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**Cultural Differences in the Tendency to Seek Practical versus Theoretical Information**

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## **Abstract**

Western thought stems from the ancient Greeks, who were intensely interested in pondering abstract information and generating theories to explain natural phenomena. East Asian thought stems from the ancient Chinese, who focused on concrete information directly perceived by the senses and on generating practical information relevant to their daily lives. Would contemporary Western and East Asian people differ in their tendency to seek practical versus theoretical information? In a series of studies, we found that Canadians showed greater interest in theoretical information than Chinese, who showed greater interest in practical information. To explain the cultural differences in information seeking, we found that Canadians were more likely to endorse an intrinsic motivation for learning (focused on fun) whereas Chinese were more likely to endorse a utilitarian motivation toward learning (focused on benefits). And these differences in motivation for learning mediated the effect of culture on information seeking.

Key words: culture; social cognition; information seeking; curiosity; motivation

Cultural Differences in the Tendency to Seek

Practical versus Theoretical Information

*Theory is when you know something, but it doesn’t necessarily work. Practice is when something works, but you don’t necessarily know why. – Unknown*

Throughout history, people around the world have been interested in both practical and theoretical information (Schiefsky, 2007). Practical information involves the creation, manipulation, and use of ideas and materials to develop tools, crafts, and machines, and is often based on empirical trial and error attempts. Theoretical information involves the creation, manipulation, and use of ideas and constructs to develop definitions, abstract concepts, and sets of relations between such concepts, and is often based on rumination and experimentation. The current states of many bodies of knowledge and forms of technology have developed through an interaction between these two kinds of information.

*Craftspeople versus Scholars*

A clear distinction stands between the two types of people who have generated such knowledge, craftspeople and the scholars (Needham, 1969). At the outset, craftspeople discovered new knowledge, such as agricultural techniques, and developed new technologies on an empirical basis (Toulmin & Goodfield, 1961). For example, ancient craftspeople ingeniously developed the lever, allowing them to lift large amounts of weight with relatively little force (Schiefsky, 2007). They exhibited little concern with understanding how or why levers worked.

Scholars, including mathematicians and philosophers, eventually analyzed such knowledge and inventions and developed abstract theories to explain the principles governing their operation (Schiefsky, 2007; Toulmin & Goodfield, 1961). For example, long after the lever was developed, the ancient Greek scholar Archimedes became interested in understanding how levers operate in general (Schiefsky). He outlined and proved a precise quantitative relationship between forces, weights, and distances from fulcrums which applied to levers in general.

Crafts often reached high standards before scholars could explain them (Schiefsky, 2007). Eventually however, scholars developed abstract theories to explain their operation, thence allowing the construction of more advanced versions. For example, the rise and proliferation of abstract mathematics in the Hellenistic era enabled theories to advance the evolution of tools, such as the lever, into complex machines, like the catapult (Gugliotta, 2008), which had tremendous effects on ancient civilizations.

*Ancient Chinese and Ancient Greeks*

In the 5th century B.C., two cultures were at the forefront of advancements in practical and theoretical knowledge, ancient Chinese and ancient Greeks. Historical evidence suggests that these two cultures sought practical and theoretical information to different extents. Ancient Chinese emphasized and esteemed practical information, whereas, ancient Greeks were intensely curious about the true nature of objects (Needham, 1969; Nisbett, Peng, Choi, & Norenzayan, 2001). The following presents a brief sample of this historical evidence.

*Philosophy.* Philosophical studies of Chinese were predominated by practical matters directly related to everyday life (Nakamura, 1997). The teachings of Confucianism, considered one of the greatest philosophical traditions emanating from China, were practically rather than theoretically motivated (Cheng, 1979), focusing on self-protection, the right way of governing the people, and methods of attaining success (Nakamura). In fact, Confucius’ orientation toward learning in general was pragmatic (Tweed & Lehman, 2002; Chan, 1999; Cheng; Hofstede & Bond, 1988). Learning for the sake of learning was not highly valued by Confucius and his followers (Tweed & Lehman). For example, as early as 2500 years ago, one of the main goals of learning was to excel in a civil service job.

In direct contrast, Socrates’ primary goal in learning was less pragmatic, as he focused on understanding the wonders of the universe (Needham, 1969). The ancient Greeks esteemed theory over practice and needed no justification of practical applicability in the pursuit of knowledge. Learning was an end unto itself, and was considered part of the good life (Toulmin & Goodfield, 1961). Greek philosophers sought to understand why changes in the heavens and on earth occurred, such as night and day and sickness and health, by actively seeking theoretical principles that could explain such events.

*Mathematics.* Chinese were adept at mathematics, using it for taxation and surveying land (Needham, 1969). Chinese mathematics comprised a multitude of practical numerical exercises, which were very useful in everyday life. However, Chinese mathematics contained few theorems or proofs. To generate mathematical theorems, one cannot rely on numbers alone. Symbolic scripts for writing the formulae that constitute theorems are necessary. Evidence indicates that instances of Chinese using symbolic scripts for generating mathematical theorems or proofs were rare. For example, Chinese recognized the relationship between the sides of the right-angled triangle before the Greeks, as evidenced by records displaying configurations in multiples of three, four, and five units. However, they do not appear to have generated an abstract representation of this relationship to establish a proof before the Greeks.

In direct contrast, the Greeks expressed an extreme interest in generating theoretical mathematical principles (Needham, 1969). The ancient Greeks received tomes of mathematics from the Babylonians and Egyptians. Similar to early Chinese mathematics, that of the Egyptians and Babylonians primarily consisted of practical exercises without theorems or proofs (Lloyd, 1991). For example, Babylonians had also recognized the relationship between the sides of the right-angled triangle (Toulmin & Goodfield, 1961). However, it was the Greek scholar Pythagoras in the fifth century B.C. who generated and proved the abstract geometric formula, a2 + b2 = c2 (Lloyd; Toulmin & Goodfield). Such examples constitute the first records of theorems and proofs in geometry (Lloyd). And following this start, the Greeks rapidly developed geometry toward a full deductive system in the fourth century B.C.

