat and reduction of mind attribution to food animals are effective in dealing with the potential cognitive dissonance from the meat paradox. The core hypotheses are that when people are aware of the animal origin of meat (beef in the research), they will attribute less mind to the food animal, or show less willingness to eat meat, but not both. One strategy, either reduction of willingness to eat meat or reduction of mind perception of food animals will be enough to resolve cognitive dissonance experienced due to the meat paradox. For this reason, the order of presentation of the

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two ways of dissonance reduction will matter, as the dissonance manipulation will reduce mind perception of food animals if it is measured first, and will reduce the willingness to eat meat if it is measured first.

9.5 Culture

The reason for studying culture is that culture itself plays an influential role in shaping people's food preference, and is the single biggest determinant of food choice (Rozin, 1990; 2007). Besides the sources of enjoyment, culinary practices are important sources of meaning embedded within culture, especially given that appetite is a powerful force for shaping much of human behavior (Bastian, Loughnan, et al., 2012). Regarding the ethical issue of meat consumption, qualitative research has shown that in British Columbia, Euro-Canadians referred very frequently to ethical issues in meat consumption when discussing their food choices, whereas Punjabi-Canadians had virtually no engagement in ethical consumption discourses, talking instead about various aspects of culinary traditions (Beagan, Ristovski-Slijepcevic, & Chapman, 2010). Although Euro-Canadians and Punjabi-Canadians dwelled in the same city (Vancouver), they showed different patterns of response when talking about meat consumption, which perhaps reflected the influence of cultural practices of eating. However, little is presently known about how meat-eating behavior will affect people's willingness to eat meat and mind perception of food animals, especially in non-Western cultures. In fact, psychology in general has conducted relatively little research in non-Western cultural contexts (Henrich, et al., 2010). Regarding the meat

paradox, the existing research mainly comes from North America and Australia (e.g., Bastian, Costello, et al., 2012; Bastian, Loughnan, et al., 2012, but see Ruby, 2012), and more results from other countries are needed to examine the generalizability of the meat paradox.

The current research will recruit participants from China and France, which are well-known in the world for their cuisines, and investigate how the Chinese and French meat eaters resolve the meat paradox. The selection of these cultural groups also will broaden the geographical reach of research on the meat paradox, particularly to Asia where very little research in this field has been conducted. On the other hand, it is often problematic to make direct cross-cultural comparisons of responses to Likert scales, because participants in different cultures may compare themselves with different standards (Heine, Lehman, Peng, & Greenholtz, 2002) and have different understanding of items. So we will focus on within-cultural comparisons. The existing findings that people reduced their willingness to eat meat or mind perception of animals after realizing the animal origin of meat mainly come from Western culture, and the cultural variation of cognitive dissonance also showed that westerners were more likely to experience cognitive dissonance than easterners (Heine & Dehman, 1997; Kitayama, Snibbe, Markus, & Suzuki, 2004). Therefore, I expected that in the present research, French participants, who generally belong to Western culture, may be affected by the meat paradox and reduce their willingness to eat meat or mind perception of food animals. However, Chinese participants may not be affected by the meat paradox.

10 Study 4: The meat paradox in the meat production process

Study 4 focused on the meat paradox in the meat production process. Adapting procedures from Bastian, Loughnan, et al. (2012), I used pictures or photos of cows with varied descriptions to activate participants' awareness of the connection between meat and animals. Through showing pictures of cows with different descriptions in a short sentence, four different conditions of dissonance manipulation, which involved possible transformation from animals to meat in three experimental conditions, were created with the aim of showing varying transparency of the connection between meat and its animal origin. A *control condition* has no experimental manipulation, and it just continues with the later parts of the study after presenting a sentence of acknowledgement for participation; a *meat condition* aims to show a common state of meat in daily life, showing a picture of cow that display the names of beef from the different parts of a cow's body; a *pasture condition* aims to build a weak connection between meat and animals, showing a photo of cow with a description that the cow will be sent to another pasture tomorrow; an *abattoir condition* aims to build a strong connection between meat and animals, showing a photo of cow with a short sentence saying that the cow will be sent to the abattoir tomorrow. In the pasture and abattoir condition, participants are asked to write a paragraph to predict what will happen to the cow, and in the meat condition, participants are asked to write a paragraph to introduce the picture to others who have not seen it.

From the control condition to the meat condition, the pasture condition and the abattoir condition, it is expected that the animal origin of meat becomes more and more obvious, due to making the slaughter process salient in the abattoir condition. On the other hand, compared with the abattoir condition, the question as to what extent the meat condition and pasture condition can activate the animal origin of meat among omnivores was relatively ambiguous. Maybe it is similar to that in the abattoir condition, or maybe it is the same as the control condition. Therefore, the abattoir condition, as a salient condition of dissonance induction, should be compared with the other three conditions, and the meat and pasture conditions, as ambiguous conditions of dissonance induction, are comparable with the control condition⁸.

Furthermore, in the abattoir and pasture conditions, it is expected that in the willingness-first order of presentation, if participants have reduced their willingness to eat meat, they will maintain a normal level of mind attribution to cows and even increase it. In the other mind perception-first order, it is expected that if participants have already reduced their mind attribution to cows, they will not reduce their willingness to eat meat and even increase it. In the meat condition, it is expected that in the willingness-first order of presentation, participants will increase their willingness to eat meat, then they will reduce the mind perception of cows, however, in the mind perception-first order of presentation, participants will reduce the mind perception of cows, but maintain their willingness to

⁸ Given the comparability between abattoir condition and other three conditions, and between control condition and other three conditions, Dunnett post hoc test would be used in the following data analyses to compare specifically one condition with other conditions.

eat meat. Therefore, we made the following correlational and causal hypotheses on the aspect of willingness to eat meat and mind perception of cows, and examined whether they would be replicated in two different cultures, French and Chinese, both of which are well known in the world for their cuisines.

10.1 Hypotheses

10.1.1 Correlational hypotheses

Hypothesis 1. Participants' willingness to eat meat will show a negative correlation with their attribution of mind to food animals.

Hypothesis 2. Participants' willingness to eat meat will show a positive correlation with their daily meat consumption habit.

Hypothesis 3. Participants' attribution of mind to food animals will show a negative correlation with their daily meat consumption habit.

10.1.2 Causal hypotheses on Willingness to eat meat

Hypothesis 4. Reminding people of the meat paradox with the varying transparency of the connection between meat and its animal origin, participants in the abattoir condition will show less willingness to eat meat than those in the pasture, meat and control conditions. Participants in the pasture condition will show less willingness to eat meat than those in the control condition. Participants in the meat condition will show more willingness to eat meat than those in the control condition.

Hypothesis 5. Participants' willingness to eat meat will be affected by the

order of presentation of the two ways of dissonance reduction. Specifically, participants in the group where willingness to eat meat is measured first will show less willingness to eat meat than those in the group with these options presented in the inverse order.

Hypothesis 6. There will be an interaction effect between conditions of dissonance manipulation and the order of presentation of the two ways of dissonance reduction. In the abattoir and pasture conditions, participants in the group where willingness to eat meat is measured first will show less willingness to eat meat than those in the group where mind perception of cows is measured first. In the meat and control conditions, participants in the two groups will have similar willingness to eat meat.

10.1.3 Causal hypotheses on attribution of mind to cows

Hypothesis 7. Reminding people of the meat paradox with the varying transparency of the connection between meat and its animal origin, participants in the abattoir condition will attribute less mind to cows than those in the pasture, meat and control conditions. Participants in the pasture and meat conditions will attribute less mind to cows than those in the control condition.

Hypothesis 8. Participants' mind perception of cows will be affected by the order of presentation of the two ways of dissonance reduction. Specifically, participants in the group where mind perception of cows is measured first will attribute less mind to cows than those in the group where the questions are presented in the inverse order.

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Hypothesis 9. There will be an interaction effect between conditions of dissonance manipulation and the order of presentation of the two ways of dissonance reduction. In the abattoir and pasture conditions, participants in the group where mind perception of cows is measured first will attribute less mind to cows than those in the group where willingness to eat meat is measured first. However, in the meat and control conditions, participants in the two groups will have similar mind perception of cows.

10.2 Study 4a The French sample

10.2.1 Method

I distributed an online questionnaire on the website of Qualtrics and put the web link on Facebook and on a French online participant pool (<http://expesciences.risc.cnrs.fr>). Participants chose to complete the questionnaire voluntarily.

10.2.1.1 Participants

A total of 547 participants clicked the link. They were randomly assigned to one of the eight conditions of a 4 (conditions of dissonance manipulation: abattoir, meat, pasture, control) \times 2 (order of presentation of ways of dissonance reduction: willingness measurement first, mind perception measurement first) between-subject factorial design.

Due to the nature of the research, those who answered fewer than 5 questions (248), and those who identified themselves as vegetarian (53) or

who were not French (3) were excluded. Finally, 243 participants (176 females, 53 males, 14 non-reported; $M_{age}=26.48$, $SD_{age}=8.25$) were included in the following analyses. Specifically, 61 participants were in the abattoir condition, 55 were in the pasture condition, 44 were in the meat condition, 83 were in the control condition.

10.2.1.2 Procedure and materials

First, they saw the stimuli for one of the four conditions of dissonance manipulation and were asked to write a short paragraph to predict what would happen to the cow in the abattoir and pasture condition or to introduce the different names of beef to others in the meat condition. This was followed with measurements of willingness to eat meat and mind perception of the cow in two different orders randomly. Some participants responded to two questions about their willingness to eat meat first and mind perception of the cow second, other participants were in the inverse order. All ratings were made on a 7-point Likert scale.

Concerning mind perception, participants answered 12 questions about the extent they think that a cow is capable of having specific mental states. Agency and experience are the two dimensions of mind perception (Waytz, Gray, et al., 2010). Of the 12 questions, six are agency-related capacities: self-control, acting morally, and planning, communication, memory, thought; the other six are experience-related capacities: feeling pleasure, feeling desire, feeling pain, feeling rage, feeling joy and feeling fear. The internal reliability was high (agency dimension: Cronbach's $\alpha = .82$, experience dimension: Cronbach's $\alpha = .77$). Willingness to eat meat,

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including beef, pork and lamb⁹, was measured by two items: desire to eat meat in the following days (to what extent do you want to eat beef in the following days) and the intended amount of meat consumption in the coming year (according to your beef consumption, you think you will.... (1 decrease, 4 keep the same, 7 increase) during the year). The internal reliability of three kinds of meat was high (Cronbach's $\alpha = .83$).

The next task was several unrelated questionnaires that took approximately 30 minutes to complete.

Last, demographic information was collected, including gender, age, vegetarian or not, religious belief, profession, daily eating habit.

10.2.2 Results

10.2.2.1 Manipulation check

We expected that both the abattoir condition and the pasture condition were likely to remind participants of the human-like characteristics of the cow and its death for producing and consuming meat. However, the meat condition, which just displayed a diagram with different names of beef on a cow's body and asked participants to introduce the picture, might not remind participants of the death of cows. As manipulation checks of the effectiveness of reminders of the animal origin of meat in the three experimental conditions where pictures were presented, texts about the writing tasks in the abattoir and pasture conditions were analyzed whether

⁹ Although it included three kinds of meat, the real concern one in the data analysis was beef, and the other two were fillers, because the activation information is about cow.

the fate of the cow was mentioned. The content in the meat condition was not coded.

We focused on whether more participants in the abattoir condition mentioned the death of the cow than those in the pasture condition. Because people's dissonance due to the meat paradox would be amplified when they were reminded of the meat's animal origin, which usually combines with knowledge about the suffering of animal slaughter (Bastian, Loughnan, et al., 2012; Bilewicz et al., 2011), I expected that participants in the abattoir condition would experience more dissonance than those in the pasture condition. If so, it is also reasonable to infer that participants in the abattoir condition will experience more dissonance than those in the meat and control condition. Concerning the fate of the cow in the written text, 60 participants in the abattoir condition mentioned the killing, 1 did not. In the pasture condition, 21 participants mentioned the killing, 34 did not. A Chi-square test revealed significant difference between the abattoir and pasture conditions, $\chi^2(1, n=116)=49.72, p<.001, \phi=.655$. The result suggests that the abattoir condition made participants associate animals with slaughter much more than the pasture condition, so the manipulation was effective. However, independent t-test showed that participants who mentioned the slaughter ($M=3.63, SD=1.28$) did not report significantly less willingness to eat meat than those who did not mention the slaughter ($M=3.87, SD=.93$), $t(113)=-1.00, p=.32$.

