# Mohawk Temporality:
# Embodiment, Ritual, and Cognition

**MSc Thesis** *(Afstudeerscriptie)*

written by

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**Abstract**

In this thesis, I investigate Mohawk temporality holistically—as an aspect of human engagement, as a culturally shared notion of time, and as a cognitive representation involved in linguistic and gestural expression. I begin by examining various Mohawk cultural expressions in order to grasp their anthropological, sociological, and spiritual engagements with time, while also providing valuable historical background. I pursue these theoretical findings in an interview-based study which examines the logical workings of a Mohawk conception of time by comparing and contrasting the participants' conceptions of time with others'. The data points to a circular conception of time in which the 'material' and 'spiritual' worlds coexist, for which a formalism is presented. In addition, I analyze gesture production in order to corroborate these findings and propose a four-part classification scheme of Mohawk temporal gesture. Finally, I conclude the project by examining what future studies on Mohawk temporality may need to consider, in light of the close connection between capitalism, colonization, and cognition of time within the increased standardization of time in Western colonial practices.

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# CONTENTS

# CHAPTER 1

# INTRODUCTION

> *When the learning stops, we stop. The Moon stops, the garden of the world stops. If the birds stop their singing, we will become bored and we will die. So there is no mystery involved, there is no magic involved. It is just complete, simple, human logic.*[1]
>
> Tom Porter, Mohawk Elder

For the traditional Mohawk, there is no clock-like indication of what ought to occur when. They do not adhere to a schedule according to a separate entity of time, but instead follow the schedule of the world in which they are embodied—taking instruction from natural changes and community behavior, and feeling the press of time from their living, spirited surroundings. Mohawk temporality is not a matter of what to do and when to do it, but rather *what-to-do-when*. As such, Mohawk temporality is grounded in cultural values and norms, in cognitive judgments, and in embodiment.

Temporality, as a shared cultural practice of 'time', encompasses cognitive conceptions of time, cultural meanings of time, and societal structuring of events. The social sciences, since the 1980s, have gained an increasingly complex understanding of culture, no longer a unitary coherent web (DiMaggio (1997), p.264). Instead, views have shifted to accept culture as fragmented, as complex structures with rules that *can* be put to use in action, but need not (Bourdieu (1990), Sewell Jr (1992)). Naturally then, culture can be rather inconsistent, where people's norms may deviate from those norms marked as their own. The study of culture has much to gain from cognitive science in understanding culture as structures, especially in the implications of cognitive science on e.g. "the study of identity, collective memory, social classification, and logics of action" (DiMaggio (1997), p.263). And indeed, numerous sociologists of culture have acknowledged and made use of cognitive science to inform their research on culture (e.g. Carley (1989), Schwartz (1991), White

[1] Quoted in *Profiles in Wisdom* by Steven McFadden (2000).

(1992)). At this promising and prosperous intersection of culture and cognition, there is a similar opportunity for the field of cognitive science, most especially in the study of time and temporality.

I aim to investigate Mohawk temporality in both cultural and cognitive domains. In doing so, I treat the Mohawk conception of time holistically—as an aspect of human engagement, as a culturally shared notion of time, and as a cognitive representation involved in linguistic and gestural expression. I consider the sociology and anthropology of Mohawk communities, and then look beyond material culture and to the experiential and conceptual, in which a notion of time is grounded. Throughout my investigations into Mohawk temporality, I rely heavily on notions of human engagement and cultural expressions in order to understand the cultural meaning of Mohawk time. Such a methodology, as detailed in Chapter 2, prioritizes conceptual, social, and spiritual elements of a cultural notion of time, while placing human engagement at the center of the dialogue. I pursue these theoretical findings in an interview-based study which examines the logical workings of a Mohawk conception of time, also in connection with use of co-speech gesture. Additionally, I address change and resistance to change in the Mohawk conception of time under Western colonial practices, which historically employ and rely on an increased standardization of time.

In Chapter 3, I explore the relationship between Mohawk embodiment and temporality in connection with the work of Roy A. Rappaport (1999), who treats ritual as constitutive of 'liturgical orders', the cycles and sequences of life that construct a culturally shared conception of time. In doing so, I lay out the various liturgical orders found in each Mohawk embodiment and instructions, governance and society, ceremony and song, and language. In each liturgical order, an aspect of time is elucidated: the dependence of time on material existence, the formation of a collectivity or unity, the experiential 'pressure of time', the organic and cosmic frequencies of time, and the inseparability of action and temporal location.

In Chapter 4, I present an interview-based study with both cognitive and anthropological interests, where I pursue in-person communication as a site for the study of the conceptualization of time. The study proceeds by requesting participants' reactions to three different conceptions of time: standardized linear time, occasionalist time, and Saint Augustine's argument. By contrasting the three ideas about time with the participants' conceptions, various logical properties of their conception can be investigated: order-theoretic and topological properties, the construction or origin of time, the nature of causation, the role of the past and future, and the existence of time. I then present and analyze the results of the study in terms of both cultural beliefs and logical workings, and rely heavily on portions of the interviews for analysis. In general, time is described as a circle, composed of the 'material world', which is logically quite similar to standardized linear time, and the 'spiritual world', in which events are simultaneous. In order to describe the logical attributes of my findings more precisely, I provide a formalism of the most salient conception of time witnessed. The model accounts for various properties of a Mohawk conception of time, formalized as a compact, closed curve with an arc representing the material world as a total order (the real line in particular), and a complete graph representing the spiritual world 'at infinity'. After constructing a one-point compactification of the real number line by adding an object '$\infty$' denoting the complete graph, I define the open sets on that space and prove that it is a

topological space and a compact space. Additionally, I define an ordering on that space and demonstrate several relevant properties.

In Chapter 5, I corroborate the data of the previous chapter by presenting an overview of temporal gestures produced by participants in the study. Approaching gestures as an additional source of information which complements speech in a single system, I report on co-speech gestures occurring in both ordinary dialogue (e.g. in the telling of a story) and in descriptions of time itself (e.g. in the explanation of why time is circular). Drawing on the system of Cooperrider and Núñez (2009), I propose a four-part classification scheme of Mohawk temporal gesture, composed of *animating*, *pointing*, *placing*, and *continuity-marking* gestures.

In Chapter 6, I return to the role of embodiment in a conception of time and address how change in that embodiment via colonial practices may affect a conception of time. The history of the rise of clock time within the West is a story of how the spread of standardized linear time as a capitalist project may alter experiences of embodiment. Loss of touch with organic and cosmic frequencies, the break-up of the day, new labor standards, (Marxist) alienation, and capitalist control over bodies are simultaneously effects of and tools for capitalism and colonial expansion. Many indigenous peoples are historically and today under colonization, and are thus also confronted with those alterations of bodily experiences. Yet indigenous societies are both highly adaptable and capable of powerful resistance. As Leo Killsback (2013) argues, indigenous perspectives often treat 'society' as a living, breathing organism capable of living in peace and dying with grace. Contrasting indigenous societies with contemporary Western society, it seems Western temporality is quite anomalous in its need to expand, conquer, and—above all—never die. Eurocentrism within academia supports ignorance of this cultural difference in regards to the lifespan and adaptability of a society, and for cognitive science, this risks neglecting a potentially fruitful field of study. 'Cognitive colonization' as a colonial practice over cognition involves significant changes to experiences of embodiment, and is thus a matter of the relationship between the external world and cognitive processes. It is in the interest of both philosophers of cognition and cognitive scientists to invest in understanding the role of significant changes in embodiment. Instead of succumbing to the typical traps of Western biases and Eurocentrism, I advocate for future research of 'cognitive colonization' because it would be worthwhile for the fields of philosophy of cognition and cognitive science, but also because the effects of capitalism and colonization, as I see it, are worth our full attention.

# CHAPTER 2
# METHODOLOGY

This thesis researches the Mohawk conception of time. The primary research question is simple enough: what is the conception of time in Mohawk culture? Yet the object of investigation itself, namely a cultural conception of time, is little understood. The literature typically investigates a conception of time under confined disciplines of anthropology, sociology, or cognitive science. The research question I undertake is contrastingly unspecified in discipline; I seek a holistic account of the Mohawk conception of time. Because the object of investigation is yet to be understood in interdisciplinary terms, this puts heavy demands on methodology.

In the present chapter, I consider the meanings of a 'cultural conception of time' and survey other methodologies employed in relevant research. I then address issues which emerge from my research question in order to develop and motivate the methodology. I conclude by outlining an approach which considers Mohawk temporality holistically—as an aspect of human engagement, as a culturally shared conception of time, and as a cognitive representation involved in linguistic and gestural expression.

## 2.1 What is a Cultural Conception of Time?

I begin by addressing the cognitive scientist's interpretation of a 'conception of time' as a cognitive object. Under this interpretation, a conception of time is a set of logical properties ruling over our judgments; it is the structuring of our temporal thought. The domain of time takes the form of a mental representation of time involved in cognitive processes.

Here, I pronounce my first deviation from typical cognitive science practices early on, due to the fact that the physics of time is not under investigation in the present thesis. The cognitive scientist typically employs the term 'conception of time' to mean a cognitive object which serves to represent the physics of time. There is only one physical time, but there are multiple accounts of 'time' in physics. So in researching a cultural conception of time, I begin with the broadest cognitive notion of a conception of time: a cognitive object

representing time and determined by constraints, both cultural and otherwise, and perhaps partly by the physics of time (though it may be indistinguishable to the researcher or cultural inhabitants).

Under the cognitive scientist's interpretation, language and gesture are treated as the key to understanding a cognitive conception of time. The extent to which language rules over cognition has been famously debated since the 1940s, rooted in the retrospectively absurd arguments of Benjamin Lee Whorf (1950). The since-debunked work argued that because Hopi has "no words, grammatical forms, construction or expressions that refer directly to what we call 'time'," the Hopi people have "no general notion or intuition of time as a smooth flowing continuum" (p.57). While no 21st century cognitive linguist would publish such bold claims today, the connection between language and cognition in relation to a conception of time remains dominant.

In *Does Language Shape Thought?: Mandarin and English Speakers' Conceptions of Time*, Boroditsky (2001) investigates the aspects of our concept of time which are not observable through our experiences of the world, and argues that our conceptions of time are also shaped by "the way we choose to talk about them" (p.4). Through her study on English and Mandarin speakers' thinking about time, she concludes that language is a powerful tool in shaping thought about time (though not in the strong Whorphian sense, she claims). This is, as I see it, one of the most agreed upon theses of the field—that language is the most crucial (non-experience-based) contributor to our cognitive conception of time. The popular stance has justified dozens of studies on verb tense, spatio-temporal metaphor use, and gesture production of a variety of languages which fascinate scholars. To stress my point, I provide a list: Moore (2011) analyzes temporal frames of reference which are metaphorically related to experiences of motion and location in Japanese, Wolof, and Aymara languages; Le Guen and Pool Balam (2012) examine time-to-space mappings in Yucatec Maya in order to "confirm" their non-linear, non-directional conception of time; Fuhrman and Boroditsky (2010) examine whether Hebrew and English speakers automatically access and employ different spatial representations when reasoning about time; Brown (2012) outlines five distinct schemata for conceptualizing time in Tzeltal. Núñez and Cooperrider (2013) take on a radical position by rejecting these linguistic cases as merely boggling temporal exotica and instead using them to "prompt reconsideration of the fundamental mechanisms that give rise to all [spatial construals of time], no matter how familiar or how peculiar" (225). But whether we look to cases of language forming cognitive conceptions of time universally or specifically, we are assuming a view on a 'conception of time' which is merely a cognitive linguistic entity. That is, while it is indeed the cognitive scientist's prerogative to treat conceptions of time in isolation from other fields, the literature of cognitive science which investigates conceptions of time tends to treat them in one dimension: linguistically. Further, the studies mentioned thus far treat language as the sole determining factor of culture. Language is seen as a legitimate and interactive dimension of cognition (and indeed, it is), but is almost entirely taken as a unique marker of culture. I write 'almost' because, on page 127 of Volume 118, Issue 1 of *Cognition*, Boroditsky, Fuhrman, and McCormick (2011) finally write:

> These properties of mental time are specified in spatio-temporal metaphors in

> language ***and in other aspects of culture***. [my emphasis]

Without inclusion of these mysterious 'other aspects of culture' within cognitive linguistics, I am left asking: how far have we come from the Worphian creed?

Oppositely, the field of psychology treats a conception of time as a group of psychological perceptions, such that people with different life experiences (not necessarily languages) understand time differently. For instance, Gonzalez and Zimbardo (1985) investigate groups' 'alienation from the future', or their detachment or estrangement from their own future events and opportunities. One of their main results is that people with lower incomes show the highest levels of Present Hedonism[1] and Present Fatalism[2], whereas the high-income participants believed most strongly that the future was somehow in their control. Under the study's interpretation, this indicates that people with lower incomes experience alienation from the future at a higher rate. Yet all participants, of all income rates, in the study were English speakers and thus, under the language-is-culture view, would be of the same culture. While psychological research on time takes into account e.g. income, race, age, nationality, mental health, which are factors that could form or contribute to subcultures, its aim is not to understand conceptions of time *in languages or cultures* but rather *in various cuts of populations*. In turn, psychological research on conceptions of time risks adopting a view on a 'conception of time' which rules out culture as its host.

Because some particular cuts of populations are significant in sociological research, psychological studies of time perception may carry weight in sociological discussions of conceptions of time. For example, the finding by Gonzalez and Zimbardo (1985) that poorer people show higher levels of alienation from the future is understandable, and perhaps predictable, according to sociological theories. and their notions of social location and the systemic nature of oppression. Alienation from the future is explainable as a characteristic of a certain social location, and functions to perpetuate systemic oppression. In particular, it functions to limit the future success (here, let's define success as safety and well-being) of an individual, and it continues to be internalized, as the study shows, because marginalized people *do* have less power over their futures. Alienation from the future, under a sociological account, is both responsible for and a result of oppressive systems. In this application of psychological findings to sociological theories, the treatment of a 'conception of time' shifts yet again.

Under sociological interpretations by Foucault (2012) and Le Goff (1982), for example, time is a method of control over classes, a conceptual tool enforced onto people in order to maintain power over their lives and actions. Similar sociologists and historians analyze the cultural conception of time in the West by assessing its affects on social classes, labor's capital value, and power dynamics. In this approach, a 'conception of time' is a social entity, a group of rules believed by a community, functioning together as a form of tyranny.

Naturally, the sociological treatment of a 'conception of time' is similar to the working definition in anthropological research, in that both are oriented towards understanding time

[1] Present Hedonism is measured by agreement with the following statements: *I take risks to put excitement in my life.* and *I get drunk at parties.*

[2] Present Fatalism is measured by agreement with the following statements: *It seems to me that it doesn't make sense to worry about the future since fate determines that whatever will be, will be.* and *I try to live one day at a time*.

as a societal entity. However, there are valuable differences in approach worth clarifying. Anthropological interest in 'conceptions of time' center at understanding how a community lives or functions together, or what role time plays in peoples' lives. A conception of time, for the anthropologist, is a set of facts by which we, together, organize our lives. For example, Turton and Ruggles (1978), in studying the Mursi of southwestern Ethiopia, researches their methods of time keeping in order to develop an account of the conception of time rooted in human interaction with time. Similarly, Hallowell (1937) looked to the Saultaux's activities in different annual seasons in order to learn about their conception of time. Yet the anthropological outlook on conceptions of time is not limited to practical daily life; it is also natural to inquire about peoples' philosophies, spiritualities, or religions. For example, Donaldson (1996) investigates the spiritual beliefs regarding time of the Australian Aborigines, in connection to their temporal practices. Whereas a sociological 'conception of time' focuses on social interactions between time and people, an anthropological 'conception of time' includes more everyday aspects of human life: their jobs, birthdays, planting seasons, belief systems, etc.

Within the fields of cognitive science, psychology, sociology, and anthropology, we witness a variety of (sometimes overlapping) perspectives on what a 'conception of time' is to a culture. Each meaning of a 'conception of time' is most evident not in the results of the research, but in the methodology: in the value they assign to 'language', in whom they speak with to engage with a conception of time, in whether they discuss power in their interpretations of results, in the activities they choose to address. Each methodology brings about a new meaning to a conception of time in culture.

As I see it, humans do not experience time cognitively, psychologically, and socially separately—we just experience. A 'conception of time' in culture, for me, is not only a mental representation, or a power structure, or an object of daily life; it is our engagement with time, our shared experience of change in space. The larger issue, then, is not *what* a conception of time is, but rather how to investigate it.

## 2.2 Challenges: Plurality, Specificity, and Development

Research on the Mohawk conception of time, then, naturally involves understanding the cultural items related to time as discussed above: mental representations, power structures, daily life, spirituality, etc. This is not only a complex task, but also one mired in larger philosophical and logical issues. Even after clearly demarcating the 'culture' as a population about which one will write, a larger question looming overhead is what it means for a group to share a conception of time, i.e. how similar two conceptions of time need to be in order to be 'of the same conception'. This leads to another urgent matter of how to understand a 'conception of time' in its own right, versus in comparison with another conception. Further, an account of a conception of time, especially an interdisciplinary one, immediately encounters numerous theories on conceptions of time that are widely respected by scholars. For child development in particular, it is questionable to what extent we can apply current theories of development of temporal know-how to the Mohawk peoples, raising issues regarding the extent to which cognitive understandings of 'conceptions of time' rely on such

theories. In the present section, I address these three issues in particular because, as I see it, they are the most challenging and thus critical in developing an appropriate and worthwhile methodology.

*Plurality*

In order to identify uniformity within a culture regarding their conception of time, one would have to employ some sort of identity criteria for conceptions of time. Yet in order to construct identity criteria for a conception of time, one would have to truly *know* a conception of time, in each of its cognitive, psychological, and social dimensions—plus their intersections. As can likely be surmised from the previous section, there is no such identity criteria for conceptions of time, nor any workable substitute.

This raises serious questions about how, if at all, one can talk about singular conceptions of time in cultures—or even individuals. For example, an individual in the English-speaking West might employ linear mental representations of time when reasoning about their future, but then circular mental representations of time when reasoning about the season cycles. In fact, this would be a rather unsurprising result since spatial construals of time vary greatly within languages. Spatial construals of time are shown again and again represented by entirely different mappings even within the same language, the same conversation, or the same sentence. Núñez, Motz, and Teuscher (2006) point out that the literature on spatio-temporal metaphor typically treats time metaphors as either inverse Moving-Ego or Moving-Time mappings: either the Ego is construed as moving with respect to fixed temporal landmarks, or Time is construed as moving with respect to the Ego. However, they also note that language has shown much more complex patterns, exemplifying as follows:

> (1) Not all spatial language for time is dynamic: *The appointments are too close together* or *they were born a year apart* simply treat times as locations. (2) When time is construed as moving, it is not always with respect to the Ego as a reference point. In *Wednesday follows Tuesday*, or in *February comes before March* times are construed as moving, where Tuesday and March are moving reference points for the locations of Wednesday and February, respectively [...] (3) As a consequence, expressions like the one just mentioned do not require the specification of the present time "Now," and therefore, they don't specify "Future" or "Past" either. (Núñez, Motz, and Teuscher (2006), p.3)

The largely varying mental representations and reasoning about time within a language—as well as subsequent blatant inconsistencies between metaphors—only further evidences the impossibility of forming identity criteria for a conception of time (in the cognitive settings). However, it would be similarly problematic to assert there is no unity or cohesion within a culture. After all, despite these severe inconsistencies within languages, cultures, and individuals, we are nevertheless able to understand each other, to communicate effectively about histories and plans, and to experience together the world's constant change.

> In everyday conversations, people make the most amazing inferences in a matter of milliseconds [...] How is it that people simply go about in their everyday

> conversations deeply understanding all these expressions, with *no effort at all*, often *not even being aware* of them, what is more, making quite sophisticated inferences about the structure of temporal experiences? (Núñez (1999), p.43-44)

As complex as conceptions of time are, humans prove to be experts at living with them. Methodologically, then, this thorny issue demands that I access the unified conception of time by directing focus to that which unites individuals' conceptions, while also paying attention to identify characteristics which might change between persons, conversations, or even sentences.

*Cultural Specificity*

A 'cultural conception of time' as a workable academic notion is methodologically demanding also because it marks a difference between two cultures. Because a culture's conception of time is a part of that culture itself, it functions to distinguish between it and another culture. At first glance, this seems to be a methodological tool; one might assume the investigation to be more straightforward since it can be focused in cultural specificity as well as evidenced by its differences with other cultures. However, contrasting conceptions only provide such benefits if there is clarity in our understanding of those other cultural conceptions of time.

One important issue that arises in such cases is the relationship between the typology of co-speech gesture production and the topological structure of a mental representation of time. In *Across time, across the body*, Cooperrider and Núñez (2009) study temporal gesture production among American English speakers in order to schematize their gestures and discuss its significance within cognitive processes. The gestures produced displayed left-to-right and back-to-front directionalities along the sagittal and transversal planes. While these gestures involve linear spatial construals of time, their study makes no such connection to 'standardized linear time' about which so much is written regarding the Western conception of time (a point to which I return in Section 2.4). If I develop a methodology which systematically compares and contrasts the Mohawk conception with others, then the present thesis will face the same limitations as the studies with which it compares its findings: only a faint connection between culture and cognition being established.

Further, most studies with which one would hope to compare are, again, isolated in discipline. For example, take two areas of interest in understanding a conception of time, such as government structures and ceremony practices. It is likely that each can be compared to other cultures respectively, but to find an intersecting analysis elsewhere would be rare. Thus, if I aim to understand the Mohawk conception of time as a whole, rather than in parts, I ought not depend too heavily on a strategy of comparison with other cultures, but instead pursue comparison only for separate areas of a conception.

*Development*

Insights into child development of temporal concepts are significant contributors to the

growth and strength of the study of cognition of time. Because children consistently acquire temporal notions and understandings at precise stages of development, it is generally accepted that there is some systematicity to cognitive processes over time.

William Friedman (1990) in *About Time: Inventing the Fourth Dimension* provides an integrated account of psychological research on the human experience of time. In his chapter *Development: The Child's Discovery of Time*, Friedman traces the growth of temporal awareness from infancy through adulthood in order to identify foundational conceptions present since birth among the "boundless and uniform time of adults" (p.85). The general story he shares is largely based in Jean Piaget's account of the development of a Western conception of time: in the first few months of life, the perceptual system is attuned to visual and auditory "patterning" in brief durations; between four and eight months of age, infants gain a sense of practical ordering of events; then between eight and eighteen months, (neurotypical) infants gain an appreciation for temporal order in that they engage in deliberate sequencing; early childhood developments then introduce quite rapidly the ability to recall increasingly detailed sequences; finally from around age ten, children use information about sequences to infer causal relations (Friedman (1990), p.85-92). In his seventh and final chapter, Friedman revels in his ponderings over "variations" of conceptions of time rooted in differences in culture (in particular, three indigenous cultures), personality, and mental health. The natural question, for me, is how the theory of child development of temporal awareness applies to these variations. Developmental theories have long postulated stages at which one can detect various neurological disorders, and so one can assume that a model of development for such cases is a deviation of the typical model described here. For culture, however, it may not be so simple as a deviation. As I see it, there are three cases: an entirely different theory of development is needed, or development is altered or re-ordered by cultural influences at a certain stage, or (the unlikely case) this model is appropriate for all cultures.

None of these options are immediately problematic. It seems only natural for different cultural conceptions to develop differently. However, the field largely relies on theories of develop to ground universal systematicity of their results. It is reasoned that the development of logical workings of a conception ought to be accounted for in order for any theory to be complete. Methodologically, then, in investigating a previously un-investigated cultural conception of time, another issue is how to address theories of child development of temporal awareness. If various properties of the cultural conception are not accounted for under the developmental theory, then those theories lose their universal positioning, and thus challenge any systematic investigation of conceptions of time. However, it is also problematic (both in terms of research methodology and ethics) to attempt applying a Western-built theory of development to Mohawk communities.

