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11

Memory Specificity Across Cultures

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Recent evidence suggests that culture can operate as a lens, bringing distinct aspects of one's environment into focus based on cultural priorities, values and experiences. Individuals from Western cultures tend to focus on that which is object-based, categorically related or self-relevant whereas people from Eastern cultures tend to focus more on contextual details, similarities and group-relevant information. For example, when asked to describe animated vignettes of underwater scenes, American descriptions focus on the prominent fish in the scene, Japanese participants, on the other hand, incorporate many more contextual details, such as the colour of the seaweed and water and the relationship of the fish to the other elements in the scene.¹ These different ways of perceiving the world suggest that culture shapes the ways in which individuals attend to and remember aspects of complex environments.

This chapter reviews the ways that culture can contribute to memory formation, in terms of its effects on both behaviour and neural function. The specificity of memory – that is, the details, organization and features of memories – offers a useful framework for considering how culture can shape memory systems. Given the limits on information processing capacity, the specific details encoded and retrieved in memory come at the expense of other details. Comparing the types of details and processes that individuals from one culture prioritize over others offers insight into the type of information given priority in cognition, perhaps reflecting broader cultural values. Furthermore, this chapter also examines some of the ways that bilingualism and linguistic ability affects memory.

To date, the field of Psychology has often treated human experiences and ways of interacting with the world as largely universal processes. Results from research studies conducted primarily in Western

locations, such as the United States, the United Kingdom, Canada and Europe, were thought to extend to people from far-flung corners of the world, with few attempts to test this assumption. With the rise of the field of Cultural Psychology and the increasing globalization of research endeavours, the potential for cross-cultural differences in human behaviour and thought is receiving increasing consideration. In terms of human cognition and information processing, extensive experience in a culture may affect the type of knowledge acquired. It may direct attention to certain aspects of the environment, determine the types of details to be encoded into memory and convey strategies for processing and organizing information in memory and thought.

Memory seems to be a promising mode through which to measure the effects of culture on cognition. Specific details are encoded and retrieved in memory at the expense of other details. This trade-off helps to reveal what a culture most values and prioritizes through memory. Such an imprint of culture is possible because memory is a constructive process, meaning that memories do not exist as static, fixed representations of events that occurred in one's past. Rather, memory is dynamic and it can potentially be shaped and reshaped by the current motivations and goals of the individual. Culture may serve as a particularly potent aspect of the environment, contributing to one's life experiences and impacting upon one's perspective on the world. This lens through which one interacts with the surrounding world can be shaped by culture in terms of what information people attend to in the world around them, and how they reconcile this information with existing knowledge and schemas. Because information processing is limited, certain information from complex environments is necessarily prioritized at the expense of other information. In terms of memory, culture guides information processing by encoding, retrieving and even distorting specific details. One's culture may affect the types of memories one recalls and, furthermore, it may reveal the values and priorities of a culture for information processing.

Certain cultural differences in values and ways of perceiving the world have been identified, particularly in terms of the concept of self and the extent to which other people are considered to be interconnected with the self. Previous studies have shown that East Asians have a more collectivist culture; they devote more attention to the larger family structure or social group.² Their relationships and connections with other people who share close social bonds impact greatly upon their concept of the self. Those growing up in Western cultures, in contrast, are more individualistic; the self is considered to be a more

independent entity that exists apart from other individuals in the social network.³

Differences in social processes across cultures may impact on cognition and information processing. Evidence suggests that Easterners, including Chinese, Japanese and Koreans, tend to be more holistic in thought whereas Westerners, including Americans, Canadians and Western Europeans, tend to be more analytical. These aspects of culture can be traced back to the ancient Greeks for Westerners and to the more collective Chinese traditions for East Asians. Nisbett and colleagues propose that it was the societal organization of ancient Greek and Chinese civilizations that systematically shaped cognition in distinct ways that contribute to cognitive differences across Westerners and East Asians today.⁴ Because of the complex nature of relations and roles across individuals, the Chinese were highly socially interdependent. This social organization meant that the Chinese 'would always have been looking outward, trying to coordinate their actions with those of others while minimizing social friction'.⁵ The Greek social system was more independent, with fewer and less involved social relationships. As Nisbett and Masuda note: 'The independence of their lives might have given them the luxury of attending to objects in light of their personal goals in relation to them.'⁶ On the basis of the divergent nature of these social relationships, Greeks adopted an analytic approach, emphasizing rules, objects and their features and categories. By contrast, Chinese adopted a more holistic approach, emphasizing relations between objects and the importance of the context in which objects are embedded. These differences in ancient cultures may have affected the organization of Eastern and Western cultures today.

