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Cultural Attraction Theory  
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## **Abstract**

Cultural Attraction Theory (CAT), also referred to as cultural epidemiology, is an evolutionary theory of culture. It provides conceptual tools and a theoretical framework for explaining why and how ideas, practices, artifacts and other cultural items spread and persist in a community and its habitat. It states that cultural phenomena result from psychological or ecological factors of attraction.

## **Main Text**

CAT conceives cultural phenomena as relatively stable distributions of similar items either in the minds of people or in their habitat. Items in people's minds are mental productions: they can be memories of a tale, religious beliefs, patterns of inference, or motor skills (such as those used in archery and driving). Items in the habitat are public productions and can be public expressions of mental contents, such as spoken or written utterances, action patterns (e.g., handshakes), or artifacts (e.g., cooked foods or tools). A cultural attraction theorist will aim to explain why and how some mental and public productions spread and stabilize in time, in a community and its habitat. The processes through which such items get distributed always include cognitive processes. For instance, a tale gets distributed through events that can include listening to its public expression, understanding, memorizing, recalling, and eventually retelling the tale, with -sequences of such processes occurring again and again across different individuals. As a consequence, the study of cultural phenomena should give an important place to the findings of cognitive psychology. To make that point, the cognitive anthropologist, Dan Sperber, first drew the analogy with medical epidemiology, in which studies about the social spread of diseases are crucially informed by the study of individual pathology. Likewise, Sperber argued, studying the spread of mental and public productions in a community should draw on the findings of psychology. He initially coined the phrase 'epidemiology of representations', though more recent work in the field refers increasingly to 'cultural epidemiology' and CAT.

CAT's main theoretical claim is that the propagation of cultural phenomena results from some processes that are reiterated again and again, and that transmit similar contents or action patterns. Most episodes of transmission will include transformations of the transmitted items. Nonetheless, cultural stability can take place when the transformations, rather than being random, converge towards, or gravitate around, the same contents or patterns. The causal factors that determine what types of transformations are more likely to occur pertain to the processes- that construct the items and to properties of those processes. The

processes and the associated causal factors can be cognitive or not, and they can be psychological (occurring in the head) or ecological (occurring in the body and the environment). The specific loci of the space of possible items towards which actual items gravitate are called *cultural attractors*. They are statistical types useful for describing the distribution of cultural items of the same cultural phenomenon. Importantly, -they have no causal power to attract other items. The causal factors are these aspects of the processes that bias transformation towards cultural attractors—they are called *factors of attraction*. Cultural Attraction Theorists aim to describe the cultural attractors that form cultural phenomena and identify the factors of attraction that influence the social transmission and production of cultural items, in ways that result in the observed cultural phenomena.

CAT differs from other evolutionary approaches to culture mainly because of its focus on the constructive processes involved in social transmission. In particular, CAT has questioned the validity of the assumption that -cultural transmission is sufficiently faithful for culture to stabilize and for cultural items to be selected. In place of a selectionist process for the evolution of culture, - CAT asserts that constructive convergence underlies cultural evolution.

Sperber drew the broad lines of theory in his 1984 Malinowski Memorial Lecture “Anthropology and psychology: towards an epidemiology of representations” -(published in 1985) and published in 1996 a collection of articles on the topic: *Explaining Culture: A naturalistic approach*. Pascal Boyer’s analysis of the role of “intuitive ontologies” as cognitive factors acting in the processes that produce religious beliefs is a seminal application of CAT -(Boyer, 2001). The most recent book analyzing traditions with CAT is Morin’s *How Traditions Live and Die* (2016).

The specific contributions of cultural attraction theory to understanding culture include:

1. a theoretical analysis of the chain of events that produce cultural phenomena
2. investigations of the evolved psychological traits at the basis of some cultural phenomena
3. a discussion of the way to model cultural evolution

## **Cultural Causal Chains**

Cultural attraction theory is based on a naturalistic ontology: Cultural phenomena are characterized as distributions of similar items in a community and its habitat, and across time. A tale, for instance, is made of its multiple versions, memorized and told. A ritual is made of its actual performances and the specific ideas that people have about how to perform it. Ideas, know-how, behaviors, artifacts, and other cultural items are natural entities that can be further analyzed with the help of other sciences: physics, biology and, most importantly, psychology. Cultural attraction theory holds that all cultural phenomena, as complex as they might appear, can be analyzed as specific distributions of natural items linked to one another by causal processes.