The ancient Greek passion for theory was not superior to the ancient Chinese tendency toward the practical. For example, Chinese accurately recorded celestial events such as sunspots and supernovae whereas Greeks remained wholly ignorant of such events, and would have found them inadmissible based on their model of the universe at the time (Needham, 1969). Similarly, Aristotle’s anatomical descriptions, based on dissections, contain surprising errors clearly colored by theoretical assumptions (Lloyd, 1991).

Furthermore, it is important to note that not all Chinese were practical and not all Greeks were theoretical. The alchemy of Taoist scholars is considered to be the foundation of modern chemistry (Needham, 1969), and Hippocrates is classified by many as a practical physician. Apart from such exceptions, however, conspicuous cultural differences remain. Chinese tended toward practical information whereas Greeks tended toward theoretical information.

Finally, the authors do not mean to imply that practical information is more useful than theoretical information. Although practical information tends to be more directly applicable because it is context specific, theoretical information can enable a deeper understanding because it transcends contexts. As outlined at the beginning, the greatest advances appear to have stemmed from an interaction between the two types of information.

*Consequences of Emphasizing Practical versus Theoretical Knowledge*

Consistent with the cultural tendencies toward practical and theoretical knowledge, ancient Chinese were more technologically advanced than ancient Greeks, thus illustrating a Chinese genius for practicality (Nakamura, 1997; Needham, 1969). The Chinese were the original inventors of: the earliest vaccination, gunpowder, steel, porcelain, the magnetic compass, civil service examinations, and many others (Clarke, 1980). In addition, Chinese mastered the difficult art of iron-casting 13 centuries before Europeans did (Needham, 1959). Indeed, until the 14th century AD, Europe was mostly receiving technology and information from China, rather than sending. Furthermore, experts agree that Chinese inventions were not the result of scientific theory and experimentation, but rather the product of intuition and empiricism (Logan, 1986; Nisbett et al. 2001).

Meanwhile, the ancient Greeks were busy analyzing the natural universe. By generating theories and debating the plausibility of such theories, they developed abstract mathematics, geometry, theoretical physics, and medicine (Toulmin & Goodfield, 1961). As a result, the ancient Greeks are credited with the invention of theory and modern science. For example, Aristotle’s Parva Naturalia appears to be one of the first writings to cite evidence, in the form of anatomical and zoological data, both to disprove alternative theories and to support his own (Lloyd, 1991).

*Contemporary Influences on Orientations toward Practical and Theoretical Information*

Such cultural differences in the tendency to seek practical versus theoretical information may persist among contemporary East Asians and Westerners, because contemporary East Asian cultures (including China, Japan, and Korea) have been greatly influenced by the ancient Chinese, and contemporary Western cultures (including Australia, Canada, New Zealand, UK, USA., and Western Europe) have been greatly influenced by the ancient Greeks (Logan, 1986; Needham, 1969; Nisbett et al., 2001). How and why might such differences be transmitted and reinforced?

*Child-rearing.* Cultural tendencies toward practical and theoretical information appear to be transmitted early on in parenting styles. For example, comparing child-rearing practices across cultures, Lin and Fu (1990) found that Chinese parents place much greater emphasis than American parents on academic achievement as a means to personal advancement, higher social status, respect, and wealth. Similarly, Chao (1996) found that Chinese-American mothers, relative to European-American mothers, placed greater emphasis on the importance of education for success (see also Tang, 2004) by often warning children that learning was hard work, and that without an education they would not enjoy a good career or life. In contrast, Chao found that a larger proportion of European-American mothers believed that academic success should not be the main goal of education, and that such an emphasis would reduce children’s self-motivation. European-American mothers emphasized the importance of helping create a stimulating environment to foster the child’s intrinsic enjoyment of exploring and understanding the world.

*Education.* The practical and theoretical orientations may then be reinforced when children enter the formal education system. In a review of Chinese learning styles, Chan (1999) proposed that a Chinese emphasis on concrete information and practicality dominates contemporary education. She further speculated that because Chinese continue to learn through concrete and practical examples in school, they excel in relatively “mechanical subjects” such as medicine and accounting. Consistent with her speculation, some have attributed the economic success of overseas Chinese to their pragmatic emphasis on everyday life and worldly affairs (Redding, 1990). Similarly, Tweed & Lehman (2002) contrasted the ancient Chinese emphasis on practical education with the ancient Greek value of learning for the sake of learning. The authors speculated that the emphasis on the practical may continue in contemporary China and that the emphasis on learning without an extrinsic goal may continue in Western cultures, as evidenced by John Dewey’s belief that education should be a goal in and of itself, without regard for practical ends.

*Motivations for learning.* Consistent with child-rearing and education practices, cultural differences in motivations for learning appear to emerge early in the schooling experience. Li and colleagues compared 4-year-old Chinese and European-American children’s conceptualizations of learning (Li, 2002b, 2004). Both groups of children expressed similar levels of positive affect toward school learning. However, Chinese children talked more than European-American children about material and social benefits to learning. Such patterns then continue throughout their years of education. In a survey of over 1500 Chinese students from grades 3 to 12 in urban schools (You, 2003), utilitarian motivations were increasingly mentioned, such as learning to benefit one’s reputation, to get into competitive schools at the next level, and for employment. Similarly, when examining university students’ conceptualizations of learning, Li (2002) found that only a third of Chinese referred to “understanding the world” compared with almost two thirds of American participants.

Different types of general motivation have been elucidated by Self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000). The two types most relevant to the present studies are intrinsic motivation and identified regulation, which were both proposed to be autonomous forms of motivation. Intrinsic motivation involves doing an activity for its own sake (e.g., learning because one finds it interesting). This is most similar to Dewey’s and Western parents’ conceptualization of learning. In contrast, identified regulation is relatively extrinsic and involves doing an activity for one’s personal goals (e.g., learning because one wants to improve one’s circumstances). This motivation is relatively more similar to Chinese parents’ and students’ utilitarian focus on education for success.