Data indicate that East Asian participants generally do, in fact, pay more attention to the field and context. East Asians invoke the social context more than Americans when explaining the behaviour of an individual, mentioning the role of other fish when making attributions about the behaviour of a single fish.⁷ For example, when shown an animation with one fish followed by a group of fish, East Asians were more likely to say that the group of fish was chasing the one fish, having the group cause the movement, whereas Americans were more likely to state that the single fish was leading the group, a more individual-oriented understanding of the scene. Even for contexts that are not so strongly social (for example, animations of fish swimming underwater), Japanese participants noticed and described the background more than American participants.⁸ Furthermore, Americans are better able to ignore conflicting context when focusing on objects.⁹ These studies serve as evidence

that members of East Asian cultures pay more attention to context than American participants, consistent with the idea that East Asians prioritize holistic processing.

This holistic information processing bias also carries over into the way that relationships are perceived between objects. When given several names of objects, Chinese participants tend to group by functional relationship instead of by category.¹⁰ For example, when presented with the items 'squirrel', 'seagull' and 'nut', Americans tend to pair the squirrel and the seagull together because they are both animals (that is, they share a categorical relationship). East Asians, however, tend to pair the squirrel and the nut together, giving explanations that emphasize the functional relationship of the items – the squirrel eats the nut.

Evidence for cultural differences in memory

As described above, memory is a constructive process, meaning that it is malleable and can be shaped and distorted in fundamental ways. Culture may determine what information is attended to, encoded into memory and, ultimately, what is accessible for retrieval. Culture may also guide which details are stored accurately, as well as how the details are distorted. A memory specificity approach encompasses these potential influences of culture, determining 'the extent to which, and sense in which, an individual's memory is based on retention of specific features of a past experience, or reflects the operation of specialized, highly specific memory processes'.¹¹ Memory specificity states that one's specific past experiences affect an individual's current memory by determining which details are prioritized and included in memory. Such past experiences include the culture in which one was raised. In this section, we will review some of the evidence for cultural differences in memory, and we will conclude by discussing promising future directions.

One way in which cultural groups differ is in their memory for objects and contexts. After viewing animated vignettes of fish swimming underwater, Japanese tend to recall information about background detail, such as the seaweed and the colour of the water, more than Americans. Americans, on the other hand, describe the primary objects from memory (for example, one large fish and two small fish) without retrieving the contextual detail.¹² In a follow-up study, Masuda and Nisbett explicitly manipulated the presence of contextual information to test whether this differentially affected memory across the two cultures. After encoding a series of pictures of objects presented against meaningful backgrounds (for example, a wolf emerging from a forest),

Japanese and Americans were tested on their memory of the object (the wolf) when the original background had been removed and replaced by a blank white background. This removal of contextual information impaired the memory performance of the Japanese participants, but not Americans, suggesting that the memories of Japanese individuals are more context-dependent; in memory, objects are more strongly associated with their backgrounds.

Neural differences across cultures also indicate differences in memory for objects and contexts. Much of this work has used functional magnetic resonance imaging (fMRI), which is a non-invasive approach that allows one to make inferences about which parts of the brain are most active based on differences in the magnetic properties of oxygenated and deoxygenated blood. During an fMRI experiment, a series of images of the brain are acquired while a participant lies still in a magnetic resonance imaging scanner. The person performs tasks while looking at text or images projected on a screen and can press buttons to give their response to the information. For example, participants could view pictures of objects alone on a blank background, or pictures of objects placed in a meaningful context. Experimenters can later estimate which regions of the brain are more engaged during the encoding of objects with backgrounds compared to those without backgrounds, and then they can compare the magnitude of this difference across participants drawn from two cultural groups. In this example, those brain regions which show the largest response are more active due to the presence of a background. In this way, fMRI experiments can help to localize different brain functions to different areas of the brain.