Why and how are items distributed the way they are? The answer lies in the properties of the cultural causal chains: the set of causally related events that produce the cultural items. These events can be cognitive, which means that they can be described and explained not only in terms of their neurological properties but, often more relevantly in terms of psychological processes characterized by the information they process. Remembering, for instance, consists in brain activities that can be described as producing

mental representations on the basis of stored input. Cognitive events need not take place only within the head of a single person. Information transfer from one individual to another by means of verbal communication is a cognitive event that involves two brains, sound waves, and maybe the use of communication technologies. More generally, the production and consumption of public representations—utterances, written symbols and other human productions that are endowed with meanings—are cognitive events that span several brains and the environment. Other aspects of the events involved in the production of cultural phenomena are ecological: they are best described in terms of physics, chemistry, biology and other natural sciences. For instance, the production of arrowheads in the neolithic involves both cognitive events related to the intentions of the makers and ecological events related to the presence of a specific type of stone (chert) in the environment and its physical properties: hardness and brittleness (Charbonneau, 2015).

The events involved in the spreading of cultural items in a community and its habitat form cultural causal chains, where some mental events cause a behavior, which modifies the environment and thus causes new mental events among the people present. With verbal communication, for instance, the speaker wants to say something (a mental state) which causes her to produce an utterance (a modification of the environment), which in turn causes the audience to interpret what is said (a new mental state). Other cultural causal chains include rituals and other public performances as well as the construction of tools, which can be used by others who understand their function. Changes in the environment can be at the origin of social cognitive causal chains even when the changes are not intended: for instance, following a path in the wood contributes to maintaining the path. The track in turn partially determines the intuitive assessment of future hikers choosing where to walk. The production of tools is an interesting -and complex case: a tool contains affordances that partially determine its usage (an event similar to using a track), but human users might attempt to understand the function of the tool by means of recovering the intention of the maker (an event similar to interpreting an utterance).

The mental and social processes involved – perception, inference, memory, imitation, communication – are not uniquely or even mainly geared to cultural transmission. They are involved in everyday interactions and generally do not leave recognizable traces on a cultural and historical scale. Yet, some of these social and cognitive chains are causally linked and form long and extended chains-, or -cultural causal chains (Sperber, 2001). Such chains can include repeated transmissions (frequent use of a concept or emulation of an action), they can be redundant (allowing learning from different sources) and they can proliferate (branching out into parallel subchains). These properties of social cognitive causal chains stabilize the cultural items they produce (Morin, 2016). Cultural attraction theorists aim at specifying the properties of the long chains that spread cultural items and that therefore account for cultural stability.

What aspects of cultural chains lead to the particular patterns of cultural distribution and stability that we observe? One hypothesis is that cultural chains are mainly constituted of processes that copy cultural items again and again. Some items are copied more often than others; cultural causal chains primarily implement a selectionist process (this idea has been defended by numerous social scientists, including Tarde, Campbell, Boyd and Richerson). Cultural Attraction Theorists have criticized selectionist models on the basis that they do not allow specifying the constructive processes of these chain. They have argued that these constructive processes are factors of attraction that bias production towards specific forms and contents even in the absence of faithful copying, and even when no attempt at actual copying was even

made. Most cultural phenomena appear not (or not mainly) because of a disposition and a capacity to copy faithfully, but because of multiple factors of attraction that result in convergent productions.