10.2.2.2 Correlational analyses

Among French participants, their willingness to eat meat showed

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significantly negative correlations with mind perception of cows, and significantly positive correlations with their daily meat consumption habit (see Table 10.1). Their daily meat consumption habit did not show a significant correlation with mind perception of cows (see Table 10.2).

Table 10.1. Correlations between willingness to eat beef and mind perception of cows and daily eating habit in the French sample of study 4

	Agency	Experience	Meat-eating days in a month	Meat-eating times in a week
Desire of eating Intended amount of beef consumption	-.11	-0.14*	.41**	.54**
	-.22**	-.18**	.31**	.43**

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Table 10.2. Correlations between mind perception of cows and daily eating habit in the French sample of study 4

	Meat-eating days in a month	Meat-eating times in a week
Agency	-.01	-.09
Experience	.03	-.10

10.2.2.3 Willingness to eat meat

The two items that measured the willingness to eat beef were significantly correlated, $r_F = .51$, $p < .001$, so they were combined into one item as the measurement of willingness to eat meat. To examine the hypotheses that being made aware of the animal origin of meat decreases willingness to eat meat, I conducted a 4 (conditions of dissonance manipulation: abattoir,

meat, pasture, control) \times 2 (order of presentation of ways of dissonance reduction: willingness to eat meat measurement first, mind perception measurement first) between-subject ANOVA on the willingness to eat beef. The main effect of conditions of dissonance manipulation was not significant, $F(3,233)=1.09$, $p=.36$, $\eta_p^2=.014$. A post hoc test¹⁰ (Dunnett) revealed that participants in the meat condition were significantly more willing to eat beef than those in the abattoir condition $p=.045$. The main effect of measurement order was significant, $F(1,233)=7.95$, $p=.005$, $\eta_p^2=.033$, such that participants in the group where willingness to eat meat was measured first were less willing to eat meat than those in the group where mind perception of cows was measured first. No significant interaction effect was found (see Table 10.3).

Table 10.3. Descriptive statistics of the willingness to eat beef in the French sample of Study 4

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Abattoir condition	3.62(1.28)	3.48(1.34)	3.55(1.30)
Pasture condition	4.12(.96)	3.67(1.07)	3.87(1.04)
Meat condition	4.38(1.43)	3.56(1.12)	4.08(1.37)
Control condition	4.05(1.40)	3.53(1.31)	3.78(1.37)
Total	4.04(1.31)	3.56(1.23)	

10.2.2.4 Mind perception of cows

To test the hypotheses about the denial of mind, 4 (conditions of

¹⁰ With respect to the use of post hoc tests in this dissertation, the Turkey HSD was used on most occasions. However, when I examined the effect of dissonance manipulations on willingness to eat meat and mind attribution to animals, I used the Dunnett post hoc test, which allows shifting of the comparable category. First, I compared the three experimental conditions with the control condition. Second, I compared the abattoir condition with the other three conditions. The significant results were reported.

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dissonance manipulation: abattoir, meat, pasture, control) × 2 (order of presentation of ways of dissonance reduction: willingness measurement first, mind perception measurement first) ANOVAs on the dimension of agency and experience were conducted.

On the dimension of agency, the main effect of dissonance manipulation was marginally significant, $F(3, 222) = 2.54, p = .06, \eta_p^2 = .033$. A post hoc test (Dunnett) revealed that participants in the control condition attributed more mind to cows on the agency dimension than those in the abattoir condition, $p = .10$, pasture condition, $p = .02$, and meat condition, $p = .03$. The main effect of measurement order was not significant, $F(1, 222) = 1.38, p = .24, \eta_p^2 = .006$. No significant interaction was found (see Table 10.4).

Table 10.4. Descriptive statistics on agency-dimension of mind perception of cows in the French sample of Study 4

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Abattoir condition	29.17(6.76)	27.97(7.35)	28.57(7.03)
Pasture condition	26.60(8.13)	28.39(8.60)	27.55(8.35)
Meat condition	26.18(7.82)	29.81(5.82)	27.50(7.30)
Control condition	30.58(6.77)	30.97(6.02)	30.75(6.40)
Total	28.42(7.45)	29.28(7.14)	

On the dimension of experience, no significant effect was found (see Table 10.5).

Table 10.5. Descriptive statistics on experience-dimension of mind perception of cows in the French sample of Study 4

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Abattoir condition	36.40(5.22)	35.10(4.89)	35.75(5.06)
Pasture condition	36.78(5.72)	36.89(4.76)	36.65(5.18)
Meat condition	34.42(7.12)	36.25(3.99)	35.12(6.13)
Control condition	36.98(4.31)	36.26(4.65)	36.65(4.45)
Total	36.16(5.33)	36.10(14.64)	

10.3 Study 4b The Chinese sample

10.3.1 Method

I distributed the questionnaires online using the website of Qualtrics in China. Some Chinese participants completed the questionnaire in the lab in small groups, and others completed it by themselves through clicking the network link at their own places.

10.3.1.1 Participants

A total of 416 participants clicked the link. They were randomly assigned to one of the eight conditions of a 4 (conditions of dissonance manipulation: abattoir, meat, pasture condition, control) \times 2 (order of presentation of ways of dissonance reduction: willingness to eat meat measurement first, mind perception measurement first) between-subject factorial design.

Due to the nature of the research, those who answered fewer than 5

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questions (116), and those who identified themselves as vegetarian (23) were excluded. Finally, 277 participants (236 females, 40 males, 1 non-reported; $M_{age}=19.92$, $SD_{age}=1.20$) were included in the following analyses. Specifically, 64 participants were in the abattoir condition, 68 were in the pasture condition, 61 were in the meat condition, 84 were in the control condition.

10.3.1.2 Procedure and materials

The procedure and materials were identical to those in Study 4a. All measures had high internal reliability (agency dimension: Cronbach's $\alpha = .71$, experience dimension: Cronbach's $\alpha = .86$, willingness to eat meat, Cronbach's $\alpha = .66$).

10.3.2 Results

10.3.2.1 Manipulation check

As in the French sample, a higher proportion (48 out of 64) of Chinese participants in the abattoir condition mentioned the slaughter than in the pasture condition (37 out of 68). A Chi-square test revealed significant differences between the abattoir and pasture conditions, $\chi^2(1, n=132)=6.10$, $p=.01$, $\phi=.215$. The manipulation of associating meat with animals in the Chinese sample was effective. However, an independent t-test showed that participants who mentioned the slaughter ($M=3.50$, $SD=1.31$) did not report significantly less willingness to eat meat than those who did not mention the slaughter ($M=3.12$, $SD=1.45$), $t(127)=1.52$, $p=.13$.

10.3.2.2 Correlational analyses

Among Chinese participants, results revealed that there were non-significant correlations between participants' willingness to eat meat and mind perception of cows, and between participants' willingness to eat meat and their daily meat consumption habit (see Table 10.6). Also, their daily meat consumption habit showed a non-significant correlation with mind perception of cows (see Table 10.7).

Table 10.6. Correlations between willingness to eat meat and mind perception of cows and daily eating habit in the Chinese sample of Study

4

	Agency	Experience	Meat-eating days in a month	Meat-eating times in a week
Desire to eat Intended amount of beef consumption	-.01	.03	.11	.18
	.04	.03	.13	.12

Table 10.7. Correlations between mind perception of cows and daily eating habit in the Chinese sample of Study 4

	Meat-eating days in a month	Meat-eating times in a week
Agency	.07	.10
Experience	.05	.03

10.3.2.3 Willingness to eat meat

As the two measurements of willingness to eat meat were significantly correlated, $r_C=.31$, $p<.001$, they were combined into one item as the

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measurement of willingness to eat meat. To examine the hypothesis that realizing the animal origin of meat decreases willingness to eat meat, I conducted a 4 (conditions of dissonance manipulation: abattoir, meat, pasture, control) \times 2 (order of presentation of ways of dissonance reduction: willingness measurement first, mind perception measurement first) between-subject ANOVA on the willingness to eat beef.

The main effect of the dissonance manipulation was not significant, $F(3, 269)=1.47$, $p=.22$, $\eta_p^2=.016$. A post hoc test (Dunnett) revealed that participants in the meat condition were more willing to eat beef than those in the abattoir condition $p=.07$. The main effect of measurement order was not significant, $F(1,269)=.01$, $p=.92$. No significant interaction was found (see Table 10.8).

Table 10.8. Descriptive statistics of the willingness to eat beef in the Chinese sample of Study 4

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Abattoir condition	3.22(1.73)	3.32(1.24)	3.28(1.46)
Pasture condition	3.45(1.46)	3.40(1.35)	3.43(1.39)
Meat condition	3.83(1.44)	3.61(1.59)	3.76(1.48)
Control condition	3.56(1.36)	3.81(1.20)	3.68(1.28)
Total	3.55(1.48)	3.54(1.31)	

10.3.2.4 Mind perception of cows

To test the hypotheses about the denial of mind, 4 (conditions of dissonance manipulation: abattoir, meat, pasture, control) \times 2 (order of

presentation of ways of dissonance reduction: willingness measurement first, mind perception measurement first) ANOVAs on the dimension of agency and experience were conducted. No significant effects were found (see Tables 10.9 and 10.10).

Table 10.9. Descriptive statistics on agency-dimension of mind perception of cows in the Chinese sample of Study 4

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Abattoir condition	27.20(7.17)	28.16(6.89)	27.77(6.96)
Pasture condition	27.97(7.04)	27.64(6.10)	27.79(6.51)
Meat condition	27.14(4.60)	26.68(6.77)	27.00(5.32)
Control condition	25.45(6.59)	26.50(5.73)	25.98(6.16)
Total	26.84(6.30)	27.29(6.28)	

Table 10.10. Descriptive statistics on experience-dimension of mind perception of cows in the Chinese sample of Study 4

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Abattoir condition	35.41(8.86)	37.53(4.75)	36.62(6.84)
Pasture condition	37.50(5.70)	36.64(5.64)	37.04(5.64)
Meat condition	37.31(4.86)	35.21(5.94)	36.66(5.26)
Control condition	35.93(6.07)	35.60(4.63)	35.76(5.37)
Total	36.59(6.30)	36.35(5.16)	

10.4 Discussion

With respect to the willingness to eat meat in the different conditions of dissonance manipulation, both Chinese and French participants in the meat condition reported the most willingness to eat meat, and those in the

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abattoir condition reported the least willingness to eat meat. This might suggest that meat, diagrammed in its original raw form (appearing on the body of a food animal with specific names corresponding to each body part in the present study), can activate people's desire to eat meat in the future. This is in line with previous results showing that when people thought that meat for sale was common in stores, they showed much more willingness to eat them (Ruby, 2008). However, the suffering of animals in the slaughter process emphasized by the abattoir reduced participants' willingness to eat meat.

Concerning mind perception, significant differences appeared in the French sample, but not in the Chinese sample. French participants attributed significantly less mind to cows on the dimension of agency after the animal origin of meat had been made explicit, than in the control condition. However, the responses of Chinese participants were in the opposite direction as they attributed *more* mind to cows when the animal origin of meat become obvious, than in the control condition, although this effect was not significant. This may imply that French participants were influenced strongly by the activation of the meat's animal origin, and this aroused much stronger cognitive dissonance due to the meat paradox. It was further justified by the effect of order of presentation of the two ways of dissonance reduction, which revealed a significant difference in the French sample but not in Chinese sample. When the willingness to eat meat was measured first, French participants were significantly less willing to eat beef than when it was measured second. As expected, French participants in the group where mind perception of cows was

measured first ($M=28.42$, $SD=7.45$) attributed less mind on the dimension of agency to cows than those in the group where it was measured second ($M=29.28$, $SD=7.14$), although the difference was not significant. However, for Chinese participants the tendency was not clearly consistent.