Intrinsic regulation toward learning does not necessarily produce greater motivation than

extrinsic regulation. For example, Ryan and Connell (1989) investigated achievement behaviors

among school children and found that externally regulated students indeed showed less interest,

value, and effort toward achievement and were more likely to disown responsibility for negative

outcomes, blaming others such as the teacher. In contrast, compared with external regulation,

identified regulation was associated with more interest and enjoyment of school and with more

positive coping styles, as well as with expending more effort. Iyengar and Lepper (1999) examined cultural differences in motivation based on choice in school children. Western children were more motivated to complete a school activity when they chose the parameters of the acitivity rather than an ingroup member choosing for them, whereas East Asian children were more motivated when the parameters were chosen by an ingroup member rather than by themselves. The results suggest that at a relatively young age, Western children are already used to making personal choices and are more motivated to learn when doing so, whereas East Asian children are used to choices being made externally by close others, and are motivated to learn in these circumstances. Buchtel et al. (2018) examined cultural differences in how people experience obligation. Compared with Chinese, Australian and Canadian (Western) participants judged obligation motivations more negatively than agentic motivations. Furthermore, compared with Western participants, Chinese perceived their own agentic and obligation motivations to be more congruent and more positive. Therefore, Chinese may be more likely to experience identified regulation positively than Westerners, and to perceive identified regulation related behaviors as relatively more agentic.

Thus, Western motivations for learning appear to be relatively more intrinsic and hedonistic, whereas Chinese motivations for learning appear to be relatively more extrinsic and utilitarian. Such cultural differences in motivations surrounding learning may lead to differential pursuit of practical vs theoretical information, which is the focus of the present research.

*Present Studies*

Based on the historical evidence and contemporary cultural practices, we predicted that differences in the tendency to seek practical versus theoretical information would be found among contemporary East Asians and Westerners. Specifically, we compared Canadians and Chinese, and hypothesized that Canadians would be more interested than Chinese in theoretical information, whereas Chinese would be more interested than Canadians in practical information. Furthermore, we hypothesized that different motivations for learning would mediate the relationship between culture and seeking practical vs theoretical information. Specifically, Chinese would have a relatively higher level of utilitarian motivation toward learning (for benefits) than Canadians, and would thus seek practical information more than would Canadians. On the other hand, Canadians would have a higher intrinsic motivation (for interest) than Chinese, and would thus seek theoretical information more than would Chinese. We conducted a series of four studies to test these hypotheses.

## **Study 1**

Participants were presented with an opportunity to ask three questions that interested them most, and these questions were later coded as practical or theoretical. We predicted that Canadians would ask more theoretical questions than would Chinese, and Chinese would ask more practical questions than would Canadians.

For all studies in this paper, tests were two-tailed because they are more conservative and this is the first research conducted in this area. All measures, manipulations and exclusions studies are reported. Sensitivity analyses were conducted using GPower (Faul, Erdfelder, Buchner, & Lang, 2009). There was no further data collection after the data analysis.

**Method**

# *Participants*

Seventy-seven European-Canadian Psychology students (60 women) from Queen’s University in Canada and 79 Chinese Psychology students (46 women) from Beijing University in China participated. For all studies in this paper, Canadian participants received course credit or $5 for their participation, and Chinese participants received course credit or a small gift. Based on calculations made using G\*Power, this final sample provided power of 0.80 to detect a small to moderate effect size (*d* = .45), an effect size typical for social psychological research (Richard, Bond, & Stokes-Zoota, 2003).

*Materials*

Participants were asked to imagine that they could receive the correct answers to three questions about anything they wanted to know, and there were no limits regarding the questions they could ask. Participants then wrote down their questions.

*Translation of Materials.* For all studies in this paper, questionnaires were in participants’ native language. Materials were generated in English, by Canadian and Chinese researchers, and translated by two Chinese researchers who have lived in North America for at least 4 years. A back-translation procedure was used to check consistency of meaning, and lastly translations were checked by Chinese researchers at Beijing University. All measures, manipulations, and exclusions in the study are disclosed, as well as the method of determining the sample size.