Environmental factors clearly have the effect of attracting production towards some forms. For instance, clothing traditions will vary depending on the climate of the habitat because people will be willing to produce and wear clothes adapted to the weather. Some environmental factors do not vary across cultures, yet they have an effect on cultural items. For instance, sailing form cultural traditions that are partially determined by the presence of wind on earth. Environmental factors of attraction also include human anatomy: an instrument maker, for instance, will be careful to build instruments that can actually be used by clients. Availability of material and food resources are also obvious factors of attraction in the production of cultural items. Psychological factors will also partly determine the form and content of cultural items. Their role has however generated more controversy. Indeed, one account of culture postulates that human psychology enables faithful recording of cultural traditions. According to this view, human psychology is necessary for culture to occur but is largely irrelevant for understanding the form and content of cultural items (famously criticized by Pinker, and Tooby and Cosmides). With a cultural evolutionary framework, one can also assume that cultural transmission is a copying process that is sufficiently faithful for culture to evolve. This assumption is made by several evolutionary theories of culture, most notably Memetics and, with different psychological assumptions, by dual inheritance theory. In this view, psychology is relevant to the extent that mental mechanisms for the faithful copying and selection of cultural items can explain culture. Cultural Attraction Theorists have criticized the assumption that there are mechanisms of faithful transmission and the selectionist models based on that assumption (Claidière & Sperber, 2007; Morin, 2016; Sperber & Claidière, 2006).

By contrast to selectionist accounts of cultural evolution, cultural attractor theorists attempt to identify the mental processes that *construct* the beliefs that are widely shared and that motivate the actions that form shared practices. Cognitive mechanisms, whether evolved or learned, will partially determine what processes are implemented, what mental representations are constructed and how one behaves. As wind does for sailing, human psychology provides enabling conditions *and* constraints for the production of shared beliefs and practices. By way of illustrating this point, imagine that Christine cooks a Boeuf Bourgignon that is generally too salty. Still, she teaches the recipe to Pierre. Because Pierre shares with his community a taste for less salty food, he is likely to cook a Boeuf Bourgignon that is closer to the ideal type Boeuf Bourgignon. In this case, shared tastes regarding salt constitute a psychological factor of attraction towards a mildly salted Boeuf Bourgignon. The mildly salted Boeuf Bourgignon is a cultural attractor. Similarly, a tale can be told in many diverse versions, yet, in spite of this, the hearer of one atypical variant will tend to produce a variant that is closer to the ideal type of the tale. Factors of attraction can be found among the numerous constructive mechanisms involved in interpreting and producing the tale. These constructive mechanisms can be shared by the community in which the tale is told, either because of shared knowledge and cognitive skills, or because they are evolved cognitive abilities that are shared by the human species. For instance, Little Red Riding Hood is a tale that exploits human evolved abilities to infer and evaluate the intentions of others—here, a child visiting her grandmother who has benevolent intentions and a wolf who has malevolent intentions. It also relies on local knowledge about how dangerous and frightening wolves are or about appropriate products to bring to grandmothers (e.g., butter in Perrault's version and wine in Grim's version).

Analyzing the psychological factors of attraction requires zooming on the psychological processes of cultural transmission: chains of events that result in the reproduction of cultural items. In cultural transmission, external inputs to the mind trigger mental processes that depend on multiple factors: evolved cognitive capacities, learned skills and acquired beliefs and also interpretative processes that strongly depend on the context. In view of individual differences and the variability of contexts, this implies that transformation will be the rule rather than the exception. Tellings of Little Red Riding Hood and productions of Boeuf Bourguignon are never identical in all respects to their previous instances. But systematic transformations towards cultural attractors can result in the formation of a cultural phenomenon. Thus, unfaithful copies of cultural items can contribute to the diffusion and stability of cultural phenomenon: they need not be selected out or lead to cultural change.

### **Some factors of attraction**

Since there is no single mechanism for cultural transmission, cognitive capacities that act as factors of attraction need to be studied on a case by case basis. This presents an empirical challenge. Cultural attraction research has identified some processes and principles of human cognition in cultural transmission.