In outlining the three issues, I have taken inventory of several main methodological challenges and responsibilities: to balance singularity and plurality in discerning the reach of a conception; to compare cultures when possible but dare to draw new connections between areas of interest; and to avoid presumptions regarding child development only in order to uphold previous research in a field. To me, these can be read as obstacles to be overcome, or as guidelines for the project. I pursue the latter.

## 2.3 Sovereignty

By now, it should be apparent that this thesis touches upon numerous Western disciplines. What may not be apparent is these disciplines' unique and intersecting relationships with sovereignty. In each discipline, we witness a juxtaposition of opportunities: to respect and validate the legitimacy of indigenous life and thought, to value indigenous perspectives as academic resources, and to maintain indigenous peoples' sovereignty—or to colonize. In the present section, I illustrate the need for sovereignty, provide a working definition for sovereignty within Western research, and outline how I use 'sovereignty' as an ethical compass in my thesis.

*The Call for Sovereignty*

Historically, many studies under the disciplines involved in this thesis have colonized. Anthropology, for example, has a long history of studying indigenous peoples in order to allege their 'savageness' and understand their perplexing lack of 'civilized' traditions. Sociology, on the other hand, has insisted on indigenous inferiority more recently, through its export of Western societal concepts unfairly onto indigenous societies. Other Western studies have produced results that depict indigenous peoples as fragile or weak, assume indigeneity itself must be terminated, and treat indigenous peoples as specimens rather than humans.

Studies of indigenous conceptions of time are especially susceptible to traps of Eurocentrism and assertions of Western superiority. Here, I review several of the most treacherous traps, in connection with specific trends in academic imperialism. First, Western research tends to reaffirm that they are most in-tune with 'reality', i.e. reaffirms itself as the center of legitimate knowledge. Studies of indigenous conceptions of time can support this legitimization by exotifying indigenous conceptions, or labeling them as 'other', so as to uphold the Western conception as 'correct'. Second, Western research insists that indigenous peoples are irrational, often citing their spirituality or intellect as un-reasoned or nonsensical. Studies of indigenous conceptions of time participate in this practice by framing discussion of their conceptions under Western logics, i.e. by treating Western reasoning as infallible and dominant. Lastly, Western research labels indigenous societies as 'uncivilized' (implying they are similar to animals) or 'under-developed' (implying they have yet to progress to Western practices). Studies on time perpetrate this by describing indigenous time as non-work-oriented, lazy, or unproductive. A study of cultural conceptions of time, then, needs to consider how to 1) avoid these traps of imperialism and 2) address the significance of academic imperialism within the conception itself.

Many approaches in Western research insist that indigenous peoples are innately inferior and display an eerily deep desire to bring progress into indigenous peoples' lives—spiritually, socially, economically, and intellectually. These practices are not only immediately harmful to indigenous peoples, but they also take part in the colonization with which those indigenous peoples are mired by denying them sovereignty, by ignoring their voices, by minimizing their value. In turn, methodology within Western research on indigenous peoples actively influences those indigenous lives it aims to study. Not only is this a large methodological quandary, but it is also an urgent call for attention to sovereignty.

*Sketching Sovereignty*

We do not solve these ethical issues by merely avoiding 'negative' depictions of indigenous peoples within academia, but rather by considering their cultures and issues *on their own terms* and *in their own terms*. This has been at the heart of many endeavors in recent years. A list of such projects also serves for a nice summer reading list: Mike Donaldson (1996) considers the resistance of Aborigines over their conception of time, thus questioning allegations of Aboriginal fragility; Roxane Dunbar-Ortiz (2014) includes Native American perspectives and experiences in retelling U.S. history, thus returning 'truth' to Native communities; Barbara Gurr (2014) provides the first analysis of reproductive health care for Native Americans through her personal involvement with the Oglala Lakota Nation, a project taken on only with consent of the Oglala Lakota; Annette Sykes (1994) assesses the participation of Maori women in New Zealand legislation, centering indigenous female voices within contemporary legal discourses; lastly, even within the home institution of this thesis, Aafke de Vos (2017) studies the logic of divinatory reasoning in indigenous communities in Nigeria, thus approaching indigenous thought as logical/reasoned instead of irrational.

These diverse projects serve to challenge imperialist norms within academia, but what makes them successful is neither their content nor their ambition alone. These projects are successful also because the interests of the indigenous peoples they research remain central to their tasks. In other words, all parties involved in the research remain sovereign. The researchers effectively protect the cultural objects about which they write (e.g. conception of time, historical 'facts', health care, legislation, reasoning). From these cases, I can approximate a working definition of sovereignty in relation to a conception of time in particular: a conception of time is sovereign if it is only defined, shared, labeled, changed, and investigated through actively invited participation or, for a community, intracommunity negotiations. An individual or community is sovereign over a conception of time if they have the authority to define, share, label, change, and investigate that conception on their own terms, in their own terms.

*Centering Sovereignty*

Linda Tuhiwai Smith, in *Decolonizing Methodologies*, summarizes the problematic relationship between Western research on indigenous peoples and wider practices of colonization:

> It is research which from indigenous perspectives 'steals' knowledge from others and then uses it to benefit the people who 'stole' it. Some indigenous and minority group researchers would call this approach simply racist. It is research which is imbued with an 'attitude' and a 'spirit' which assumes a certain ownership of the entire world, and which has established systems and forms of governance which embed that attitude in institutional practices. These practices determine what counts as legitimate research and who count as legitimate researchers. (Smith (1999), p.56)

In other words, academic imperialism is involved with insidious and increasingly complex institutional practices of colonization. Thus, as I see it, a study's methodology risks both

*upholding colonizing practices/institutions* and *colonizing*.

I aim to pursue a potentially ameliorating strategy by relying on sovereignty as an ethical yardstick. For my study's methodology, this means accepting responsibility to prioritize sharing Mohawk conceptions on their own terms and in their own terms, situate the Mohawk conception in connection to other aspects of human life (i.e. treat subjects as humans, not specimens), and address colonization as it impacts a Mohawk conception of time. I choose to center 'sovereignty' within my methodology because 1) it serves as a guideline for ethical engagement with indigenous peoples, thought, and lives, 2) it focuses my project on issues of colonization which may have otherwise been ignored, and 3) communities ought to have rights to it.

## 2.4 Desired Results

My overall goal is to practice an approach which 1) prioritizes an interest in understanding the Mohawk conception of time in a meaningful way, 2) is guided by overcoming challenges to the task, while simultaneously respecting scholars' different theoretical goals and empirical methods, and 3) considers the role of colonization and academic imperialism within the Mohawk conception of time. The present chapter has taken inventory of diverse, in fact sometimes disparate, approaches to 'conceptions of time' across disciplines and outlined several challenges for this project in particular. Finally, I make clear the desired results of the research and outline a methodology appropriate for the task.

Along with research on the anthropology, sociology, and history of Mohawk communities' interaction with 'time', a holistic investigation of a conception of time ought to address the inner-workings of a conception, especially cognitively. Among cognitive studies in the literature on cultural conceptions of time, little has been deduced regarding such a holistic picture I describe. Studies typically pursue a conventional methodology: task the participants to (re)tell stories in order to analyze their tense use, linguistic expressions, and temporal gesture production (e.g. Fuhrman and Boroditsky (2010), Moore (2011), Le Guen and Pool Balam (2012), Boroditsky and Gaby (2010), Levinson and Majid (2013), Núñez et al. (2012), (Cooperrider and Núñez, 2009)). The ubiquity of this approach has indeed achieved some successes; it is generally agreed upon now that spatial construals of time in language are universal, that time can be described and gestured as a variety of topologies, and that there is great consistency within cultures' gestural production as well as great variety between cultures. However, the results have reached the limitations of their data. Data confined to the co-production of verbal and gestural temporal expression offers little information in regards to an entire conception of time; no researcher would confidently argue any conclusion, based on this data alone, regarding the plentiful and diverse aspects of a conception of time. Instead of pursuing data which impedes holistic conclusions, I suggest prioritizing those constitutive aspects of a conception of time in determining the type of data to seek. These aspects include: mental representations (i.e. topologies), the creation of time, logical rules over causation (i.e. orderings), the role of higher beings in causation, and the realness of the past and future. In order to investigate these aspects, I propose engaging participants in reasoning tasks relating to them, which can be achieved by comparing and

contrasting with other conceptions of time. In Section 4.1, I outline the conceptions to be discussed in the study and, more importantly, the various aspects of a conception of time they bring into question. Through this approach, similar data from the studies identified above remain accessible, since participants will naturally tell story-like sequences of events and, of course, gesture throughout their explanations. Interestingly, this data will nevertheless differ from that of the above studies since the stories will not function to merely fulfill a task, but to actually *communicate* a thought or argument. By treating gestures, verbal language, and mental processes as part of a single system, I can then use the gestural data to corroborate the results of the interviews.

I consider the Mohawk conception of time without boundaries by discipline; I aim to investigate the conception from multiple perspectives in one cohesive project. I begin by considering various Mohawk cultural expressions in order to grasp anthropological, sociological, and spiritual engagements with time, while also providing valuable historical background. I then seek out Mohawk voices themselves through an interview-based study in which I am concerned with the logical inner-workings of the Mohawk conception of time, which I pursue in the study by comparing and contrasting the participants' conceptions of time with others'. I also review use of gesture from those interviews in order to corroborate any mental representation of time which is discussed in the interviews. Finally, I conclude the project by examining what future studies on Mohawk temporality may need to consider, in light of the close connection between capitalism, colonization, and cognition of time. I aim to investigate Mohawk temporality holistically—as an aspect of human engagement, as a culturally shared notion of time, and as a cognitive representation involved in linguistic and gestural expression.

# CHAPTER 3

# MOHAWK RITUAL AND TEMPORALITY

The Mohawk dwell in the same three dimensional space as you and I, with the land beneath our feet and the sky overhead. Yet Mohawk engagement with the world is structured by instructions, community, and a wide variety of rituals which mark the difference between Mohawk culture and any other. Human engagement concerns the interaction between the individual or collective and their conceptions. Regarding temporality, human engagement includes verbal and non-verbal references to temporal locations, perceptions of time, beliefs regarding time, and the societal role of time. Each of these engagements with time are reflected within *intangible cultural expressions*.

> Intangible cultural expressions are a form of socio-material culture that embody enculturated habitus and reflect a cultural group's way of being in the world. Intangible cultural expressions or heritage include such features as oral traditions and expressions, song, verbal and non-verbal communications, power and authority, relationships and kinship, ceremony and ritual performance [...] The depository of these intangible cultural expressions is the human mind and body, ancestors, and homelands. (Kearney (2009), p.212-213)

A Mohawk conception of time then, as an object of human engagement, is reflected in Mohawks' intangible cultural expressions. Yet, the relation between intangible cultural expressions, as features of Mohawks' *being in the world*, and the construction, or coming about, of Mohawks' *temporality* is likely even more significant than 'reflection'.

In *Ritual and Religion in the Making of Humanity*, Roy A. Rappaport (1999) investigates *ritual* as "the performance of more or less invariant sequences of formal acts and utterances not entirely encoded by the performers" and argues that ritual as such logically entails the establishment of various social practices (including convention, social contract, and orders) as well as the construction of time and eternity (p.24). Individual rituals, as well as the invariant sequences of rituals that make up cycles and other series, constitute "liturgical orders" (p.169). Rappaport plays on the term 'order' in multiple senses: as a natural order in which processes are governed by common principles and rules; as a system which may

systematically order or rank; as a constitutive directive for performers; and finally, as a sequencing of events. Due to the intentional heftiness of the term, liturgical orders can be realized in several dimensions: the *simultaneous* or *synchronic* in which many meanings are represented at once; the *hierarchical* in which understandings are organized within ritual through a non-equal structuring; and the *sequential* in which one event follows another. Rappaport's work demonstrates how the various realizations of liturgical orders function to unify communities' bodily experiences by 1) establishing a collective agreement to acknowledge rituals as such, 2) dissolving the distinction between individuals, and 3) forming tempos, duration, rhythm, and frequencies among three regions (the organic, social, and cosmic). Moreover, Rappaport demonstrates how *ritual* and *liturgical orders*, through these effects, ultimately construct a conception of time.

In the present chapter, I unpack several intangible cultural expressions of the Mohawk (embodiment and instructions, governance and society, ceremony and song, and Mohawk language) in terms of liturgical orders in order to depict how the Mohawk conception of *being in the world*, i.e. Mohawk embodiment, constructs a Mohawk conception of time. In addition to making use of Rappaport's observations on liturgical orders in the construction of time, I contribute a notion of bodily engagement with liturgical orders particular to the Mohawk, namely 'time pressure'.

## 3.1 Embodiment and Instructions

For the Mohawk[1], the world is a spiritual one. The material world is an aspect of the spiritual world; it is one dimension in which we experience the Earth, consciousness, and liturgical orders. The fuller, spiritual world is called, in English, the *Creation*, though also referred to as the *Creator* or the *Great Spirit*. It is described in *The Creation Story* that everything material comes from the Creator and that we are given instruction from the Creator at the beginning of the world. People are supposed to follow these instructions, for the well-being of the Creation of which they are (since every thing in the material world shares one spirit, the Creation, the Great Spirit). In order to apprehend the instructions and enact them, especially over generations, the Mohawk value passing on teachings. People are said to have an obligation to learn the teachings from their elders and ancestors and then to pass on teachings during their lives. For passing on instructions and awaiting their enactment, the Mohawk measure seven generations of time; communities may set a goal or anticipate a change (sometimes corrective), where the endpoint is in seven generations. When a person dies, their obligation to instruct and follow instructions ends. Their spirit lingers on earth for one year, in order to see four seasons, during which no one speaks their name; then there is a ceremony for them; then they leave time and their name behind for their family and go back to 'Creators' land', the non-material world for peace.

It is said that it is humans' (only) duty to understand and enact the Creator's instructions throughout our material lives. Much of Mohawk spirituality—and their *being in the world*—consists in those instructions, their apprehension, and their enactment. Yet in order

[1]Information on Mohawk spirituality, ceremony, and beliefs in Section 3.1 is sourced from personal interviews, recorded with notes, with Mohawk elders Niioieren and Otsitsakenra (20 May, 2016).

to uphold such a spiritual culture centering around instructions, there needs to be a demonstrable commitment to recognize instructions as such. This is easily and dually witnessable. First, Mohawk people make use of the term 'instruction' and accept its meaning as that which *ought* to be done. In this sense, a liturgical order is already taking shape; instructive practices are understood as such, as directives of what to do when. Second, there is a social commitment to pursue the apprehension and enactment of instructions, to participate in the "natural order of things", to agree to engage with the world in terms of following instructions. Rappaport illustrates that "conformity to invariant orders not only makes it possible for members to congregations to indicate acceptance of those orders but to become unified through coordination of their individual acts of acceptance" (p.226). The central role of Mohawk instructions within Mohawk spirituality and culture *is* conformity to invariant orders, in both senses Rappaport discusses. The uniformity for which he claims such conformity is responsible can be characterized by the sum of those instructions: Mohawk embodiment. The material world is not only *an* aspect in which one experiences instruction, but *the* aspect in which one experiences instruction; the material world in which bodily experiences occur is defined by the occurrence (or recurrence, as we will see) of instructions. The meaning of Mohawk *being in the world* is the apprehension and enactment of instruction; instruction is Mohawk embodiment. Thus, the collective commitment to follow instructions unifies Mohawk bodily experience, constructing a shared conception of embodiment. Further, because instructions may be addressed to both the individual and the collective, this conception is applicable on both the level of the individual and of the collective.

Instructions may differ for each person and in each situation. For example, the instruction to continue and protect traditional ceremonies emerged since the contact period with colonizers (even those ceremonies about events that no longer occur, such as the migration of birds whose population declined from over-hunting). To summarize some general themes, instructions say to take care of the Earth and each other, to consider the next seven generations in your actions, and to pray (i.e. 'say thanks'). Some instructions are communicated through The Creation Story itself, such as being quiet during the night. It is said that the night time is for ancestors and we are supposed to respect them by not making noise. Other instructions are communicated through ceremonies and natural events, by marking the right time for some community activity. For example, the strawberry ceremony occurs when the strawberry leaves turn green and serves to greet the strawberries; then, the people know to begin harvesting them. Lastly, many instructions are cyclic in that they are consistently given every e.g. sunrise, full moon, or winter season. For example, the sun's movement tells us how much energy to use; it is instructed to use more energy as the sun gets higher in the sky and less as it lowers. There is not only a sense of tempo found within the ceremony (to which I return in Section 3.3) or other instructed community event, but there is also a sense of tempo of the recurrent events themselves. The liturgical orders encoded with instructions gain tempos on multiple levels—simultaneously—both within a ritual and the recurrence of a ritual as a whole. Instructions contribute to liturgical orders multiple senses of time, from daily, monthly, yearly, to generational tempo.

Regarding events' interaction with liturgical orders, a mysterious distinction that ought to be clarified early on is that of "mundane time" and "extraordinary time" (or "times out of time" or "sacred time"). As Rappaport uses the terms, "extraordinary time" refers to

the liturgical orders which occur in official gatherings, ceremonies, or events. "Mundane time" refers to liturgical orders occuring in everyday life, outside of "extraordinary time" (Rappaport (1999), p.216). For the Mohawk, instructions are provided and received all the same; being quiet during the night ought to be the same sort of experience of embodiment as participation in the medicine ceremony—in that they are both the following of instructions. While I have provided numerous characteristics of instructions which may be used to distinguish among them (where they are found, when they recur, whom they address, etc.), there has been no distinguishing characteristic between instructions of the proceedings of a ceremony and instructions of the proceedings of, say, planting, or any other everyday activity. Mohawks say that *being spiritual means your life is a ceremony*; ritual inside and outside the longhouse ought to be nearly the same, in terms of liturgical orders. However, even the Mohawk have a separate concept of 'ceremony' in order to express this. There is a vague but nevertheless present distinction between ceremony-time and non-ceremony-time in order to analogize between *living spiritually* and *participating in ceremony*. In Section 3.3, I expand upon the two sorts of time, but for now let it rest that instructions are viewed similarly across both "mundane" and "extraordinary" times.

Instructions provide information on how to live, on what Mohawk embodiment consists of. Instructions do not provide information of what to do and when to do it, but rather what-to-do-when. Importantly, they are not encoded by the performers (the people, birds, plants, etc.) but rather they exist to be found within the *Creation* itself (the sum of all spirits, the one spirit). Instructions, then, constitute the information of the invariant sequences of Rappaport's 'ritual'. As a working definition, *instruction* is information of *what-to-do-when* which 1) is not entirely encoded by the performers and 2) found in natural occurrences, a being, or a community.

Throughout Mohawk embodiment, we see liturgical orders forming through the central notion of instructions. For the Mohawk, time—and liturgical orders altogether—is an aspect only of the material world, which can be left behind with other material experiences. The instructions are often temporal in that they serve to tell people *what-to-do-when* based on their material environments. For Mohawks, then, time is not an entity separate from the material world in which we are all embodied, but instead is something which needs no consideration—due to the conception of embodiment and its necessary collective commitment to the apprehension and enactment of instructions. Even without direct consideration, there is, of course, still interaction with time through liturgical orders. This temporality can be further investigated through a notion of 'time pressure' as the experiential receipt of instructions. Time pressure is the push of an event's anticipation felt by an individual or group as a Mohawk experience of liturgical orders.

## 3.2 Governance and Society

Long before clocks were installed in church towers, before the 1884 International Meridian Conference, before the Babylonians divided the day into 24 parts, the Mohawk people lived, governed, and produced across today's New York State, southern Ontario, and southern Quebec. The Mohawk have represented the most eastern—and geographically largest—

portion of the Haudenosaunee confederacy (or Six Nations of the Iroquois Confederacy), along with the Seneca, Cayuga, Oneida, and Onondaga (as well as the Tuscarora, who joined in the early nineteenth century). The Haudenosaunee as a federal state structure incorporated culturally diverse nations, spanning thousands of villages and hunting grounds "from the Great Lakes and the St. Lawrence River to the Atlantic, and as far south as the Carolinas and inland to Pennsylvania" (Dunbar-Ortiz (2014), p.24). Avoiding centralized power, the Haudenosaunee maintained a clan-tribe system of democracy, with a collective stewardship of the land. Moreover, some even call Haudenosaunee society a "feminist dream"[2]. For example, corn crops were stored in granaries and distributed equally among the society by clan mothers, the eldest women of each clan (Dunbar-Ortiz (2014), p.24). Female elders decided whom, among the men, would represent their clans in councils, and if the men did not perform as instructed, clan mothers could recall them altogether or directly step in the council as their replacement. In general, voting systems and decision making formed a consensus-based model, where members often sacrificed their individual interests for the sake of the community's cohesion (Dunbar-Ortiz (2014), p.27). The Haudenosaunee constitution (termed the Great Law of Peace) is said to have informed parts of the U.S. Constitution. Oren Lyons, a faithkeeper of the Turtle Clan, explains the substance of that constitution:

> The first principle is peace. The second principle, equity, justice for the people. And third, the power of the good minds, of the collective powers to be of one mind: unity. And health. All of these were involved in the basic principles. And the process of discussion, putting aside warfare as a method of reaching decisions, and now using intellect.[3]

Importantly, Lyons attributes the current problems of the U.S. government to their neglectful exclusion of the spirit world in the adoption of these principles. In doing so, he reveals a critical aspect to Mohawk society: a spiritual unity.

As already discussed in Section 3.1, Mohawk spirituality entails a shared commitment to the acknowledgement of instructions as such, which unifies Mohawk people through the coordination of their individual acts of acceptance. Rappaport (1999) contends that "this coordination often has cognitive and affective as well as social consequences, producing a state of mind, as well as society..." (p.226). For the Mohawk, and Haudenosaunee in general, the spiritual coordination of individuals' commitment to follow instructions is deeply embedded in their governance. In fact, that coordination, according to Lyons, *is* the critical difference between their society and the one which colonizes them. Further, that coordination of individuals' commitment to follow instructions constitutes, as shown earlier, Mohawk embodiment; for the Mohawk, *being in the world* means *apprehending and enacting instructions*. The coordination of internalizing instructions, which according to Rappaport constructs a society, is Mohawks' defining experience of embodiment. Society is a longstanding system in which Mohawks are embodied.

The indigenous peoples of North America had established comprehensive trade routes and systems, successfully sustained their own populations in disparate environments, and

[2] In particular, Charles C. Mann (2005).
[3] Cited by Roxanne Dunbar-Ortiz (2014), p.26.

adapted nature to meet needs. Fire was commonly used to tame the landscape and encourage young grasses (to attract herbivores as well as those who seek them); sanctuaries were staged for deer, elk, bear, and other game as an effective alternative to domestication; complex irrigation systems for corn, a persnickety crop, were learned and taught generationally. The Mohawk were profoundly committed to producing cycles of production, harvest, and ceremony. Charles C. Mann (2005) in *1491: New Revelations of the Americas Before Columbus* describes the scene dreamily: "Rather than the thick, unbroken, monumental snarl of trees imagined by Thoreau, the great eastern forest was an ecological kaleidoscope of garden plots, blackberry rambles, pine barrens, and spacious groves of chestnut, hickory, and oak" (p.286). The people did not only take instruction from the land, animals, and atmospheric changes, but it was a place where each took instruction from the others. Indeed, the "mundane times" of the pre-invaded Haudenosaunee do not seem so mundane. Every action was by instruction; the world was one ritual. Rappaport describes true 'communitas' as a state of mind as well as of a society.

> Indeed, the boundary between individuals and their surroundings, especially others participating in ritual with them, may seem to dissolve. [...] Indeed, the distinction between the social and experiential is surrendered, or even erased, in a general feeling of oneness with oneself, with the congregation, or with the cosmos. (Rappaport (1999), p.220)

Mohawk embodiment, *being in the material world*, is within a larger world, a spirit world where every bodied person is one spirit together. Through the Mohawk conception of embodiment, a spiritual society erects itself not as a composition of many individuals but as one state of mind, one congregation, one cosmos.