Denial of animals' capacity to suffer, especially pain, has been found to be an effective strategy to facilitate meat-eating behavior (Loughnan, Bastian, & Haslam, 2014), but we found significant differences only on the dimension of agency, and not on the dimension of experience that included the feeling of pain. The theory of dehumanization provides a perspective to explain this pattern. Haslam (2006) proposed that two forms of dehumanization involved the denial of two distinct senses of humanness: characteristics that are uniquely human and those that constitute human nature. Denying uniquely human attributes to others represents them as animal-like, and denying human nature to others represents them as objects or automata. In other word, animals and humans are thought to share characteristics of human nature other than those that are unique to humans, and automata are attributed more uniquely human characteristics than those belonging to general human (and animal) nature (Loughnan & Haslam, 2007). Human uniqueness corresponds broadly to the dimension of agency which clearly marked the human-animal distinction, and human nature corresponds closely to the dimension of experience, which primarily differentiated living humans and animals from inanimate, mechanical, and disembodied entities such as dead people, robots, and God (Haslam, et al., 2012). According to this classification of dehumanization and correspondence between

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dehumanization and mind perception, the suffering of animals in the slaughter may be too evident to deny when meat is connected with slaughter in the meat production process, so denial of the experience-dimension of mind perception lost its power to deal with the cognitive dissonance from the meat paradox. Conversely, the agency-dimension, because it is uniquely human, easily draws a distinction between human and animal, so to attribute less mind on the dimension of agency differentiates animals from humans, and further makes meat-eating behavior reasonable. In other words, by attributing less mind to food animals on the dimension of agency, meat eaters emphasize the dissimilarities between humans and animals, which rationalizes the meat-eating behavior. In this view, humans are perceived to share animals' capacity for sensation but are differentiated by their capacity for intellect (Gray, et al., 2007; Haslam, 2006). Humans' rational autonomy makes most humans feel unlike animals, but sentience makes humans appear to be much more similar to animals (Marcu, Lyons, & Hegarty, 2007). What is more, it can be said that the agency-dimension, such as the capacity of memory, planning, thought, is part of intelligence. However, perceived intelligence of animals was one of the chief predictors of disgust at the thought of eating meat (Ruby & Heine, 2012), so to attribute less mind on the dimension of agency may also inhibit the disgust related to eating meat.

Study 4 provides qualified support for the hypotheses that meat eaters would reduce their willingness to eat meat to resolve cognitive dissonance due to the meat paradox. The expected pattern of results was obtained in

both samples, but was only statistically significant in the French sample. It also supports the hypothesis that meat eaters would reduce their mind attribution to cows to resolve cognitive dissonance due to the meat paradox in the French sample. However, the slaughter of food animals is conducted “out of sight, out of mind” for most people in modern life, and the manipulation of a strong link to lead participants to deliberately pay attention to the slaughter involved in the meat production process is a little contrived. If just showing the different names of beef in the meat condition could activate participants’ willingness to eat meat, what about a delicious dish, which represents the natural process of meat consumption? Thus, in Study 5, I turned to the question of how the meat paradox can be presented in the context of daily meat consumption.

11 Study 5: The meat paradox in the meat consumption process

Study 5 investigated responses to the meat paradox in the context of everyday meat consumption. The same procedure was used as in Study 4, but the manipulation of the connection between meat and its animal origin was a dish described with a recipe. Adapted from Ruby (2012), I described a recipe, in which the main ingredient was beef, accompanied by a photo of a cow or a photo of a dish to represent different conditions of the dissonance manipulation. The *recipe alone condition* just shows a text description of the recipe; the *dish image condition* shows the text description with a photo of the dish; the *animal image condition* shows the text description with a photo of cow, illustrating the source of beef in the dish; the *Control condition* does not present a picture or recipe but moved directly on to the dependent measures after showing a sentence of acknowledgement for participation.

From the control condition to the recipe alone, the dish image and the animal image conditions, it can be said that the animal origin of the dish becomes more and more obvious, due to showing an animal image with a recipe in the animal image condition. On the other hand, the recipe alone and the dish image are both routine ways of showing dishes in daily consumption. Therefore, the animal image condition, as a relatively salient dissonance induction condition, should be compared with the other three conditions, and the recipe alone and dish image conditions are also

comparable with the control condition. I expected that with the increasing transparency between meat and its animal origin, less mind will be attributed to the food animal, and the willingness to eat meat will be high in the recipe alone and dish image conditions, and low in the animal image condition.

Furthermore, in the animal image condition, I hypothesized that participants in the willingness-first order of presentation will reduce their willingness to eat meat, and then tend to maintain the mind perception of cows; those in the mind perception-first order of presentation will reduce their mind perception of cows, and then tend to increase their willingness to eat meat. In the other three conditions, participants in the willingness-first order of presentation will increase the willingness to eat meat, and reduce the mind perception of cows; those in the mind perception-first order of presentation will reduce the mind perception of cows, and increase the willingness to eat meat. Specially, we made the following correlational and causal hypotheses on the aspect of willingness to eat meat and mind perception of cows, and examined whether they would be replicated in both Chinese and French cultures.

11.1 Hypotheses

11.1.1 Correlational hypotheses

Hypothesis 1. Participants' willingness to eat meat will show a negative correlation with their attribution of mind to food animals.

Hypothesis 2. Participants' willingness to eat meat will show a positive

correlation with their daily meat consumption habit.

Hypothesis 3. Participants' attribution of mind to food animals will show a negative correlation with their daily meat consumption habit.

11.1.2 Causal hypotheses on willingness to eat meat

Hypothesis 4. Due to the increasing transparency of the connection in the dish between meat and its animal origin, participants in the animal image condition will show less willingness to eat meat than those in the other conditions. However, participants in the dish image condition and recipe alone condition will show more willingness to eat meat than those in the control condition.

Hypothesis 5. Participants' willingness to eat meat will be affected by the order of presentation of the two ways of dissonance reduction. Specifically, participants in the group where willingness to eat meat is measured first will show less willingness to eat meat than those in the group with these two options presenting in the inverse order.

Hypothesis 6. There will be an interaction effect between conditions of dissonance manipulation and the order of presentation of the two ways of dissonance reduction. In the animal image condition, participants in the group where willingness to eat meat is measured first will show less willingness to eat meat than those in the group where mind perception of cows is measured first. In the other three conditions, participants in the two groups will be similar on the willingness to eat meat.

11.1.3 Causal hypotheses on mind perception of cows

Hypothesis 7. Due to reminders of the meat paradox with the varying transparency of the connection in the dish between meat and its animal origin, participants in the animal image condition will attribute less mind to cows than those in the other three conditions. And participants in the dish image condition and recipe alone condition will attribute less mind to cows than those in the control condition.

Hypothesis 8. Participants' mind perception of cows will be affected by the order of presentation of the two ways of dissonance reduction. Specifically, participants in the group where mind perception of cows is measured first will attribute less mind to cows than those in the group where willingness to eat meat is measured first.

Hypothesis 9. There will be an interaction effect between conditions of dissonance manipulation and the order of presentation of the two ways of dissonance reduction. In the animal image condition, participants in the group where mind perception of cows is measured first will attribute less mind to cows than those in the group where willingness to eat meat is measured first. In the other three conditions, participants will attribute similar mind to cows.

11.2 Study 5a The French sample

11.2.1 Method

Participants were recruited online using the website of Qualtrics in France.

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I distributed an online questionnaire and put the web link on Facebook and on a French online participant pool (<http://expesciences.risc.cnrs.fr>). Participants chose to complete the questionnaire voluntarily.

11.2.1.1 Participants

A total of 348 participants took part. They were randomly assigned to one of the eight conditions of a 4 (conditions of dissonance manipulation: recipe with dish image, recipe with animal image, recipe alone, control) × 2 (order of presentation of two ways of dissonance reduction: willingness to eat meat measurement first, mind perception measurement first) between-subject factorial design. After deleting those who answered fewer than 5 questions (29) and those who self-identified as vegetarian (18), 301 participants (194 female, 73 male, 34 non-reported; $M_{age}=38.99$, $SD_{age}=17.35$) were included in the following analyses. Specifically, 78 were in the dish image condition, 79 were in the animal image condition, 74 were in the recipe alone condition, 70 were in the control condition.

11.2.1.2 Procedures and materials

The procedure and materials were the same as in Study 4, except that the information used to remind the animal origin of meat was not the fate of cows, but varying descriptions of the same dish. In addition, two dependent variables as manipulation check (liking the taste of the dish and the extent of hunger) were added.

Participants saw the stimuli for one of the four conditions of dissonance manipulation and judged their extent of liking the dish, and then reported

their current state of hunger (control group is without the question about liking the dish). The following tasks, including measurement of willingness to eat meat, mind perception of cows, the unrelated questionnaires, demographic information, were the same as in Study 4. Participants indicated their responses on a 7-point Likert scale. All measures had high internal reliability (agency dimension: Cronbach's $\alpha = .79$, experience dimension: Cronbach's $\alpha = .75$, willingness to eat meat, Cronbach's $\alpha = .77$).

11.2.2 Results

11.2.2.1 Manipulation check

The liking for the dish and the extent of hunger were examined first. The liking for the dish was tested with a one-way ANOVA. It revealed that participants in the different conditions of dissonance manipulation showed significantly different liking for the dish, $F(2, 228) = 5.20, p = .006$. A post hoc test (HSD) showed that participants in the animal image condition reported less liking than those in the dish image condition ($p = .05$) and recipe alone condition ($p = .007$). The latter two had no differences. However, one-way ANOVA on the extent of hunger in the different conditions of dissonance manipulation did not show significant difference, $F(3, 297) = .58, p = .63$ (see Table 11.1).

Table 11.1. Descriptive statistics of liking for the dish and extent of hunger in the French sample of Study 5

	Dish image	Animal image	Recipe alone	Control
Liking for the dish	5.27(1.80)	4.62(2.02)	5.49(1.30)	
Extent of hunger	2.97(1.84)	2.61(1.76)	2.88(1.92)	2.76(1.81)

11.2.2.2 Correlational analyses

To examine the correlations among willingness to eat meat and mind perception of cows, and individuals' daily meat consumption habits, Pearson's correlations were calculated. Among French participants, participants' willingness to eat meat showed significantly negative correlations with experience-dimension of mind attribution to cows on the aspect of intended amount of beef consumption in the future, and significantly positive correlations with their daily meat consumption habit (see Table 11.2). Unlike Study 4, the correlations between mind perception of cows and daily meat consumption habit were significantly negative, except between agency dimension and meat-eating days in a month (see Table 11.3).

Table 11.2. Correlations between willingness to eat beef and mind perception of cows and daily eating habit in the French sample of Study 5

	Agency	Experience	Meat-eating days in a month	Meat-eating times in a week
Desire to eat beef	-.01	-.07	.43**	.32**
Intended amount of beef consumption	-.19**	-.18**	.22**	.20**

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 11.3. Correlations between mind perception of cows and daily eating habit in the French sample of Study 5

	Meat-eating days in a month	Meat-eating times in a week
Agency	-.08	-.16**
Experience	-.16*	-.21**
MP	-.14*	-.20**

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

11.2.2.3 Willingness to eat meat

As in Study 4, the correlation between the desire to eat beef in the following days and the intended amount of beef consumption in the coming year was significantly correlated, $r_F = .33$, $p < .001$, so they were combined into one item as the measurement of willingness to eat meat. To examine the hypotheses that realizing the animal origin of meat decreases the willingness to eat meat, I did a 4 (conditions of dissonance manipulation: recipe with dish image, recipe with animal image, recipe alone, control) \times 2 (order of presentation of the two ways of dissonance reduction: willingness measurement first, mind perception measurement first) between-subject ANOVA with a Dunnett post hoc test. No significant difference was revealed (see Table 11.4).

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Table 11.4. Descriptive statistics of willingness to eat beef in the French sample of Study 5

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Animal image	4.02(1.16)	3.71(1.39)	3.84(1.30)
Dish image	3.97(1.15)	4.11(1.16)	4.04(1.15)
Recipe alone	4.28(1.10)	3.94(.80)	4.14(.99)
Control	3.93(1.36)	3.71(1.09)	3.82(1.24)
Total	4.06(1.19)	3.86(1.16)	

11.2.2.4 Mind perception of cows

To test the hypotheses that realizing the animal origin of meat would decrease attribution of mind to the food animals, I also conducted a 4 (conditions of dissonance manipulation: recipe with dish image, recipe with animal image, recipe alone, control condition) \times 2 (order of presentation of the two ways of dissonance reduction: willingness to eat meat measurement first, mind perception measurement first) between-subject ANOVAs on the two dimensions of agency and experience. No significant differences were found (see Tables 11.5 and 11.6).