### **Communication triggers a presumption of relevance or efficiency**

Pragmatics, the study of language as used in communication, has shown that verbal communication is not a process of faithful coding and decoding: interpreting what someone says involves an inferential process that takes context into account in order to recover the speaker's meaning. The same applies to non-verbal communicative behavior, in which the audience interpret the communicator's behavior so as to recover the information that communicator intends to convey. In this way, people interpret behaviors intended to demonstrate something—a weaving technique, for instance, or possibly rituals and images.

Transformation is highly probable with communication because the interpretation of what is communicated involve contextual factors. The interpretation of utterances and communicative gestures is, according to Sperber and Wilson (1996), a process geared by the presumption that the communicator will convey relevant information. This presumption can act as a factor of attraction. For instance, it will gear the interpretation of a demonstrated skill toward the most efficient behavior to be learned. Thus, a bad weaver can transmit good weaving techniques to a skilled learner because the learner transforms the demonstrated behavior towards greater efficiency. In a similar way, a bad story teller can transmit a good tale, because the hearer will attempt to recover its interesting and relevant aspects. The hearer, when retelling the tale, is likely to be able to produce an interesting version for her audience.

The presumption of relevance and efficiency is held even in cases where the relevance of utterances and the efficacy of action remains opaque. This can cause a willingness to preserve texts and rituals, especially when the source of information is deemed to be trustworthy. Thus, many religious statements will be assumed to have deep meaning even when the meaning is far from apparent (the dogma of the holy trinity in Christianity being a paradigmatic example of an opaque statement). Likewise, some religious rituals, rain dances for instance, will be assumed to have desirable effects even if their efficacy is not directly perceived or understood. What is more, the quest for relevance might generate multiple interpretations that contribute to the maintenance of the opaque statement and practices in the community. In spite of the changing contexts, the opaque practices and statements are thought to remain justified and worth repeating or imitating (Sperber, 1975, 1982, 2010).

Furthermore, willingness to preserve and distribute beliefs and practices, whether opaque or not, can lead to implementing specific processes and institutions whose function is preservation: repetition of actions, writing, schooling institutions, etc. Attraction theorists have recently depicted such preservative processes as special cases of attraction (Claidière et al. 2014). If communication is involved in the preservative processes, then zooming on the interpretation should reveal re-constructive processes with factors of attraction. For instance, interpretations of the scriptures have evolved across historical contexts, which partially determine what is relevant to historically situated interpreters. These varying interpretations have in turn played a role in the preservation of the scriptures.

### **Evolved capacities can form cognitive inheritance tracks**

Evolved and universal cognitive capacities are likely to be systematically involved in processing cross-culturally recurrent cultural inputs because they are shared by all humans. An illustration of this point is the relation between face recognition—humans are endowed with a mental capacity specially dedicated to recognizing faces—and the wealth of cultural items that tap into this perceptual capacity: masks, portraits, make-up, smileys. The evolved function of the mechanism is to process visual stimuli from plain faces, but the stimuli that trigger its inferences also include cultural artifacts (Sperber & Hirschfeld, 2006). The success of these cultural artifacts is thought to be largely due to the fact that they tap into mechanisms of face recognition.

The work of Pascal Boyer provides the best known and most discussed analysis of the role of evolved cognitive mechanisms in the emergence of cultural phenomena. Boyer has shown that when processing input about supernatural agents, people will make numerous inferences on the basis of their evolved “intuitive ontologies” (Boyer, 1998). These evolved intuitive ontologies are cognitive mechanisms that form expectations and implement domain specific inferences. For instance, the physical-mechanical intuitive ontology guides expectations that objects will collide rather than pass through each other. Ghosts, as agents, are expected to have a material body that have the same properties, yet they are entities that surprisingly do not respond to that expectation. Yet, because stories about ghosts present them as agents, the stories trigger a set of inferences regarding ghosts’ intentions, beliefs and desires. Stories about ghosts will be understood by making inferences on the basis of naive psychology: an evolved cognitive capacity for making inferences about mental states. More generally, culturally successful stories about supernatural agents tend to contradict a few intuitions, which makes them attention-grabbing, -but at the same time trigger many inferences from “intuitive ontologies”, including their motivations and beliefs as agents with minds. Such stories are “minimally counter-intuitive.” The intuitions that flesh out the story are produced by intuitive ontologies, which are shared by the community. Consequently, the inferences are likely to be similar within the community even though individual members of the community will have heard different variants of the story. Intuitive ontologies thus constitute, as Boyer says, “inheritance cognitive tracks”: transmission chains borrow similar inferential paths from one transmission to the other, in spite of the variability in the input. A story about ghosts can be told in numerous versions, yet it will always trigger the same set of inferences about the intentions of the ghost.