For the Haudenosaunee, the white invasion began in the mid-1770s, when settlers began squatting on Six Nations' territories. Since the contact period with European settlers began, Mohawk people, with other Natives across the continent, have been mired in political, physical, and spiritual opposition to their termination. In 1775, the Haudenosaunee met their largest disagreement yet, when each nation held different interests in the growing wars around them. The Mohawk Nation, along with the Seneca, allied with the British; the Oneida allied with the separatist settlers; the Cayuga, Tuscarora, and Onondaga remained neutral (Dunbar-Ortiz (2014), p.76-77). In response to these decisions, George Washington wrote to General John Sullivan

> to lay waste all the settlements around . . . that the country may not be merely overrun but destroyed . . . . [Y]ou will not by any means, listen to any overture of peace before the total ruin of their settlements is effected . . . . Our future security will be in their inability to injure us . . . and in the terror with which the severity of the chastisement they receive will inspire them. (Washington (1779))

By 1889, "80 percent of all Haudenosaunee land in New York State was under lease to non-Indian interests and individuals" (LaDuke (1999), p.13). During the 1900s, Mohawks resisted—environmentally, culturally, and economically—the continued, violent seizing of land and bodies (as well as continuous disregard for treaties). In order to further examine

liturgical orders in Mohawk governance and society, I examine these three aspects of Mohawk resistance throughout colonization, before considering social organization in today's Mohawk societies.

*Environmental Resistance*

Environmental degradation of the land and water by which the Mohawks live was—and continues to be—a strategic line of attack on Mohawk life and an effective tool for colonial economic growth. The initial impact during the contact period was from overhunting, which eradicated numerous species whose migrations served to provide tempo and duration for Mohawk liturgical orders. In the 1950s and 60s, environmental changes became more directed to Mohawk territories and reservations. Despite the numerous treaties which declared certain spaces to be under Mohawk sovereignty, various colonial development projects (e.g. St. Lawrence Seaway, Moses-Sanders Power Dam, Kinzua Dam) flooded thousands of acres of Mohawk land (LaDuke (1999), p.14-15). These projects allowed huge ships to enter the Great Lakes from the Atlantic Ocean for the first time and produced cheap hydro-electric power, both of which served to lure large corporations to the St. Lawrence river, home to several Mohawk reservations and territories (LaDuke (1999), p.15). By the 1990s, 25 percent of all North American industry was located on or near the Great Lakes, putting both Akwesasne and Kahnawá:ke directly downstream from extensive pollution.

In the past hundred years, Mohawks have challenged the degradation of their land through physical barricade, legal action, and political activism, making small strides in protecting their land and large strides in preserving their cultural attachment to that land. In *All Our Relations*, Winona LaDuke articulates the significance and resistance of these trends for Mohawk people:

> The creation is unraveling, and the welfare of the entire planet is at stake. As the Mohawks would say, when the turtle dies, the world unravels. Instead of letting that happen, the Mohawks are determining their history. They are facing down General Motors, the Environmental Protection Agency, and the big industries. They are demanding a change and making stronger their community. (LaDuke (1999), p.23)

Within the Mohawk resistance to colonization, new instructions have appeared. When the contact period began only seven generations ago, it was instructed to continue traditional ceremonies and ways of life, and this instruction remains prominent throughout traditional Mohawk discussions. In particular, this instruction is interpreted to mean that Mohawks ought to continue those ceremonies for which there is no immediate instruction provided. A large black crow-like bird used to reside up and down North America, and its migration was said to 'make the sky black'. This specific migration instructed Mohawk men to return from their hunt and begin the ceremony of thanks. Even without this migration, longhouses' faithkeepers maintain their liturgical order by initiating the ceremony nevertheless, as an instruction to protect their traditional ways in a world with a crying Earth.

*Cultural Resistance*

Culturally, there are extensive forms of resistance against the colonizers' regime, especially in overt efforts to maintain Mohawk culture. Discussions among parents and grandparents in the 1970s led to the founding of numerous independent Mohawk elementary schools, such as the Akwesasne Freedom School, which aim to keep Mohawk language and culture alive. By 1985, Mohawk-language immersion became a typical education method, where classes are taught only in Mohawk. Curricula center around the Mohawk "Thanksgiving Address", which is used as the bases of the other subjects, including the Mohawk ceremonial cycle and Mohawk history, as well as reading, writing, math, and science (LaDuke (1999), p.14). The Mohawk approach to education is best described by Louellyn White (2015), who paraphrases the words of Mohawk elder Sakokwenionkwas (Tom Porter) in *Free to Be Mohawk*:

> In order to take that route [of following instructions] you need to have your language, your Mohawk name, and be dressed in your traditional clothing [...] The school and its children have to be cared for like a garden. They need water, they need to be weeded, and they need to be talked and sung to each day and need room to grow. In the fall the corn will grow tall and the melons will be ripe for picking. (White (2015), p.178).

The Mohawks' resistance to the colonization of Mohawk culture stems from the basic desire to follow instructions, a bodily experience which naturally requires traditional ways. Thus, Mohawks actively teach Mohawk culture to new generations as a form of resistance, as a form of conformity which unites Mohawk communities together in efforts to protect their instructions. In this sense, the Mohawks (or at least their instructions) are rather Rappaportian; Rappaport and Mohawk elders alike view preservation of united *ways of life* or *ritual* as preservation of *life itself*.

*Economic Resistance*

Economically, throughout the nineteenth and twentieth centuries, Mohawks often and disproportionately worked as high-steel workers, a trade for which they would become legendary, and built a large portion of the infrastructure of northeastern North American cities. By the 1970s, the demand for this precipitous work had significantly declined, and the subsequent unemployment rates among Mohawk men badly hurt Mohawk economies (Winegard (2009), p.8). Concurrently, Canadian governments were introducing 'sin-taxes' on tobacco and alcohol, and some Mohawks began profitable businesses in the trade using their 'tax-free' status. From the 1980s, Mohawks have become increasingly more involved in a controversial "import-export" business across the colonial U.S.-Canada border. However, this economic response to colonial settlement is highly debated as a form of resistance. There is a strong political divide between those who see illegal and legal smuggling as acts of reclaiming native sovereignty and those who see it as an act which, in the end, reinforces "state" control via "elected councils" (Busatta (2009)).

The traditional economy of the Haudenosaunee (that of collective stewardship, fair labor

distribution, and trade) has been eradicated more drastically than other aspects of society, having been replaced nearly in whole by contemporary capitalism (with the small exceptions of food which can be grown locally). However, Mohawk people typically resist the white work ethic and participation in employment by white settlers. Their economic resistance to colonization shows, despite conflict, a unified agreement to establish independence from U.S./Canadian economies. The survival of Mohawk temporality can be, in part, attributed to Mohawk resistance to white work, as resistance to drastically changed experiences of a capitalist economy.

Today, Mohawk people live among five reservations and territories in New York, Ontario, and Quebec, as well as 45 percent of the Mohawk population who reside off-reservation and off-territory (reported[4] by Aboriginal Affairs and Northern Development Canada (2014)). While the past seven generations of Mohawks have experienced modernization and colonization, during which many rituals have been altered (environmentally, culturally, and economically), traditions and spirituality remain central in Mohawk society. Importantly, through the contact period with the settlers, Mohawks have started to employ some dominant, Western notions of time. While jobs, schools, and businesses make use of Western schedules, traditional lives involving ceremonies and planting continue to function with 'time pressure', the experiential receipt of instructions. Time pressure, here, can be analyzed as a societal system of social organizing. While time pressure is difficult to experience for those living a several-hour-long drive from the longhouse, it may also be an inconvenience for someone living on-reservation or on-territory. For the traditional activities at Kahnawá:ke, practicing time pressure is an act of cognitive resistance, an affirmation of a liturgical order.

The 'right time' for an event for the Mohawk is when the plants, weather, people, etc. are ready. The right time is marked by neither a sign nor an announcement nor a decision by any person(s); it is marked by the event *happening*, by the people beginning to gather. The green in the plants' leaves instructs people to have a ceremony, but it is the community's actions that instruct the ceremony to start: when people think and chatter about its happening, when the preparations begin, and when people see others moving toward the longhouse. Mohawks find the 'right time' for a ceremony through time pressure, the push of an event's anticipation felt by the individual.

Time pressure as a method for community organizing is driven by a common desire for togetherness. When a person sees gathering or preparations, they join because they want the community to share that event together. Further, time pressure achieves this togetherness; an event (that requires togetherness, such as a ceremony or festival) can only happen when there is such togetherness. For a traditional Mohawk, the timing of events is precise, occurring at the exact moment when everyone is together and the event was *instructed* to begin. But for the modern Westerner who measures precision by the standardized clock, Mohawk time pressure may appear neither definite nor exact.

[4]The reports provided by Aboriginal Affairs and Northern Development Canada are based on the communities on which it has data. It is important to note that, for this reason, their data is limited since many Mohawk people refuse to participate in the Canadian Census and other surveys.

> One dimension along which cultures clearly vary is the extent to which people's lives are regulated in time. Undoubtedly members of all cultures form representations of environmental regularities and use them to achieve a sense of orientation and of what they should be doing now. But the frequency and precision of orientation and the pressure to be doing the right thing in time is undoubtedly greater in modern Western societies than in traditional cultures. (Friedman (1990), p.111).

For the modern West, it seems pressure to be doing the right thing is driven largely by schedules, measured by standardized linear time, and there is also pressure to determine what the 'right thing' is exactly. Yet for traditional Mohawks, pressure to be doing the right thing in time is tied to a shared commitment—a coordination—to follow the Creator's instructions, to perform the what-to-do-when which they themselves did not encode. Pressure to be doing the right thing not only applies to the Mohawk, but it is the base for their conception of embodiment, as well as their conception of society. The green leaves give pressure to have a ceremony, the people and their actions give pressure to begin the ceremony, and the ceremony gives pressure to harvest. For the Mohawk, temporal experiences are experiences of pressure. What ritual, as the following of instructions, *feels like* is tempo, duration, rhythm, and frequency—the experience of Mohawk embodiment, the experience of time pressure.

Lastly, I would like to note that it would be mistaken to think of the natural occurrences discussed (such as the moon shape, leaf color, bird migration, or peoples' preparations) as a Mohawk substitute for the societal role of a clock. These occurrences do not represent time as a separate entity, but rather serve to instruct people on their actions. They initiate time pressure in a way the clock does not; they are a part of the Mohawks' material world, and following their instruction is a spiritual experience. However, if one were to think of the clock as a substitute for these natural occurrences, the Mohawk may warn it is a poor one.

> "Modern cultures have *no concept*. Everything is related to a clock or a computer or a machine which has no life, no spirit. That's why the world is confused." (Charlee Patton, Kahnawá:ke, May 20, 2016)

To the Mohawk, modern linearized time appears as a flailing attempt to take instruction from a spirit-less object (akin to following constitutional principles without spiritual applications), one which cannot possibly deliver instructions. To the Mohawk, society is only cohesive if it is bound by ritual, if it is spiritual.

Ritual, as the following of instructions, unifies the Mohawk by establishing a shared commitment to acknowledge instructions as such; ritual, as the following of instructions as a society, dissolves the distinction between individuals, between the social and the experiential. Resistance, for the Mohawk, means maintaining sovereignty over Mohawk society through sovereignty over Mohawk ritual, from the "mundane" to the "sacred".

## 3.3 Ceremony and Song

A sense of union is encouraged by coordination of physical acts encoded in instructions. Thus far, we have witnessed both spiritual and societal unification through ritual (i.e. the

performance of instructions), establishing a liturgical order across both "mundane" and "sacred" time.

> To sing with others, to move as they move in the performance of a ritual, is not merely to symbolize union. It is *in and of itself* to reunite in the reproduction of a larger order. Unison does not merely symbolize that order but *indicates* it and its acceptance. The participants do not simply *communicate* to each other *about* that order but *commune with* each other *within* it. (Rappaport (1999), p.220)

In mundane time, or non-ceremonial time, the Mohawk are unified by performance of instructions, spiritually in their notion of embodiment as well as socially in their governance. In sacred time, or ceremonial time, there is a unification of another sort, where the three temporal regions of the organic, the social, and the cosmic are established in one liturgical order. The organic temporal region is defined by the highest frequencies, more rapid than the rhythms of basic organic processes, "such as pulse, breath, and brainwave" (Rappaport (1999), 223). It is the temporal region characteristic of "rhythmical changes" internal to organisms, such as physiological processes of breathing, release of hormones, nerve reactions. The cosmic temporal region contains the lowest frequencies, that which is so slow that it is unlikely to be noticed by a society's memory (or if it is, it is remembered as epochal). The social temporal region contains everything in between organic and cosmic. It contains everyday social life, where days and moons pass.

I address ceremony and song together because they are both, in different ways, sacred time. Ceremony and song share a *sort* of time that differs from everyday performances of ritual. Ceremony is an ordered procedure, a string of acts and utterances, which are followed as a group. Ceremony is like a song, performed by a chorus, with the melody already established by no one singer but carried through by all singers. Most importantly, as I illustrate here, ceremony and song alike call together the organic, the social, and the cosmic into one liturgical order.

Mohawk ceremony begins with 'smudging', the wafting of sage smoke from the shell where it burns, into the grasp of a feather, and onto a person and their belongings. 'Smudging' is said to release negative energy from material. This is the beginning of the song, the first note. Ceremonies take place on sacred sites, in the longhouse, and around kitchen tables. Ceremonies are events that happen where they are needed. For some longhouse ceremonies, such as the medicine ceremony, the door is locked, and the happenings within the warm, wooden structure are distinctly marked from those outside. Often a fire burns throughout the ceremony or a drum beats along. Some ceremonies include dance, where the group moves counterclockwise around a space, and some include singing or chanting. Mohawk song is as rhythmic as the drum; voice is another pulsing pitch which calls and responds to the drum, calls and responds to another voice, calls and responds to the entire song. The dancers are rhythmic visually and audibly, often decorated in bells and rattles, with their shuffles sounding off the floor. As the dancers' movement(s) synchronizes with each other, the beat, and the singers' voices, the sound and dance are unified as one song. Mohawk song, dance, and ceremony is an experience of rhythm, falling in both social and organic temporal regions. Mohawk music and ceremony pace everyone's breath, pulses, movement, and pitch into, what feels like, exact unison. These are organic and social pro-

cesses unified at once.

In Mohawk ceremony, four sacred plants are used: sage, cedar, sweet grass, and tobacco—the latter of which carries prayers to the spirit world when burnt. As the ceremony concludes, it is common to share a meal together, often containing berries as a way to connect with ancestors. Mohawk ceremony takes place where boundaries are cross-able between the spirit world and the material world, between ancestors and the living, and thus, between temporal regions. The cosmic temporal region is one where frequencies are slower than one could notice; yet Mohawk ceremony communicates directly across it. If the ceremony occurs, as it appears, in ordinary space, then ordinary space can transcend mundane time into sacred time, accessing both organic and cosmic temporal regions through the social region. In Mohawk ceremonial and musical rituals, there becomes a sort of equilibrium of the three categories, a unification of all temporal regions and frequencies. Ceremony and song times are sacred; their instructions unify not only bodies and society, but temporality itself.

## 3.4 Mohawk Language

Mohawk is often referred to as a "tenseless" language, one whose verbs do not have past, present, and future tenses as in English. However, the Mohawk not only have a sense of time, but can also easily use their language to express it. Baker and Travis (1997) argue that "the mood prefixes are not analogous to tense morphemes in English; rather, they are analogous to the article system in English noun phrases, in that they mark the verbal equivalent of definiteness and indefiniteness" (p.216). There are three modal prefixes in Mohawk, each expressing an attitude of the speaker toward what is being said and reflecting the validity, probability, or desirability of the action or state in the statement (Bonvillain (1973), p.164). The modal prefixes are mutually exclusive for semantic purposes; their meanings would never co-occur. They are used to express either pastness or present certainty, futureness, or definite futureness (that which will *certainly* occur, or ought to). Additionally, there are eight non-modal verbal prefixes which can occur in Mohawk verbs. These "express a variety of different ideas which cannot be unified under a more specific label" (Bonvillain (1973), p.172). Bonvillain (1973) notes that "the only generalization which can be offered about the semantic characteristics of non-modal verbal prefixes is the idea of the unity of spatial and temporal locatives" (p.174). For example, the coincident prefix expresses ideas that have to do with temporal or spatial relationship of action and states, particularly temporal sequences or facts that certain states or actions occur in relation to other states or actions, and the coincident prefix expresses the idea that two or more states or actions are the same or occur at the same time (Bonvillain (1973), p.180). In investigating the construction of Mohawk liturgical orders through embodiment, a linguistic unity of space and time becomes immediately relevant.

The unification (i.e. construction) of temporality is present in embodiment, society, ceremony, and song, and Mohawk language is particularly well-suited to express the concepts of a temporality characterized as such. Temporal diction, such as moon cycles, seasons, and daily occurrences, often mean 'when it happens that...' I provide several examples of

Mohawk terms that are temporally oriented, directly indicating a unified temporality.

For the Mohawk, language is said to be 'the ancestors' mind' and gifted to people through the Creation Story. It is regarded as inherently spiritual because many words come directly from the Creation Story itself. For example, the Mohawk word for Native or Indigenous persons translates to "real people," which refers to the creatures created with clay in the Creation Story. The words presented here[5] also appear in the Creation Story, from which their meanings are said to come.

| Mohawk Term/Phrase | English Translation | Rough Literal Translation |
|---|---|---|
| O:nen enskahten:ti ki'wáhi | goodbye | it's time for me to leave, do you agree? |
| she:kon skennen'ko:wa ken | [greeting] | is the great peace still/again/more with you? |
| kakwité:ne | spring | when the new tree saplings beginning to grow |
| akohserá:ke | winter | when the year ends and renews |
| kanenna'ké:ne | fall | when the seeds come to the end and when they are collected |
| tsi ia'tewatshénthos | sunset | when over there it sinks |
| tsitkarahkwinéken's | sunrise | when the light is coming up |
| ahsonthennéhkha' | midnight | the light at night that is provided by the moon |

First, I provide severeal notes. *Tsi* in Mohawk translates best to *time*, as it is used in explicitly temporal words, such as *tsi ia'tewatshénthos* (sunset) and *tsitkarahkwinéken's* (sunrise). *tsi ia'tewatshénthos* (sunset) literally translates to *the time when over there it sinks*, where *ia* means *over there*. *akenhá:ke* (summer) has an unknown root, but it is speculated that it could be *aionken:tane*, meaning when it shows or produces. Lastly, *O:nen* (it's time) is commonly used as slang for *O:nen enskahten:ti ki'wáhi*, and *she:kon* (still/again/more) is used as slang for *she:kon skennen'ko:wa ken* ([greeting]).

In each phrase presented, the term expresses some occurrence or temporal readiness, often in terms of negotiation. Mostly, the terms refer to occurrences in the social temporal region since they refer to everyday interaction with temporal landmarks. Yet concurrently, these meanings *are* the concepts themselves. In addressing the seasons, Mohawks refer directly to what occurs or the seasons' appearances, which in turn indicate the time pressure that attaches to them, and similarly to daily occurrences, sunrise, sunset, and midnight. The meaning of these temporal events is in human engagement with them, and that is in no way limited to the social temporal region. The term not only represents the time pressure associated with a temporal event, but it also marks a recurrence of that time pressure across even the cosmic temporal region, starting at the Creation itself. Engagement with temporality is not only an aspect of the Mohawk embodiment, society, ceremony, and song, but also of Mohawk language.

[5]The literal translations were provided by Eileen Patton, in writing from Kahnawá:ke (June 18, 2016).

# CHAPTER 4

# A STUDY ON MOHAWK TEMPORALITY

In the present chapter, I analyze the Mohawk conception of time through an interview-based study. I report on the logic employed by participants in order to offer an introductory investigation into the Mohawk conception(s) and representation(s) of time, outside of the linguistic system. Literature on conceptions of time commonly employs methodology which tasks participants to detail stories or temporally ordered events in order to elicit temporal gestures and expressions (Boroditsky and Gaby (2010), Fuhrman and Boroditsky (2010), Le Guen and Pool Balam (2012), Levinson and Majid (2013), Núñez et al. (2012), Tversky, Kugelmass, and Winter (1991), etc.). The present study takes a contrasting approach by inquiring directly about temporal concepts and reasoning. Thus, the study's data is situated in both contexts: discussions of time itself (e.g. an explanation of linear time) and discussions of temporal happenings, as in the literature (e.g. a story of aging). The study achieves this by soliciting participants' reactions to and reasoning about various conceptions of time.

Each interview is composed of three main questions, consisting in the presentation of a conception about time and requesting the reaction of the participant. The three conceptions discussed are *standardized linear time* (as in modern Western temporality), *occasionalism*, and *Saint Augustine's argument*. Each conception introduces various properties of time to the participant, thus bringing up those characteristics in relation to their own conception. I begin the chapter with a discussion of the logical and philosophical considerations of these three conceptions in order to anticipate potential variations on them via comparing and contrasting. Then, after laying out the method of the study, I report on responses to each question with focus on their logical workings. I conclude by analyzing the findings and formalizing the most prominent conception found in the data. In the next chapter, I report on the production of gestures, in connection to the logical findings of the study.

## 4.1 Logical Considerations of the Study

The present study aims to contrast three ideas (or conceptions) about time with the participants' conceptions by presenting and requesting reactions to each. Thus, before proceeding with the study which aims to understand the logical workings of a Mohawk conception of time, it is worthwhile to review the three ideas about time with which the participants compare and contrast. In the present section, I present mathematical, logical, and philosophical considerations of the three ideas, in order to sketch the relevance of each in relation to potential comparative results. Note that any mathematical and logical discussion is not meant to formalize a conception of time precisely but rather lend language and concepts for their descriptions.

**Standardized Linear Time**

The contemporary Western notion of time, standardized by the clock, forms a linear structuring of events. The literature greatly varies in the formalisms of such a conception of time (e.g. Russell (1936) or Benthem (1988)), from understandings of 'events in time' as instants versus intervals, to opinions on the density and continuity of the linear structuring. Without pursuing a study on the particularities of the Western conception of time, it is hard to discern the precise properties worth formalizing (after all, they may differ subculture to subculture or even person to person). Nevertheless, at its most general form, there are some properties worth speculation. For ease of communication, let $X$ be the set of events in time (thought of as moments or instants, again for ease), $\leq$ be the binary relation 'occurred before or at the same moment as', and $\langle X, \leq \rangle$ be the event structure of Western time. First, no pair of distinct moments can be related to one another. That is, two events that happen at different moments cannot both 'occur before or at the same moment' as each other. The relation $\leq$ is *antisymmetric*:

$$\forall a, b \in X : (a \leq b \wedge b \leq a) \rightarrow a = b.$$

Next, whenever $a$ occurs before or at the same moment as $b$, and $b$ occurs before or at the same moment as $a$, then $a$ also occurs before or at the same moment as $c$. $\leq$ is *transitive*:

$$\forall a, b, c \in X : (a \leq b \wedge b \leq c) \rightarrow a \leq c$$

Most importantly, the Western conception of time is linear. This means that under the relation $\leq$, every two moments in time are related. $\leq$ is *total*:

$$\forall a, b \in X : a \leq b \vee b \leq a$$

Due to these basic characteristics, the Western conception, in general, can be thought of as a linear or total order. Of course, it can also be formalized as a strict total order on $\langle X, < \rangle$, where $a < b \leftrightarrow \neg(b \leq a)$; in this case, $<$ would mean 'occurs before'. I proceed by discussing topological and order theoretic variations and contrasting views to this conception. I begin by addressing circularity and present some mathematical curiosities surrounding such a conception, before addressing temporal speed in terms of continuity and differentiability.

If Western time is totally ordered, then it carries an order topology. Thus, as a topological space, Western time, depicted as a total order, is homeomorphic to any of its open

intervals. It is not, however, homeomorphic to a circle, except in the case that one employs compactification to achieve the 'real projective line', extending the number line with a point usually denoted $\infty$. This exception $\mathbb{R} \cup \{\infty\}$ seems rather dissimilar to Western dealings with time since a Westerner does not typically represent time in circular motions, nor eternity in a solitary position (see Cooperrider and Núñez (2009)). However, it is a potential variation on a total order that would topologically be similar to a circle (i.e. a closed curve).