**Results**

*Coding of Questions*

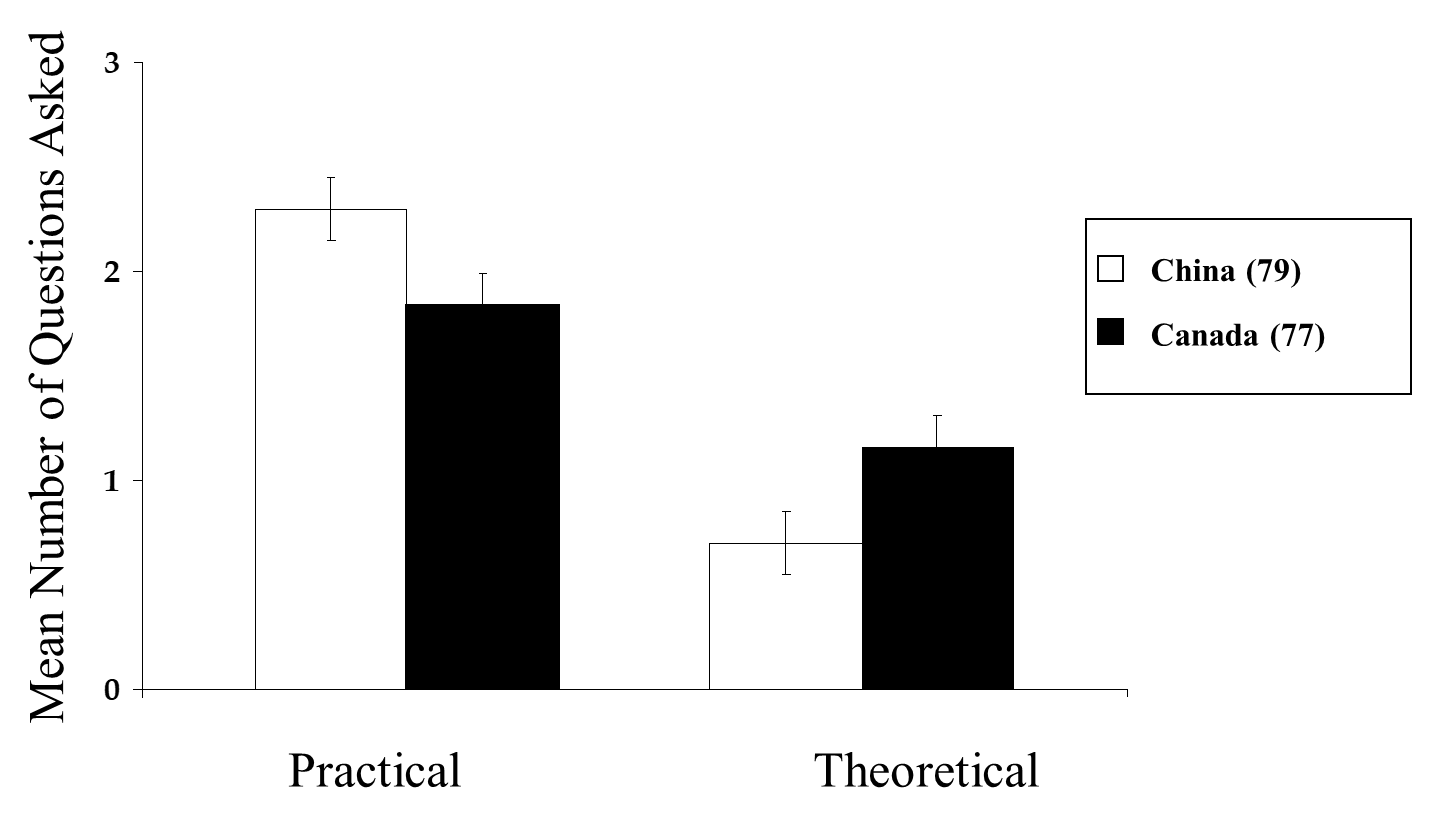
Chinese responses were translated into English (using the same procedure outlined above) before coders received them. One European Canadian and one Chinese Canadian, who were unaware of both the hypothesis and the cultural origin of the responses, then independently coded the questions as theoretical, practical, or other, based on the following definitions: Practical questions were defined as, “seeking information that is concerned with everyday matters, is directly applicable, or involves experience or actual use, rather than theory or speculation.” Theoretical questions were defined as, “seeking information that is concerned with ideas, theories, or concepts that may or may not exist; involves belief or speculation rather than experience or actual use.” Examples of practical questions included, “Should I marry my girlfriend?” and “What should I do to do better in school?” Examples of theoretical questions included, “How was the universe created?” and “Is the theory of evolution true?” Questions that did not fit either definition were coded as other. Inter-rater reliability was high, as indicated by Cohen’s ĸ = .85, *p* < .001. After the initial coding, coders discussed the questions they disagreed on until they reached a consensus.

*Cultural Differences in Information Seeking*

Six responses were coded as other, three from a Chinese participant and three from a Canadian participant. It was obvious from the questions that these two participants had not understood the task, and thus we excluded them from the analyses. Furthermore, because participants generated three questions in total, the number of practical questions and the number of theoretical questions are complementary. Therefore, we arbitrarily focused on the theoretical questions in our analysis.

No significant gender or age effects were found for any of the studies reported in this paper, *p*s > .05, and thus gender and age will not be mentioned further. Overall, participants asked a greater number of practical questions (*M* = 2.08, *SD* = 1.01) than theoretical questions (*M* = .92, *SD* = .1.01), *F*(1, 155) = 51.24, *p* < .001, η2 = .25. As hypothesized, Canadians asked a greater number of theoretical questions (*M* = 1.16, *SD* = 1.01) than did Chinese (*M* = .70, *SD* = .95), or alternatively, Chinese asked a greater number of practical questions than did Canadians, *t*(154) = 2.92, *p* =.004, *d* = .47.

*Figure 1.* Cultural differences in number of practical versus theoretical questions asked (+ SE) (Study 1).



Both cultures expressed a greater interest in practical over theoretical information. Furthermore, in support of our hypothesis, Canadians expressed more interest in theoretical information than did Chinese, and Chinese expressed more interest in practical information than did Canadians.

## **Study 2**

Study 2 sought to replicate Study 1 using a different method. In Study 2, participants indicated their interest in reading two essays on the same academic subject. One essay focused on practical applications and the other focused on theories. We used two academic subjects, anthropology and physics, in order to increase the generalizability of our results.

**Methods**

# *Participants*

One hundred forty-one European Canadian Psychology students (104 women) from Queen’s University and 143 Chinese Psychology students (99 women) from Beijing University participated. Based on calculations made using G\*Power, this final sample provided power of 0.80 to detect a small to moderate effect size (*d* = .34).

*Materials and Procedure*

Participants were randomly assigned to either the anthropology or physics version. In the anthropology version, participants read a brief description of two essays, one explaining three major applications (practical) and the other explaining three major theories (theoretical) from the anthropology literature. In the physics version, ‘anthropology’ was replaced with ‘physics’. Participants were told they would choose and read the essay that interested them most, practical or theoretical, and then answer some questions. Participants’ interest was measured in two ways. First, participants indicated their interest in both essays on a 9-point scale (1 = *not at all interested*, 9 = *very interested*). Second, they chose an essay to read. Participants were then debriefed and informed that there was no actual essay. In summary, the study had a 2 (culture: Canadians vs. Chinese) by 2 (subject: anthropology vs physics) by 2 (essay focus: practical vs. theoretical) design. Subject was a between-participant factor and essay focus was a within-participant factor.