Table 11.5. Descriptive statistics on agency-dimension of mind perception of cows in the French sample of Study 5

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Animal image	25.25(7.23)	25.50(7.24)	25.40(7.19)
Dish image	24.72(7.87)	25.12(7.69)	24.94(7.72)
Recipe alone	25.14(7.08)	29.61(6.36)	27.01(7.10)
Control	25.25(6.78)	24.36(6.40)	24.83(6.56)
Total	25.09(7.17)	25.99(7.20)	

Table 11.6. Descriptive statistics on experience-dimension of mind perception of cows in the French sample of Study 5

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Animal image	35.22(4.92)	34.73(5.28)	34.94(5.10)
Dish image	34.06(6.25)	33.15(6.73)	33.57(6.48)
Recipe alone	34.35(6.53)	35.71(3.98)	34.92(5.61)
Control	33.78(5.58)	33.21(4.77)	33.51(5.18)
Total	34.33(5.87)	34.17(5.44)	

11.3 Study 5b The Chinese sample

11.3.1 Method

Participants were recruited online using the website of Qualtrics in China. Some Chinese participants completed the questionnaire in the lab in small groups, and others completed it by themselves through clicking the network link at their own places.

11.3.1.1 Participants

A total of 290 participants participated. They were randomly assigned to one of the eight conditions of a 4 (conditions of dissonance manipulation: recipe with dish image, recipe with animal image, recipe alone, control) × 2 (order of presentation of two ways of dissonance reduction: willingness measurement first, mind perception measurement first) between-subject factorial design. After deleting those who answered fewer than 5 questions (59) and those who self-identified as vegetarian (14), 217 participants (153 female, 55 male, 9 non-reported; $M_{age}=22.53$, $SD_{age}=3.40$) were included in the following analyses. Specifically, 56 were in the dish image condition, 50 were in the animal image condition, 61 were in the recipe alone condition, 50 were in the control condition.

11.3.1.2 Procedure and materials

The procedure and materials were identical to those in Study 5a. All measures had high internal reliability (agency dimension: Cronbach's $\alpha = .74$, experience dimension: Cronbach's $\alpha = .89$, willingness to eat meat, Cronbach's $\alpha = .68$).

11.3.2 Results

11.3.2.1 Manipulation check

The liking for the dish was tested with a one-way ANOVA. It revealed that participants in the different conditions of dissonance manipulation showed significantly different liking for the dish, $F(2,164)=6.95$, $p=.001$. A post hoc test (HSD) showed that participants in the animal image

condition reported much less dish-liking than those in the dish image condition ($p=.01$) and recipe alone condition ($p=.002$). The latter two had no differences. However, a one-way ANOVA on the extent of hunger in the different conditions of dissonance manipulation did not show significant differences, $F(3, 213)=.35, p=.79$ (see Table 11.7).

Table 11.7. Descriptive statistics of liking for the dish and extent of hunger in different conditions of the Chinese sample of Study 5

	Dish image	Animal image	Recipe alone	Control
Liking for the dish	5.55(1.57)	4.64(1.93)	5.74(1.39)	
Extent of hunger	3.45(1.97)	3.30(1.85)	3.18(1.73)	3.08(2.28)

11.3.2.2 Correlational analyses

Among Chinese participants, there were no significant correlations between participants' willingness to eat meat and mind perception of cows, and between participants' willingness to eat meat and their daily meat consumption habit (see Table 11.8). The correlation between mind perception of cows and daily meat consumption habit was also non-significant as in Study 4 (see Table 11.9).

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Table 11.8. Correlations between willingness to eat beef and mind perception of cows and daily eating habit in the Chinese sample of Study

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	Agency	Experience	Meat-eating days in a month	Meat-eating times in a week
Willingness to eating beef	-.04	.01	.02	.004
Intended amount of beef consumption	.03	.08	.12	.12

Table 11.9. Correlations between mind perception of cows and daily eating habit in the Chinese sample of Study 5

	Meat-eating days in a month	Meat-eating times in a week
Agency	-.07	-0.07
Experience	.02	.05

11.3.2.3 Willingness to eat meat

As in Study 4, the correlation between the desire to eat beef in the following days and the intended amount of beef consumption in the coming year was significantly correlated, $r_C=.42$, $p<.001$, so these items were combined into one item as the measurement of willingness to eat meat. To examine the hypotheses that realizing the animal origin of meat decreases the willingness to eat meat, I did a 4 (conditions of dissonance manipulation: recipe with dish image, recipe with animal image, recipe alone, control) \times 2 (order of presentation of the two ways of dissonance

reduction: willingness measurement first, mind perception measurement first) between-subject ANOVA. The main effect of conditions of dissonance manipulation was marginally significant, $F(3, 209)=2.21$, $p=.09$, $\eta_p^2=.03$. A post hoc test (Dunnett) showed that participants in the animal image condition were less willing to eat beef than those in the recipe alone condition, $p=.08$; participants in the dish image condition were more willing to eat beef than those in the control condition $p=.09$; those in the recipe alone condition were more willing to eat beef than those in the control condition $p=.04$. No other main effects or interaction effects were revealed (see Table 11.10).

Table 11.10. Descriptive statistics of willingness to eat beef in the Chinese sample of Study 5

Conditions	Measurement order		Total
	Mind perception first	Willingness first	
Animal image	3.70(1.37)	3.55(1.26)	3.61(1.29)
Dish image	4.03(1.65)	4.04(1.41)	4.04(1.54)
Recipe alone	3.76(1.41)	4.48(1.59)	4.11(1.54)
Control	3.52(1.67)	3.54(1.10)	3.53(1.36)
Total	3.78(1.52)	3.90(1.40)	

11.3.2.4 Mind perception of cows

To test the hypotheses that realizing the animal origin of meat would decrease mind attribution to food animals, I also conducted a 4 (conditions of dissonance manipulation: recipe with dish image, recipe with animal image, recipe alone, control) \times 2 (order of presentation of the two ways of dissonance reduction: willingness measurement first, mind perception measurement first) between-subject ANOVA on the agency

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and experience dimensions. No significant difference was revealed (see Tables 11.11 and 11.12).

Table 11.11. Descriptive statistics on agency-dimension of mind perception of cows in the Chinese sample of Study 5

Conditions	Measurement order		Total
	Mind perception	Willingness	
	first	first	
Animal image	26.67(6.60)	28.39(5.07)	27.40(6.76)
Dish image	27.70(5.98)	27.20(7.32)	27.47(5.98)
Recipe alone	29.06(7.71)	29.93(6.77)	29.49(7.21)
Control	28.27(6.37)	28.04(5.54)	28.14(5.87)
Total	27.96(6.76)	28.40(6.33)	

Table 11.12. Descriptive statistics on experience-dimension of mind perception of cows in the Chinese sample of Study 5

Conditions	Measurement order		Total
	Mind perception	Willingness	
	first	first	
Animal image	35.43(6.06)	37.78(4.02)	35.06(7.37)
Dish image	36.15(7.47)	34.33(7.34)	36.45(5.35)
Recipe alone	36.94(6.71)	37.59(7.54)	37.25(7.07)
Control	35.23(6.96)	36.29(5.36)	35.82(6.07)
Total	35.98(6.67)	36.41(6.43)	

11.4 Discussion

The manipulation check showed that the pattern of participants' liking for the dish was very similar in the French sample and the Chinese sample. Both liked the dish much less in the animal image condition than in the dish image condition and the recipe alone condition. This suggests that

when the animal origin of meat is emphasized, people tend to dislike eating the meat dish. In other words, it is very possible that participants in the animal image condition experienced more dissonance from the meat paradox than those in the other conditions, because of the more obvious link between meat and animal in the animal image condition. Meanwhile, it is also possible that participants had reduced their dissonance from the meat paradox by showing less liking to the dish. I believe that there exists such a possibility, but it cannot reduce all the cognitive dissonance. First, the liking for the dish in the experimental manipulation was specific, but the meat paradox is usually not specific to one kind of meat, but to all edible meat. So to report less liking for the dish may partially reduce the dissonance from the meat paradox, but not all. Second, the finding that both Chinese and French participants in the animal image condition reported less willingness to eat meat than those in the dish image and recipe alone conditions suggests that they were trying to reduce dissonance in response to the meat paradox, although this pattern only reached statistical significance in the Chinese sample.

Another manipulation check, the extent of hunger, showed no significant differences between experimental conditions in both samples, but the finding that participants in the animal image condition felt the least hunger was consistent with the hypothesis that making the relation between beef and living cows salient would inhibit their desire to eat. It is possible that the extent of hunger was not an effectively controlled measurement, because most participants completed the online questionnaire according to their own schedule and the feeling of hunger

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varied tremendously.

11.4.1.1 The vanished order effect

I failed to replicate the finding of Study 4 that there was an order effect of measurement (between willingness to eat meat and mind perception of cows) on the dependent variables. Thinking about the weak link between a dish and its animal origin defined above, such a result was not so surprising. It is very plausible that the effect of measurement order of questions about willingness to eat meat and mind perception of cows may not be sufficient to affect attitude to meat consumption in one's daily diet. Due to long-term culinary practices, the cognitive dissonance from the specific meat consumption of the same recipe with different images may not be strong enough to defeat the chronically objectified idea among omnivores that meat is essential in one's daily diet and that food animals are used for meat. Compared with the strong link established between beef and its animal origin in Study 4, the weak link between dish and its animal origin may correspond well with the habits of daily consumption, and it may even strengthen the idea that enjoying the delicious meat dish is reasonable and necessary, so participants who answered questions of willingness to eat meat before mind perception questions need not apparently reduce their willingness to eat meat than those answered these two questions in the inverse order, and participants who answered mind perception questions before questions of willingness to eat meat need not reduce the attribution of mind to cow than those answered these two questions in the inverse order.

11.4.1.2 Chinese omnivores' willingness to eat meat

On the other hand, the weak link highlighted the dish's animal origin in the condition of *an animal image* by showing the recipe with a photo of the cow, and highlighted the deliciousness of dish in the condition of *dish image* and *recipe alone condition* by showing the recipe with/without a photo of the dish. These emphasizees may affect the willingness to eat meat. The animal image condition, which showed a living cow in a photo, might be possibly associated with the suffering that the food animals experienced in the process of slaughter, and made people reduce the willingness to eat meat. On the contrary, the dish image and recipe alone conditions, which reflected the deliciousness of meat, may lead people to increase their willingness to eat meat. In this study, Chinese participants in the animal image condition reported less willingness to eat beef than those in the recipe alone condition, but not those in the dish image condition. It seems that participants' willingness to eat beef would not be affected as long as they were not aware that the origin of beef was once a living cow. On the other hand, participants in the dish image condition reported more willingness to eat beef than those in the control condition, but not those in the animal image condition. It suggests that the recipe with dish image may activate participants' willingness to eat meat, but the recipe with an animal image cannot. Altogether, it seems to be that an animal image, as a symbol of meat's animal origin, makes participants be less willing to consume meat in the future, but a text description of a recipe, as a symbol of meat's deliciousness, is a source that promotes meat consumption in the future. This kind of result in the Chinese sample provided qualified support for the hypotheses that a recipe with an animal

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image would reduce meat eaters' willingness to eat meat. A similar pattern of responses in the willingness to eat meat in the French sample was found, albeit not one that was statistically significant. The greater willingness to eat meat in the recipe alone and dish image conditions may demonstrate that people may have been more strongly affected by the deliciousness of the ordinary diet in the meat consumption process, as this is likely to be more immediately present to awareness than detailed consideration of animal suffering in the process of transformation from animal to meat. Except in a condition where there was a relatively clear reminder of the origin of meat (an animal image), participants tended to reduce their willingness to eat meat when they became aware of the link between meat and animal.

12 General discussion

The present research set out to investigate whether two strategies were effective in resolving the potential cognitive dissonance from the meat paradox among omnivores in two different cultures. Study 4, which presented a strong link between meat and its animal origin in the meat production process, found evidence for dissonance resulting from the meat paradox, at least in the abattoir condition, in that many more participants thought about the slaughter. French participants showed a tendency to reduce their willingness to eat meat and their mind attribution to food animals to resolve the cognitive dissonance from the meat paradox, but Chinese participants seemed to reduce only their willingness to eat meat. In Study 5, a weak link between meat and its animal origin was shown in the meat consumption process. The finding that participants showed least liking for the dish in the animal image condition suggested that participants experienced cognitive dissonance from the meat paradox in the meat consumption process when the link between meat and its animal origins was made transparent. The finding that Chinese participants reported significantly less willingness to eat meat when the animal origin of meat was relatively clear gives qualified support to the hypothesis that people would reduce their willingness to eat meat as a strategy to deal with the dissonance resulting from the meat paradox.