The real projective line, adopting the topology of a closed curve and (roughly) the ordering of a continuum, is one of many possible results of an investigation into a conception of time. Let us consider other potential circular conceptions with various orderings and topologies. The most obvious order within order theory to arrange a set into a circle is the cyclic order, defined by the ternary relation $C$ (written $[a, b, c]$ as in Černák and Jakubík (1987)) meaning 'after $a$ occurs, $b$ occurs before $c$ occurs'. Let $X$ be the set of events in time. Then, as in Novák (1984) (p.323), $\langle X, C \rangle$ is a cyclically ordered set *iff* $C$ is:

$$\begin{gathered} \textit{asymmetric}\text{: } [a,b,c] \rightarrow \neg[c,b,a] \\ \textit{cyclic}\text{: } [a,b,c] \rightarrow [b,c,a] \\ \textit{transitive}\text{: } ([a,b,c] \wedge [a,c,d]) \rightarrow [a,b,d] \\ \textit{total/linear}\text{: } (a \neq b \neq c) \rightarrow ([a,b,c] \vee [c,b,a]) \end{gathered}$$

Cyclically ordered sets provide a solid first depiction of a circular conception of time. They allow for either finite or infinite cycles, clockwise or counterclockwise orders, and linearly ordered 'cuts'. Yet the ternary relation $C$ is rather idealistic in its definition. A person or community may conceive of time as an ordering with more precision than 'after $a$, $b$ occurs before $c$'. A binary relation $<$ may be needed. Of course, given a cyclically ordered set $\langle X, C \rangle$, an event $a \in X$ can define a linear order $<_a$ on the remainder of the set $X \setminus a$ by the rule $x <_a y$ *iff* $[a, x, y]$, where the binary relation $<$ is such that $[a, b, c]$ *iff* $(a < b < c) \vee (b < c < a) \vee (c < a < b)$ (Huntington (1935), p.7). However, a linearly ordered (or totally ordered) cut is not a fully circular conception of time; its start and end are not the *same point*.

Let us address a mathematical attempt at navigating a circular conception based in an order $\leq$, '$a$ occurs before or at the same time as $b$'. Consider a finite example where $X = \{x_1, ..., x_n\}$ (for $n > 1$) and $\leq$ is defined such that $x_1 \leq x_2 \leq ... \leq x_n \leq x_1$. Assume $\leq$ is transitive. It can be deduced that $x_1 \leq x_n \wedge x_n \leq x_1$ ('$x_1$ occurs both before and after $x_n$'). In fact, it could be deduced that for any two distinct members $a, b \in X : a \leq b \wedge b \leq a$, i.e. that $\leq$ is symmetric. Thus, if a circular conception of time (at the level of *binary* relations of events, not ternary) were transitive, then it would be symmetric. Under such a conception, one could reason that an event occurred both before and after another event. This is a possible, though highly unlikely, conception of time. After all, humans generally need to communicate the binary ordering of events (e.g. *where one went earlier* or *what one is about to do*) without error. Further, note that if there was only one distinct member of $X$, then $\leq$ would be transitive *and* antisymmetric. For a circular conception of time, this would be conceived of as an ordering on a singleton $X = \{x\}$ (a curious conception worth many philosophical questions).

The final note regarding circular conceptions of time is topological. A circle as a topological space is a closed curve, having one hole and no tails, and so with only slight variation

of the mathematical circle, we find an entirely new topology. According to the basic classes of homeomorphisms, the variations include a circle with one or more tail(s) and a closed curve with one or more handle(s). For a conception of time, any of these topologically distinct variations are imaginable, if time were to have 'off-shoots' (tails) or multiple 'routes' (handles).

Another aspect of the Western conception of time is that of *pace* or *speed*. While time can be said to 'fly by' or 'pass slowly', there is little structure in the conception itself that accounts for changes in perception. The linear nature of the conception is steady and, in mathematical terms, differentiable and with a slope of 0 at any point (if described in two-dimensional terms). A variation on this conception could be a differentiable curved line, a non-differentiable straight line, or a non-differentiable curved line (in the latter cases, a question would arise regarding where and how many points are not continuous). Further, as the slope changes along the domain, one may ask what a slope indicates. Most obviously, analogizing with physical inclines/declines would suggest that a positive slope is a slower pace, and a negative slope is a faster pace (just as one moves on inclines/declines). Lastly, variations need not differ from the Western conception by subsisting in the two-dimensional plane; in three dimensional terms, a conception could also move along the Z-axis, i.e. left and right. Again analogizing with bodily movement, these cases might indicate a more comfortable path (think of walking around a hill instead of over it), or it might be a longer path (think of having to move around an obstruction). In comparison with the Western linear conception of time, a variety of logical properties of a conception of time are available for investigation. Ordering and its relevant properties, topologies and homeomorphisms, and differentiability each connect to different aspects of a conception of time, from rules employed in reasoning, to the mental representation of time (possibly present in gesture), and the accommodation of subjective experiences of time.

**Occasionalism**

The second temporal notion that will guide comparative discussions of Mohawk temporality is that of occasionalism. Such a philosophical theory on causation claims that created entities cannot be 'real' causes of events but rather all events are caused by God. The famously occasionalist Nicolas Malebranche, in *The Search after Truth*, describes the position centering around the distinction between 'true' causes and 'occasional' causes:

> [...] there is only one true cause because there is only one true God; that the nature or power of each thing is nothing but the will of God; that all natural causes are not *true* causes but only *occasional* causes, certain other truths that will follow from these. (Malebranche (1997), p.448)

Occasionalism puts forth that God is responsible for all created things, and so causation as well, in the sense that he and only he makes one event lead to another. Temporally, then, God is responsible for not only the causation of one event by another, but also for the continuing existence of uneventful beings. The example presented by Edwards (1835) in *Original Sin* deals with the moon's being; the moon cannot *cause* its existence in the next moment since 1) it does not actively act to cause anything and 2) it cannot produce effects in another *time and place* than where it is.

> That God does, by his immediate power, *uphold* every created substance in being, will be manifest, if we consider that their present existence is a *dependent* existence, and there is an *effect* and must have some *cause*; and the cause must be one of these two, either the *antecedent existence* of the same substance, or else the *power* of the *Creator*. But it cannot be the *antecedent existence* of the same substance [...] For not only was what existed the last moment, no active cause, but wholly a passive thing; but this also is to be considered, that no cause can produce effects in a *time and place* in which itself is *not*. (Edwards (1835), p.223)

Occasionalism involves a temporality in which time is created continuously by God, where temporal events occur by God's will and may appear as 'true' causation. Under this philosophical theory, time is created as it is experienced, rather than all at once.

In prompting participants' reactions to this temporal idea in occasionalism, I will investigate the creation of time, the nature (or realness) of causation, and the role of a more powerful being or force. Of these three topics, there is immense variation to consider. Any one of the occasionalist properties could be rejected or accepted, or offered amendment in many ways. Further, the relationship between statuses of various properties will also require consideration. For example, the Creation Story, central to Mohawk spirituality and culture, details the creation of the material world from the spiritual world, and it seems natural that time would also have been created then with the material world. Yet this could be further detailed by the *role* of the Great Spirit (or Creation) within causation or the recurrence of time. Regarding the 'realness' of causation, the status of free will and determinism come into question as well.

**Saint Augustine's Argument**

The final conception of time to which participants will react comes from Saint Augustine's *Confessions*. In Book XI, Saint Augustine asks God what it *is* that he measures when he measures a duration of time.

> For what is it I measure, I ask thee, O my God, when I say either, roughly, "This time is longer than that," or, more precisely, "This is twice as long as that." I know that I am measuring time. But I am not measuring the future, for it is not yet; and I am not measuring the present because it is extended by no length; and I am not measuring the past because it is no longer. What is it, therefore, that I am measuring? (*Confessions* Book XI 33)

Saint Augustine concludes that time does not truly exist. He reasons that since the past is no longer and thus does not exist and the future has not yet occurred and thus does not exist, we are left only with the present. However, if the present were perpetually present, there would be no time, but only eternity. Saint Augustine, through his religious workings, finds that time exists only in the sense that it tends to non-existence. Time, then, marks a difference between God and other beings; God does not experience the perplexing 'present' as we and Augustine do.

> Between God and the creature is the same difference as between a consciousness

> in which all the notes of a melody are simultaneously present, and a consciousness which perceives them only in succession. In its normal operations the human mind through memory in some measure transcends time, as, for example, when we apprehend as a whole a metre or a melody, though the individual notes and sounds are successive not simultaneous. (Hausheer (1937), p.504)

Saint Augustine's argument brings into question the realities of the past and future, the existence of time for purely spiritual beings, and the role of memory in the distinction of past and present. Its potential rejection could take many forms, either opposing one or more premise(s), its soundness, or its many consequences on the capabilities of memory and the sequential experience of the material world. Its (even partial) acceptance, on the other hand, would detail a conception of time in regards to spiritual beings, the passing of the present, and memory.

## 4.2 Method

In all communications before an interview, participants were only told the researcher was studying time and "interested in time in Mohawk ways". The questions and specific interest in gesture were concealed.

**Participants**
Ten Mohawk people aged 35-74 took part in the study (5 women, 5 men). Seven participants were fluent speakers of Mohawk, used both English and Mohawk for day-to-day communications, and were literate in both. Of those seven, four were raised bilingual and one was raised only speaking Mohawk. One participant who was raised bilingual also speaks Seneca and Oneida. The three participants who were not fluent in Mohawk know some Mohawk and understand Mohawk to varying extents. Of those three, one was fluent in French in addition to English.

All participants reside in Kahnawá:ke. Nine participants were raised there, and one was raised in Akwesasne, a nearby Mohawk territory. All participants are active and regular participants in a traditional longhouse at Kahnawá:ke, meaning that they attend traditional Mohawk ceremonies frequently. At least three participants have been traditional Mohawk their entire lives. The other seven have had varying Christian influences in their childhoods and adolescences. One participant was forcibly Catholicized in a boarding school from age 6, and remained Catholic until age 54 (20 years ago). Some participants knew the interviewer personally prior to the study.

**Procedure**
Three interviews were conducted in-person, with the interviewer seated with the participant(s); the other six interviews were conducted via webcam, and recorded with a separate camera. For this reason, the interviews were conducted in a variety of locations, both indoor and outdoor, with and without tables. The interviewer was also filmed during the interviews to record gestures, in case of mimicry or error. In general, the interviewer avoided any gestures, except when explicitly describing shapes. All interviews were seated and had no strict

time limit. One interview was conducted with two participants at once.

The format of each interview included a one-by-one presentation of three ideas or conceptions of time (in particular, standardized linear 'clock' time, occasionalism, and Saint Augustine's argument), and then a request of the participant's initial reaction. Participants were instructed to listen carefully to the description of 'another way of thinking about time' and then give their 'intitial reaction, what makes sense or doesn't make sense'. The interviews were intentionally conversational. Follow-up questions, on both ends of the participant and the interviewer, were common and welcome. After the three prepared questions regarding other conceptions of time, the participants were also asked about the culture of the longhouse and Mohawk spirituality, such as when a ceremony begins and if there is time in the 'spiritual world', often in connection to their previous answers.

## 4.3 Results

The participants were very willing to discuss conceptions of time and articulate their reactions immediately. In general, arguments for or against certain properties of time drew from Mohawk spiritual teachings, e.g. the Creation story, ceremony cycles, medicines, and harvests. I proceed by addressing each question in turn, for which I account for each participant's response. Throughout, I reference segments of interview transcripts cited with the participant's number (P1-P10) as well as the clip number and time stamp (e.g. 1 00:00-00:01). My selection of transcripts highlights responses which are either representative of a group's responses, or unusual in comparison to other responses.

### 4.3.1 Responses to Standardized Linear Time

When presented with the contemporary Western conception of time (i.e. standardized linear time), seven participants explicitly disagreed with the view, among nine who described a topologically different idea. The one participant who agreed that time is 'like a straight line' later added that it may 'go up and down'.

Of those seven, disagreement with the conception was rather immediate, in that no clarification was needed from the interviewer before concluding that it was not an accurate picture of time. Most participants reacted immediately with a negative response, the strongest being:

> **Participant**: That is the most absurd thing I ever heard in my life! Where'd you get that line from? (P7; 1 5:08-5:19)

Moreover, of those seven who disagreed with the linear conception, all participants explicitly cited a circle as a better picture of how time works. Most participants cited that time couldn't be a straight line because it does not resemble 'how nature works'. Two participants cited that time isn't always the *same* as it continues, as the linear picture shows. Instead, they suggested, time has to be able to adjust as it continues.

> **Interviewer**: The first kind of thinking about time is from the West. It's the idea that time is a straight line that continues forever in both directions. It's totally

> empty and exists whether or not events are occurring. It exists totally separately from anything else that goes on. It exists forever and goes on and on as a straight path. What would be your reaction to that?
>
> **Participant**: Well, I don't know if I, if it's uh, I'm sure that uh, if we look at what our teachings are, I don't think there's a big difference in that. Except that we look at time instead of just a straight path, as a circle, as a continuum, a rotation. It just keeps going around, you know? Just like the Earth goes around. That's the way time works. And even like cycles. It cycles. It goes around. So what you might see now you might see it again in a thousand years, you know? And that's the way time is.
>
> **Interviewer**: We experience many cycles at the same time, you were saying though.
>
> **Participant**: Yeah.
>
> **Interviewer**: But it still takes the form of one circle?
>
> **Participant**: Everything that lives, right, has its own cycle. The grass that grows here, it has its own life cycle. It has its own life cycle. So how long it lives, how it lives, where it lives, how it reacts to the things around us. It's, you know, all a part of this cycle of life. Everything reacts to things differently. Everything grows in its own way, you know? Everything adjusts, makes the adjustment, like the uh, yesterday we have about three or four–a month of drought, so the grass shut itself down to adjust. The leaves here, you see the tops of the trees. The tree couldn't supply all those leaves. So in order to live, it had to kill–some of its leaves had to die. To conserve the water, use the water it needed–or that it had, you know? So it has to make those adjustments in its own way. What's happening around time is that everything is on its own cycle.
>
> **Interviewer**: And none of them are straight lines, you're saying?
>
> **Participant**: Yeah, no I don't. Yeah. [interruption] But you know what I mean? I don't think there is just one straight line. Everything is like this, everything is moving in its own dimension, in its own space, and functioning in its own rate of time. (P1; 1:03-4:18)

Further, all participants discussed the spirit world (or sky world) as conceptually above the ego (though it has no physical, material location). Three participants explained that the sky world has a place on the circle, either at the top or the top half of a vertically oriented circle.

> **Participant**: We're made of the clay of the Earth. This is the Earthly part of us. And this Earthly part, we walk on the Earth for a time that the Creator allowed us. And then when we're done, we go back into the Earth, and we, we put our

> clay back into our mother the Earth. And then we go on a spirit journey, which is a continuation, the other side of the cycle. And go back into the sky world, where we came from. So it makes a circle. There's no straight line in there. Everything's a circle. (P1; 11:34-12:12)

In this explanation, the circular conception gains orientation (namely a vertical one), and the circular conception is detailed in segments of a material life and a non-material (purely spiritual) life.

Participants who cited a circle were also presented with a helic shape, and all seven participants responded negatively to the idea.

> **Interviewer**: And so if time for you, if you don't think it would be like a straight line—-
>
> **Participant**: No way.
>
> **Interviewer**: –what do you think it would look like instead?
>
> **Participant**: It's a circle, comes to my mind. It's a circle. Always in a circle. Like the way his face [the sun's] is, it's circular.
>
> **Interviewer**: What if I were to talk about another shape, where instead of a circle, it was a circle that kind of moved like this, kind of like a slinky? What would you think of that shape?
>
> **Participant**: That would still seem odd to me. Because he has that flavor of clockwise movement, so the only way I could relate to that is if it's a slinky movement going in the clockwise spin, turning. Ok? You know that I'm not too great at the linear thinking, eh? I did some educational pieces, Ha-da-ga-gueh and all those learning things that our people are like so it's really foreign to me, ok? And I understood why. Gotta bare with me, girl. [laughs]
>
> **Interviewer**: And for this circle, does it also have a movement, or a direction?
>
> **Participant**: Yes, always. Always. The Earth going counterclockwise, and also the Sun going clockwise. And here's the thing—-not to mock you or anything, when you do your dishes, check on your end when you unplug the drain, which way the water spins. I got a little more prudish. I would say "flush the toilet and see which way the water turns". It's called go-with-the-flow type deal. (P6; 1 7:55-10:00)

While this participant noted that he agreed with the directed motion of a helic shape, the other participants responded that a helix cannot resemble time since its beginning and end are not the same.

Of the other two participants who described a conception of time which topologically

differs from a straight line (but did not cite a circle), one described a hill. The hill-like thinking about time was immediately connected to a cyclical movement:

> **Interviewer**: I had a couple more questions about time as a straight line. So you said it's bumpy and it might have curves, and it might change. What does it look like to you, though when you—-well, that's a sort of zoomed in picture of it, that's what it looks like from our perspective. It looks like it curves up or something like that. But when you kind of zoom out, what does it all look like? Does this curvy, bumpy path go in a straight line sort of, when you're really far away from it? [pause] Does it go to a particular destination?
>
> **Participant**: Well, it depends on how far you can see. So, like me, I can see pretty far. And I see it going to a curve, but like high, going up high and coming down. So it's like a hill. It would be a hill. It seems more curved to the right to me. So it can be a curve coming up, like an S in the road. And it could be, people think cause we live on Earth and the Earth is round, that's how we go. Round and round. (P7; 1 14:02-15:37)

The description differed from others in that it placed the ego into the description of time, rather than discussing its properties unrelated to the ego. The last participant who described a different idea than a straight line insisted that time does not exist and so could not describe its shape. She reasoned that there is only the present since the past is no longer and the future has yet to happen (interestingly, nearly exactly Saint Augustine's argument):

> **Participant**: Well, I think time [pause] time really doesn't exist. There's uh–it's always now. We live in the present, in the now. And, the past is gone, and the present [sic] isn't here yet. So it doesn't exist. We're only in the now. I just have to tell you a little story about when I was in residential school. I was six years old and all by myself with my sister. And many many horrible things happened to me. So I never said "Today is Wednesday". I always said "Tomorrow is Thursday". I lived in the future because, because today was too hard. It was too difficult. I was being abused, even sexually, and so to me, in my mind, I was not here. I was–and the future hadn't arrived yet. So nobody could harm me. So that was, something there. But I–right now, in my life, that's what I feel. There's only now.
>
> **Interviewer**: So you feel like it's different for you now, then back then? That back then you tried to live in the future, but now you live in the present?
>
> **Participant**: Yes.
>
> **Interviewer**: You said that it's like the past doesn't exist because it already happened. Do you think that's the same for the future, that it hasn't happened yet and so it doesn't exist?

> **Participant**: Yeah, that's right. It doesn't exist. It hasn't been here yet. It's just now. (P10; 1 7:51-9:48)

The participant immediately connected this way of thinking about time with mental health. It was also noted by two other participants that perception of time is connected to mental health; one noted that living outside of the past is good mentally (P9; 1 5:14) and another noted that the Creation seems halted for people who have experienced trauma (P6; 1 17:45).

The only participant who agreed that time is linear indicated that it may go up and down, though provides no further detail or explanation:

> **Interviewer**: I wanted to ask a little more about this straight line picture. Do you think that this line would be perfectly straight always?
>
> **Participant**: I don't know. Maybe it would go up and down. (P9; 1 10:48-11:13)

This participant clearly differed from others in her topological description of time, but as is shown in later responses, agrees with the majority of participants on matters relating to the creation of time.

Participants' reactions to standardized linear time were generally non-linear. In the cases where circles were cited with orientation, the circle was oriented vertically. Helices were overall rejected. The three responses which did not cite circles explicitly were distinct from one another, sharing few characteristics topologically.

### 4.3.2 Responses to Occasionalism

When presented with the occasionalist idea that time is being created as it is experienced, nine participants agreed, and one participant responded that it was possible. Seven participants indicated that time is being created continuously by the Creation itself (i.e. the material world, that which was created in the Creation story).

> **Interviewer**: The next question was about how time is given to us. So, there's another idea of, that every moment is created and then given to us, created and then given to us, over and over again. So not all of time was created all at once, but every moment is created and then experienced. What's your first reaction to that?
>
> **Participant**: I can only go back to the original instructions given to everything that is on this planet, is on this land. And everyone–everything–got the same instructions about working together to have a peaceful existence. And that if you do that, you will have a good life. [...]
>
> **Interviewer**: Was time also something that was created during the Creation?
>
> **Participant**: It's like I don't even think about it that way. It's like it's part of

> life, you know. Time is living. Life was given. Before there was human life, there was spirit life. That's the life that comes from the sky world. The spirit life comes here, and originally they say that it was all spirit. Everything here was spirit life. And the Creator has to settle things, make agreements, for everything to work together because initially there are stories about conflict where the Ha-do-nee faces are—you know how humans are, we run into people that are full of themselves, and "I am the most strongest, powerful, best, and if you don't listen to me you're done for". The creator had to go around to all of those other spirit beings and reach an agreement, and they say the Creator always protected the humans, always looked for a way for the humans to be considered. And so that's why we got-—we are where we are. We've got this protection. So for me, I don't think about time that way. I just think about what I see. And it's provided. (P2; 15:27-18:57)

It was explained that the Creator made the Creation (the world) so that it could continuously create time, as we experience it. All of time was not created at once, but rather a world was created at once which could sustain time for itself.

> **Interviewer**: So the next idea about time is the idea that time is constantly being created. So when somebody goes to create all of time, it wouldn't be enough to create it all at once. Instead, they would have to create it little by little. So this is the idea that every 'now' that we experience, it's being created as we experience it. What's your reaction to that?
>
> **Participant**: I hundred percent agree to that. You are what you are. A piece of that creation is within all of us. [...] It never stops. It continues. I agree a hundred percent. Things are changing all the time. Our elders were never fearful of earthquakes. They said, "oh, turtle island has to grow a little more to support its people. He's in the growing pain or process. Each time the earth shook, he grew again to support the people." Yes, I agree with that part. Every day is a work of Creation. Within us, everything around us, and Creation itself. Even learning something everyday, remembering something, is bringing the past and the present together, to be able to understand that future, what's it's going to bring. It's in our teachings, all of this, what I just said to you.
>
> **Interviewer**: And you said it comes from the Creation, these moments, these 'nows'. But what does that mean, coming from the Creation? Is that a being, or is it in—
>
> **Participant**: It's an energy movement that's going to continue. The intent, the initiative, was all foundated. Now we get to polish and shine up that movement forward into the future. But we can never forget the past part of it because that's the foundation of all of the things. (P6; 1 14:14-17:13)

Because the Creation is the material world, time seems to be further detailed as a part of and a result of the living world. It was not created all at once, but rather something (namely

the Creation) was created all at once so that it could continuously create time. Here again, as in the responses to standardized linear time, time is noted as somehow *adaptable*. Time is something which is created everyday so that the world can sufficiently adapt and grow.

All seven participants who attributed the creation of time to the Creation itself provided examples of how the Creation makes time. Two participants attributed the creation of time, in part, to the rotations of the Sun and Earth, as a part of the Creation. At least six participants indicated that ceremony continuously creates time. One participant explains,

> **Participant**: Well, it's simple. The belief is that if all of the ceremonies stopped, then the world stops. Cause there's a direct correlation between the lower world and the upper world. So like my grandfather says, if we didn't–stopped doing these things, the world dries up. So us as human beings, if we stopped giving these thanks, then what happens? Then there's going to be no life. (P8; 4 0:58-1:23)

Ceremonies are a form of communication between the material (lower) and spiritual (upper) worlds. They affect both worlds and 'keep things going'. Three participants provided an example that the recent longhouse ceremony, which occurs at the beginning of Spring, "encourages the trees" or "makes more sap" in the trees. This is done by giving thanks to the trees and to the Great Spirit in the form of prayers which are sent to both worlds. Thus, the Creation is able to continuously create time due, at least in part, to its interactions with the spiritual world.