**Results**

*Cultural Differences in Essay Interest*

As expected, the results did not differ between the anthropology and the physics versions, and therefore, we collapsed the data across them. A 2 (culture: Canadians vs Chinese) by 2 (essay focus: practical vs. theoretical) Mixed-Model ANOVA was run with culture as the between-subjects variable and essay focus as the within-subjects variable. Overall, participants were more interested in the practical essay (*M* = 5.97, *SD* = 1.95) than the theoretical essay (*M* = 4.42, *SD* = 2.14), 95% CI [1.89, 1.21], *F*(1, 278) = 138.31, *p* < .001, ηp2 = .33. This main effect was qualified by a significant interaction effect between culture and essay focus, *F*(1, 278) = 73.08, *p* < .001, ηp2 = .21. As hypothesized, Canadians expressed more interest in the theoretical topic than did Chinese, *F*(1, 279) = 10.95, *p* < .001, ηp2 = .04, and Chinese expressed more interest in the practical topic than did Canadians, *F*(1, 281) = 43.26, *p* < .001, ηp2 = .13.

*Figure 2.* Cultural differences in interest (+ *SE*) in practical versus theoretical essays (Study 2).



*Cultural Differences in Essay Choice*

More Canadians (42.9%) than Chinese (13.5%) chose the theoretical essay to read, or alternatively, more Chinese (86.5%) than Canadians (57.1%) chose the practical essay to read, χ2(1, *N* = 281) = 30.01, *p* < .001, *W* = .33.

Thus, using a free-choice paradigm in Study 1 and a forced-choice paradigm in Study 2, we found that participants from both cultures preferred practical over theoretical information. Furthermore, Canadians expressed more interest in theoretical information than did Chinese, and Chinese expressed more interest in practical information than did Canadians.

**Study 3**

One may argue that people with less wealth tend to be more preoccupied with their basic needs and thus would be more interested in practical information, compared with more affluent people who have the luxury to think about less essential issues. Therefore, the findings could be due to SES differences across our samples, rather than culture. Furthermore, it is very possible that students studying different majors would be interested in different types of information. Therefore, the findings could be due to differences in university major across our samples, rather than culture. Although all of the students in Studies 1 and 2 were registered in the same Introductory Psychology course, they may not have all been Psychology majors. We thus designed Study 3 to rule out the possibility that the cultural differences in information seeking could be explained by different mean levels of SES or different university majors across our cultural samples.

In Study 3, we used a hypothetical scenario designed to minimize economic concerns. Participants imagined they would inherit enough money to never have to work again, if they completed one of two academic majors, one theoretical or one practical. They subsequently rated their interest in each academic major and chose the one they would be more interested in completing to inherit the money. They then indicated their socio-economic status (SES), their families’ household income, and their own current university major. We included two different academic subjects, chemistry and sociology, in order to further increase the generalizability of our results.

**Methods**

# *Participants*

Seventy-seven European-Canadian students (55 women) from Queen’s University and 69 Chinese students (56 women) from Central China Normal University in Wuhan participated. Based on calculations made using G\*Power, this final sample provided power of 0.80 to detect a small to moderate effect size (*d* = .46).

*Materials and Procedure*

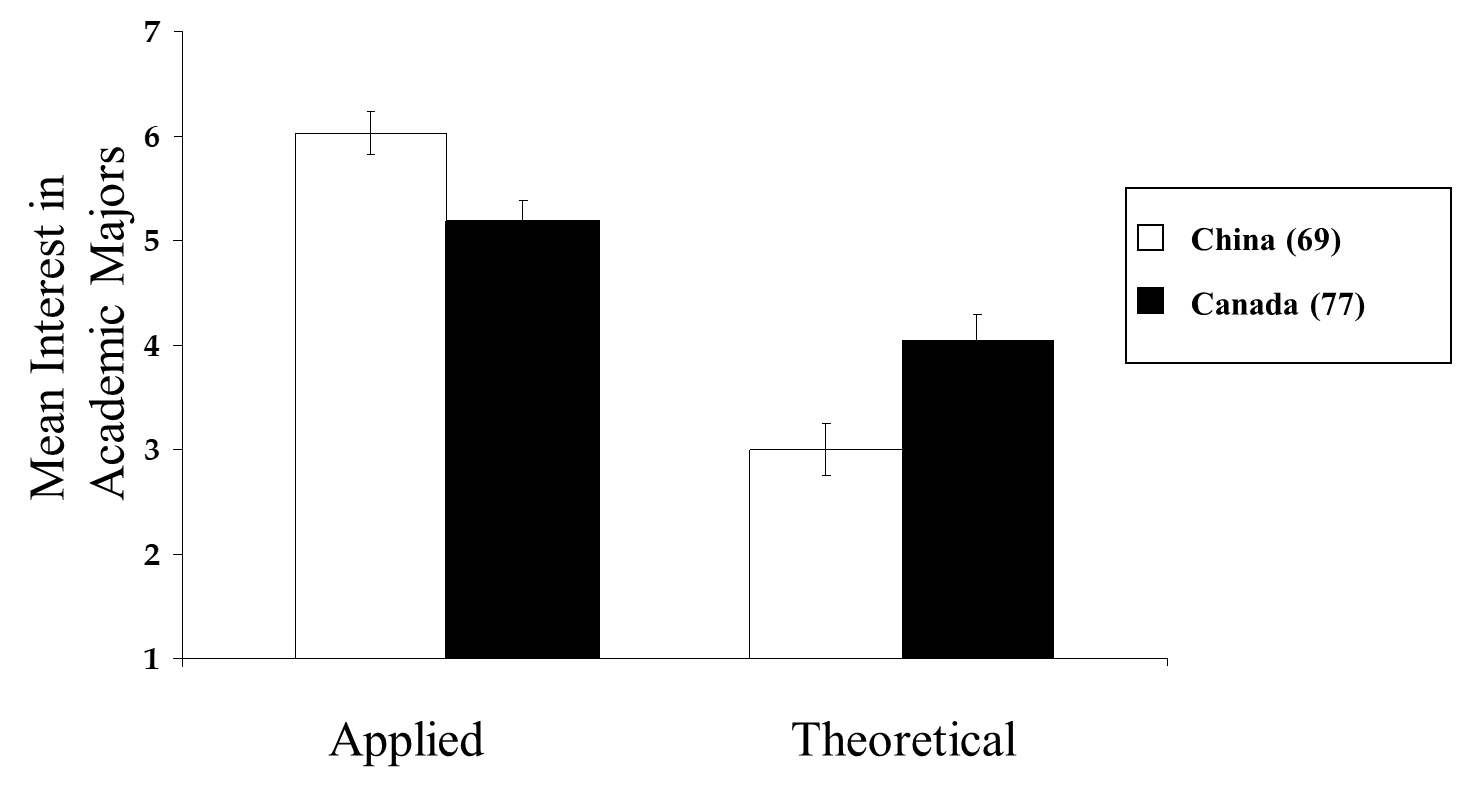
Participants were randomly assigned to a chemistry or a sociology version.In the chemistry version, participants were asked to imagine they had a wealthy eccentric relative who had passed away and left them an inheritance. The inheritance was sufficient that they would never need to work again. However, receiving the inheritance was contingent upon them completing one of two academic majors, applied chemistry (practical) or theoretical chemistry (theoretical). In the sociology version, ‘chemistry’ was replaced with ‘sociology’. Participants indicated their interest in each major on a 9-point scale (1 = *not at all interested*, 9 = *very interested*). Next, they chose the major they were more interested in. Lastly, participants indicated their families’ SES on a 5-point scale (1 = *lower class*, 2 = *lower middle class*, 3 = *middle class*, 4 = *upper-middle class*, and 5 = *upper class*), as well as their families’ gross household income. Finally, participants indicated their university major.