Functional MRI experiments comparing Easterners and Westerners during the processing of object and context information reveal neural findings that are consistent with the behavioural results put forward by Masuda and Nisbett in 2001. Americans engage more object processing regions than Easterners when people encode complex scenes that contain both a focal object and meaningful contextual information.¹³ The most robust cultural differences emerged in a part of the brain that responds to semantic information about objects. In background-processing regions, however, cultural differences were negligible. This is somewhat surprising, given that behavioural studies have suggested that East Asians may be attuned to context and Americans more attuned to objects. However, the finding of a cultural difference in the neural activity underlying object, but not background, processing converges with the results of another fMRI study. An additional paradigm employed to study cultural differences in object and background processing

capitalized on the property of neural regions to adapt with repeated use during a task. This means that a neural region that initially responds very robustly to a particular picture would adapt, or respond less, during subsequent presentations of the same picture. To separate adaptation responses to backgrounds from those to objects, the researchers created quartets of pictures where either the same background was repeated across all four presentations but the object was new, or vice versa (for example, the same object was repeated across all four presentations but the background was new). Quartets consisting of the same complete picture or entirely novel pictures were also included in the experiment for control purposes. First, without considering the role of culture, the researchers found that the lateral occipital complex (LOC), a region in the visual cortex that is particularly sensitive to object information, responds to repeated objects by showing greater adaptation when the object is repeated across quartets compared to when the object is not repeated.¹⁴ A different region, the parahippocampal gyrus, which is in the medial temporal lobes and is particularly sensitive to scene information, adapts when backgrounds are repeated across quartets. When the role of culture is considered, cultural differences emerge in object-processing regions, in line with the previous finding from the scene encoding task.¹⁵ Older Singaporeans show less adaptation, or change, in neural responses in object regions than those exhibited by older Americans. However, cultural differences are only pronounced for older adults; young adults exhibit similar neural responses across the American and Singaporean groups. The presence of cultural differences for older, but not younger, adults may indicate that the effects of culture on cognition are more pronounced when people are immersed in a culture for a longer period of time or are undergoing neurobiological changes due to ageing. However, it is difficult to rule out cohort-specific effects (cultural forces that affect only a constrained generation of individuals, with effects limited to a particular time and place). Due to the limited amount of research addressing cultural differences across age groups, particularly for older adults, additional studies are needed to better understand the ways that culture affects cognition across the lifespan.

As these studies illustrate, fMRI holds great promise for the study of cultural differences because identifying the *location* of brain regions that exhibit cultural differences can indicate the types of processes that differ, constraining theories about the nature of cultural differences. These studies show that cultures seem to differ in object processing. This may not have been apparent through the use of solely behavioural measures,

which seemed to emphasize cultural differences in the processing of background context. Despite the differences in paradigms, participant groups and even in the specific neural regions that emerge in these two fMRI studies, the results suggest that the effects of culture operate in relatively lower-level perceptual and semantic processes. One might have expected cultural differences to emerge in the prefrontal cortex, a region subserving more higher-order processes. This pattern of cultural differences would have indicated that the lens of culture operates through much higher-level executive functions, which play a role in guiding attention, switching between competing demands and other effortful, resource-intensive processes. Such a pattern emerged in a study of cultural differences in attentional processes¹⁶ but, to date, it has not emerged in studies of long-term memory. Thus, culture does not appear to shape the encoding of pictures containing objects and backgrounds by functioning as an attention-demanding lens; rather, culture shapes the engagement of more automatic perceptual and semantic processes.