12.1 Strength of meat paradox across different cultural contexts

The results that participants from Study 4 in the abattoir condition mentioned death of cows more frequently and that participants in the animal image condition in Study 5 expressed the least liking for the dish provided evidence for the existence of cognitive dissonance resulting from the meat paradox in both Chinese and French samples. In other words, both Chinese participants and French participants experienced cognitive dissonance arising from the meat paradox, which contradicted the cultural hypothesis that French participants, but not Chinese participants, would be affected by the meat paradox. However, the strategies used to deal with the cognitive dissonance from the meat paradox between the two cultures were different. The findings in the French sample support the previous research on the mind perception of food animals in the meat production process, and demonstrate the role of cognitive dissonance arising from the meat paradox in motivating the denial of mind to the food animals (Bastian, Loughnan, et al., 2012; Loughnan et al., 2010). However, the findings in the Chinese sample did not replicate the denial of mind to the food animal found in the previous research. The differences between Chinese and French participants on the mind perception of cows in the meat production process may reflect a cultural difference in the meat paradox. That is, French, but not Chinese participants, were more strongly influenced by being made aware of the meat paradox in the meat production process. From the perspective of cognitive dissonance, dissonance is experienced whenever an important

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part of people's self-concept is threatened, but dealing with the dissonance may be culture-specific, and depend on the particular nature of the important self-concept espoused in a given culture (Hoshino-Browne et al., 2005). In cross-cultural comparisons between French and Americans with respect to diet, French people focused more on the experience of pleasure in the process of eating, and eating behaviors implied a function of social communication among French, as they spent much more time on eating (Rozin, 2005). If so, cognitive dissonance from the meat paradox in the meat production may be much more related with the self-concept and needs to be managed among French participants. For Chinese participants, evidence is lacking about the relation between diet and self-concept, and further research is needed to examine this question.

12.2 Participants' autonomy in response to the experimental manipulation

In addition, the autonomy given to participants to connect meat with a living animal in the writing task may also reflect cultural differences in the influence of the meat paradox. Compared with previous research where participants were reminded of the animal origins of meat by external information, the dissonance manipulation in Study 4 focused more on a self-realized process by asking participants to predict the cow's future situations in a writing task, which gave participants the autonomy to think of the animal origin of meat. In other words, when given the writing task, participants in the current study had more freedom to avoid thinking about the connection between meat and animals. According to the analysis of the fate of cows in the writing text, Chi-square tests found

that there were significantly more French participants than Chinese participants who mentioned the slaughter in the abattoir condition, $\chi^2(1, n=125)=14.51, p<.001, \phi=.341$, but in the pasture condition the number of participants mentioned killing between French sample and Chinese sample was similar, $\chi^2(1, n=123)=3.21, p=.07, \phi=.162$. It seems that French participants associated animal origin of meat more often with the butchering than Chinese, and thus were affected more deeply, which can partially explain why French participants, but not Chinese, attributed less mind on the dimension of agency in experimental conditions than those in the control condition.

12.3 The power of the daily eating habit

At the beginning, I intended to explore the meat paradox in the meat production process and meat consumption process respectively, and so I showed the strong link and the weak link between meat and animals. The strong link in the meat production process motivated the French participants to deal with the cognitive dissonance from the meat paradox. However, when turning to the meat consumption process, neither Chinese nor French showed obvious denial of mind to the food animal. Maybe the manipulation of a weak link between meat and animals is too “mild” to reveal the meat paradox in the meat consumption process. However, participants’ least liking for the dish in the animal image condition also reflected the cognitive dissonance from the meat paradox. One possible explanation is that the meat paradox in the meat consumption process is trivialized, because the connection with animals has been severed, and no distinct cruelty has been shown in the meat consumption process. Adding

to the long-term culinary practices, the deliciousness of meat plays a dominant role in the meat consumption, and the influence of the meat paradox becomes weak. The prior result that the strong barriers to prevent people to be vegetarians were the enjoyment of eating meat and the unwillingness to alter the dietary habit (Lea & Worsley, 2003) also reflects the attractiveness of meat. Also, with regard to the ambivalence in attitudes to meat, the high appeal of delicious meat to omnivores and meat's short term nutritional value were pitted against concerns about the long term health risks and immoral treatment of animals (Rozin, 1996). Another fact that most meat eaters keep their meat-eating behavior during their whole life also reveals the weak influence of the meat paradox on meat consumption, otherwise, there would be fewer and fewer people who like to eat meat. In a British sample of 1018 participants, 28% participants reported they would reduce their meat consumption, but less than 25% of those claiming to reduce meat consumption actually did so (Richardson et al., 1993). Similarly, Danish participants maintained their usual meat-eating behavior, although they expressed critical attitudes to meat consumption (Holm & Mohl, 2000). Even among the self-identified vegetarians, they also acknowledged that they ate red meat, chicken or fish sometimes. For example, in a large-scale study of American teenage vegetarians, 46% reported eating fish, and 25% reported consuming chicken (Robinson-O'Brien, Perry, Wall, Story, & Neumark-Sztainer, 2009). In another American sample, Gossard and York (2003) found that self-identified vegetarians consumed an average of 83.2 total grams of meat per day, nearly 40% of what omnivores reported. Defining those vegetarians who sometimes eat meat as semi-vegetarians, Rothgerber

(2014) found that semi-vegetarians were more likely to express liking for meat, and felt less disgust to meat than the strict vegetarians who never consumed animal flesh. Such existing results also reflected that the deliciousness of meat in meat consumption is much stronger than the dissonance experienced in response to the meat paradox, even among some vegetarians. Furthermore, from the current results of the willingness to eat beef, images of meat (in the form of a recipe with/without a picture of the dish, or a diagram of the cow's body) showed their power in activating participants' appetite on the willingness to eat meat both in the Chinese sample and French sample. Such results illustrate that activating thoughts about the deliciousness of meat often takes precedence over thoughts about the animal origin of meat. For example, when reminded of the animal origin of meat by images of various animals, participants did not reduce their willingness to eat commonly eaten animals, such as cow, lamb, but did reduce the willingness to eat uncommonly eaten animals such as dog or monkey (Ruby, 2012). Only conditions that present relatively salient reminders of the meat's animal origin, such as the slaughter in the meat production process, or show an animal image in the meat consumption condition, have the strength to overcome the deliciousness of meat.

12.4 Limitations

The present research examined the strategies meat eaters used to deal with the cognitive dissonance from the meat paradox, but it is not without its limitations and needs more research.

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First, it is important to acknowledge that the Chinese sample and French sample were not similar. In the Chinese sample, most participants were students on the campus; however, in the French sample, half the participants were non-students and also much older than the Chinese participants. Such inconsistencies may reduce the comparability across sample and the generalizability of the current findings, but the fact that all the participants were meat-eaters and no direct comparison across nations was made can alleviate the problems of sample equivalence across the nations.

Second, the validity of the questionnaire may have been reduced by its web-based administration, as it is possible that the easy participation and perceived greater anonymity may increase frivolous responses (Fessler, Arguello, Mekdara, & Macias, 2003). It is worth noting, however, that only the participants who answered all questions were included and the manipulation checks were effective in the present research. Furthermore, recent research also showed that collecting data online is generally effective and rapid (Buhrmester, Kwang, & Gosling, 2011). In addition, I recruited participants from a diverse set of backgrounds (age and profession), especially in the French sample, by using online surveys. However, the participants were predominantly netizens, and thus our findings may be more generalizable to the two countries' netizens than their general populations. However, as a universal behavior, meat-eating behavior should not be so different between netizens and non-netizens, as long as they are meat eaters.

Third, although self-reported attitudes toward vegetables and meat were an almost perfect predictor of whether someone was a vegetarian or omnivore (Houwer & Bruycker, 2007), self-reported measurements on the willingness to eat meat and mind perception of animals may be too overt in the present research to wholly capture the actual behavior. Future research could imply the implicit measurement to access people's willingness to eat meat or mind perception of animals to test the effectiveness of strategies in coping with the meat paradox.

Fourth, the mental states included in the mind perception survey were limited. We just chose six agency-related and six experience-related mental states in the mind perception measurement. Especially on the dimension of experience, all mental states, such as pain, fear, joy, were primary emotions, which were easily thought to be shared by both human and animals (Demoulin et al., 2004). Relative to vegetarians, omnivores only attributed less secondary emotions (e.g., nostalgia, regret, etc.) to animals, but attributed similar primary emotions to animals (Bilewicz et al., 2011). Future research may include other mental states to explore the mental states that humans would (not) attribute to animals more broadly.

12.5 Future directions

As a universal behavior, enjoying the deliciousness of meat for most humans is an amazing experience. Meanwhile, the slaughter of animals is always prior to the tasting of the delicious flavor. Given the existing research in Western samples and the current findings, the experience of the meat paradox seems to be shared across cultures. However, whether it

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becomes a problem to be resolved is a culturally specific question. It seems to be a problem for western participants when presented with a strong link to the animal origin of meat in the production process (but less so for the Chinese participants), and a problem for Chinese participants when presented with a weak link to the animal origin of meat in the consumption process (but less so for the French participants). Therefore, it remains to be seen whether this pattern in the experience of dissonance in response to the meat paradox would be replicated in other cultural contexts or might be particular to Western cultures. Also, whether using some other means for activating information about the link between meat and animals, such as videos or pictures of slaughter, may more strongly impact the meat-related attitudes and behaviors.

As a cultural phenomenon, diet reflects lots of cultural traditions, and includes some cultural taboos. Regarding meat consumption, what kind of meat can be edible varied tremendously cross-culturally. How people from different cultural contexts attribute minds to animals whose consumption as food is controversial, such as dogs, dolphins, is a question that deserves to be investigated in order to better reveal the motivation and cognition involved in the meat paradox.

Different groups, such as vegetarians vs. omnivores and pet owners vs. non-pet owners, show different attitudes to animals. For example, vegetarians ascribed more emotions to animals that are commonly perceived as uniquely human (Bilewicz et al., 2011). Similarly, pet owners attributed more primary emotions than secondary emotions to animals, but

they also thought their pet possessed secondary emotions, especially jealousy (Morris, Doe, & Godsell, 2008). However, it is still an open question what factors may play a determining role in affecting people's attitudes to animals. Is it the character of human beings that they are meat eaters (or pet-owners), or is it the kind of animals that they are food animal (or companion animal)? Future research can explore such questions, which might provide insight to protect endangered species.

13 Conclusion

The current research demonstrated that the dissonance reduction in response to the meat paradox existed among both French participants and Chinese participants, and thus seems to generalize across cultures. However, whether the cognitive dissonance arising from the meat paradox is a problem to be resolved depends on the transparency of the animal origin of meat as well as on culture. The meat paradox in the meat production process where the animal origin of meat is clear is a real problem to be resolved, at least for French participants. However, the meat paradox in the meat consumption process where the animal origin of meat is vague seems to be more a problem for the Chinese participants than for the French participants, and may be defeated by the enjoyment of eating meat in the dietary habit.

Chapter 4 General discussion

Across five studies in two different domains of daily life, this dissertation set out to explore how people in different cultural contexts attribute mind to religious targets, because of their own religious belief or disbelief, and to food animals, because of their meat-eating behaviors. Below I discuss the implications of this research from the perspective of relation between mind perception and morality.

To investigate the link between mind perception and morality, Gray and his colleagues argued that mind perception is the essence of moral judgment. The attribution of moral responsibilities is correlated with agency-dimension of mind perception; the attribution of moral rights is correlated with experience-dimension of mind perception. Agency – the capacity for intention and action – endows an entity with the capacities to be a moral agent, who can perform moral or immoral deeds and take responsibility for his behavior, and Experience – the capacity for sensation and feeling – determines whether an entity is a moral patient, who is a potential beneficiary or victim and deserves moral rights and protection from harm (Gray & Wegner, 2011; Gray et al., 2012). According to the correspondence of agency and moral agent, and experience and moral patient, this research has several implications.

14 Implications

Frist, the findings of mind perception concerning gods in Study 2 support previous results in the initial study of mind perception that God was

thought to be high on agency and low on experience in a sample of 70% participants self-reported as Christian (Gray et al., 2007). Both Chinese and French participants with religious beliefs thought gods had high agency, although French religious participants also thought gods had high experience. These effects may suggest that the perception that gods are moral agents is not culturally specific, but general. Whether gods are thought to be moral patients may depend on culture. According to the mediation effect of anthropomorphism, it seems that in a culture that people anthropomorphize gods first and then attribute mind to gods, gods tend to be also a moral patient.