**Results**

*Cultural Differences in Academic Major Interest (Practical vs Theoretical).*

The results did not differ for the chemistry or sociology versions, and therefore, we collapsed the data across them. A 2 (culture: Canadians vs Chinese) by 2 (major: practical vs. theoretical) Mixed-Model ANOVA was run with culture as the between-subjects variable and major as the within-subjects variable. Participants’ interest ratings were not significantly correlated with their families’ SES or income for Canadians or Chinese, rs < .13, *p*s > .30. Overall, participants were more interested in the practical major (*M* = 5.58, *SD* = 1.82) than the theoretical major (*M* = 3.55, *SD* = 2.16), 95% CI [1.57, 2.49], *F*(1, 144) = 59.53, *p* < .001, ηp2 = .29. This main effect was qualified by a significant interaction between culture and academic major, *F*(1, 144) = 12.41, *p* < .001, ηp2 = .08. As hypothesized, Canadians expressed more interest in the theoretical major (*M* = 4.05, *SD* = 2.28) than did Chinese (*M* = 3.00, *SD* = 1.88), 95% CI [.36, 1.73], *F*(1, 144) = 9.15, *p* = .003, ηp2 = .06, and Chinese (*M* = 6.03, *SD* = 1.35) expressed more interest in the practical major than did Canadians (*M* = 5.18, *SD* = 2.08), 95% CI [-1.43, -.27], *F*(1, 144) = 8.30, *p* = .005, ηp2 = .05.

*Figure 3.* Cultural differences in interest (+ SE) in applied versus theoretical university majors (Study 3).



*Cultural Differences in Academic Major Choice (Practical vs Theoretical)*

Participants’ choices were not significantly related to their families’ SES or income for Canadians or Chinese, rs < .12, *p*s > .34. As hypothesized, more Canadians (40.3%) than Chinese (10.1%) chose the theoretical major, or alternatively, more Chinese (89.9%) than Canadians (59.7%) chose the practical major, χ2(1, *N* = 146) = 17.14, *p* < .001, *W* = .34.

Participants also indicated their own major. All participants were enrolled in an Introductory Psychology course. Most participants, both Canadian (*n* = 50) and Chinese (*n* = 47) were Psychology majors. Others, both Canadian (*n* = 20) and Chinese (*n* = 20) were life science majors. The rest were education majors (*n*Canadian = 7, *n*Chinese = 2). Canadian and Chinese participants did not significantly differ in the proportion enrolled in different academic majors, χ2(2, *N* = 146) = 2.44, *p* = .30. Additionally, participants’ choices overall did not significantly differ according to academic major, χ2(2, *N* = 146) = 1.90, *p* = .39.

In summary, when economic factors and university major were accounted for, the pattern of results remained. Overall, participants expressed more interest in practical majors than theoretical majors. Furthermore, Canadians expressed more interest in the theoretical majors than did Chinese, and Chinese expressed more interest in the practical majors than did Canadians.

**Study 4**

Studies 1, 2, and 3 indicated that Canadians seek theoretical information more than Chinese do and that Chinese seek practical information more than Canadians do. In Study 4, we examined a proximal mediating mechanism for this cultural difference, namely differences in learning motivation. We hypothesized that Canadians’ stronger intrinsic motivation and Chinese’ stronger utilitarian motivation for learning contributed to the cultural differences in information seeking.

**Methods**

# *Participants*

Ninety-one European-Canadian students (71 women) from Queen’s University and 128 Chinese students (93 women) from University of Macau participated. Based on calculations made using G\*Power, this final sample provided power of 0.80 to detect a small to moderate effect size (d = .38).

*Materials and Procedure*

Participants completed the same Physics essay materials from Study 2, in which they indicated their interest in both a theoretical and practical essay on a 9-point scale (1 = *not at all interested*, 9 = *very interested*). However, to rule out the possibility that some participants might assume the practical essay would contain both theories and their applications (thus allowing them to learn both types of information in a single essay), we made it clear that the practical essay described only applications of knowledge from Physics and did not describe any theories. Furthermore, the theoretical essay described only theories from Physics and did not describe any applications1.

*Mediating Variables.* Next, we measured the mediating variables, namely participants’ general motivations for learning (intrinsic and utilitarian). Participants indicated how accurately each of two statements described them (1 = *not at all*, 6 = *very much*). For intrinsic motivation, participants responded to the item “I am generally interested in learning things that are fun to learn, even if they do not directly benefit me.” For utilitarian motivation (similar to identified regulation in Deci and Ryan’s research), participants responded to the item “I am generally interested in learning things that can benefit me directly, even if they are not fun to learn.” Higher scores indicated higher intrinsic and utilitarian motivations respectively.