Easterners and Westerners also differ in the extent to which they organize information by categories. Categorization can affect memory through its potential use as a strategy to organize incoming information and through its connection to rich stores of existing knowledge, which can provide multiple cues to aid in retrieving information from memory. One of the classic findings in Psychology is that people tend to spontaneously organize information by categories during recall.¹⁷ For example, when presented with a list of randomly intermixed words, some drawn from the category of 'fruits', others drawn from the category of 'clothing' and others drawn from the category of 'animals', people tend to spontaneously cluster the words by category when recalling them from memory. They systematically retrieve the words one category at a time. To test the influence of culture on the tendency to use a category-based strategy in memory, Chinese and American participants learned lists of 20 words in which the items were drawn from four different categories. The words had been normed across both cultures to ensure that the items shared a similarly strong relationship to the underlying category across both Chinese and American cultures.¹⁸ Participants then listed all of the words that they could remember; we assessed the amount of information recalled, as well as the order that information was outputted, according to categories. Results indicate that while younger adults did not differ across cultures in their use of categories, older Americans order the words they retrieved by category to a greater extent than older Chinese.¹⁹ According to our interpretation, these results indicate that a greater absorption of culture over time may magnify cultural differences,

particularly when strategies are well practised and require little effort to implement, as could be the case for categorization.²⁰ Although age groups could cause differences in the strategies and information processing biases that culture conveys *within* a cultural group (the meaning of 'culture' could differ across younger and older adults), we maintain that our results likely reflect effects of ageing per se, as cross-cultural differences in the use of categories have been identified in a number of previous studies testing largely younger adults drawn from diverse cultural backgrounds. Thus, it seems unlikely that our older adult cohort would be unique in the way that they use categories, compared to younger adults.

Consistent with the differences in social systems across cultures, memory for self and others is another area in which cultural groups differ. As noted, Westerners tend to have a more individualistic orientation whereas East Asians adopt a more collectivist one.²¹ These collectivist and individualistic orientations can affect the content of memory; this was demonstrated through the study of autobiographical memory, memory for one's personal experiences and history. In their autobiographical memories, Asians emphasize social interactions and contain more information about people compared to Caucasians, while Caucasian Americans tend to recall more individual, as opposed to more social, information than Asians.²² Asians' memories, in turn, contain more information emphasizing social interactions and people than do Caucasians' memories. Culture affects both initial encoding processes in addition to the way in which memory is reconstructed upon retrieval. Cultural differences emerge early in child development, with autobiographical memory and self concept dynamically contributing to the construction of each other.²³ For example, cultural differences in childrearing practices influence the onset of autobiographical memory, with children raised collectively in reformed kibbutzim reporting later first memories than children raised in more individualistic settings.²⁴ This finding suggests that autobiographical memory is formed hand-in-hand with the development of the view of oneself as an independent entity.

The study of self and other also allows for another application of the concept of memory specificity, in terms of unique domains of memory. One example from the social domain is the distinction between self and other: thinking about oneself is vastly different than thinking about other people. The self is associated with memory enhancements, as well as patterns of errors, that do not characterize memories for other people.²⁵ Neuroimaging methods provide strong support for this

distinction by revealing that self-referencing engages a unique region of the brain, the medial prefrontal cortex, which is not engaged when referencing other people.²⁶ Moreover, engaging the medial prefrontal region during encoding is associated with subsequent recognition of self-referential information, suggesting that the region is implicated not only in thinking about the self, but plays a critical role in memory.²⁷

Some evidence for cultural differences in the specificity of memory exists for the encoding of information in relation to the self or other. Americans treat the self as a unique and distinct domain; East Asians extend that domain to include close others. For the domain of the self, the construct is highly specific for Americans, but broader for East Asians. Recent work with fMRI provides converging neuroscience evidence that the relationship between self and others differs across cultures.²⁸ While both Westerners and Chinese differentiate self from distant, unfamiliar others, only Westerners differentiate self from close others (for example, mother). These differences also emerge in memory measures, with self-referenced adjectives better remembered than mother-referenced adjectives for Americans, whereas memory for both conditions is equivalent for Chinese.