Second, the findings of mind perception concerning a Christian target in Study 3 indicate that mind attribution to the Christian target unfolds differently between believers and nonbelievers across cultural contexts, and reinforces the call for more research to be conducted among different religious targets of mind perception across cultures. Among our Chinese participants, when religious beliefs were aroused, atheist participants attributed less mind, and religious participants attributed more mind on the experience-dimension to the Christian target, suggesting that Chinese religious participants treat the Christian target as a moral patient, but atheist participants did not. Among our French participants, religious participants and agnostic participants attributed more mind to the Christian target than those they attributed to the control target or atheist target, implying that a Christian is more likely to be a moral patient for religious and agnostic participants. Thus, it would appear that belief in gods/religious beliefs may make different religious people (not atheists)

treat a Christian as a moral patient.

Third, Study 4 and 5 indicate that awareness of the meat paradox caused by eating meat and killing animals depends on the clearness of the link between meat and its animal origin. Extending the present literature, which has found that realizing the suffering of animals reduces meat eaters' attribution of mind to food animals, we found that when the link between meat and animal was strong, French participants attributed less mind to a food animal, and Chinese participants reported less willingness to eat meat in future. However, when the link was weak, the meat paradox, as a problem, does not seem to be serious. The deliciousness of meat stemming from the long-term dietary habit is dominant and obscures the suffering of animals. Although these studies did not show statistically significant results, they suggest that there is much to be uncovered by more in-depth investigations across a broader array of cultural contexts.

Finally, the present research has practical implications for resolving the conflicts between religious groups and nonreligious groups and for the marketing of meat products. Studies 1-3 suggest that as mind perception concerning religious targets and religious beliefs are highly related, especially that the more religious people are, the more mind on the experience-dimension they attributed to a Christian target, it may be useful to alleviate the conflict related to religion by highlighting people in one religious group, such as Christian, Muslim, as moral patients, who are capable of having good or evil, right or wrong, done to them. Studies 4 and 5 suggest that as people become more aware of the detail of meat

production, they experience more cognitive dissonance. It is important for the advertisers of animal products to emphasize the humane treatment given to food animals.

15 Final conclusion

Understanding how people think about minds has long been a fundamental concern of cognitive science. At least since Heider's (1958) ground breaking work on the psychology of interpersonal relations, social psychologists have been sure that inferring others' mental states—reading minds, even if somewhat imperfectly, seems to be a natural process, for most adults. When people perceive others, they were more likely to infer mind than to judge personality (Malle & Holbrook, 2012), which also points to the primacy of mind perception. This dissertation was designed to explore mind perception in the aspect of religion and diet, which respectively belong to people's spiritual life and dietary life, across two different cultural contexts. In the spiritual aspect, the findings presented here suggest that the stronger religious beliefs people have, the more mind they attribute to gods and religious target. Gods are attributed more mind on the agency-dimension within Chinese cultural context, and are attributed more mind on both the agency-dimension and the experience-dimension within French cultural contexts. However, Christian targets are attributed less mind by Chinese atheist participants, but more mind by French and Chinese religious participants on the experience dimension. In the dietary aspect, mind perception concerning food animals depends on culture and the link between meat and its animal origin. When the link is clear and strong, French participants attributed less mind to food animals, but Chinese participants did not. When the link is vague and weak, both French and Chinese participants did not attribute

less mind to food animals. There was also some support for the conjecture that the French reduced their willingness to eat meat in the future when the link between meat and its animal origins is strong, and that the Chinese did so when it is weaker. Taken together, these findings provide insight into how people perceive gods and religious targets in their spiritual lives and food animals in their dietary lives.

Appendix

Annex 1. Analyses of the structure of mind perception and religiosity in
Chinese and French sample

Annex 2. Mind perception survey in Study 1, 2 and 3

Annex 3. The measurement of religiosity in Study 1, 2, and 3

Annex 4. The scrambled sentence tasks in Study 2 and 3

Annex 5. The measurement of anthropomorphic concepts of gods

Annex 6. The Control target in Study 3

Annex 7. The Atheist target in Study 3

Annex 8. The Christian target in Study 3

Annex 9. The conditions of dissonance manipulation in Study 4 in
Chinese and French

Annex 10. The conditions of dissonance manipulation in Study 5 in
Chinese and French

Annex 11. The measurement of willingness to eat meat

Annex 12. Mind perception survey in Study 4 and 5

16 Annex 1. Analyses of the structure of mind perception and religiosity in Chinese and French samples

Several factor analyses were performed to ensure that there was similar structure in the current samples of the scales that measured mind perception and religiosity in the Chinese and French cultures, as the original measurements were mainly adapted from American culture.

16.1 Chinese data

16.1.1 Factor analysis of mind attribution to God

To maximize the stability of the solution, the analysis was performed on the combined sample of responses from Study 1 and Study 2 ($N = 188$). A principal components extraction with varimax rotation and 2 factors to be extracted showed that the two factors were consistent with a priori conceptualization of mind perception on the dimensions of agency and experience that explained 39% and 29% of the variance respectively (see Table 16.1). The 12 items formed a reliable scale (Cronbach's $\alpha = .93$), and item total correlations were high, averaging .52 with a minimum of .19. Reliability analyses performed on composite variables devised to reflect each component separately revealed highly internal consistencies (Cronbach's $\alpha = .88$ (agency: self-control, planning, memory, thought, communication, morality), and Cronbach's $\alpha = .91$ (experience: pain, fear,

joy, rage, desire, pleasure)), sufficient to justify further analyses using all these factor composites.

Table 16.1. Factor analysis of mind attribution to gods in Study1 and Study 2 in the Chinese sample^a

Mind perception items	Component	
	Experience	Agency
Pain	.83	
Fear	.81	
Joy	.80	.41
Rage	.79	
Desire	.74	
Pleasure	.72	.36
Self control		.81
Planning		.78
Memory	.48	.67
Thought	.51	.66
Communication	.44	.65
Morality	.50	.64

a. absolute value below .30 were suppressed.

16.1.2 Factor analysis of mind attribution to individuals

Given the intuitive difference between human beings and gods, namely that humans are natural beings and gods are supernatural beings, I also performed factor analysis of mind attribution to religious and nonreligious individuals. To maximize the stability of the solution, the factor analysis was performed on the combined sample¹¹ (N =623). A principal components extraction with varimax rotation and 2 factors to be extracted showed that memory as a component of agency loaded on the dimension

¹¹ In study 1, the same participant answered two separate parts about a religious person and a nonreligious person, so the sample of study 1 in factor analysis enlarged twice from 91 to 182. In study 3, the religious target was just Christian. Actually, we also collected data on other religious targets, such as Buddhism, Muslim. When we did factor analysis, we included all the data to maximize the stability of the solution, so the number of participants included was 623.

of experience (.58), and pleasure as a component of experience loaded on the dimension of agency (.67). So I deleted these two components and performed the analysis again. The results revealed two factors corresponding to a priori conceptualization of mind perception that explained 31% and 23% of the variance respectively (see Table 16.2). The 10 items formed a reliable scale (Cronbach's $\alpha=.79$), but item total correlations were not high, averaging .29 with a minimum of .01. Reliability analyses performed on composite variables devised to reflect each component separately revealed high internal consistencies (Cronbach's $\alpha=.70$ (agency: planning, self-control, thought, communication, morality), and Cronbach's $\alpha=.79$ (experience: rage, fear, pain, joy, desire)), sufficient to justify further analyses using all these factor composites.

Table 16.2. Factor analysis of mind attribution to religious and nonreligious targets in the Chinese sample^a

Mind perception items	Component	
	Experience	Agency
Rage	.86	
Fear	.80	
Pain	.79	
Joy	.57	.37
Desire	.54	
Planning		.80
Self control		.77
Thought	.35	.63
Communication	.43	.50
Morality	.42	.46

a. Absolute value below .30 were suppressed.

16.1.3 Factor analysis of religious belief

To maximize the stability of the analysis, we also used a combined sample from Studies 1, 2 and 3 (n=411). A principal components extraction with varimax rotation revealed four factors that explained 11% to 18% of the variance respectively (see Table 16.3). It was a little different from the original structure of the scale (Gorsuch & McPherson, 1989), which had at most three sub-structures. Another negligible difference was on item R8¹² (what religion offers me most is comfort in times of trouble and sorrow). It should be on the dimension of personal extrinsic religiosity, but it cross-loaded both on intrinsic and personally extrinsic religiosity.

Table 16.3. Factor analysis of intrinsic and extrinsic religiosity in the Chinese sample^a

Items	Component			
	Intrinsic religiosity	Social extrinsic religiosity	Personal extrinsic religiosity	others
R4	.69			
R7	.64		0.35	
R1	.63			
R5	.60		0.38	
R3	-.58			
R12	.49	0.32		
R13		0.84		
R11		0.84		
R2		0.65		
R6			0.77	
R9			0.72	
R8	0.363		0.49	
R14				0.84
R10				0.80

a. Absolute values below .30 were suppressed.

¹² See the Annex 3 about the specific content of each item

The two items (R10 and R14) belonged to intrinsic religiosity but comprised a single component in the factor analysis may not have been very suitable for the Chinese sample, of which religious participants were minority, as the two items premised that people were religious. I therefore deleted these two items and did another factor analysis. Three factors that explained 15%, 17% and 21% of the variance respectively were revealed, corresponding with the original structure of the scale. The 12 items formed a reliable scale (Cronbach's $\alpha=.74$ (all), Cronbach's $\alpha=.70$ (intrinsic religiosity), and Cronbach's $\alpha=.64$ (extrinsic religiosity)), sufficient to justify further analyses (see Table 16.4).

Table 16.4. Factor analysis of intrinsic and extrinsic religiosity in the Chinese sample^a

Items	Component		
	Intrinsic religiosity	Social extrinsic religiosity	Personal extrinsic religiosity
R4	.680		
R7	.645		.357
R1	.625		
R5	.591		.389
R3	-.591		
R12	.508	.327	
R13		.844	
R11		.840	
R2		.643	
R6			.773
R9			.721
R8	.361		.497

a. Absolute values below .30 were suppressed.

16.2 French data

16.2.1 Factor analysis of mind attribution to God

To maximize the stability of the solution, the analysis was performed on the combined sample of responses from Study 1 and Study 2 (N =164). A principal components extraction with varimax rotation and 2 factors to be extracted showed that the two factors that explained 44% and 38% of the variance respectively were consistent with the *a priori* conceptualization of mind perception in terms of the dimensions of agency and experience (see Table 16.5). The 12 items formed a reliable scale (Cronbach's $\alpha=.97$), and item total correlations were high, averaging .75 with a minimum of .59. Reliability analyses performed on composite variables devised to reflect each component separately revealed high internal consistencies (Cronbach's $\alpha=.96$ (agency: self-control, planning, memory, thought, morality, communication), and Cronbach's $\alpha=.95$ (experience: fear, pain, rage, joy, pleasure, desire)), sufficient to justify further analyses using all these factor composites.

Table 16.5. Factor analysis of mind attribution to gods in Study1 and Study 2 in the French sample^a

Mind perception items	Component	
	Agency	Experience
Self-control	.891	.312
Planning	.832	.369
Memory	.810	.458
Thought	.740	.569
Morality	.739	.565
Communication	.696	.492
Fear		.853
Pain	.416	.814
Rage	.495	.746
Joy	.663	.666
Pleasure	.612	.654
Desire	.551	.649

a. absolute value below .30 were suppressed.

16.2.2 Factor analysis of mind attribution to individuals

Because of the difference between human beings and gods, we also performed factor analysis of mind attribution to religious and nonreligious individuals. To maximize the stability of the solution, the factor analysis was performed on the combined sample¹³ (N =391). A principal components extraction with varimax rotation and 2 factors to be extracted showed that memory as a component of agency was on the dimension of experience (.72 vs. .59), and pleasure as a component of experience was on the dimension of agency (.76 vs. .45). So I deleted these two components and analyzed again. The result revealed that the two factors that explained 42% and 41% of the variance respectively corresponded with the *a priori* conceptualization of mind perception (see Table 16.6).

¹³ In Study 1, the same participants answered two separate parts about a religious person and a nonreligious person, so the sample of Study 1 in factor analysis was doubled from 84 to 168. With the 223 participants in Study 3, the total number was 391.

The 10 items formed a reliable scale (Cronbach's $\alpha=.97$), and item total correlations were high, averaging .74 with a minimum of .63. Reliability analyses performed on composite variables devised to reflect each component separately revealed highly internal consistencies (Cronbach's $\alpha=.93$ (agency: self-control, planning, morality, thought, communication), and Cronbach's $\alpha=.95$ (experience: rage, fear, pain, joy, desire)), sufficient to justify further analyses using all these factor composites.