Six participants centered the discussion around every *day* being created as it is experienced, as opposed to every *moment* or *now*. Five participants explained that life consists of days. Two pointed out that in the Mohawk language, the literal translation of "dying" is "running out of days". One participant distinguished between days, as parts of time which are given as they are created, and 'time':

> **Participant A**: Che-nye-ash-gue, as we call it,
>
> **Participant B**: Yeah, "when it's time"
>
> **Participant A**: Yeah, but we don't say "time".
>
> **Participant B**: No, I know, but... It's at that moment.
>
> **Participant A**: Yeah, when it's-—you arrive there, that's why-—there's days, days. Because when this—-I forgot about this part. When he created the first man, he was supposed to live for two hundred years or more. In fact, actually, he was supposed to live forever. Our time, whatever you're gonna say now, you can say 'our time'. But they said he made notches on a long stick, and he made notches. He gave us days, not time. See? That's what we're missing. It's days. Because when you run out of days, you will die. And it doesn't—cause we live–when we're born, going back, when you're born, you live for this one reason. That one day, it's going to run out, and you're going to be laying there like that.

> No more breath, your body's cold. You ran out of days. That's the only way I can explain to you about time. Because there was no time long time ago, in the first place, for us. There was only days.
>
> [explains how to carve notch into a stick]
>
> **Participant A**: Because when the first death came upon the man, he was working, they say, in Akwesasne, he fell down. No more days left into him. He didn't say time. So they did not know what happened to miss his parents. I know this story because, in fact, tonight I have to do a wake. We talk about this coming of death. This is uhh–I got to be careful talking not to forget what I'm talking about. [...] It's not time. You run out of days. That's how our people–
>
> **Participant B**: In our language, the word, "you run out of days". (P3,P4; 20:35-25:56)

It can be seen here that the conception may include portions of time which are not totally (or even partially) ordered. Rather, the experience of days provides an ordering throughout one's lifetime that is notably different before and after death. The difference between time in the material and spiritual worlds is again addressed in numerous responses to Saint Augustine's argument, in the next section.

Lastly, the conception is further grounded in a distinction between the material world and the spirit world as 'lower' and 'upper', respectively. One participant explained that entering in and out of the material world is like following an arch on the East and West:

> **Participant**: You have people, for example, today, our people here in the longhouses, that have been in those longhouses for years but still feel that form of disconnect. Because they lost their foundation prior to. Due to colonial times, due to low self esteem, due to low self confidence, trauma, etcetera. Creation seems to stop for them and it kinda holds them hostage, to even whereas they go into some semi self destruction of no growth. Just clinging to the past and not moving forward. I do passage on a turtle's back. Each plate has cross-overs. Linears—-there's your linears! The lines on the turtle's plate gives us the ladders to go over. So what I'm getting at is: everyday you spend here, the way it was taught, was spending, practicing, working, everything that was laid out. Because in the end, as you pass, it's looked at as 'you've reached the top of your latter'. You've got all the tools, everything's with you to practice that. A duality, the lower world, and the upper world. Makes sense to you?
>
> **Interviewer**: Yeah, yeah. Definitely. When you were talking about moving forward into the future, is that like moving up on the ladder?
>
> **Participant**: You're going to move to that new beginning. At the same time, you're ascending, rising at the same time. That ok? Like a graph, you're going parallel to horizontal, and at the same time you're rising up. And I don't do

graphs a lot. It's all in my head. I can't draw it out for you, but it computes in here.

**Interviewer**: And what about when you come from the upper world, when you're born? Is that similar?

**Participant**: When I what? Say that again, please.

**Interviewer**: When you come from the upper world, when you're born, is that similar?

**Participant**: Very. That's where it all begins. Because we were thought of as spirits, deriving from sky world. Coming back to the Earth, seeming like to grow and to shed. It's like a purification process. You're brought back here to make some sort of things right. Form of reincarnation. And you elevate—-that's what I mean by you're shining yourself up to a form of such a pure, straight forward, innocent entity. Where nothing can hold you back. No doubt, no self confidence. Everything just continues to go forward without any obstructions—-obstacles for you to be staggered or, or coupled with, hand cuffed. It's like freeing yourself, of anything that can hold you down. Quite a process, quite a growth, quite a journey.

**Interviewer**: When you come into the world, is it the same? You're saying to go up, on a diagonal. When you come in, do you go down on a diagonal? Is it similar like that? Or is it just straight down?

**Participant**: This is where they say it's, uh, set forth here way early in Creation. We come down through the pathway of souls, and we return through the same pathway of souls. It's not a straight up and down. It's kinda goes the same way, from East to West. An arch. A celestial dome type. A half circle type thing. You understand? And then it forks off three quarters of the way. For some reason, they call it a fork, which was made by the first lady. We call her sky woman when she returned. But, there was a little offshoot path, so they say we don't know what that area is until we reach that crossroads. Some of our rituals still attach to that. This morning, I had a meeting with one of my friends. And he was talking about at this place, spirit is caught up in his business. So we have to use the greatest gift of Creation is food. We make 80 kernels, a little cookie, to draw the spirit back to it, and put him on his journey by the same symbolism of a fork tree branch. You place the bread there, and then it ascends him from being here Earth-bound to get him on his journey. We call it a travel meal bread, traveling bread.

**Interviewer**: But that's one of the branches, right? Where does the other branch go?

**Participant**: Well, there's so many interpretations to that. And I don't want to sound religious or anything. But they say that the twins is the one that decided to make that split. So each brother has his side. They say the other one is a super highway six-lane, smooth, very shiny and bright. The other one is hard to see, very narrow, and rocky. But there strawberries on both sides of it. So there you go... Mhm... Making sense to you?

**Interviewer**: Yeah, this is great to hear.

**Participant**: I guess you would call it, the way it's said, Garden of Eden. But we would call it Creator's strawberry fields. You find that path sneaking through that strawberry field, and if you're lucky enough to meet your maker, the master of life... Are you with me still?

**Interviewer**: Yeah.

**Participant**: Your mind is going really fast!

**Interviewer**: As it should. Yeah, with this half circle that you're describing, you said that three quarters of the way it would split.

**Participant**: Yes.

**Interviewer**: Is that three quarters of the way around the top half?

**Participant**: Yeah. And the other thing too is that, let you know that, there's a lot of paths offshoot off that main trail, ok? There's a lot of trails coming off of it. I guess we'll say, in our legend, the tree fell in the Creation story way up in sky world. When that tree fell, it–every tree that falls is not flat. It's always bent. So when you look at the pathway of souls, through astrology, it's like a bent tree, and the roots is where sky world is, and then coming back to Earth is those paths. And it's the same way coming back to it. You understand? Just like a bent tree.

**Interviewer**: And so these split paths, they're paths–choices that you have in life? Or is it at birth?

**Participant**: You have the choice at birth, but it's still up to you to decide. [...]
**Interviewer**: And so how does the tree that's turned over related to the circle? Because it has an arch, but it's—-how does it relate to a circle, or some sort of circle of time you were talking about?

**Participant**: It's like a half moon, and when you're on Earth, you're complet-

> ing that other circle when you leave again. You're walking from one end, and you're doing a semicircle on the ground or underneath. So half is submerged in the Earth. Half is submerged, or up in the sky. This is why they say when you burn tobacco, this goes to the center core of the Earth downward and upward. It goes up and down all at once. Can you understand that? So in the end, you have a medicine wheel, four directions in that. Just like a man's hat, a guh-stoa. Always have that understanding and that mindset when you wear that hat in ceremony. The medicine wheel's four directions is placed in his own mind. And the eagle feather he wears on top is dictating, or pointing upwards to where we came from, skyworld. So much symbolism to your questions.
>
> **Interviewer**: Yeah, that's exactly what I'm interested in. All this symbolism.
>
> **Participant**: You're going to have to write a whole book to explain that! (P6; 17:13-29:00)

He explains that three-quarters of the way across the arch, there are off-shoots, also comparing the picture to a fallen tree from the Creation story. The tree forms an arch over the ground, and three-quarters across it, its trunk splits into branches. The participant further detailed the top of this arch as the spirit world, and the sides are birth and death. The arch forms a full circle by a person's experience in the material world. In this picture, time is topologically not a closed curve in that it may have branches, or handles, at different parts, most especially at birth. Again, the sky world is located at the top of this circle, and the material world at the bottom.

Overall, the majority of participants agreed that time is created 1) continuously as part of the Creation, 2) by ceremony, 3) in segments of one day, and 4) as two semicircles, 'lower' and 'upper'.

### 4.3.3 Responses to Saint Augustine's Argument

When presented with Saint Augustine's argument that time does not exist, participants reacted most disparately. While two participants disagreed that the past is no longer, and two participants disagreed that the future hasn't happened yet (all citing a circular movement of time), seven participants in total attempted to re-structure the argument, and one participant explicitly agreed with the current phrasing.

> **Interviewer**: So my last idea about time is that time does not exist at all. And so this is because time is made up of the past, the present, and the future. But the past already happened and so it's no longer and doesn't exist. The future hasn't happened yet and so it also doesn't exist. And the present is so tiny, so that all of time–the past, present, and future–doesn't exist. What's your reaction to that idea?
>
> **Participant**: Very confusing. It's because, because there's a time and place for everything, ok? So everyday we walk within that circle. [...] So one whole day

> is a cycle for you. And in that whole day, you walk about. You are entertaining past, present, and what that future shall be, in that number three. Because the fourth part is not complete for you. That becomes your whole spirit essence, in the after world.
>
> **Interviewer**: And so you're saying that each day cycle has all three in it, the past, present, and future?
>
> **Participant**: Yes, always. So leaving any of it behind, the only thing that is done is that leave that negative part behind. And to go bring that to the future, creating that positive. You're creating, you're rejuvenating that innocence, that purity, upon your final departure to return back to Earth—umm sky world. Where you came from, with spirit. Yeah. That's why you shed your body back to the Earth when you return back to the spirit the way you came. Full circle again. (P6; 1 29:00-31:43)

This participant's reaction centers around a unity of time. He breaks time not only into the past, present, and future, but also the spirit world. These four parts make up one whole, both experientially and conceptually. Experientially, he notes, a person lives through the past, present, future, and spiritual in cycles. Conceptually, they are all equally existent as one whole.

Another participant also reacts by discussing the unity of a cycle of time. He notes that experiences recur in cycles, so as to correct the conception of 'present' in the argument. Instead, he suggests, the present is connected to other parts of the circle, since it is experienced in a cycle.

> **Interviewer**: So it's the idea that the future, we don't know yet at all. And the past has already happened. It's no longer here with us. And the present is so small. So none of time could exist.
>
> **Participant**: And?
>
> **Interviewer**: So the future hasn't happened yet. The past has already passed by. It's not here with us. So they think that time can't possibly exist.
>
> **Participant**: Well, maybe it depends on who–how you're looking at it. My granddaughter, she'd go into crowds, and she'd feel uneasy. She'd sense when people are hurting, when people are traumatized, when people are really heavy and negative energy and things like that. And it got to the point where she couldn't stay in crowds because she could feel all this energy around her. So she went to talk to counselors and different people. And all they could say to her was "Maybe you've got ADD, and so maybe we should give you medication to slow down these feelings". You know? That's how they deal with those things. They medicate it. They put those things to sleep by medication. And dull those feelings. So she went to sit with a friend of ours who works with those kinds of

> things, and she said, "I know what you're going through because I went through the same thing as a young girl". And she said, they actually were thinking of putting me in an institution. And then she said, I began to work with people. And what it is, she said, I was feeling the other lives that I have been through. So if in other lives, when there was trauma, and sickness, and emotion, and negative. When I come into this world around me, I've been there before and I feel those same feelings. And that's what I feel, and that's what my spirit feels. So I've been there before. So if you look at there's no future, maybe we've already been to the future. We go back to the future–I think that's a movie. You know? Because we've been there before. And it all goes back in a circle, right? So what we're seeing here, we're going to see there. Because the circle evolves. And it always continues like this. So the future, the players might change, but the future will evolve in a certain way. An asteroid, they say, hit the Earth and killed all the dinosaurs. Maybe human beings, the next year, will go crazy, will throw all their atom bombs and create the same destruction as an asteroid. But the fire will hit, and the Earth will seemingly be destroyed. But the Earth is long lived. We're not long lived. But when the smoke and the heat stops, when the Earth heals herself, which she will, and we're gone, then she's going to continue what she's always been doing. She'll create new life. She'll readjust the way life is. Maybe new animals will evolve out of the ashes. And life will continue. So, you know, maybe we'll become, we'll be the same as the dinosaurs were. So life is like this. It continues in a circle. It changes and adjusts but it never stops. Even when we dance in the longhouse, we dance the Creator's dance. And that Creator's dance, when the song ends, first one song ends, we don't stop walking. We just keep going. And we keep walking in a circle until the next song starts. And then we dance that song. And when that song ends, we keep walking gently in a circle until the next song starts. Cause life doesn't stop. Like, when you're talking about there's no future, well we know there's a future. And the future has already shown us what it could be. We've seen it all before. Uh, now they talk about what's in the future. The glaciers may–are going to melt, the oceans will rise. Cities will–that were way above water will be under water. (P1; 17:04-22:57)

The participant employs a metaphor to explain that the cycle continues despite the end of certain events (the existence of humans being mapped onto the song). Under this mapping, the cycle of time would *move* and *exist* regardless of the existential statuses of the past, present, and future. The participant seems to reject the initial phrasing of the argument which contrasts the existence of the present with the existence of *time*; instead, he argues that time's existence is *movement*, and that the present interacts (in his example, through emotion) with other events in the cycle.

Saint Augustine's argument also contrasts the present, as a moment, with the past and future. One participant discussed the present in terms of a day rather than a moment. In doing so, she did not accept Saint Augustine's distinction between past, present, and future, but instead assumed the present to be a whole cycle, which Saint Augustine would consider

to be made up of the past, present, and future. Yet since days exist solely in the material world (as expressed in interviews in the previous section), the necessary question regards the existence of time outside of the material world.

> **Interviewer**: So the last idea about time is–imagine someone that says time doesn't exist at all. And so this is because time is made up of the past, the present, and the future. And the way this goes is that the past is no longer and so it doesn't exist. The future hasn't happened yet, so that also doesn't exist. And the present is so small that all of time can't actually exist. What would your reaction to that be?
>
> **Participant**: [laughs]
>
> **Interviewer**: This is a weird one, don't worry.
>
> **Participant**: I know, I'm sorry for laughing but, I don't know. Because, you know, a lot of people live in the past. [laughs] So the past has to exist. It exists in history books, you know. It exists in people's minds, or in people's hearts, you know. People never forget something, you know. Somebody did something wrong or whatever, they don't forget that, you know. I mean, the present, you know, the present is one day, twenty-four hours. There's your present. Every day is twenty-four hours. And the future, well, you can look ahead to the future. But you can't predict the future. And we can't say that the future is nonexistent because you know there's going to be a tomorrow. There always is. But it becomes today.
>
> **Interviewer**: About how time would work in the spirit world, is there such thing as time in the spirit world?
>
> **Participant**: No. No!
>
> **Interviewer**: No. Only we experience it.
>
> **Participant**: No, there's no time in the spirit world.
>
> (P7; 1 7:58-9:57)

The temporal experience of days contrasts with the temporality of the 'spirit world' (i.e. the 'upper world', the 'sky world'). Overall, six participants expressed that time is different in the spirit world than it is in the material world, and no participants expressed that time is the same in the two worlds. Of those six, two participants claimed that time may be condensed in the spirit world (so that, for example, one material month is one spiritual second).

> **Interviewer**: Do you think that there is time in the spiritual world?

**Participant**: Yes.

**Interviewer**: Is it similar to time here in the material world?

**Participant**: No, no.

**Interviewer**: No. What's different about it?

**Participant**: Well, um, the way things I know, the stuff I believe in, time is different for that spirit world. It matches the world that's here on Earth, but in the spirit world it's different. Like maybe a month could be like one second in the spiritual world. That could be the difference.

**Interviewer**: Yeah, ok. So time there is–that seems to me like time there would all be closer together.

**Participant**: Yes.

**Interviewer**: More unified almost.

**Participant**: Yeah.

**Interviewer**: Ok. Do you think that–are there experiences of time in the spirit world? Do you think that it feels slower or faster or different in some way?

**Participant**: Well, that's hard to say because I've never been in the spirit world. [laughs]

**Interviewer**: [laughs] That's true.

**Participant**: If I would think about it, like I said, I think time is condensed in the spirit world. That's what I think. But who knows? We haven't visited that spirit world, and I don't think I'm ready to do that right now. (P9; 1 5:59-7:38)

Another two participants claimed there is *no* time in the spirit world, and one participant claimed time in the spirit world is *eternal*.

**Bystander**: Do you think there is time in the spiritual realm?

**Participant**: Well, not the way we understand it here.

**Bystander**: Well, explain.

**Participant**: The only thing I could say is that there's still this essence that is and always will be. (P8; 2 7:07-7:22)

One participant claimed that time may be very slow in the spirit world compared to the material world, also indicating that it is rather similar to eternity in that way.

> **Interviewer**: Do you think there is time in the sky world, or in the spirit world?
>
> **Participant**: That is very slow up there. I would say much slower. That's why they say you live forever up there.
>
> **Bystander**: But if time were slow, wouldn't you just live a lot longer?
>
> **Participant**: Same notion. He just rephrased the whole saying. [laughs] (P6; 2 3:36-4:15)

The sole participant who explicitly agreed with Saint Augustine's argument (in fact, before it was even presented) was one of the participants who argued there is no time in the spirit world. Yet she agreed that time's non-existence in the spirit world is nevertheless different from time's non-existence in the material world:

> **Interviewer**: I wanted to ask you also then about time in the spirit world, or in the sky world. If there's time in the spirit world.
>
> **Participant**: No.
>
> **Interviewer**: No. Is it different from how it is here? Because here, we're saying that time doesn't exist but there are still–we still experience the present again and again and again. So is that true in the spirit world too? Is there a present?
>
> **Participant**: I don't think so. Because um, we don't have bodies there. We don't have–we're spirit. Pure spirit. And we're spirit here too, you know, on Earth. But we have bodies. And I remember I asked–there was a question that um, Ar-do-dar-ho, was one of–Ar-do-dar-ho, he's Onandaga chief. And they asked him, they said, what does Ge-ena-de-goah mean? Where Ge-ena-de-goah, in English, would say 'the great nice'. And he says, 'Ge-ena-de-goah means on making your way–on becoming a human being'. So through that, being in the present, we're always becoming that human being as we make our way back to the sky world. And that, and that Ge-ena-de-goah means it's nice. So when we live as a human being, it's supposed to——when we come from the sky world as that human being, then that's when the Ge-ena-de-goah happens. But always being in the present, til we get to the sky world. But um, but there are like you said, changes. How do we notice changing happens?
>
> **Interviewer**: So you're saying that this stops when we get to the sky world, that when we come from the sky world, then we experience this again and again until we get back to the sky world?

> **Participant**: Well, we, we're becoming a human being. Those are those changes you're talking about. You know, becoming a human being. (P10; 3 0:06-3:09)

Time of the material world can be said to exist only in the sense that it tends to non-existence, just as Saint Augustine pictured. According to this participant, we notice 'changing happens' and there is lifelong growth, but time is still non-existent. This contrasts the spirit world, where time does not merely tend toward non-existence but *is* non-existent; events in the spiritual world are simultaneous or non-ordered.

Additionally, it was noted several times that spirits from the spirit world can and do interact with the material world, at precisely the time when it is needed in the material world:

> **Participant**: To me, like, the spirits, they're–they're the guides. They're the teachers. They come, the spirit life comes back to teach you, to help you continue, I guess. That's what we were talking about in the car. About all the times, like–they say that the outline for our history is on our hand. You know, the beginning there was original instructions to all of the real things from the Creator. Everybody got the same direction. But at that point it was real things. Before that, it was spirit life. And then, people being the weakest link, they forgot. The next visitor to come and remind people to do–give thanks everyday because it's the people who need these reminders. Give thanks everyday, that's the only thing they have to do. And people forgot. Four messengers came, and they brought the sacred ceremonies to remind us: Get together once in a while! Do a ceremony! That's what your job is. That's the original instructions. Give thanks. People forgot, and then the messengers came back again. The peacemaker brought the great law, and tried to unify all the people and get them to stop killing each other. And use your brain because your brain is your best weapon. And just live peacefully. Strive for peace. And a messenger, a spirit–a spiritual guide came to give us that teaching. Interact with human beings. They tell it in a story as if he was also a human being. Nobody knows because it's such an old story. But he managed to get all the people together, and that's why we have the Iroquois Confederacy, you know. And people forgot or were driven, that was when the Europeans came, and it was constant warfare once they got here. It was never peace after that. And so, life got so bad that nobody was being cared for, and messengers came and told Scu-na-ga-deo, gave him guidance, direction. He was the worst, and told him, go back to your own ways. That's the only way you're going to continue. The spirit, the messengers, were from the sky world. And so they interact that night to teach in your dreams, and so that's–that was the last ones that came, and that's maybe three hundred years ago now. And they came so that we could deal with what was called 'modern times' three hundred years ago. Modern times was all of the stuff that the Europeans brought that were foreign to us: the drinking, the gambling, the abuse of women and children, neglect, and um... So the messengers tried to get people to return to their old ways because that's the only thing that's gonna help us to live right. And we're still, three hundred years later, haven't learned from those messengers. Because

> we're still having problems with the same things that came, that were foreign to us. So to me, that's the interaction between the spirit and the humans. They come in as messengers and in dreams or in some sort of form. (P2; 27:46-31:34)

While in the previous section it was expressed that people in the material world can affect the spiritual world (e.g. through burning tobacco), here it is noted that spirits in the spiritual world can similarly affect the material world (e.g. through 'messages'). Thus, the temporal differences between the worlds do not prevent communication altogether, but perhaps limit communication to prayers and messages. The communications are have effects in the material world only and are not placed in an ordering relation in the spiritual world. Thus, the material world is structured whereas spiritual world is without a similar structure.

Overall, the majority of participants did not agree with Saint Augustine's argument in its phrasing. There is evidence that conceptions of 'present' and 'existence' may differ from the presented argument. The unity of the past, present, and future in a cyclic form was reasoned on several occasions to be sufficient to escape the intuited paradox of the argument. It was found that time in each the material and spiritual worlds is dissimilar, and participants presented three different properties of the spiritual world: timlessness, condensed time, and slow time.

## 4.4 Analysis of Results

To assert that a conception is purely linear, circular, helic, or otherwise seems rather heterogeneous as a result. It is more likely that people can conceive of time in many topological forms, depending upon the use of the conception in various contexts. In the present study, time was discussed very generally, as well as within different contexts (e.g. the seasons, moons, days), and small variations were observed. The analysis of the results primarily focuses on the most general notion of 'time' employed by participants, though acknowledges that other representations likely arise as needed. In the present section, I examine the findings of the study in order to develop the most prominent conception of time employed by participants when discussing properties of time. Throughout, I draw on the logical considerations of the study identified in Section 4.1 in order to develop a logical account of the conception.

When time was presented as a continuous line, seven participants reacted that they *do not* think about time as a straight line and cited a circle as a more accurate representation. The other three participants cited various representations, which were different from one another. However, the questions which followed resulted in many similar reactions from all participants—both those who cited a circle and those who did not. These results largely concerned the creation and inner-workings of a cycle. The present analysis focuses on the properties of this circular conception.

The circle was largely discussed as being composed of two worlds: the material and the spiritual. The material world is often called the 'lower world', and the spiritual world is often called the 'upper world'. Moreover, the spiritual world was detailed as being on the "other half of the circle", and the material world was detailed as an arc, as a journey on the ground of the earth which completes the circle. No other arc or point was identified on the

circle. Logically, then, the conception is represented as a circle consisting of two parts, the material and the spiritual. I proceed, then, by characterizing the two parts respectively, as well as the circle as a whole.