Future directions

The brief review of cultural differences in memory establishes that culture can shape the type of information encoded into memory (for example, object versus context; self versus other), as well as the use of memory strategies such as categorization. Thus far, though, the research is limited, adopting an approach that emphasizes 'how much' information is accurately recalled rather than assessing the details and qualities of those memories. For example, types of details, whether perceptual or emotional, could be differentially emphasized across cultural groups. Memories can also be distorted by being overly general, consisting of gist-based, or general thematic information, without specific perceptual details. Remembering that one saw a bicycle, but not remembering the specific perceptual details such as its colour or the shape of the handlebars, is an example of an overly general memory. Preliminary data from our laboratory provide some support for the idea that specific details of memories can be encoded differentially across cultures. After encoding a series of perceptually detailed pictures, participants had to discriminate the previously studied picture from a very similar exemplar (for example, a picture of a strawberry ice cream cone versus a vanilla ice cream cone) on a memory test. This approach allows one to assess

how much perceptual detail is encoded into memory. Correct responses require more detailed visual information to be available (for example, the appearance of the ice cream) in order to distinguish the item from a conceptually similar one. On this task, American participants exhibited better memory for the perceptual details than East Asian participants.²⁹ This pattern is consistent with prior work by Nisbett et al. in 2001, suggesting that Americans are more feature-based and analytic in their information processing. This type of an approach, which emphasizes details, could also allow a better exploration of memory distortions and errors, in order to test whether information is systematically translated in memory so that it is more consistent with the values and goals of the individual. Such an approach may allow for more sensitivity in detecting cultural differences than one based on the amount of accurate information retrieved.

Another promising approach to the study of culture is a further exploration of cultural differences in autobiographical memories. Autobiographical memories include rich sensory, spatial, contextual, personal and emotional information, and engage a number of corresponding neural regions.³⁰ Given the complex and diverse types of information which is contained in autobiographical memories and the quantity of information that may be retrieved for these personal memories, there is abundant opportunity for some details and types of information to be prioritized over others. Moreover, contextual information, including social contexts, can comprise a substantial portion of autobiographical memories, and these are known areas of cultural differences.

The interplay between language and memory also is an important topic for further consideration. To some extent, language shapes thought, with some research suggesting that testing language can mitigate the extent to which cultural differences emerge in cognition.³¹ In terms of preferences for category or relational strategies to organize information, East Asians who are tested in their native language sometimes exhibit larger cultural differences than East Asians tested in English, compared to Americans.³² However, the overall pattern of cultural differences in preferred strategies extends across testing language for this task. These findings would likely extend to the domain of memory, with the language of presentation (for verbal information) or even the language in which the test is administered influencing the types of details remembered and the strategies used to encode information into memory. Furthermore, language is often an integral part of a culture, and studying how language affects memory will further our understanding of how culture affects memory.

It is also possible that the effects of language exert broader influences on memory for bilingual populations. Linguistic ability has been shown to affect many different cognitive functions. For example, it affects several functions which may have an influence on how one is acculturated, and may affect how one creates memories. Bilingualism affects cognition by increasing the amount of associated information that is available to an individual such that switching languages allows bilinguals to perform better on brainstorming tasks,³³ to exhibit heightened awareness of phonological structures and sounds,³⁴ and to be better at learning novel words.³⁵ However, bilingualism can also hamper cognition by increasing the amount of competing information that must be inhibited. For example, in the study of lexical retrieval, the ability to recall the meaning of a single word (to generate a synonym or antonym), and lexical access, the speed and ability to access one's vocabulary, appear to be poorer for bilinguals than monolinguals.³⁶ The second language is thought to interfere and cause slower reaction times in tasks requiring only one language.³⁷ When a word in one language is activated, the second (or third) language is activated as well, and the individual has to inhibit the other languages to focus on a single language. Interestingly, bilinguals' greater experience with interfering and competing information may lead to advantages in some domains when tasks require executive control, including task switching, working memory and inhibition control. Due to their experience in focusing on only one language and inhibiting other languages when speaking, bilinguals can be better able to resolve various types of response conflicts.³⁸