Table 16.6. Factor analysis of mind attribution to religious and nonreligious targets in the French sample

Mind perception items	Component	
	Agency	Experience
Rage	.38	.87
Fear	.40	.86
Pain	.44	.81
Joy	.57	.76
Desire	.59	.62
Self-control	.86	.36
Planning	.78	.42
Morality	.75	.45
Thought	.75	.50
Communication	.67	.57

16.2.3 Factor analysis of religious belief

To maximize the stability of the analysis, we also used a combined sample from Studies 1, 2 and 3 ($n=387$). A principal components extraction with varimax rotation revealed three factors that explained 37%, 17% and 13% of the variance respectively (see Table 16.7). It was different from the original structure of the scale. The social extrinsic religiosity was loaded on one dimension, but the personal extrinsic religiosity was loaded on the same dimension with intrinsic religiosity. Also, three items, which

belonged to intrinsic religiosity, formed a single dimension. Since these three items suppose that people are religious, they may be not applicable to the current sample, which mostly consisted of nonreligious individuals. I excluded them and did another factor analysis with a principal components extraction with varimax rotation and 3 factors to be extracted. The results that explained 31%, 22% and 22% of the variance respectively showed the three sub-dimensions of religious belief.

Table 16.7. Factor analysis of intrinsic and extrinsic religiosity in the

Items	Component			
	Intrinsic religiosity	Social extrinsic religiosity	Personal extrinsic religiosity	others
R5	.835			
R4	.821			
R8	.799			
R12	.797	.306		
R1	.787			
R7	.750			
R6	.731			
R9	.711			
R11		.904		
R13		.898		
R2	.415	.708		
R14				.858
R10				.800
R3				.479

a. Absolute values below .30 were suppressed.

The 11 items formed a reliable scale (Cronbach's $\alpha=.92$ (all), and item total correlations were high, averaging .51 with a minimum of .27. Reliability analyses performed on composite variables devised to reflect each component separately revealed high internal consistencies

(Cronbach's $\alpha=.90$ (intrinsic religiosity), and Cronbach's $\alpha=.84$ (extrinsic religiosity)), sufficient to justify further analyses using all these factor composites (see Table 16.8).

Table 16.8. Factor analysis of intrinsic and extrinsic religiosity with 3 factors extracted in the French sample

	Component		
	Intrinsic religiosity	Social extrinsic religiosity	Personal extrinsic religiosity
R12	.819		
R5	.781		.355
R1	.771		.307
R4	.734		.404
R7	.625		.430
R11		.899	
R13		.896	
R2	.457	.708	
R6	.335		.771
R8	.436		.746
R9	.339		.744

a. Absolute values below .30 were suppressed.

16.3 Summary

According to the results of factor analyses, most measurements in both samples appear to correspond with the original structure of the measurements, although two or three items were excluded in some factor analyses. The reason that I used exploratory factor analysis rather than confirmatory factor analysis was that the main purpose of the factor analyses was not to examine whether the existing structure of scales would be replicated in the current cultural samples, but to explore what it would be in the present research and try to ensure that they have similar structures to the original ones.

In addition, similar to the original exploration of dimensions of mind perception (Gray, et al., 2007), there were also cross-loadings for some items on both agency-dimension and experience-dimension in the current factor analyses. Since in the original analysis of Gray et al. (2007), agency and experience were treated as two dimensions of mind perception, I also treated them as two dimensions in the current analyses.

17 Annex 2. Mind perception survey in Study 1, 2 and 3

17.1 Chinese version

Q1. 神灵能够自我控制。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q2. 神灵能够制定计划。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q3. 神灵能够体验快乐。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q4. 神灵能够体验欲求。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q5. 神灵能够做道德的事。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q6. 神灵能够感受痛苦。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q7. 神灵能够体验愤怒。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q8. 神灵能够交流。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q9. 神灵能够记忆。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q10. 神灵能够体验喜悦。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q11. 神灵能够体验害怕。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

Q12. 神灵能够思考。

完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
1	2	3	4	5	6	7

17.2 French version

Q1. Dieu (Il) est capable de se maîtriser.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q2. Dieu (Il) est capable de s'organiser.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q3. Dieu (Il) est capable d'avoir du plaisir.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q4. Dieu (Il) est capable de désirer.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q5 Dieu (Il) est capable d'agir moralement.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q6. Dieu (Il) est capable de ressentir de la douleur.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q7. Dieu (Il) est capable de ressentir de la colère.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q8. Dieu (Il) est capable de communiquer.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q9. Dieu (Il) est capable de se souvenir.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q10. Dieu (Il) est capable de ressentir de la joie.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q11. Dieu (Il) est capable de ressentir de la peur.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

Q12. Dieu (Il) est capable de réfléchir.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

18 Annex 3. The measurement of religiosity in Study 1, 2 and 3

18.1 Chinese version

R1. 我喜欢阅读宗教类的书籍。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R2. 我去寺庙（或者教堂，清真寺等）是因为这有助于我结交朋友。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R3. 只要我好好的，信仰什么是无关紧要的。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R4. 对我来说，花时间于个人沉思和祷告很重要。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R5. 我经常强烈地感觉到神灵是存在的。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R6. 我祈祷主要是为了获得安慰和保护。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R7. 我尽力依据我的宗教信仰来生活。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R8. 宗教给我最多的是在我身陷麻烦和悲痛时的安慰。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R9. 祈祷是为了自己的平安和幸福。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R10. 虽然我是信仰宗教的，但是我不会让它影响我的日常生活。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R11. 我去寺庙（或者教堂，清真寺等）主要是为了和朋友们在一起。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R12. 我的整个生活方式都基于我的宗教信仰。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R13. 我去寺庙（或者教堂、清真寺等）主要是因为 I 乐于在那里见到我认识的人。。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

R14. 尽管我信仰宗教，生活中还有很多其他更重要的事。

不关心	完全不同意	不同意	有点不同意	不确定	有点同意	同意	完全同意
0	1	2	3	4	5	6	7

18.2 French version

R1. J'apprécie lire des textes à propos de ma religion.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R2. Je vais à l'église (ou bien à la mosquée, ou à la synagogue, ou au temple, etc.) parce que cela m'aide à me faire des amis.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R3. Ce qui m'importe ce ne sont pas tant mes croyances religieuses, mais le fait que je me comporte bien.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R4. Il est important pour moi de passer du temps en introspection et en prière.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R5. Je ressens souvent fortement la présence de Dieu.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R6. Lorsque je prie, c'est surtout pour être soulagé et protégé.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R7. Je tente de vivre ma vie le plus possible en accord avec mes convictions religieuses.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R8. Ce que la religion m'offre le plus, c'est un réconfort dans les moments difficiles et tristes.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R9. Prier a pour but de promouvoir la paix et le bonheur.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R 10. Bien que je sois croyant, je ne laisse pas la religion influencer ma vie quotidienne.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R11. Je vais à l'église (ou bien à la mosquée, ou à la synagogue, ou au temple, etc.) surtout pour passer du temps avec des amis.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R12. Mon approche globale de la vie est basée sur ma religion.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R13. Je vais à l'église (ou bien à la mosquée, ou à la synagogue, ou au temple, etc.) principalement parce que j'y suis content de voir les gens que je connais..

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

R14. Bien que j'adhère à ma religion, beaucoup d'autres choses sont plus importantes dans la vie.

Pas du tout d'accord	Pas d'accord	Plutôt pas d'accord	Pas sûr	Plutôt d'accord	D'accord	Tout à fait d'accord
1	2	3	4	5	6	7

19 Annex 4. The scrambled sentence tasks in Study 2 and 3

19.1 Religious priming condition in Chinese

感觉	她	宽敞	神灵	能够
句子 01 :				

甜点	祭神的	是	刀叉	这份
句子 02 :				

受欢迎的	出现	是	把握	她的
句子 03 :				

再次	纸张	它	把	做一遍
句子 04 :				

送走	我	必须	她	电器
句子 05 :				

罪恶	感谢	给予	天神	把
句子 06 :				

昨天	任务	完成了	踪迹	她
句子 07 :				

神明	蔚蓝	著作	描述了	这部
句子 08 :				

预言	这个	未来	单纯	神仙
句子 09 :				

体会	需要	我	搬家	立刻
句子 10 :				

19.2 Neutral priming condition in Chinese

摔倒	担心	都在	她	一直
句子 01 :				

鞋子	产生	换掉	旧的	这些
句子 02 :				

探查	快乐的	他	一天	回忆
句子 03 :				

再次	纸张	它	做一遍	把
句子 04:				

送走	我	必须	她	电器
句子 05:				

看到了	锤子	他	火车	那会儿
句子 06:				

昨天	任务	完成了	踪迹	她
句子 07:				

天空	无形的	蔚蓝的	是	那里的
句子 08:				

对待	我	今天	车锁	购买
句子 09:				

体会	需要	我	搬家	立刻
句子 10:				

19.3 Religious priming condition in French

expérience	c'est	éliminer	spirituelle	une
Phrase 01 :				

chant	divin	est	fourchette	ce
Phrase 02 :				

appréciée	performance	est	imagination	sa
Phrase 03 :				

fois	papier	le	Une	fais
Phrase 04 :				

envoie	il	partout	Ça	expédié
Phrase 05 :				

diable	remercie	tout	Dieu	pour
Phrase 06 :				

hier	a	terminé	Traces	il
Phrase 07 :				

sacré	était	livre	Renvoyer	ce
Phrase 08 :				

révèlent	les	l'avenir	Simple	prophètes
Phrase 09 :				

prêt	plutôt	Je	Suis	chômage
Phrase 10 :				

19.4 Neutral priming condition in French

chute	était	soucieuse	elle	toujours
Phrase 01 :				

chaussures	don	range	vieilles	ces
Phrase 02 :				

reviens	bonne	passe	journée	une
Phrase 03 :				

fois	papier	le	une	fais
Phrase 04 :				

envoie	il	partout	ça	expédié
Phrase 05 :				

vit	marteler	il	un	train
Phrase 06 :				

hier	a	terminé	traces	il
Phrase 07 :				

ciel	le	continuation	bleu	est
Phrase 08:				

plaisir	elle	aujourd'hui	Tout	achète
Phrase 09 :				

prêt	plutôt	je	Suis	chômage
Phrase 10 :				

20 Annex 5. The measurement of anthropomorphic concepts of gods

20.1 Chinese version

下面有11个描述个人特征的形容词，你觉得它们适合描述神灵吗？请从1到9做出你的判断。

Q1. 关心他人的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q2. 令人欣慰的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q3. 有掌控力的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q4. 冷漠的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q5. 宽容厚道的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q6. 有判断力的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q7. 慈爱的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q8. 没有人情味的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q9. 富有同情心的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q10. 无法接近的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

Q11. 愤怒的

完全不 适合	比较不 适合	不适 合	有点不 适合	不确 定	有点适 合	适 合	比较适 合	完全适 合
1	2	3	4	5	6	7	8	9

20.2 French version

Ci-dessous, il y a 11 adjectifs qui décrivent des aspects de la personnalité. D'après vous, sont-ils pertinents pour décrire Dieu ? Rendez votre jugement en entourant l'un des chiffres de 1 à 9.

Q1. Attentionné

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q2. Réconfortant

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q3. Dominateur

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q4. Distant

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q5. Clément

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q6. Juge

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q7. Aimant

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q8. Impersonnel

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q9. Réceptif

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q10. Indisponible

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

Q11. Coléreux

Pas du tout approprié	Relative ment pas approprié	Pas approprié	Plutôt pas approprié	Pas sûr	Plutôt approprié	Approprié	Relative ment approprié	Tout à fait approprié
1	2	3	4	5	6	7	8	9

21 Annex 6. The Control target in Study 3

21.1 Chinese version

邱晓是一个 20 岁的在校大学生。他主修英语，而且对政治学也很感兴趣。课余时间，他喜欢运动。他是校游泳队的一员，也经常踢足球。尽管经常代表校游泳队参加各类比赛，但是他认为自己就是一个运动爱好者而非严格意义上的运动员。在周末，邱晓经常参加一些聚会或者是和朋友一起四处逛逛，有时也回家同家人聚聚。邱晓希望自己毕业时能继续攻读硕士或从事媒体工作。

21.2 French version

Pascal est un étudiant de 20 ans qui fait ses études à l'Université. Il s'est spécialisé en anglais et il est aussi intéressé par les études religieuses. Durant son temps libre, il aime faire du sport. Il fait partie de l'équipe de natation de son université et joue souvent au football. Bien qu'il participe aux différents concours de natation pour l'équipe universitaire, Pascal se considère lui-même comme un amateur de sport mais non un vrai athlète. Les weekends, il participe à des rencontres ou des balades avec ses amis, ou bien parfois il rend visite à sa famille. A moyen terme, Pascal souhaite poursuivre ses études et faire un Master dans son domaine ou travailler dans le domaine des médias.