For any cultural phenomenon, there may be a cognitive track that produces, again and again similar cultural items. But the cognitive track can involve diverse cognitive capacities: stories about supernatural agents involve capacities to ascribe beliefs and intentions, while the recipe of the Boeuf Bourignon involves the ability to distinguish tastes as well as the ability to memorize an ordered set of actions. The

important point is that existing cognitive mechanisms, which are sufficiently shared within a community, will determine what inferences are likely to be made when members of this community are presented with a cultural input. Cognitive mechanisms that are shared by most members of the community thus constitute factors of attraction because they produce inferences that are parts of the inheritance cognitive tracks. Analyses of the role of evolved mechanisms in stabilizing culture are also thought to include cultural taxonomies of animals and plants, which are grounded on evolved ‘folk biology’ (Atran, 1998), the relationship between mother’s brother and sister’s son in patrilineal societies, which is grounded on evolved disposition to discriminate and favor biologically related individuals (Bloch & Sperber, 2002), and the success of direct-gaze paintings due to an innate attentional bias that favor direct gaze faces (Morin, 2013).

### **Historically contingent factors of attraction, institutionalization, etc.**

The above points illustrate how evolved properties of the human mind might have pervasive consequences on culture. But, although the work of cultural attraction theorists has so far been mainly focused on evolved cognitive mechanisms involved in cultural chains, more local and historical factors of attraction can also have important effects on culture. Factors of attraction can take the form of historically contingent interests, existing cultural artifacts and techniques, and already stabilized beliefs (Heintz, 2009; Morin, 2016). The following are some examples: composers compose with the current instruments available at their time - harpsichord for Vivaldi and piano for Chopin, for instance; Chinese men had an interest in having a Manchu haircut during the Qing dynasty because they were punished for not doing so; precise knowledge about the planets’ positions in the sky enabled the development and success of heliocentric theories. Thus, the success of cultural items is not only dependent on evolved human psychology but also on already stabilized culture. Arguably, this is a central characteristic of cumulative culture (Heintz, 2014).

The existence of historically contingent factors of attraction does not erase the role of evolved capacities: First, evolved capacities are likely to have lasting effects in spite of local and historical cultural variations (Morin, 2016). Second, the local factors of attraction need to be themselves sufficiently stable to facilitate the emergence and success of new cultural items. Local factors of attraction are themselves stabilized by stable factors of attraction, which are eventually grounded on evolved cognition (Heintz, 2014). Reading is a case in point: it plays a huge role in contemporary cultural transmission, it is learned, and yet it is grounded in evolved mechanisms of visual perception and more specifically recognition of shapes (Dehaene & Cohen, 2007). Third, the distinction between acquired and evolved psychological traits need not be strict: traits result from developmental processes where both inherited DNA and the context have causal roles.

Factors of attraction also include institutionalization and coordination. Institutions are characterized as practices that are maintained in a community mainly because most people do what some regulative representations tell them to do. For instance, the baptized person is immersed into water because orthodox priests have been instructed to do so. Similarly, -telling Little Red Riding Hood should include mentioning a child, her grand-mother and a wolf, otherwise people will tell you that your story is not the true Little Red Riding Hood. When regulative representations have a crucial role in stabilizing a practice, then it becomes an institution. In other words, institutions are cultural phenomena that are stabilized because there are parts of cultural chains that include representations, mental or public, whose content is

to specify how things are to be done (Heintz, 2007; Sperber, 1996). The need to coordinate will also constitute a strong factor of attraction for pursuing strategies that are a good response to what others do or did in the past. For instance, if some drivers drive on the right, then the need to coordinate with them strongly motivates another driver to also drive on the right. The practice stabilizes because every newcomer benefits by adopting the same practice, thus reaping the benefits of coordination. This leads to well-studied phenomena, such as path dependency and lock-in. Although such points have not yet led to specific studies within CAT, they are worth mentioning in order to show the diversity of factors of stabilization and their psychological bases that can be considered and analyzed with the conceptual tools of CAT.