In terms of the advantages of bilingualism in memory, research thus far is largely confined to the topic of working memory, as opposed to long-term memory which has been the focus of our review. Working memory is comprised of the information that one is holding in mind and currently thinking about at any given moment. This includes the active manipulation and monitoring of information.³⁹ Inhibition control is used in working memory to focus only on certain items and to keep other items out of working memory. Executive control in working memory directs one's attention to certain items while directing one's attention away from other items. Bilinguals are believed to have higher levels of working memory due to their experience inhibiting one language any time another language is used.⁴⁰ However, this finding is not conclusive, as other studies have found similar working memory abilities between bilinguals and monolinguals.⁴¹ Inhibition should also contribute to long-term memory, with a role in memory retrieval through focused selective attention. When one is retrieving a memory,

one first activates a category of memories then inhibits the items other than the specific desired memory. Therefore, the retrieval of one piece of information causes inhibition of similar pieces of information that do not need to be recalled at that time.⁴² Stronger inhibition control therefore can enable a greater retrieval of the correct memories at the cost of inhibiting similar memories in the future, which would suggest that bilinguals should have an advantage for long-term memory tasks requiring greater inhibition of related information. We are currently conducting research to address the potential advantages of bilingualism for long-term memory when there is competing information. The study of linguistic ability and memory builds upon previous research on culture and memory to further our understanding of how the different aspects of culture, be it language or cultural values, affects how one codes and processes memories.

Summary

Although the study of cross-cultural differences in memory is in its infancy, initial results suggest ways in which culture affects not only the content of what is stored in memory, but also differences in memory strategies that impact the organization of and access to information. Future work can extend into richer domains of memory, using more nuanced measures to assess the qualities – both accurate and inaccurate – that have been incorporated into representations in memory. Culture has the potential to be studied in a variety of ways focusing not only on Eastern and Western differences, which has been the emphasis of research so far. Rather, cultural differences can also emerge within a nation based on subregions, linguistic differences and subpopulations. Importantly, culture is a mutable construct; even priming different aspects of one's culture or identity, such as collectivism or individualism, can lead individuals to behave in a culturally proscribed manner to a greater or lesser degree.⁴³ Thus, the study of cultural differences in memory holds great promise as a window into the ways that people view the world and organize the information they encounter around them, based on their cultural experiences.

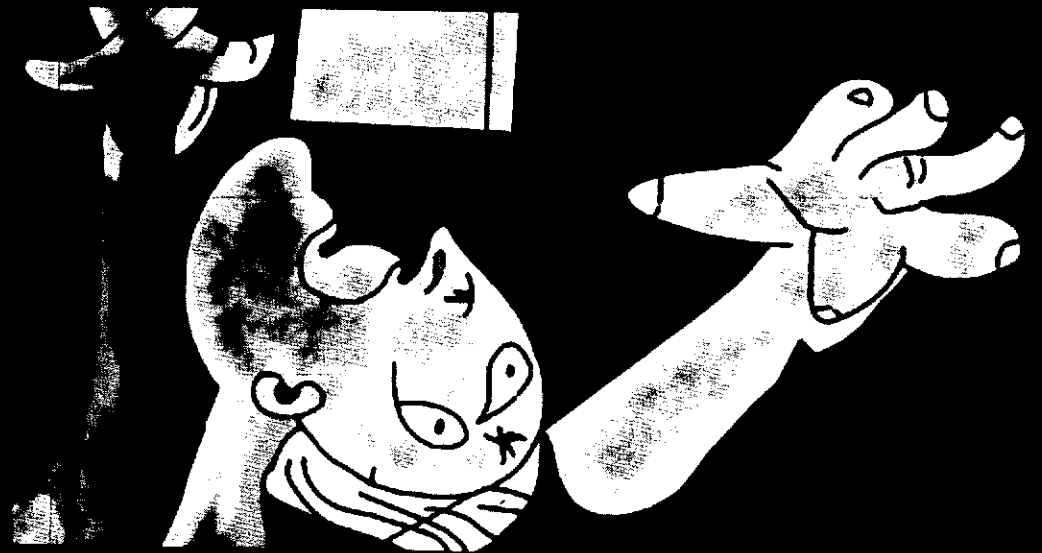
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