While occasionalists typically assert that God is solely responsible for the creation of all things, including causation, the results of the study show a similar belief where the Creation is responsible. The spirit world does not act as God, but rather the material world sustains itself physically and causally. This conception of causation is largely reciprocal. For example, the tree's behavior (i.e. getting warmer, getting damp) causes the people to have a ceremony, which causes the tree to produce sap. These interactions of causation are the substance of the Creation, and it is in this sense that the Creation is responsible for the continuous creation of time. Interestingly, this places the ego directly in causal power, a belief which directly opposes occasionalism where God is the only causal power. Further, the examples of causation provided require properties of asymmetry, transitivity, and totality, and so time in the material world can be modeled as a total order (with a circular topology).

Not only was it found that events in time are continuously created by the Creation, but it was also found that time itself—in both the material and spiritual worlds—is due to the Creation. From the examples provided, it seems the Creation creates time by causing *movement* or *flow*. For example, the causal interactions between people's ceremonies and trees' production of sap makes time *move*, the circle *flow*. Causation and movement are distinct from one another under this view in that causation is an occurrence of the material world only, whereas movement is present in both the material and spiritual worlds. When participant P3 distinguishes between 'time' and 'days', he is making clear that there is some ordering in material temporality that is not present in spiritual temporality—but there is nevertheless movement in both. This is consistent with the results of participant P1, who indicates that time's existence is *movement* which continues after death. Time, then, is not a total order in the spiritual world, a non-empty subset of it, and is thus not a total order itself.

Time as a flow is a prominent theme in responses to Saint Augustine's argument, where most participants restructured the argument to understand time as a unity, as one cycle. While participants did not generally disagree with the argument as a whole, they indicated that they disagreed with the conceptions of 'present' and 'existence'. The present is agreed to be as fleeting as in Saint Augustine's *Confessions*, but it is always experienced within a larger cycle. Thus, the present is just as existent as the past, future, and spiritual because it is always accompanied by them, inside one whole. Further, the present is not experienced singularly, but rather connects to other cycles through the recurrence of pain, energy, and emotions. The circle appears here as continuous at any point.

Two issues arise in the study's inquiry regarding Saint Augustine's argument: the countability of the material and spiritual worlds respectively, and the role of trauma within the responses. I address each in turn.

Participant P7 demonstrated the unity of a cycle in relation to the existence of time when she understands the 'present' to be an entire daily cycle. On the one hand, this indicates that the present is not conceived of outside of a cycle (as though it can never be separated from its cycle). Yet on the other hand, it brings into question the countability of the conception. If time in the material world is constituted by days, as was similarly expressed by participant

P3 in contrast to 'time' in general, then the 'present' is not a point in an uncountable set, such as the real number line, but is instead a point in a countable set, such as the natural number line. It is feasible that different people conceive of the same circular representation of time differently, i.e. as countable, uncountable, or even both on different arcs. However, this study's data show no indication as to *why* two participants discussed a countable conception of material temporality, while the others discussed an uncountable conception. Of course, whenever the present is discussed as a day, the conception is countable, and whenever the present is discussed as an infinitely small point (i.e. a moment), the conception is uncountable. Thus, countability of the material world is a present, though not prominent, variation on the conception. There are some circumstances where the conception is countable on the material arc, and others where it is not.

The second issue concerns the role of trauma in a person's conception of time. Participant P10, who at the beginning of the interview presented an argument that time did not exist, immediately connected her views to her experiences of violence. Similarly, two other participants connected themes in Saint Augustine's argument to improving mental health or coping with trauma. The psychological hardships, especially related to anxiety and ongoing or generational violence, can undoubtedly affect perceptions of time. In the present study, conceiving of time as non-existent is a method of recovery, requiring to emotionally release the past and not worry about the future. Because the Mohawk people both historically and today experience violence in many forms, the effects of mental illnesses on the cultural conception of time are truly a part of the conception. Psychological perspectives on time ought not be excluded in a study on such a population. Instead, I see mental illnesses as a potential cause for variations on a conception of time. In particular, experiences of trauma may illicit the use of a differing conception of time e.g. time's non-existence.

Lastly, I return to understand the properties of time in the spiritual world. A majority of participants expressed that time was dissimilar in the material and spiritual worlds. While there were different results regarding the *nature* of spiritual time (i.e. time's non-existence, pace, or eternity), most participants agreed that spiritual time is not ordered, in that it didn't exist or was eternal. In participant P2's response to Saint Augustine's argument, she describes how the spirits send messages to the material world *at the right moment*, but it is the right moment in the material world—not necessarily the spiritual world. The notion of a 'right time' demands an ordering, which the spiritual world is without.

Overall, the data shows a conception of time as a non-transitive closed curve consisting of two parts: a 'timeless' spiritual world and a totally ordered material world (as an arc). Communication between the two worlds occurs regularly via 'messages' such as prayers, signs, and dreams. The material world itself (including individual persons) is responsible for both the creation of time and causation, in the same way occasionalism attributes causal power to God. Every spiritual event is both before and after every material events; every spiritual event is simultaneous with other spiritual events, and material events form a total order.

## 4.5 Formalizing a Mohawk Conception

In order to provide an introductory account of the Mohawk conception of time, I provide a formalism of the results of the study in which time is conceived of as a circle composed of both the spiritual and material worlds. Such a model needs to account for the following characteristics:

- The conception is circular, i.e. a closed curve.
- The closed curve is 'repeatable', i.e. compact.
- The closed curve is composed of two parts, the spiritual world and material world, the latter being represented by an arc.
- That which occurs in the spiritual world is both before and after that which occurs in the material world.
- The spiritual world is somehow 'timeless'.
- The material world is a total order.

I begin by constructing a 'timeless' spiritual world. Let $S$ be the set of all events in the spiritual world, including e.g. the sending of a message, the receiving of a prayer, the falling of sky woman (as in the Creation story). In such a timeless world, all events are related to one another; no one event is before others; all events are rather simultaneous. In order to form the complete graph with $|S|$ vertices, let the set $E$ of edges be $\{(x, y) \in S^2 | x, y \in S\}$. Let the graph $(S, E)$ represents 'the spiritual world'.

Next, I represent the material world, before taking its union with the spiritual world to get a whole picture of the Mohawk conception. Because stories and causation behave under the properties of antisymmetry, transitivity, and totality, the events of the material world can be represented by a total order. Because the events are also connected, in that there is some fluidity in time, as well as infinitude, I represent the material world by the real number line. Let the real number line $\mathbb{R}$, a non-compact space, be the set of all events in the material world. Let $\tau$ be the existent topology on $\mathbb{R}$. Construct a one-point compactification denoted $\hat{\mathbb{R}}$: let the symbol $\infty$ (called 'infinity') denote the graph $(S, E)$. Let $\hat{\mathbb{R}} = \mathbb{R} \cup \{\infty\}$. I define an open set in $\hat{\mathbb{R}}$:

**Definition 4.5.1.** A set $U \subset \hat{\mathbb{R}}$ is open in $\hat{\mathbb{R}}$ if and only if either

1. $\infty \notin U$ and $U \in \tau$, or
2. $\infty \in U$ and $\mathbb{R} \setminus U$ is a compact closed subset of $\mathbb{R}$.

Let $\hat{\tau}$ be the set of all such $U$. I will show that $\hat{\tau}$ forms a topology on $\hat{\mathbb{R}}$ (i.e. that $(\hat{\mathbb{R}}, \hat{\tau})$ is a topological space).

> *Proof.* By the definition of a topology, to prove $\hat{\tau}$ is a topology on $\hat{\mathbb{R}}$, it suffices to show:

1. Both the empty set and $\hat{\mathbb{R}}$ are members of $\hat{\tau}$.
2. Any union of elements $U \in \hat{\tau}$ is itself a member of $\hat{\tau}$.
3. Any intersection of finitely many elements $U \in \hat{\tau}$ is itself a member of $\hat{\tau}$.

I show each in turn.

1. Note $\infty \notin \tau$ since $\infty \notin \mathbb{R}$. Then any member $U \in \tau$ satisfies (1) of the definition of an open subset in $\hat{\mathbb{R}}$. So, $\tau \subset \hat{\tau}$. Because $\emptyset \in \tau$, $\emptyset \in \hat{\tau}$.

   Next, because $\hat{\mathbb{R}} = \mathbb{R} \cup \{\infty\}$ and $\mathbb{R} \setminus \mathbb{R} = \emptyset$ which is closed and compact, we know $\hat{\mathbb{R}} \in \hat{\tau}$ by (2) of the definition of an open subset in $\hat{\mathbb{R}}$.
2. Let $U_i \in \hat{\tau}$ for $i \in \mathcal{I}$, and let $U = \bigcup_{i \in \mathcal{I}} U_i$. We need to show $U \in \hat{\tau}$. There are two possible cases: either (a) $\infty \notin U$ or (b) $\infty \in U$.

   (a) Assume $\infty \notin U$. Then all sets $U_i$ cannot satisfy (2) of the definition of open subsets in $\hat{\mathbb{R}}$ and instead satisfy (1). So, all sets $U_i$ are also members of $\tau$. Because $\tau$ is a topology, we know the union of its subsets is in $\tau$, i.e. $U \in \tau$. Because $\tau \subset \hat{\tau}$, we also know $U \in \hat{\tau}$.

   (b) Assume $\infty \in U$. For any $U_i$ such that $\infty \notin U_i$, write $U_i = V_i$. For any $U_i$ such that $\infty \in U_i$, write $U_i = W_i \cup \{\infty\}$ with $W_i \subset \mathbb{R}$ such that $\mathbb{R} \setminus W_i$ is compact and closed. Then $U = A \cup \{\infty\}$ where:

   $$A = (\bigcup_{i \in \mathcal{I}} V_i) \cup (\bigcup_{i \in \mathcal{I}} W_i)$$

   Then, by DeMorgan's law:

   $$\mathbb{R} \setminus A = \mathbb{R} \setminus [(\bigcup_{i \in \mathcal{I}} V_i) \cup (\bigcup_{i \in \mathcal{I}} W_i)] = (\bigcap_{i \in \mathcal{I}} (\mathbb{R} \setminus V_i) \cap (\bigcap_{i \in \mathcal{I}} (\mathbb{R} \setminus W_i)$$

   which is a closed subset of $\mathbb{R} \setminus \bigcup_{i \in \mathcal{I}} W_i$, which in turn is compact. Thus $\mathbb{R} \setminus A$ is also compact. So $\mathbb{R} \setminus U$ is also a compact closed set of $\mathbb{R}$, and thus by the definition of $\hat{\tau}$, $U \in \hat{\tau}$.

   In either case (a) or (b), $U \in \hat{\tau}$. Therefore, any union of elements $U \in \hat{\tau}$ is itself a member of $\hat{\tau}$.
3. For any $V_1, ..., V_n \in \hat{\tau}$, let $V = \bigcap_{i=1}^{n} V_i$. We need to show $V \in \hat{\tau}$. There are two possible cases: (a) $\infty \in V$ or (b) $\infty \notin V$.

   (a) Assume $\infty \in V$. Then each $V_i$ has the form $V_i = A_i \cup \{\infty\}$ where $\mathbb{R} \setminus A_i$ is compact and closed. Thus, $V = A \cup \{\infty\}$ where $A = \bigcap_{i=1}^{n} A_i$. To show that $V$ is closed, we need to show that $\mathbb{R} \setminus A$ is closed and compact:

   $$\mathbb{R} \setminus A = \mathbb{R} \setminus \bigcap_{i=1}^{n} A_i = \bigcup_{i=1}^{n} (\mathbb{R} \setminus A_i)$$

   Because $\bigcup_{i=1}^{n} (\mathbb{R} \setminus A_i)$ is a finite union of closed compact sets, it is also closed and compact. So, $V$ is closed. Thus, $V$ satisfies (2) of the definition of open subsets of $\hat{\mathbb{R}}$ and $V \in \hat{\tau}$.

(b) Assume $\infty \notin V$. We know there exists at least one $V_i$ such that $\infty \notin V_i$. If there does not also exist $V_i \in V$ such that $\infty \in V_i$, then we know that for every $V_i$, $V_i \in \tau$. In that case, $V \in \tau$, and since $\tau \subset \hat{\tau}$, we know $V \in \hat{\tau}$. If there does exist a $V_i$ such that $\infty \in V_i$, then we can re-order the $V_i$'s such that:

$$V_i \in \tau \text{ and } V_j = A_j \cup \{\infty\}$$

for $i = 1, ..., m$ and $j = m+1, ..., n$. $\mathbb{R} \setminus A_j$ is closed and compact, and in particular $A_j$ is open in $\mathbb{R}$. Then:

$$V = \bigcap_{i=1}^{n} V_i = (\bigcap_{i=1}^{m} V_i) \cap (\bigcap_{j=m+1}^{n} A_j)$$

Because $(\bigcap_{i=1}^{m} V_i) \cap (\bigcap_{j=m+1}^{n} A_j)$ is a finite intersection of open sets in $\mathbb{R}$, it is also open in $\mathbb{R}$. Since $\tau$ is a topology on $\mathbb{R}$ (i.e. the set of all open sets in $\mathbb{R}$), we know $V \in \tau$. Thus, $V$ satisfies (1) of the definition of $\hat{\tau}$, and so $V \in \hat{\tau}$.

In either case (a) or (b), $V \in \hat{\tau}$. Therefore, any intersection of finitely many elements $V \in \hat{\tau}$ is itself a member of $\hat{\tau}$.

Because the three conditions for a topology are satisfied, $\hat{\tau}$ is a topology on $\hat{\mathbb{R}}$. ■

Next, the Mohawk conception of time as a closed curve is thought of as repeating, and thus compactness is meaningful in its conception since without it, the circle could not repeat. Here, I show that $\hat{\mathbb{R}}$ is compact. By the definition of a compact space, it suffices to show that each of its open covers has a finite subcover.

*Proof.* Let $\mathcal{F}$ be an open cover of $\hat{\mathbb{R}}$. By definition, $\mathcal{F}$ is a collection of open subsets $U_a$ of $\hat{\mathbb{R}}$ whose union $\bigcup_{a \in \hat{\mathbb{R}}} U_a$ is the whole space $\hat{\mathbb{R}}$.

Because $\infty \in \hat{\mathbb{R}}$, there must be some set $U_0 \in \mathcal{F}$ such that $\infty \in U_0$. By (2) of the definition of an open subset of $\hat{\mathbb{R}}$, we know $\mathbb{R} \setminus U_0$ is a compact set. We also know it is covered by $\mathcal{F}$, since $(\mathbb{R} \setminus U_0) \subset \mathbb{R} \subset \hat{\mathbb{R}}$. Because $\mathbb{R} \setminus U_0$ is compact and covered by $\mathcal{F}$, there is a finite number of elements $U_1, ..., U_n \in \mathcal{F}$ whose union contains $\mathbb{R} \setminus U_0$. Then $\mathcal{G} = \{U_1, ..., U_n\}$ is a finite subcover of $\mathcal{F}$.

Therefore, each open cover $\mathcal{F}$ of $\hat{\mathbb{R}}$ has a finite subcover $\mathcal{G}$, and so $\hat{\mathbb{R}}$ is a compact space. ■

Lastly, I extend the order structure $\leq$ of $\mathbb{R}$ to an order $\leqq$ on $\hat{\mathbb{R}}$:

**Definition 4.5.2.** For any $x, y \in \hat{\mathbb{R}}$, $x \leqq y$ iff either:

1. $x \leq y$, or
2. $x = \infty$, or
3. $y = \infty$.

Put differently, this means that $[\leqq] = [\leq] \cup \{(x, \infty) | x \in \hat{\mathbb{R}}\} \cup \{(\infty, y) | y \in \hat{\mathbb{R}}\}$. Thus, for all $x \in \hat{\mathbb{R}}$, $x \leqq \infty$ and $\infty \leqq x$. This order is total and reflexive, but not antisymmetric, symmetric, or transitive.

> *Counterexample to antisymmetry*: Choose some $x \in \hat{\mathbb{R}}$ such that $x \neq \infty$. By the definition of $\leqq$, $x \leqq \infty$ and $\infty \leqq x$. Yet $x \neq \infty$.

> *Counterexample to symmetry*: Choose some $x, y \in \hat{\mathbb{R}}$ such that $x \leqq y$ and $x \neq y \neq \infty$. Then by the definition of $\leqq$, $x \leq y$. By antisymmetry of $\leq$, $y \not\leq x$. Again by the definition of $\leqq$, $y \not\leqq x$.

> *Counterexample to transitivity*: Choose some $x, y \in \hat{\mathbb{R}}$ such that $x \leqq y$ and $x \neq y \neq \infty$. Then $y \not\leq x$ by antisymmetry of $\leq$. By the definition of $\leqq$, $y \not\leqq x$. Yet $y \leqq \infty$ and $\infty \leqq x$.

Under the ordering $\leqq$ on $\hat{\mathbb{R}}$, the structure as a whole is not antisymmetric, symmetric, or transitive, but the material world remains a linear order (i.e. antisymmetric, transitive, and total).

Let $(\hat{\mathbb{R}}, \hat{\tau})$ represent Mohawk time. By modeling a Mohawk conception of time as the compact topological space $(\hat{\mathbb{R}}, \hat{\tau})$, constructed with the real number line and the complete graph, it is possible to account for the properties identified in the study. Under the ordering of $\leqq$, it remains a circular conception while evading troubles of the compatibility of antisymmetry and transitivity. It depicts a distinction between the spiritual and material worlds regarding their ordering while maintaining the total order of the material world.

# CHAPTER 5

# CLASSIFICATION OF MOHAWK TEMPORAL GESTURE

Gestures are accepted as ubiquitous in human communication; gesture "constitutes a universal feature of human linguistic production across cultures" (Cooperrider and Núñez (2007), p.3). The most common explanation for this ubiquity is that of the embodiment of human thought and language:

> Real spoken language production in context is always a multimodal process, performed by a gesturing body embedded in a physical setting. (Sweetser (2007), p.201)

Lakoff and Johnson early on suggested experiential grounds for spatial construals of time, which rest in shared bodily experience of space and its correlation with temporal experience (Lakoff (1993); Lakoff and Johnson (1999)). These bases amount to a 'universal hypothesis' that cognitive processing of temporal concepts is inherently spatial, i.e. that all cultures employ spatial construals of time (SCTs). The universal hypothesis has attracted great attention—and great criticism; numerous cognitive linguistic studies have proposed revised hypotheses on the basis of their finding an absence of spatial mappings of time within oral language (Sinha et al. (2011); Levinson and Majid (2013)). However, even at its weakest, where the hypothesis claims a universal presence of spatial construals of time, though not necessarily through speech, it still holds:

> To date there are no systematic empirical reports describing a culture that lacks SCTs altogether, although cultures appear to vary considerably in the 'degree' to which SCTs surface in both linguistic expressions and in cultural representations. On one end of the spectrum, languages such as Aymara of the Andes and English are replete with spatial metaphors for time in their basic lexicon and in their store of common expressions. Note these are not just a willy-nilly sprinkling of spatial words, but the systematic recruitment of spatial contrasts to construe temporal contrasts. On the opposite end, Kuuk Thaayorre of Australia has none. And yet all three of these groups have been documented to oper-

> ate with culturally shared SCTs, as evidenced by gesture and other behaviors. (Núñez and Cooperrider (2013), p.223)

While the hypothesis serves to explain the thus-far universal finding of spatio-temporal metaphor in gesture, Núñez and Sweetster point out that "it would be perfectly possible for there to be both some very culture-specific and some universal models of time" but criticize the "inaccurate comparisons" and "mythical contrasts" invoked in the research (Núñez and Sweetser (2006), p.4). Indeed, gestures vary cross-linguistically and cross-culturally, as has been shown by the work of McNeill and Duncan (1998), Kendon, 2004, Haviland (2000), and Núñez and Sweetser (2006). In turn, our knowledge of mappings has moved beyond Lakoff's original description of the prominent metaphor as Time Passing Is Motion (Lakoff (1993)); today we know of dozens of different kinds of mappings, each invoking different combinations of *ego-reference-points*, *time-reference-points*, and their variations, as well as representing S-time, D-time, and T-span[1] in a variety of ways (Boroditsky and Gaby (2010); Brown (2012); Fedden and Boroditsky (2012); Fuhrman and Boroditsky (2010); Le Guen and Pool Balam (2012); Moore (2011); Núñez and Sweetser (2006); Núñez et al. (2012); Sinha et al. (2011)). In the present chapter, I analyze the gestures produced in the study of Chapter 4 in order to determine any systematic mappings and further investigate the 'universal hypotheses' in the literature.

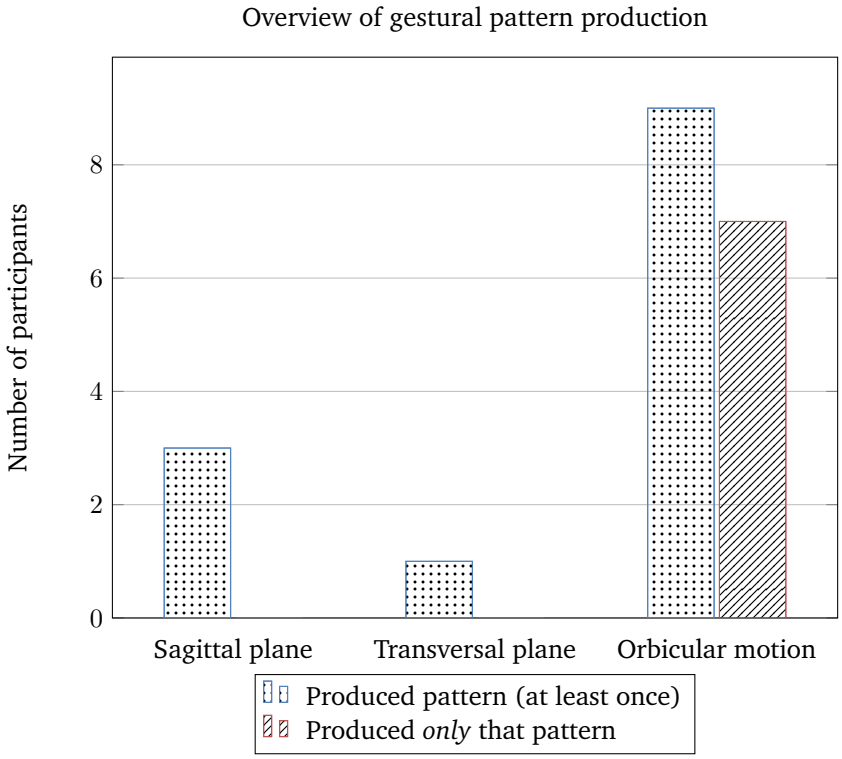
Throughout the chapter, I approach gestures as more than merely "a curious epiphenomenon, always piggy-backing on speech but unrelated to the cognitive and conceptual processes driving language production" (Cooperrider and Núñez (2007), p.17). Quite oppositely, I agree with Sweetser (2007) that "the visual-gestural medium offers information almost impossible to squeeze into the oral-auditory medium" (p.201), and instead consider gesture a legitimate site for cognitive investigations. Gestures grant us new insight into cognitive and conceptual processes, and are thus a valuable additional source of information, one which complements speech. As such, drawing on Engle (2000) and McNeill (2015), I understand temporal gestures as contributors to *composite signals*, "multimodal cognitive acts that include at least motoric action, speech, and mental imagery" in a meaningful setting (Cooperrider and Núñez (2009), p.188). I report on the co-speech gestures under an approach that treats gestures, verbal language, and mental processes as part of a single system. The present chapter addresses the gestural components of this system, in connection with the findings of Chapter 4. In doing so, I identify temporal gestures in regards to their morphology and dynamics along with their accompanying speech, in order to suggest a classification system for Mohawk temporal gesture and consider gesture within an investigation into a Mohawk conception of time.

[1] S-time, also called 'tenseless' or 'sequential' time, concerns the relation between temporal points, without any necessary reference to the present. D-time, also called 'tensed' or 'deictic' time, assumes a present and attaches temporal categories of past and future to it. Lastly, T-span refers to the concept of duration or temporal span. (Núñez and Cooperrider (2013))

## 5.1 Gesture Types

Patterns (e.g. sagittal or transversal), directionality, hand-shape, and use of gesture-space will all be of interest in the analysis in order to report on the *typology* employed, the "systematic pairing of certain types of gestures with certain types of temporal concepts" (Cooperrider and Núñez (2009), p.185), especially in connection to the concepts identified in Chapter 4. The report introduces a simple classification system of Mohawk temporal gestures in four types: *animating*, *placing*, *pointing*, and *continuity-marking*.