**Results**

*Information Seeking.* A 2 (culture: Canadians vs Chinese) by 2 (essay focus: practical vs. theoretical) Mixed-Model ANOVA was run with culture as the between-subjects variable and essay focus as the within-subjects variable. Replicating the results from Studies 1, 2, and 3,participants were more interested in the practical essay (*M* = 6.15, *SD* = 1.56) than the theoretical essay (*M* = 4.98, *SD* = 1.84), 95% CI [.75, 1.29], *F*(1, 217) = 54.75, *p* < .001, ηp2 = .20. This main effect was qualified by a significant interaction effect between culture and essay focus, *F*(1, 217) = 37.52, *p* < .001, ηp2 = .15. As hypothesized, Canadians expressed more interest in the theoretical topic (*M* = 5.73, *SD* = 2.07) than did Chinese (*M* = 4.45, *SD* = 1.45), *F*(1, 217) = 28.57, *p* < .001, ηp2 = .12, and Chinese expressed more interest in the practical topic (*M* = 6.32, *SD* = 1.39) than did Canadians (*M* = 5.90, *SD* = 1.74), *F*(1, 217) = 3.92, *p* = .05, ηp2 = .02.

*General learning motivations as mediators.* We performed two mediation analyses, one with theoretical knowledge seeking as the DV and one with practical knowledge seeking as the DV.

For theoretical knowledge seeking, culture (Canadians = 0 and Chinese = 1) was entered as an IV and interest in the theoretical essay was entered as a DV. Intrinsic and utilitarian motivations for learning in general were entered in parallel as mediators2. As predicted, Canadians had a stronger intrinsic learning for learning motivation than Chinese, *b* = -.37, *t* = -2.68, *p* = .008, and Chinese had a stronger utilitarian motivation for learning than Canadians, *b* = .36, *t* = 3.05, *p* = .003. Furthermore, intrinsic motivation predicted interest in the theoretical essay, *b* = .35, *t* = 2.96, *p* = .003, whereas utilitarian motivation did not, *b* = .11, *t* = .80, *p* = .43. More importantly, a bias-corrected bootstrap confidence interval for the indirect effect based on 5,000 bootstrap samples did not include 0 for intrinsic motivation, CI[-.32 to -.03], but did for utilitarian motivation, CI[-.07 to .22]. Therefore, intrinsic motivation mediated the relationship between culture and theoretical information seeking, whereas utilitarian motivation did not.

*Figure 4.* Motivation for learning mediates relationship between culture and interest in theoretical essay. The CIs for the indirect effects were bootstrapped on 5000 samples (Study 4).

*b* = -.37, *p* = .008

*b* = .35, *p* = .003

*b* = .36, p = .003

*b* = .11, *p* = .43

Direct Effect: *b* = -1.18, *p* < .001

Indirect Effect IM: CI[-.32 to -.03]

Indirect Effect UM: CI[-.07 to .22]

Intrinsic Motivation toward Learning in General

Utilitarian Motivation toward Learning in General

Interest in Theoretical Information

Culture: Canadians = 0

Chinese = 1

For practical knowledge seeking, culture (Canadians = 0 and Chinese = 1) was entered as an IV and interest in the practical essay was entered as a DV. Intrinsic and utilitarian motivations for learning in general were entered in parallel as mediators. As described above, Canadians had a stronger intrinsic learning motivation for learning than Chinese, *b* = -.37, *t* = -2.68, *p* = .008, and Chinese had a stronger utilitarian motivation for learning than Canadians, *b* = .36, *t* = 3.05, *p* = .003. Furthermore, utilitarian motivation predicted interest in the practical essay, *b* = .33, *t* = 2.64, *p* = .009, whereas intrinsic motivation did not, *b* = .10, *t* = .95, *p* = .34. See Table 1 for mean values and Table 2 for correlations.

Table 1

Mean and standard deviation values (in brackets) of Canadian and Chinese information seeking and learning motivation (Study 4).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Essay Interest | |  | | Motivation | |  | |
| Culture | | Theoretical | | Practical | | Intrinsic | | Utilitarian | |
| Canadian | | 5.73  (2.07) | | 5.90  (1.74) | | 4.93 (1.02) | | 4.79  (.89) | |
| Chinese | 4.45  (1.45) | | 6.32  (1.39) | | 4.56  (.99) | | 5.15  (.84) | |

More importantly, a bias-corrected bootstrap confidence interval for the indirect effect based on 5,000 bootstrap samples did not include 0 for utilitarian motivation (.02 to .30), but did for intrinsic motivation (-.16 to .05). Therefore, utilitarian motivation mediated the relationship between culture and practical information seeking, whereas intrinsic motivation did not.

*Figure 5.* Motivation for learning mediates relationship between culture and interest in practical essay. The CIs for the indirect effects were bootstrapped on 5000 samples (Study 4).

*b* = .10, *p* = .34

*b* = .33, *p* = .009

Culture: Canadians = 0

Chinese = 1

Intrinsic Motivation toward Learning in General

Utilitarian Motivation toward Learning in General

Interest in Practical Information

*b* = -.37, *p* = .008

Direct Effect: *b* = .35, *p* = .11

Indirect Effect IM: CI[-.16 to .05]

Indirect Effect UM: CI[.02 to .30]

*b* = .36, p = .003

**Discussion**

Overall, participants sought more practical than theoretical information. More importantly, across four studies, Canadians sought theoretical information to a greater extent than did Chinese, and Chinese sought practical information to a greater extent than did Canadians. The pattern of results remained when personal wealth and university major were controlled for; thus the differential interest in theoretical and practical information by Canadians and Chinese was not due to individual differences in economic needs or university majors across the samples.