### **Methodology and model**

The theoretical claims of CAT imply that the best approach to explaining a cultural phenomenon consists in analyzing properties of the cultural chain that produces it. In particular, it consists in specifying what factors of attraction lead to the success of specific cultural items. To this end, CAT recognizes the value of participant observation for gathering ethnographic data, but encourages using multiple methods. An illustration is found in Miton, Claidière and Mercier's analysis of the success and spread of bloodletting (2015): their methods consist of reviewing ethnographic data across cultures, running behavioral experiments with transmission chains and mathematically modeling the cultural chains that lead to the success of bloodletting.

Comparative anthropology offers tools for investigating recurrent patterns across different cultures. This provides crucial information for identifying general factors of attraction, which originate in universal characteristics of human psychology or universal ecological factors. The qualitative comparisons and analysis of recurrent patterns across societies (e.g. Boyer, 2001), can be supplemented with a range of quantitative methods (e.g. Morin, 2013). Note that the search is not necessarily one of cultural universals because innate constraints on psychological development can lead to different expressions in different cultures and environments (e.g. Atran, Medin, & Ross, 2004).

Controlled psychological and behavioral studies across cultures can provide empirical insights into the interplay between factors of universal cognitive development and local cultural factors. Rita Astuti and colleagues (2004), for instance, have used controlled questionnaire-based studies among the Vezo in Madagascar, to study the relations between local explicit theories and intuitive knowledge. While cross-cultural psychological experiments can facilitate systematic comparisons of the psychological bases of culture, CAT approaches have advocated prudence when interpreting the results of such experiments. Causes of cultural variation might occur at many levels: from deeply ingrained cognitive processes to superficial differences in interpreting the experimenter's instructions.

Cultural attraction theorists have also formalized the idea that the mechanisms involved in cultural transmission are such that the output they construct will most likely be a modification of the input they process (Claidière & Sperber, 2007; Claidière, Scott-Phillips, & Sperber, 2014). The impact of these mechanisms on the frequencies of cultural items can then be modeled as linear functions from the number of occurrence of items of different types at time  $t$  to the probable number of constructed items present in the environment at time  $t+1$ . These linear functions are called Evolutionary Causal Matrices, because they can be expressed as matrices of numbers specifying the probable effect of an occurrence of an item of type A at time T on the frequency of occurrence of an item of type B at time  $t+1$ . Cultural attraction will

occur if such functions systematically favor the production of items at or in the vicinity of a cultural attractor over a relatively large range of input types. Evolutionary Causal Matrices thus can allow modeling an evolutionary process which, instead of marginalizing the role of transformations, is based on convergence across transformations. It can thus help examine the spread and success of cultural items at the population level in terms of the diverse psychological and ecological mechanisms thought to be involved in cultural transmission.

## Conclusion

The hallmark of work in Cultural Attraction Theory is the type of explanation that is being put forward: an evolutionary account of a cultural phenomenon that zooms in on the causal mechanisms disseminating the cultural items in question. These causal mechanisms will include, but are not restricted to, mental processes, which are better understood with the help of cognitive psychology. \_

CAT is a framework theory: it says little about the causes of any specific cultural phenomenon, but it specifies why recruiting theories from cognitive psychology and possibly other sciences can help describe factors of attraction, which, in turn, explain the actual distribution of cultural items. Still, one could expect CAT to provide more methodological tools for the analysis of culture and more case studies that demonstrate the usefulness of the framework.

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Theory of Mind: development and cross-cultural variation

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