Of the ten participants, nine produced gestures (at least once) co-timed with expressions of temporal happenings. Of those nine, three patterns were observed:




Three participants produced gestures along the sagittal plane (frontward, backward, etc.), one along the transversal plane (leftward, rightward, etc.), and nine along an orbicular pattern. No participant produced gestures along *only* the sagittal plane; no participant produced gestures along *only* the transversal plane; and seven produced *only* orbicular motioned gestures. Only one participant produced a *future-in-front/past-in-back* gesture once, and two participants produced a *past-in-front/future-in-back* gesture once each. All nine participants who produced temporal gestures produced both pointed and non-pointed hand shapes (at least once). I proceed by providing descriptions and examples of each gesture type. (Note: time stamps link to video clips.)

### 5.1.1 Animating

The class of gestures which are co-produced with particular phrases as mimicry are animating gestures. In this class, the hands enact an idea, simulating any of its motion, shape, speed, etc. Animating gestures occur often in the data, and animate both temporal and non-temporal ideas. That is, the participants animated descriptions of time itself, such as "a circle...a continuum... a rotation," as well as ideas with which they compared time, such as "the way nature is". The data show great variation in morphology among animating gestures, most especially in uses of pointed and non-pointed (as well as semi-pointed) hand shapes. However, among particular temporal concepts, there is striking consistency in typology.

The first prominent gesture identified involves one hand (pointed or non) moving in a circular path in front of the body in the contralateral vertical plane, motioned counterclockwise.

| | |
|---|---|
| Precisely this gesture | 5 |
| Roughly this gesture | 3 |
| Not at all | 2 |

Table 5.1: Number of participants who produced the *circular animating gesture*

Participant P1 explains how his conception of time differs from the linear conception of the contemporary West. When presented with the linear conception and asked for his reaction, P1 explained, "Well I don't know if I—I'm sure that if we look at what our teachings are, I don't think there's a big difference in that," before adding an exception: that his conception of time is not a straight path but instead a "circle" or "continuum" or "rotation". Co-produced with these descriptions were five continuous counterclockwise circular motions, so that the index finger traced a circular path in front of the body, in a vertical, contralateral plane (P1; 1:22-1:35). The same gesture is produced by participant P6 in describing time, in response to the same question (Note: bolded text marks the co-speech of the gesture):

> It's a circle, comes to my mind, **is a circle**. (P6; 1 8:01-8:05)

While in the first use, the gesture animates time itself, here the gesture also animates a circle in a description of time as circular.

The data show the same gesture again produced to animate related concepts, all in the context of a description of time. For example, when asked for her reaction to standardized linear time, participant P2 explains a comparison between "the way nature is" and the geometric shape of her conception of time. P2 traces with her index finger a circular path counterclockwise in front of the body for two and a half rotations (P2; 7:49-7:55). This is the same gesture (with a different number of rotations) as produced by P1, but it animates her description of nature, whereas that of P1 animates his description of the gemoetric shape of time. Another participant animates the cycle of the sun and moon with the same gesture, in reaction to the occasionalist creation of time:

> The cycle of **the sun and the moon**, and the **rotation of the Earth**. That creates time. (P5; 1 2:47-2:55)

Another animating gesture is seen here, co-produced with "rotation of the Earth", where the pointed circular motion is in a horizontal rather than vertical plane. Five participants produced a vertical, circular animating gesture (at least once), and another five produced a horizontal, circular animating gesture (at least once). Two participants produced both. When animating time itself, however, only the vertical circle was produced.

Animating gestures were also produced to describe certain events along a circle, including a spiritual journey, birth, and death. For example, when asked if time has an end (in comparison with standardized linear time), participant P1 animates the spiritual world as the top semicircle of a vertical circle:

> And then, now we go on a spirit journey, **which is a continuation, the other side of the cycle and go back to the sky world, where we came from. So it makes a circle**. (P1; 11:59-12:11)

He holds his left hand, with his index finger pointed, in one location, as his right hand (also pointed) travels in a vertical circular path in a plane contralateral to the body. His left hand marks the most left point on the circle. His right hand traces the bottom of a circle an then stops at the most right point, before he says "the other side of the cycle..." The participant continues tracing a circle and then stops, holding his right hand at the top of the circular path while he says "go back to the sky world, where we came from". He then traces the same circle again, faster, as he completes the explanation: "So it makes a circle".

This circle was explained more explicitly by participant P6 in response to Saint Augustine's argument. He gestured straight upward with a pointed hand shape, then downward in a curved motion, and then produced another vertical circular motion, in order to explain death, birth, and the entire circle, respectively:

> That's why you shed your body back to the Earth and you **return back** in spirit, **the way you came**. **Full circle again**. (P6; 1 31:34-31:44)

Here, the participant explained the left and right arcs of the circle, as he gestures to each. Six participants gestured along the top, left, or right sides of a vertical circle when describing notions of death, birth, future, and bridging the past and future.

| | |
|---|---|
| Precisely a right arc gesture | 4 |
| Roughly a right arc gesture | 0 |
| Precisely a left arc gesture | 3 |
| Roughly a left arc gesture | 0 |
| Precisely a top arc gesture | 4 |
| Roughly a top arc gesture | 1 |
| No arc gestures | 3 |

Table 5.2: Number of participants who produced the *right arc, left arc, and top arc animating gestures, respectively*

Four participants produced a gesture tracing the right side of a vertical circle upwards (contralateral to the body) co-timed with ideas of returning to the sky world or dying. For example, when asked what the differences are between the spirit and material worlds, participant P9 explained how a person transitions between the two:

> And then **you go back. You go back home** because **your spirit wants to be back up** in spirit world because that's where you came from. That's where you were created. (P9; 1 13:38-13:47)

Three participants produced a gesture tracing the left side of a vertical circle downwards co-timed with ideas of coming from the spirit world or birth. For example, when asked if there is a beginning to time, participant P1 explained the beginning of human life:

> See, in our story **when human beings were made**, the Creator took the first human being, and he [...] (P1; 10:48-10:56)

Another participant produced animating gestures of each left and right arcs (animating coming from and returning to the sky world, respectively), when explaining that time is circular in comparison to standardized linear time:

> We **come from the sky world**, we're here for the time that we're supposed to be here, and **then we return to the sky world**, and in some cases I've even heard that they say **you can** come back. (P2; 2:06-2:21)

Lastly, four participants produced a gesture tracing the top of an arch co-timed with ideas of "the ancient one", "jumps to the future", "toward the afternoon or night", and "the afterworld". Among the gestures which animated death, birth, and the spirit world, handshapes were pointed, non-pointed, and semi-pointed, and all movements were counterclockwise.

While the *animating* gestures exemplified in the present section appear similar to *placing* and *pointing*, gestures, I classify them as *animating* due to their function; in the present examples, gestures were co-produced with speech that described an action (usually of travel), rather than simply referring to the spirit world. Further, the motion produced was a curved path that resembles the animation of the circular motion described as 'time'. In Section 5.1.3, I return to classify *pointing* gestures which do refer to the spirit world as a temporal object, which differ from the curved-motion gestures reported here.

### 5.1.2 Placing

A placing gesture locates an event or time in a speaker's peripersonal space such that the speaker can refer back to it by referring to its placement. While it is common, generally, to place a referent with a downward stroke (Cooperrider and Núñez (2009), p.189), a placing gesture is not limited to any particular handshape. Further, while placing gestures are typically presented within the literature as locating a *specific time in relation to the speaker*, placing gestures can also locate a *duration of time in relation to the speaker or other placed gestures*.

The first gesture addressed here was uniquely produced by participant P3 in explaining the problems of standardized linear time, as she saw it. Participant P3 explains developments in one's life in order to illustrate their non-linearity. She places durations and then refers back to those locations by tracing back its direction, though not reaching its exact location (P3; 16:21-17:17). P3 places her middle finger and thumb on the table laterally to place the first developmental period ("your learning period"), and then repeats the placement slightly closer to her person, placing the next developmental period ("when you become an adolescent"). P3 remains in this location for several seconds, then raises her hands from the table to further explain the details of this period for 32 seconds. Then, forming the handshape of the initial two placing gestures, P3 traces a counterclockwise circle on the table, passing contralaterally closest to her person while describing the period of "becom[ing] an adult." P3 then places again to indicate the next developmental period ("a certain time in your life when you become grandparents and become teachers"). Next P3 reverses the circular pattern and stops as she refers back to "the grandchildren". The participant refers to the previously located period "your learning period" though does not gesture to the same exact location. Rather, she traces back along the circle pattern as far as her right hand can trace without crossing her body.

The data show gestures of the 'present' which could be classified as either *placing*, *pointing*, or even *animating*. I represent it here since gestures co-timed with speech relating to the 'present' were often referred back to again or further detailed at that location. The first example of this gesture was produced by participant P10. When asked if the future exists in discussion of Saint Augustine's argument, participant P10 responded negatively and explained:

> So, we're **always**–we're **always in the present**. That's where we **live**. That's where our ceremonies, are part of it. They come in the **present**. (P10; 1 10:58-11:11)

Participant P10 describes living "always in the present" while producing a gesture on the table directly in front of her. This gesture involves two flat hands extended vertically so that the fingers point away from her, with both palms facing towards each other, about a hand's length apart. At the beginning of the gesture, the speaker looks to the hand position. As she describes what happens in the present, she makes additional gestures within or ending at this space, so as to indicate that ceremonies "are part of it" or "come" into it. Four participants in total produced exactly this gesture:

| | |
|---|---|
| Precisely this gesture | 4 |
| Roughly this gesture | 1 |
| Not at all | 5 |

Table 5.3: Number of participants who produced the *two-handed present placing gesture*

Participant P3 also produced the two-handed placing gesture, along with the co-speech "There's a certain time in your life", and again later when explaining the problems of standardized linear time:

> For us, there's **certain times when you do things**: spring, summer, fall, and winter. That's how we, um, perceive time, you know? There are certain times of the season when you do certain things. (P3; 17:32-17:34)

The same gesture was also produced to indicate singularity by participant P5, when explaining that when a circle 'repeats', different events occur each repetition:

> Nothing is the same, as far as we know. It's all unique, and it's **once only**. (P5; 1 3:29-3:32)

Again, the gesture is produced by participant P4 to indicate the 'stopping' of time. In reaction to standardized linear time, participant P4 suggested a circular conception and explained that actions cannot be undone even though time is circular:

> You see, you don't go back. Time doesn't **stop** for nobody. (P4; 3:39-3:45)

The gesture is notably non-pointed in both hand shape and location. The location to which they bring the listener's attention is, instead, an area between their palms, in which they can further detail the present or return to in later gesture. Importantly, no other gesture was produced with co-speech relating to the present, singularity, or 'stopping' of time.

### 5.1.3 Pointing

While a placing gesture positions a temporal entity in space for future reference, a pointing gesture directs the listener's attention to a particular temporal object (Clark (2003)). This class is most commonly distinguished based on its handshape, such as in Cooperrider and Núñez (2009), where the index finger extends and the rest of the fingers form a fist. However, the present data show that such a handshape is not typical and thus cannot be used to distinguish between placing and pointing. Instead, I suggest the distinction be made on the basis of its *use*, whether it functions as a reference point or represents a deictic temporal notion. For example, participant P3 lists the four seasons, as she points to four locations on the table in a counterclockwise orbicular motion (P3; 17:32-17:38). The handshape used is a downward extension of the hand, where all fingers touch the table. The four instances of pointing here appear in succession along one path; her hand does not return to one space in between each instance. In this sense, it can be understood that P3 points four times (once to each season), or that P3 points once (to all the seasons).

The most salient use of pointing in the data was in reference to the 'sky world'. Six participants produced pointing gestures upward (with either pointed or non-pointed hand shapes) along with co-speech of "the spirit world", "the sky world", "spirit realm", "another world", and "deriving from spirits".

| | |
|---|---|
| Precisely this gesture | 6 |
| Roughly this gesture | 0 |
| Not at all | 4 |

Table 5.4: Number of participants who produced the *upward pointing gesture*

For example, participant P1 extends his left arm upward and to the right, with a non-pointed handshape and all fingers extended upward, when asked about the beginning of time:

> They say the creator came from–**from the sky world**. (P1; 27:07-27:12)

While participant P3 pointed to the sky world in retelling a story, participant P5 produced a similar pointing gesture in describing the (non-literal) location of that world. When asked about the creation of time in comparison to occasionalism, participant P5 explained how the material world came from the sky world. He raised his hand straight upwards, with a flat handshape and his palm facing down:

> There has to be another **force, Creator force, somewhere else, because there was another world**, another Earth, society, everything. Up in the sky world. (P5; 1 12:33-12:44)

The gesture was also produced in comparison between the material and spiritual worlds. When asked about the temporal differences between the two worlds, participant P9, for example, pointed straight upwards, with a non-pointed handshape and fingers extended upward:

> Time is **different for–in that spirit world**. It matches the world that's here on Earth, but in the **spirit world**, it's different. (P9; 1 6:20-5:32)

Pointing gestures which direct the listener's attention to the spirit world were produced in various contexts of describing, locating, and comparing the spiritual worlds.

Two of the six participants who produced pointing gestures to the spirit world used pointed handshapes (at least once). Both participants produced the same upward motion, centered in front of their body, as the previous two examples. One participant (P6) pointed to each the lower and upper worlds in succession. A pointed hand upward was co-produced with the first two and last 'bold' phrases; a pointed hand downward was co-produced with the third 'bold' phrase:

> Because in the end, when you pass, it's looked upon as 'you've reached **the top of your ladder**'. You got all the tools, everything's with you to **practice that up there**. A duality: **lower world** and **upper world**. (P6; 18:29-18:45)

As participant P6 uttered "a duality", he produced an additional gesture that involved holding his right hand in front of the body horizontally, palm facing the body, extending the index and middle finger, and making a fist with the rest of the fingers. This gesture could be identified as an animating gesture if it were interpreted that the two fingers each represent one world in relation to the other. However, the gesture could also be identified as a pointing gesture if it were interpreted that each finger pointed to each world.

Lastly, I address instances of pointing in reference to first-order representations of space, i.e. physical locations. First, participant P3 produced a gesture with the co-speech "what's around you" where her right hand, pointed, motions a horizontal circular pattern, as she glances out in front of her (P2; 3:33-3:36). Next, participant P5 produced *pointing* gestures co-timed with "out West" and "from Mexico" such that his gesture aligned with the appropriate cardinal direction (P5; 2 0:57-1:11 and P5; 2 1:23-1:28). No other participants produced pointing gestures related to cardinal direction.

### 5.1.4 Continuity-marking

Continuity-marking gestures express properties of the perpetuation of some event, property, or behavior, usually in a repetitive or ongoing process. Participants produced continuity-marking in relation to both constancy and adaptability. Morphologically, a continuity-marking gesture involves two non-pointed hands rotating around each other in a vertical circular motion, perpendicular to the body. Several slight variation on this morphology were observed, and are described in turn.

Five participants produced continuity-marking gestures (at least once), in various contexts.

| | |
|---|---|
| Precisely this gesture | 5 |
| Roughly this gesture | 1 |
| Not at all | 4 |

Table 5.5: Number of participants who produced the *continuity-marking gesture*

I begin with the example with the most immediately relevant co-speech, where participant P1 describes "how different kinds of life" come about in a *continual, natural process*. He produced three different gestures in the explanation. The first involves two non-pointed hands rotating, just as described above, though the two hands are placed apart from one another horizontally. Each hand moves in a repeated, vertical, circular pattern in the same direction, at opposite sides of the revolution, but are held apart from one another. The second gesture has the hands placed closer together, so that they are rotating around each other (produced twice in succession, represented by the second and third 'bold' phrase below). The last gesture forms a larger rotation, shifted so that it's horizontal instead of vertical:

> Different kinds of life that weave the fabric of that dress are given the original instructions. And they **adjust, and they change, and they evolve, and they adapt**. And–and they're just **evolving and living in an ongoing process**. They're not creat–recreating and giving to us a new thing everyday. They're just **continuing**. They **continue in the cycle of life**. (P1; 8:53-9:21)

Another context in which continuity-marking was used occurred in participant P3's description of the repetition of times in one's life, in order to exemplify circularity in time:

> It's time for us to–what do you call it–to be able to **act, you know, do that relationship with our children and our grandchildren, and show them that** the role modeling and **all those things**, you know? (P3; 17:17-17:28)

Participant P3 continued the gesture throughout her description, just as P1 and two other participants, and produced the fastest rotations of all participants.

In one case, continuity-marking was produced to animate the property of being natural or of nature, such as in the explanation of how stones are created:

> That's what you call 'sa-we-er-da'. That's–nature put it there. It **came natural**. Nobody put it there. (P4; 29:27-29:35)

Here, participant P4 gestured with two hands only one half rotation around one another, along with the co-speech "came natural". This differed from other instances of continuity-marking in that the motion did not complete several rotations, but instead just one.

Additionally, there were two instances of a continuity-marking gesture being produced with only one-hand. In the first, participant P6 held an object in his left hand as he gestured with his right a vertical, non-pointed, circular motion, perpendicular to the body. Participant P6 reacts to the occasionalist creation of time by explaining how he sees the continual creation of energy:

> [...] **creating that positive, you're creating–rejuvenating that innocence, that purity**, upon your final departure to return back to Earth–uh, sky world. Where you came from, with spirit. (P6; 1 31:17-31:34)

The second instance involves participant P5 producing both one- and two-handed continuity-marking gestures in one thought:

> Although it takes **time**, there's an interpreter in that video that **translates everything** the guy says in Spanish. (P5; 1 15:54-16:00)

The first, two-handed gesture could be interpreted as an animating gesture for 'time', but here further details the constancy of the interpretation described. The second, one-handed gesture could, similarly, be interpreted as an animating gesture for 'translate', but here further details the continuation of the translation, which continues throughout the video. In general, the data do not show a substantial difference between one-handed and two-handed continuity-marking gestures.

## 5.2 Discussion

The temporal gesture patterns identified in the present chapter carry throughout community dialogues as well as conceptual temporal descriptions; the data is sourced from speech that relates to temporal happenings and otherwise. The data show both pointed and non-pointed handshapes in pointing and placing gestures, as well as orbicular patterns (both lateral and contralateral) employed in all four gesture types discussed. Additionally, most—in fact, nearly all—circular motion, whether forming a complete revolution or only a curve, was counterclockwise (unless indicating an event in the past relative to another). The directionality of temporal gestures of the Mohawk is, then, not sagittal front-to-back nor left-to-right. Instead, directionality appears along the orbicular motions as counterclockwise.

Orbicular and curved patterns were identified across all gesture types discussed. Moreover, the absence of linear gestures is similarly consistent with the circular conception of time found in the study through verbal data, which generally rejected the linear conception. Thus, the gestural data provide evidence of a circular mental representation of time.

Conceptual metaphor theory and embodied cognitive linguistics uphold a view on metaphor where abstract domains, such as time, are constituted by bodily experience (Lakoff and Johnson (1999)), and serve as evidence of the human ability to reason about abstract concepts using concrete tools (Cooperrider and Núñez (2009), p.201). Cooperrider and

Núñez (2009) question the iconic-metaphoric split in the classification system of McNeill (1992). They ask rhetorically: "Is a given instance of temporal gesture, then, a case of metaphoric virtuosity, or an iconic gesture that represents commonplace temporal imagery?" (Cooperrider and Núñez (2009), p.201). In the case of Mohawk temporal gestures, then, this split becomes even more dubious. The present study shows animating gestures for "time" to be identical with those for analogous concepts: "a circle", "the way nature is", "the cycle of the sun and the moon", etc. Not only can gestures be informed by second-order representations of temporal concepts (e.g. calendars, language), but they can also be deeply connected with other cultural uses of metaphor. As "the way nature is" and "time" are verbally analogized, they are also similarly mapped onto the concrete domain using the circular animating gesture. Another question arises, further blurring the iconic-metaphoric split: Is a given instance of temporal gesture a case of metaphoric virtuosity or an iconic gesture that represents an analogous concept?

Animating and pointing gestures were consistent with the findings of Chapter 4 by locating the spirit world at the top of a circle. While pointing gestures ubiquitously located the spirit world as above-the-ego, an expected analogy for its verbal synonym "sky world", animating gestures located the spirit world as the top of a circle. Two co-speech temporal gestures suggest evidence for such a mental representation of the spirit world: the co-production of gestures along a right upward arc with speech relating to death, and the co-production of gestures along a left downward arc with speech relating to birth. Such gestures were not only produced in contexts of explicit explanations of the conception of time and location of the spirit world, but they were also produced in other contexts, such as summarizing the story of Creation, or explaining birth and death.

Continuity-marking gestures were most cohesive in terms of morphology and dynamics, in that, across variations, the movement and hand orientation were identical. Continuity-marking was employed to describe natural progressions, or the continuance of some property or event. In some cases, continuity-marking also includes what is classified as a 'bridging' gesture, which expresses a transition between two events, as identified by Cooperrider and Núñez (2009). The class of continuity-marking gestures is larger, including descriptions of on-going events which may not be composed of separate, individual events. Continuity-marking gestures, then, are a natural result of the study in that they represent a more cohesive, cyclical structuring of events.

# CHAPTER 6

# CAPITALISM, COLONIZATION, AND COGNITION

Mohawk temporality is grounded by Mohawk embodiment—by the apprehension and enactment of instructions. For the past several hundred years of colonization, Mohawk communities have been confronted with violent change in that embodiment. Instructions of protecting the earth, making children safe, eating from gardens, and speaking your language are, for the first time in Mohawk history, challenges to enact; instructions no longer comprise the easiest, most peaceful way to live, and our ability to follow instructions is under threat. Among traditional Mohawk communities, there is an urgent question of how to follow instructions under colonial powers, how to be embodied in a world which threatens your embodiment.

The study on the Mohawk conception of time in Chapter 4 and 5 is only a snapshot into the lifespan of Mohawk conceptions. Undoubtedly, Mohawk conceptions and gestures were different say, four hundred years ago, and as Mohawk society continues to change, the next generation's conceptions may differ from this one's. How the Mohawk change and resist change in their temporality is relevant to studies of each colonization and cognition. Yet due to the impact of colonization on Mohawk embodiment, these changes are not only of interest to the two fields respectively, but also indicate a close connection between them that has yet to be explored.

The extended mind hypothesis, and embodied cognition in general, assert that a person's body and environment are bound with their cognition, and thus, as I see it, have natural interest in colonization as a process which can drastically alter one's embodiment. In the present chapter, I investigate how cognitive scientists and philosophers of cognition can engage with 'colonization' in research on indigenous peoples. I begin by tracing the increasing use of clock time as a global capitalist project in order to illustrate how such projects may alter bodily experiences, thus showing their relevance to cognitive frameworks. I then probe how temporalities may change—or resist change—within processes of colonization, paying particular attention to the societal values attached to change and resistance. Finally, I identify and analyze several relevant positions within philosophy of cognition which can

be easily extended to address colonization. Throughout, I call for further research on the colonization of cognition in order to provide further material for current research and to contribute to a truer understanding of colonial practices.

## 6.1 The Rise of Clock Time

In the late 18th century, during an exploratory period of far-reaching maritime voyages, navigators began adjusting their time pieces according to the drop of the ball atop the Eastern Turret of the Royal Observatory at Greenwich in London. Land-based communities soon followed suit in assimilating their time pieces, and thus their time itself, to Greenwich time. This is the beginning of the story of *the rise of clock time*, the story of dozens of countries' citizens' assimilation to one time in lieu of their respective cultural temporalities.