22 Annex 7. The Atheist target in Study 3

22.1 Chinese version

邱晓是一个 20 岁的在校大学生。他主修英语,而且对经济学也很感兴趣。课余时间,他喜欢运动。他是校游泳队的一员,也经常踢足球。他是一个坚定的无神论者。他从不相信这个世界会存在神或者超自然的力量,坚信人是生命的主宰。他对宗教更是没有任何兴趣。邱晓希望自己毕业时能继续攻读硕士或从事媒体工作。

22.2 French version

Pascal est un étudiant de 20 ans qui fait ses études à l'Université. Il s'est spécialisé en anglais et il est aussi intéressé par l'économie. Durant son temps libre, il aime faire du sport. Il fait partie de l'équipe de natation de son université et joue souvent au football. Étant un athée depuis toujours, Il n'a jamais cru en l'existence de Dieu ou bien d'une force divine dans ce monde, et il est fermement convaincu que l'homme est le seul maître de sa vie. De plus, il n'a aucun intérêt pour les religions. Après avoir obtenu son diplôme, Pascal souhaite faire un master ou travailler dans le domaine des medias.

23 Annex 8. The Christian target in Study 3

23.1 Chinese version

邱晓是一个 20 岁的在校大学生。他主修英语，而且对宗教学也很感兴趣。课余时间，他喜欢运动。他是校游泳队的一员，也经常踢足球。作为一个虔诚的基督徒，他每天都诵读《圣经》，一有机会就和其他教友研读基督教教义。每天睡觉前，他都会向上帝祷告。每个周日，他一定都会去教堂聆听牧师的布道，并虔诚地祈祷。他还经常向周围的人传福音，希望他们也能接受耶稣基督成为一名基督徒。邱晓希望自己毕业后能攻读宗教学硕士或在基督教协会工作。

23.2 French version

Pascal est un étudiant de 20 ans qui fait ses études à l'Université. Il s'est spécialisé en anglais et il est aussi intéressé par les études religieuses. Durant son temps libre, il aime faire du sport. Il fait partie de l'équipe de natation de son université et joue souvent au football. Etant un chrétien engagé, il lit la Bible tous les jours et étudie la doctrine avec d'autres chrétiens le plus souvent possible. Il prie Dieu quotidiennement avant de dormir. Il va à l'église le dimanche et prie dévotement. Il prêche l'évangile dans son entourage en espérant qu'ils deviennent chrétiens. Après avoir obtenu son diplôme, Pascal souhaite faire un Master en études religieuses ou travailler dans une association chrétienne.

24 Annex 9. The conditions of dissonance manipulation in Study 4 in Chinese and French

24.1 Abattoir condition

请看下面的图片并阅读图片下方的句子。

Veillez regarder l'image et lire la légende ci-dessous .



这头牛明天将被运送到屠宰场。

La vache sur l'image sera vendue demain à un abattoir.

你能预想一下接下来这头牛会发生什么吗?请写一段至少 60 字的短文来预测这头牛的境遇。

Pouvez-vous imaginer ce qui arrivera à la vache? Veuillez rédiger un paragraphe d'un minimum de 30 mots pour décrire ce que vous pensez va lui arriver.

24.2 Pasture condition

请看下面的图片并阅读图片下方的句子。

Veillez regarder l'image et lire la légende ci-dessous .



这头牛明天将被运送到一个更大的牧场。

La vache sur l'image sera déplacée demain vers un autre grand
pâturage.

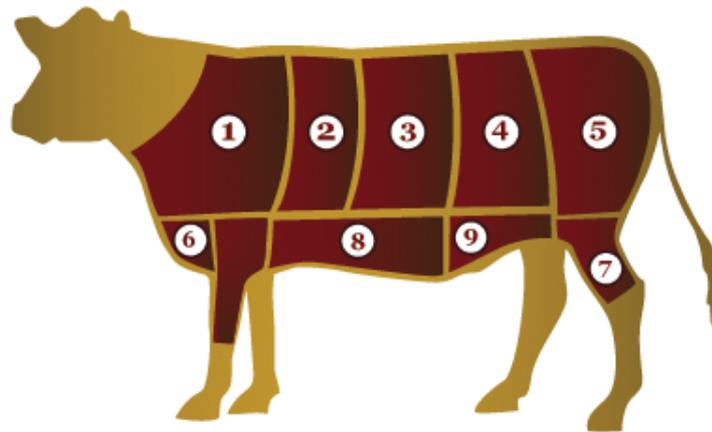
你能预想一下接下来这头牛会发生什么吗?请写一段至少 60 字的短文来预测这头牛的境遇。

Pouvez-vous imaginer ce qui arrivera à la vache? Veuillez rédiger un paragraphe d'un minimum de 30 mots pour décrire ce que vous pensez va lui arriver.

24.3 Meat condition

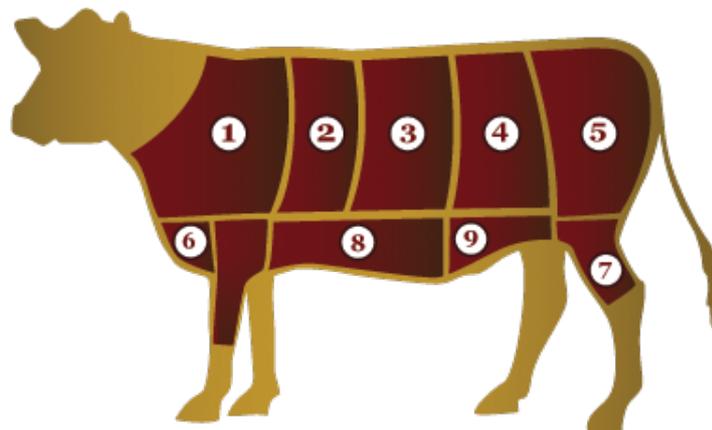
下面的图片简要呈现了牛不同部位的肉的名称。你会如何向未看到这

幅图片的人描述该图片呢?请写一段至少 60 字的 短文向他人描述该图。



1. 肩肉 2. 带骨腹肉 3. 里脊肉 4. 前背肉
5. 大腿肉 6. 前胸肉 7. 牛腱肉 8. 后胸肉 9. 牛腩肉

Cette image affiche les noms des viandes issues des différentes parties du corps de la vache. Comment décririez-vous cette image à une personne qui ne la verrait pas ? Veuillez rédiger un paragraphe d'au minimum 30 mots et utiliser les noms de toutes les différentes parties, suivant la légende.



- 1- Épaule 2- Côte 3- Longe courte 4- Surlonge 5- cuisse
6- Pointe de poitrine 7- Jarrets 8- Poitrine 9- Flanc

25 Annex 10. The conditions of dissonance manipulation in Study 5 in Chinese and French

25.1 Animal image condition

下面呈现了一道菜的菜谱。请判断你在多大程度上喜欢吃这道菜。

Une recette de plat vous est présentée ci-dessous. Veuillez juger à quel point vous aimeriez manger ces plats.

私房土豆烧牛肉

Goulache

这是一道比较容易做的菜。主要的原料牛肉取自牛的肩部,俗称“肩肉”。其他配料有 3 个土豆,2 根胡萝卜,2 个洋葱,2 瓣大蒜,1 棵百里香,1 片月桂叶,2 汤匙辣椒粉,3 汤匙花生油,少许盐和胡椒。

C'est un mets facile à cuisiner. Il marie une belle épaule de bœuf avec les ingrédients suivants : 300g d'oignons, 3 carottes, 2 pommes de terre, 2 gousses d'ail, 20 cl de crème fraîche épaisse, 3 cuillère à soupe d'huile d'arachide, 1 branche de thym, 1 feuille de laurier, 2 cuillère à soupe de paprika en poudre, 1 pincée de poivre de cayenne, 1 pincée de cumin, du sel et du poivre.

这道菜里的牛肉来自于类似下图呈现的一头牛。

La viande de ce plat provient d'une vache semblable à celle présentée sur l'image ci-dessus.



25.2 Dish image condition

下面呈现了一道菜的菜谱。请判断你在多大程度上喜欢吃这道菜。

Une recette de plat vous est présentée ci-dessous. Veuillez juger à quel point vous aimeriez manger ces plats.

私房土豆烧牛肉

Goulache

这是一道比较容易做的菜。主要的原料牛肉取自牛的肩部,俗称“肩肉”。其他配料有 3 个土豆,2 根胡萝卜,2 个洋葱,2 瓣大蒜,1 棵百里香,1 片月桂叶,2 汤匙辣椒粉,3 汤匙花生油,少许盐和胡椒。

C'est un mets facile à cuisiner. Il marie une belle épaule de bœuf avec les ingrédients suivants : 300g d'oignons, 3 carottes, 2 pommes de terre, 2 gousses d'ail, 20 cl de crème fraîche épaisse, 3 cuillère à soupe d'huile d'arachide, 1 branche de thym, 1 feuille de laurier, 2

cuillère à soupe de paprika en poudre, 1 pincée de poivre de cayenne,
1 pincée de cumin, du sel et du poivre.



25.3 Dish alone condition

下面呈现了一道菜的菜谱。请判断你在多大程度上喜欢吃这道菜。

Une recette de plat vous est présentée ci-dessous. Veuillez juger à quel point vous aimeriez manger ces plats.

私房土豆烧牛肉

Goulache

这是一道比较容易做的菜。主要的原料牛肉取自牛的肩部,俗称“肩肉”。其他配料有3个土豆,2根胡萝卜,2个洋葱,2瓣大蒜,1棵百里香,1片月桂叶,2汤匙辣椒粉,3汤匙花生油,少许盐和胡椒。

C'est un mets facile à cuisiner. Il marie une belle épaule de bœuf avec les ingrédients suivants : 300g d'oignons, 3 carottes, 2 pommes de terre, 2 gousses d'ail, 20 cl de crème fraîche épaisse, 3 cuillère à soupe d'huile d'arachide, 1 branche de thym, 1 feuille de laurier, 2 cuillère à soupe de paprika en poudre, 1 pincée de poivre de cayenne, 1 pincée de cumin, du sel et du poivre.

27 Annex 12. Mind perception survey in Study 4 and 5

27.1 Chinese version

1. 牛能够自我控制	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
2. 牛能够制定计划	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
3. 牛能够体验快乐	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
4. 牛能够体验欲求	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
5. 牛能够做道德的事	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
6. 牛能够感受痛苦	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
7. 牛能够体验愤怒	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
8. 牛能够交流	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
9. 牛能够记忆	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
10. 牛能够体验喜悦	绝对不能 0	0	0	不确定 0	0	0	绝对能 0
11. 牛能够体验害怕	绝对不能 0	0	0	不确定 0	0	0	绝对能 0

12. 牛能够思考	绝对不能	0	0	0	不确定	0	0	0	绝对能	0
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27.2 French version

1. La vache est capable de désirer	Certainement pas capable	0	0	0	Pas sûr	0	0	0	Certainement capable	0
2. La vache est capable de d'agir moralement	Certainement pas capable	0	0	0	Pas sûr	0	0	0	Certainement capable	0
3. La vache est capable de ressentir de la douleur	Certainement pas capable	0	0	0	Pas sûr	0	0	0	Certainement capable	0
4. La vache est capable de ressentir de la joie	Certainement pas capable	0	0	0	Pas sûr	0	0	0	Certainement capable	0
5. La vache est capable de ressentir de la peur	Certainement pas capable	0	0	0	Pas sûr	0	0	0	Certainement capable	0
6. La vache est capable de réfléchir	Certainement pas capable	0	0	0	Pas sûr	0	0	0	Certainement capable	0

7. La vache est capable de ressentir de la colère	Certainement pas capable 0 0 0	Pas sûr 0 0 0	Certainement capable 0
8. La vache est capable de communiquer	Certainement pas capable 0 0 0	Pas sûr 0 0 0	Certainement capable 0
9. La vache est capable de se souvenir	Certainement pas capable 0 0 0	Pas sûr 0 0 0	Certainement capable 0
10. La vache est capable de maîtriser	Certainement pas capable 0 0 0	Pas sûr 0 0 0	Certainement capable 0
11. La vache est capable de s'organiser	Certainement pas capable 0 0 0	Pas sûr 0 0 0	Certainement capable 0
12. La vache est capable de éprouver du plaisir	Certainement pas capable 0 0 0	Pas sûr 0 0 0	Certainement capable 0

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