Furthermore, motivation for learning mediated the relationship between culture and information seeking. Canadians had a stronger intrinsic motivation toward learning, whereas Chinese had a stronger utilitarian motivation toward learning. Intrinsic motivation was associated with theoretical information seeking, whereas utilitarian motivation was associated with practical information seeking. Therefore, the cultural differences in information seeking can be partly explained by the cultural differences in motivations for learning.

*Limitations*

Study 3 found no significant differences in seeking theoretical vs practical information across either SES or university majors. The findings were useful in ruling out the possibility that the cultural differences in information seeking were simply due to individual differences in SES and university majors across the cultural samples. However, we cannot rule out a potential relationship between either SES or university major and information seeking. Our samples had a very restricted range of SES (90.55% were middle or upper-middle class) and most students were Psychology majors. Further research would be needed to determine whether SES and academic major would indeed predict information seeking.

Studies 2, 3, and 4 relied on self-report methods. Such methods can be problematic when self-presentation concerns cause participants to answer less truthfully. However, participants were unaware of the hypotheses and that the study was being simultaneously conducted in another culture. Furthermore, we are not aware of any concerns with creating the impression of differential interest in the two types of information. Additionally, manipulation check questions indicated that participants did indeed believe they were going to actually read the essay, thus making their essay choice a behavioral measure. Lastly, any such concerns could not account for the results in Study 1, where participants freely asked the questions that interested them most.

*Contributions and Implications*

*Cultural Psychology.* Some authors have discussed differences in the tendency toward practical and theoretical information in a historical context (Nakamura, 1997; Needham, 1969; Nisbett et al, 2001). However, our studies provide the first evidence we are aware of that such tendencies exist in contemporary cultures. Furthermore, the present research provides the first evidence that different motivations for learning may lead people to differentially seek practical vs theoretical information.

In addition, the present findings may be tangentially consistent with Nisbett et al.’s review (2001), in which the authors summarized research evidence that East Asians (including Chinese, Japanese, and Koreans) tend to reason holistically whereas Westerners tend to reason analytically. Our studies make a significant contribution to the cultural psychology literature by complementing and augmenting these findings. Specifically, Westerners tend to focus on objects, ignore the context, and categorize the objects, thence allowing them to use rules and logic to understand them. Such analytical thinking may have contributed to or reinforced Westerners’ pursuit of theoretical knowledge, as theoretical knowledge transcends particulars and lies at a more abstract level, independent of context.

In contrast, East Asians tend to perceive objects as inextricably bound to their contexts, and focus on relationships between the objects and their context (see also Ji, Zhang, & Nisbett, 2004). Therefore, such context-bound objects are relatively concrete rather than abstract. Such holistic thinking may have contributed to or reinforced Chinese pursuit of practical knowledge, as practical knowledge is relatively context dependent, focusing on concrete particulars in specific contexts.

*Individual Differences.* Aside from the cultural differences in seeking theoretical and practical information, the substantial variability in responses across individuals within each culture suggests a potential novel individual difference construct, practical-orientation versus theoretical-orientation. We are not aware of any individual difference or personality measure that resembles such a construct. Our findings may thus lead to interesting predictions for future research on individual difference variables.

*Information Seeking.* Researchers have defined information seeking as the process by which individuals acquire information to understand, predict, and control their environments, and to increase task mastery (Myers & Knox, 2001). Although most content areas in the information seeking literature have stressed the importance of considering culture, little research has been conducted in this vein. Furthermore, the few studies that have been reported included only one culture, thus rendering them unsuitable for considering the influence of culture on information seeking behaviors (Baldwin & Hunt, 2002). Therefore, the present studies contribute to the information seeking literature by providing the first evidence of cultural differences in seeking different types of information.

*Education*. Education researchers have created a number of tools to assess individual differences in learning styles. The present findings lead us to speculate whether we would find cultural differences in such learning styles. For example, Kolb’s Learning Style Inventory (1984) classifies learners along two dimensions that describe how people ideally approach learning. One ranges from experiencing to conceptualizing and the other from acting to reflecting. Based on our pattern of results, it would be interesting to examine if North Americans would be more likely to lie further along the conceptualizing and reflecting ends of the dimensions, and if East Asians would be more likely to lie further along the experiencing and acting ends of the dimensions.

Our findings could be fruitfully applied in education or training contexts. Universities are becoming increasingly multicultural. Educators may implicitly assume that students from different cultures are inherently interested in the same kinds of information. Our results suggest that such educators may thus improve their teaching by emphasizing either the intrinsic value or the utility of certain types of information when developing learning materials and activities for a culturally diverse set of students.

Kurt Lewin stated that there is nothing so practical as a good theory. Our results suggest that this view may be endorsed more by North Americans than by Chinese.

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Footnotes

1Out of curiosity, we also assessed how participants felt about learning practical and theoretical knowledge. Specifically, participants answered, “How fun is learning theoretical knowledge for you?”, “How fun is learning practical knowledge for you?”, “How useful do you think theoretical knowledge is for you?”, and “How useful do you think practical knowledge is for you?” All 4 questions were answered on 6-point response scales (1 = not at all, 6 = very much).

We found that Canadians felt learning theoretical knowledge was more fun (M = 4.26, SD = 1.28) than did Chinese (M = 3.07, SD = 1.14), F(1, 217) = 52.68, p < .001. And Chinese felt that learning practical knowledge was more useful (M = 5.19, SD = .73) than did Canadians (M = 4.43, SD = 1.02), F(1, 217) = 42.33, p < .001. There was no significant difference in how fun learning practical knowledge was for Canadians (M = 4.71, SD = .98) and Chinese (M = 4.62, SD = .97), F(1, 217) = .53, p = .47. Lastly, Canadians felt that learning theoretical knowledge was more useful (M = 4.52, SD = 1.09) than did Chinese (M = 3.88, SD = .94), F(1, 217) = 21.26, p < .001.

2We chose this model because theoretically it makes more sense to assume that general learning motivation predicts essay interest, rather than essay interest predicting general learning motivation.