Beginning in the 1820s, the increasing installations of railways across Europe "eventually forced a uniform time on a not-unwilling population" (Howse (1980), p.87). By 1880, nearly all (98 percent) of public clocks in England were set to Greenwich Mean Time (GMT). Moreover, the later 19th century saw an increase in coordination to produce standardized time measurement between European countries, as well as Europe and North America, where railroads production was likewise insistent on enforcing uniform time (Nguyen (1992), p.32-33). The 1884 International Meridian Conference hosted delegates from 25 countries "to discuss both the principles and the logistics of a universal and standard measurement of time" (Nguyen (1992), p.33). If one were able to identify the moment of the hegemonic deployment of standardized clock time for the West, it would likely be the close of that conference.

In the present section, I trace the rise of clock time since 1884 as a capitalist project in terms of a shifting Western temporality, and illustrate how the increase in use of standardized linear time may alter bodily experiences. I begin the discussion by situating the rise of clock time within wider practices of colonization, before assessing capitalism's effects on embodiment which are realized through clock time.

Studies of world history generally lack a clear explanation of *why* global colonization by the West occurs. Eurocentric biases regularly promote that 'human nature' is responsible. This popular assumption is academically suspect because it is rather unimaginable as a verifiable position *and* it serves to morally relieve the dominant West. The forced spread of standardized clock time, across vast areas and diverse cultures, is undoubtedly linked to the concurrent forces of colonization of the era, and thus any study of it risks adopting similar Eurocentric trends. There is danger—even in presenting a history of clock time—of portraying the dominance of clock time as a natural occurrence in human history (due to 'human nature'), i.e. 'damning all humans'. Claims which attribute the desire to assimilate others into one's own temporality to a natural human tendency would 1) be unfair to those who are victims of colonialism or who faced political consequences of clock time and 2) amount to a shallow investigation into how and why the use of clock time increased so drastically in Western society. Among scholars who avoided the latter mistake are Stephen Kern and Dan Thu Nguyen, who have suggested accounts for the rise of clock time which go further than 'damning all humans'. In his book *The culture of time and space: 1880-*

*1918*, Kern (2003) connects the Western European ideology of imperialism and repeated appropriation of others' lands with a "philosophy of the future in the active mode" (p. 102). Such an 'active mode' is described as a philosophy (though perhaps better described as a temporality), where "the future does not come toward us but it is that toward which we move". According to Kern, the culturally embedded 'active mode' can be attributed to—as well as contributes to—Western practices of colonization. In this sense, Western temporality was becoming increasingly unified in its 'activity', in its shared attitudes towards the future, in the 18th century. Nguyen (1992), in *The Spatialization of Metric Time: The conquest of land and labour in Europe and the United States*, puts forth another, more political and less cognitive, explanation for the rise of clock time. Tracking the growth of the temporal regime of Western metric time (standardized clock time) in connection to capitalism and practices of colonization, Nguyen argues that "the conquest of space is intrinsically tied to the mastery of time" i.e. that the rise of clock time has to do with physical colonization (Nguyen (1992), p.30). The cognitive, cultural, political, and philosophical shifts, as postulated by Kern and Nguyen, in the relationship between space and time is central to an investigation into Western embodiment and the rise of clock time. It is worth clarifying that I do not embrace the entirety of Nguyen's work since we have not witnessed the "irreversible destruction of all other temporal regimes in the world" which he so boldly claims (see Donaldson (1996) for a formidable counterexample). Instead, I focus my analysis on the effects of the Western temporal regime *on the West* throughout this section's investigation.[1]

The demand for increased time measurement did not rise from the masses. In the fourteenth century, nine out of ten Europeans lived on land outside of cities, and there was little incentive to increase their own production through time measurement.

> On the whole, labor time was still the time of an economy dominated by agrarian rhythms, free of haste, careless of exactitude, unconcerned by productivity—and of a society created in the image of that economy, *sober and modest*, without enormous appetites, undemanding, and incapable of quantitative efforts. (Le Goff (1982), p.44)

Instead, David Landes (1995) suggests in *Of Time: Work, Prayer, and Monks*, (mostly Christian) religious practices of regular prayer by the use of bells lead to the "unintended consequence" of a new order:

> But the new bells and the calculations they made possible (how long until? how long since?) were a school for all who listened and began to organize their lives around them. Meanwhile the church clung to old ways and, so doing, yielded the rhythm of life and work to the lay authorities and the bourgeoisie. Equal hours announced the victory of a new cultural and economic order. (Landes (1995), p.258)

If this new order was indeed unintentional, then the fourteenth century monks must have been astonished to witness how immediately and powerfully it affected society. Measurement of time was quickly adopted in for-profit projects. Merchants in the Middle Ages began

[1] This paragraph was the product of another research project, under the supervision of Martin Stokhof in February 2017.

the practice of *interest*, a controversial sale of the time. Franciscan monks warned that the charge for interest on loaned money was unethical since it "*would be selling time* and would be committing usury *by selling what does not belong to him*" (Le Goff (1982), p.29). The new cultural and economic order was immediately employed to increase profits by assigning value to structured time, and so it is unsurprising that the industrial revolution further bolstered standardization of time for economic advantages.

While the increase in standardized time has significant economic and cultural effects on society, it also effects the *experiences* of individuals. The adoption of clock time and eventual abandonment of its predecessor(s) have altered human experiences of embodiment, as is witnessable in their numerous effects: loss of touch with organic and cosmic frequencies, the break-up of the day, new labor standards, (Marxist) alienation, and capitalist control over bodies. The most immediate alteration that arises in discussions of this transition is that of temporal regions. The form of standardized metric time is a structure which subsists only within the social temporal region. Minutes, hours, and days are measurements of frequencies of the social, and with their adoption, organic and cosmic temporal regions become increasingly displaced experientially.

> No longer determined by either organic or cosmic cycles of time, 'Greenwich time' is a mathematical fiction which signals the collapse of the human experience of space and time into a mathematical formula of space-time. (Nguyen (1992), p.33)

The experience of space and time shifts through the use of clock time; space and time *feel* of a more narrow frequency. Of course, the experience of following a clock may be a spiritual, or holy, one e.g. in the cases of those religious practices of the Middle Ages (see Taylor (2007) and Landes (1995)).[2] In everyday and spiritual practices, clock time differs experientially from non-clock time in their frequencies.

As the 19th century industrial revolution increased the production of factories, it simultaneously increased the production (and quality) of timepieces. What afforded the increased production, and thus the revolution itself, was interestingly a shift in factories' use of time: the synchronization of labor using clocks. As David Landes (1995) writes, "The clock did not create an interest in time measurement; the interest in time measurement led to the invention of the clock" (Landes (1995), 253). Agreements to exchange an *amount* of labor for pay were replaced by agreements to exchange a *duration* of labor for pay—measured by the factory clock (Thompson (1967), p.61). For the individual, days were broken into segments of work-time and non-work-time, as determined by the factory. In turn, the production cost of an item was measurable by the amount of work-time it required. For this reason, it is unsurprising that the use of time in factories quickly became a science. Frederick Winslow Taylor in 1911 published *The Principles of Scientific Management*, a monograph detailing how to increase collective and individual efficiency, a process which requires the reconceptualization of the 'working day' (Taylor (1914)). For the worker, the industrial revolution entailed the experience of time becoming an experience owned by those more powerful, by

[2] A future research question could ask if or how strict practices of the clock, as spiritual experiences, relate to narrowed frequencies.

those who dictate one's employment and wages, by those who hold the stopwatch. However, as Nguyen writes,

> It was not enough that time-discipline be imposed on the workers from above, they must also actively participate in the construction of the temporal regime. Thus, factory workers contribute to the formulation and execution of their own discipline insofar as they are encouraged to 'fight, not against time, but about it'. (Nguyen (1992), p.41)

Indeed, factory workers' initial outrage over the imposition of a clock eventually transitioned from fighting against the clock to fighting about it. As workers and employers disputed over the length of the work day and the frequency of breaks, the workers not only internalized the clock time forced upon them, but also logically upheld it. Time was no longer the object of individual or collective bodily experience, but the object of logical workings and capital value.

These socio-political changes in 'time' also altered the *bodily* experiences of time, in a time when there was new power over life to be taken. On the broadest level, bodies increasingly became under control of others, most clearly described in Michel Foucault's *The History of Sexuality: Vol. I*. Foucault (1978) examines two forms of power: 1) the "*anatomo-politics of the human body*" where the human body is treated as machinery, resulting in a more disciplined population, and 2) the "*bio-politics of the population*" where the reproductive capacity of a human body is under control of another, resulting in control over the make-up of classes and populations (Foucault (1978), 139). These two forms, as power over bodies and populations, together compose *biopower*.

> This biopower was without question an indispensable element in the development of capitalism; the latter would not have been possible without the controlled insertion of bodies into the machinery of production and the adjustment of the phenomena of population to economic processes. (Foucault (1978), p.140-141)

Bodies were part of the machinery organized by a clock, a physical unit within the process of production. Thus, control over entire populations, Foucault writes, is incentivized under capitalist systems. For many workers in Europe and North America, clock time meant their bodies were a (literal) tool for production.

On a more individual level, the rise of clock time in capitalism permitted new control over bodily movements and experiences. Capitalist thinkers such as Henry Ford, Frederick Taylor, and Frank B. Gilbreth, studied the human activities of workers in order to maximize production (e.g. structure of the factory, motions of the workers' bodies, assembly line behavior, etc.). For example, Gilbreth used cyclographs to produce maps of laborers' arm movements during production (Nguyen (1992), 39-40). In turn, factory employers could design and enforce processes which use the arm most efficiently, repeating simpler motions more times in the work-day rather than repeating more complex motions fewer times. Thus, as the chronometric processes of the factory were restructured, so were the bodily experiences of workers. The temporal happenings of an individual's day (task repetition, break times, task duration, etc.) were tied to certain spatial happenings (arm movements, bodily

positioning, shape of the room, etc.). Or, as Foucault writes, "Time penetrates the body and with it all the meticulous controls of power" (Foucault (2012), p.145).

The rise of clock time, as a story of temporal control over human experiences, granted *seemingly* disparate changes to take place: the settlement of land and extraction of resources through extended travel, the reformation of temporal experiences (across frequencies and days), a sudden increase in laborers' objectification, and an advanced control of a nation over its people. There is nothing disparate about these consequences; each functions within a larger process of colonization, the control of one group over another group's bodies, land, children, resources, safety, spirituality, and/or livelihood. The rise of clock time, then, is a mechanism of colonization of both Western and non-Western peoples and land largely by altering experiences of embodiment, their very existence in a world of space and time.

## 6.2 Change in Temporalities and Resistance

The rise of clock time, situated within a larger narrative of colonization, also concerns contact with indigenous societies. The natural question, then, is what happens during that contact: how do indigenous temporalities change or adapt, and how is change resisted.

Within Western treatments of indigenous peoples and cultures, the dominant—not to mention politically instrumental—perspective is that indigenous thought (and often indigeneity itself) is necessarily terminated throughout colonization. Studies of time are similarly susceptible to these harmful paradigms. Scholars often assume that Western culture will necessarily lead to "irreversible destruction of all other temporal regimes in the world," most especially indigenous temporalities (Nguyen (1992), p.30). When the academy promotes paradigms of indigenous inferiority, indigenous peoples become estranged from their own histories and societal values—and more familiar with the global colonial narrative. Attitudes and assumptions that depict indigeneity as fragile or weak are not only harmful to indigenous people by promoting a colonial narrative; they also exclude indigenous perspectives, thus failing to recognize more nuanced characteristics of indigenous societies which ought be considered in successful research. Cheyenne scholar Leo Killsback (2013) in *Indigenous Perceptions of Time: Decolonizing Theory, World History, and the Fates of Human Societies* develops an historical paradigm that accounts for how indigenous understandings of time can be applied to the studies of human societies. I begin by illuminating Killsback's finding of a temporal characteristic of indigenous society, which is neglected and subsequently threatened by colonial perspectives:

> Human societies can also be perceived as organisms of earth bound by laws of the physical world, but to maintain purpose and balance must also rely upon spirituality. If all human societies exist as organisms, then they are no different than similar living beings: they must be conceived, born, mature, reproduce, age and eventually die in a predictable sequence of life cycle. (Killsback (2013), p.94)

Killsback depicts an indigenous societal value of a spiritual objective to *live in peace* and *die with grace*. Under such a view on society, change in any dimensions of society is a natural

occurrence which allows for peaceful living.

Change in indigenous conceptions of time, then, is not a necessary event in colonization practices, but instead a potential adaptation. Through resistance, indigenous peoples may succeed (and in many cases have succeeded) in maintaining their cultural temporalities or parts of their temporalities (see Donaldson (1996)). Further, if their temporalities are to adapt to modern societal changes, it would demonstrate the society's adaptability, and those temporalities would be no less their own. Of course, this is not to assign more agency to indigenous societies than accurate, since the forcible taking of agency is an often-employed device of colonial powers. Each indigenous society has a unique culture and relationship to colonial nation-states, and thus require individual consideration, most especially to assess agency.

### 6.2.1 Haudenosaunee Adaptability

Haudenosaunee resistance to colonial influences, as laid out in Chapter 3, serve to maintain Haudenosaunee cultures in the modern era of the contact period with European settlers. Historically, this is not the first violent, tumultuous time Haudenosaunee peoples have encountered. As Chief Leon Shenandoah described it, the five nations were once at constant war:

> "Everywhere people were abusing one another—ambushing innocent people on the trails in the forest, attacking people in fishing camps, and even in the towns [...] It was a very bad time." (Wallace (1946), p.10)

War time ended among the five nations when "The Peacemaker" united the five nations under the Grand Council governing system and established the Great Law of Peace, around 1142 (Killsback (2013), p.101). Today, the history of the cruel, disgraceful events, which would be shameful for any society to address, live on in Haudenosaunee stories of Tadadaha, a man-turned-monster. Killsback points out:

> Here historians may find a problem in that the Haudenosaunee did not collapse, implode, or fall as a fragile and unsophisticated society when compared to European monarchs. The society survives and was able to reinvent itself. (Killsback (2013), p.102)

The legacies of the Great Law of Peace and the Grand Council persevered through the colonial era as the Haudenosaunee dealt with European settlers and the United States, and through the modern era as the Haudenosaunee participant in forums of the United Nations. "The Haudenosaunee society has proven to be an organism that is capable of sustaining its reality into eternity; as each progeny society is born, it persists in the near-exact image of parent societies" (Killsback (2013), p.102).

The adaptability of the Mohawk society, including its ability to take on the markedly difficult task of addressing shameful pasts, is a part of their temporality. While the study of Chapter 4 depicts a particular Mohawk conception of time, it is likely to change and adapt in the future of the society's life, and be passed on to progeny societies when, eventually, the current one dies with grace.

### 6.2.2 The Anomaly of Western Temporality

Western societies are strikingly dissimilar to indigenous societies in their cultural views on the lifespans of societies. From an indigenous perspective, Western society aims to expand at any cost, in order to gain more land, wealth (for some), and power. Western society does not embrace death and change, but has come to fear it.

> This unique society allowed for its offspring to take on the same destructive life cycle, sever ties to a homeland, and create systems to justify the domination of others. This organism was able to create a historical tradition based on fantasy that dehumanizes entire groups of people and damns whole societies while excusing itself from any past, current, or future acts of inhumanity. Eventually it produced progeny that suffer from a societal bipolar disorder: half-colonizer and half-colonized. (Killsback (2013), p.107)

In light of the mentioned indigenous societal values, Western society appears a dysfunctional (perhaps sickly) anomaly. As reflected in the actions and structure of its society, Western temporality is largely linear, and not one of cycles; it sees only an infinite future of conquering and power without adaptability or recycling. Western society's determination to eliminate other temporalities and replace them with their own is a part of *its own* temporality. When scholars approach indigenous temporalities and the cognition of indigenous peoples by assuming their inevitable destruction, it only reflects their own temporality, expecting the domination of others due to its justification within Western reasoning.

## 6.3 Cognitive Colonization

Historically, human reasoning has been regarded largely as a function of the mind with little consideration of the body, and cognitive and psychological research has generally neglected treatment of 'full embodiment'.

> We have inherited from the Western philosophical tradition a theory of faculty psychology, in which we have a "faculty" of reason that is separate from and independent of what we do with our bodies. In particular, reason is seen as independent of perception and bodily movement. In the Western tradition, this autonomous capacity of reason is regarded as what makes us essentially human, distinguishing us from all other animals. (Lakoff and Johnson (1999), p.52-53)

The preceding analysis seriously challenges this norm since it exposes how colonization, as a process *over bodies*, is not only a political operation, but can also be a cognitive one. An alteration in how people measure, experience, and conceive of time is a transformation of their cognition of time. Because both bodily and cognitive experiences change within the same process, externalist debates become immediately relevant in understanding 'cognitive colonization'. Full embodiment "explicitly develops a paradigm to explain the objects created by the human mind themselves (i.e. concepts, ideas, explanations, forms of logic, theories) in terms of the non-arbitrary bodily experiences sustained by the peculiarities of

brains and bodies" (Núñez (1999), p.56). In the present section, I situate externalist positions within the preceding analysis of the rise of clock time in order to lay out a potential future area of research within the field of cognitive science: colonization of cognition of time.

Active externalism, as presented by Clark and Chalmers (1998), is proposed as a third option in debates of internalism versus externalism. It puts forth the concept of the extended mind in order to move beyond the Cartesian idea that cognition is a private, mental occurrence. Central to their concept of the extended mind is the *parity principle* (not yet so-named):

> If, as we confront some task, a part of the world functions as a process which, *were it done in the head*, we would have no hesitation in recognizing as part of the cognitive process, then that part of the world *is* (so we claim) part of the cognitive process. (Clark and Chalmers (1998), p.8)

The principle, in part due to its reliance on 'recognition', is largely left open to interpretation.[3] Various interpretations offer numerous analyses of how adopting 'clock time' into one's life may introduce standardized linear time into one's cognition.

Active externalism aims to explain, using the extended mind, how the processes work "that enable mental states of a given content or quality type" (Hurley (2006), p.1). Under active externalism, the environment can play an active role in cognitive processes. For cognition of time, then, the time piece becomes a part of cognitive processes. This is explainable by the parity principle since, for example, clock-reliant measurement of time (e.g. in waiting five minutes by setting a timer, or estimating if you will arrive at work by 9:00), *were it done in the head*, would be recognized as part of the cognitive process. Active externalism suggests the use of a clock as a part of cognitive processes.

Shaun Gallagher (2013) pursues a more liberal interpretation of the parity principle in support of his *socially extended mind*, which treats the socially extended mind as a mind which has 'mental institutions' as extensions, as full members of its distributed cognition. For cognition of time, then, the social institution of standardized linear time—as a socially upheld and enforced method of time measurement and management—becomes a part of the cognitive process.[4] This is explainable by the parity principle since, for example, the social conventions of standardized linear time (e.g. setting meeting times by the hour, or employing linear spatio-temporal metaphors in language), *were they done in the head*, would be recognized as part of the cognitive process. Social externalism, then, suggests not only the use of a clock, but also the socio-cultural temporality of standardized linear time, as part of cognitive processes.

Additionally, spatio-temporal metaphor use across languages is often presented as strong evidence that cognition itself is fully embodied. The support of Rafael Núñez (1999), for example, of full embodiment is based largely in spatio-temporal metaphor use, in the universal

[3] This paragraph was, in part, the product of research done for the course Philosophy of Cognition (2016) at the UvA.

[4] Additionally, under Gallagher's interpretation of the parity principle, capitalism itself could be understood as a 'mental institution', a relevant point to consider in future research of colonization and cognition.

hypothesis that human cognition conceptually maps time to space. In adopting full embodiment, he claims, "conceptual systems and forms of understanding are not considered a priori, but they become subject matters to be explained in real-time bodily grounded terms" (Núñez (1999), p.56). It would be unsurprising, then, for a supporter of full embodiment if the bodily effects of colonization were cognitively influential.

Active externalism, social externalism, and full embodiment approaches to cognitive science are all similarly corroborated by the close—dare I say interactive—relationship between embodiment and cognition of time within processes of colonization. Each position claims that cognition is inclusive of some bodily experience(s), and colonization surely entails diverse bodily experiences (e.g. the arm movements of laborers, far-reaching travel, the adjustment of time pieces). However, the positions offer little insight into *how* colonization affects cognition. The current analysis suggests that changes in embodiment (even control over bodily experiences) are effective in changing or altering cognition, but it also asks how this occurs: *do changes in embodiment necessarily lead to changes in cognition? what role does language, including gesture, play in altering cognition? how does the adoption of standardized linear time in one's life affect their own temporality?* Cognitive science as a field has yet to understand—or truly engage—how colonization affects cognition.

I advocate 'cognitive colonization' as a future area of research for two reasons. First, if we wish to understand the relationship between the external world and cognitive processes, there is much to be gained from examining the cognitive effects of large, forceful changes in that external world. It is in the interest of both philosophers of cognition and cognitive scientists to invest in understanding these diverse changes. Second, the effects of capitalism and colonization, both today and historically, are worth our full attention, worth an attempt at a truer understanding.

# CHAPTER 7

# CONCLUSION

Everyone is embodied in the same world; we all participate in rituals; we each conceive of 'time'. These three universals are, as Rappaport (1999) claims, entirely connected. Through our experiences of embodiment and practice of ritual, we gain a temporality: a practice and understanding of time. Our individual cultural temporalities are shaped by universal properties of human existence: embodiment, ritual, and cognition.

As Núñez and Sweetser (2006) predict, there are both universal and culture-specific models of time (p.4). For culture-specific conceptions of time, we are granted the opportunity to investigate the relationships between a particular culture's embodiment, ritual, and cognition, in order to understand how they together shape a temporality. Universal conceptions of time naturally provide broader insight: into the structural properties of their relationships, into the necessity of the co-existence of embodiment, ritual, and cognition.

In investigating Mohawk temporality by examining embodiment, ritual, and cognition, we witness both universal and culture-specific aspects of 'time'. Mohawk embodiment is determined by their apprehension and enactment of instructions, by their performance of ritual. This embodiment simultaneously unifies traditional Mohawk communities and constructs their cultural temporality through a shared commitment to acknowledge instructions as such, and through a coordination of that commitment within governance and society, ceremony and song, and language. The Mohawk temporality which is constructed is that of a natural cycle where processes continue and adapt, and where we, in the material world, are given instructions from the spiritual world. Rappaport's universal hypothesis that embodiment and ritual construct temporality is again upheld, but is successfully applied to understand the particulars of Mohawk temporality.

A Mohawk conception of time, stemming from embodiment and ritual, carries logical properties: a closed curve with the spiritual world 'at infinity', where every event occurs simultaneously, and with the material world, where events are totally ordered. Their conception upholds transitivity, antisymmetry, and totality only in the material world, where we experience causation and create time continuously by following instructions. This con-

ception, as an object of cognitive processes, is also closely tied to their temporal gesture. Animating, placing, pointing, and continuity-marking gestures were consistently circular in motion. Speech relating to traveling to and from that spiritual world (i.e. death or birth) was co-timed with gestures along orbicular paths upward and downward; speech relating to time and analogous concepts was co-timed with circular animating gestures; the 'spiritual world' was consistently placed and pointed to as above-the-ego. Gestures are ubiquitous in human communication, and are increasingly being treated as a part of a unified system which includes speech and mental processes. Importantly, gestures are also a part of each embodiment, ritual, and cognition. Gestures are movements of our bodies; they are most often shared culturally as ritual; they assist in mental processes as an embodied cognition.

Any scholar who is convinced of the interactive properties of embodiment, ritual, and cognition (most likely e.g. externalists, historians of time, sociologists of culture) ought also be intrigued by the role of colonization in this interactions. Western colonial practices, especially as capitalist projects, have historically employed and relied on the forcible spread of clock time. This was not only politically consequential, but also cognitively. As the rise of clock time effected connection with organic and cosmic frequencies, broke up the day, introduced new labor standards, and increased capitalist control over bodies, it altered bodily experiences of Western peoples and altered their conception of time, the cognitive object with which they mentally process. Colonization is not typically theorized under a cognitive lens, but due to its significant impact on embodiment and ritual of both Western and indigenous peoples, it is a worthwhile pursuit. Philosophers of cognition and cognitive scientists have much to gain in such investigations, and, more importantly, cognitive colonization explores exactly how far colonial practices reach: through our bodies, through our rituals, into our cognition.

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