A Cognitive Meta-Theory for TESOL

Lorin Friesen

Angelina Van Dyke

Abstract

A general theory of human cognition must be able to explain all aspects of human thought including scientific and rational thinking, normal thought, and personal identity and emotions. We present a theory that began as a system of cognitive styles, was expanded through an analysis of biographies, mapped onto neurology, developed through a study of personality, and then tested by using it to explain human thought in a number of dissimilar fields. This type of evidence cannot be presented within the confines of a single paper. Instead, we will introduce the theory, show how it is consistent with neurological research, and then use it to analyze the TESOL field, a ‘specialization’ that brings together a broad range of topics related to human thought and behavior which are normally viewed in isolation. The typical second language learner is struggling to learn a new language with all of its idiosyncrasies, while acquiring new paradigms, navigating culture and negotiating personal identity. Examining the mechanisms involved in diverse elements of TESOL, such as language acquisition and learning, identity constitution, intercultural pragmatics, research methodology, critical discourse analysis, and male and female intellectual development through the lens of a general meta-theory of human cognition has application both for TESOL and for cognitive science in general.

Key Words

cognitive science, TESOL, meta-theory, pragmatics, identity

Introduction

The TESOL field is an unusual specialization because of its multidisciplinary character and lack of theoretical and methodological cohesion. In his state of the art address in *TESOL Quarterly*, Canarajah (2006) relates, among other issues, how differing perspectives over adopting a

cognitive or social orientation in SLL, testing, and teacher education, have divided the field. Furthermore, some current attempts to unify sociolinguistic and psycholinguistic aspects of language learning, identity construction, and motivation (Norton, 2000; Marchenkova, 2005; Dörnyei, 2005; Vitanova, 2013) offer valuable observations, but without revealing the mechanisms at work.

This paper will present a cognitive meta-theory that was developed outside of the TESOL field and use it to explain various aspects of the TESOL field. Therefore, we will begin by describing the theory and then we will connect the theory with established literature. Lorin Friesen began studying cognitive styles in the mid 1980s, using a system of cognitive styles first elaborated by Don Pickerell in 1974 (Harvey, 1976) which is not well known academically, but is taught fairly widely in some circles (Fortune, 1987). Lane Friesen (the brother of Lorin Friesen) used this system to gather qualitative data on 200 historical biographies, leading to a vastly expanded set of personality traits. The two brothers then realized that these traits are expressions of simple underlying cognitive mechanisms that correspond to the functions of major brain regions, resulting in a mapping between cognitive style and neurology. Because brain regions connect together in a specific way, the set of seven cognitive styles could be turned into a simple model of the mind, which we call the model of mental symmetry, shown in **Figure 1**. If people with similar brains have different cognitive styles, then this implies that cognitive style reflects consciousness in a different part of the mind, with each cognitive style naturally emphasizing the aspect of thought that is conscious. Each cognitive style then provides a ‘window’ into a different part of the mind, making it possible to put together a composite picture of how the entire mind functions. Thus, for instance, ‘Perceiver thought’ will refer to a cognitive module

Figure 1: Diagram of Mental Symmetry

that is present within all minds, whereas ‘Perceiver person’ refers to a person with the cognitive style of Perceiver who is conscious within Perceiver thought.

The initial study of personality led to the conclusion that the seven cognitive styles can be divided into the four simple styles of Perceiver, Mercy, Server, and Teacher which focus upon mental content, and the three composite styles of Exhorter, Contributor, and Facilitator which focus upon using this content. For instance, the Mercy person ‘lives’ within an internal world of emotional experiences, while the Exhorter person uses emotional experiences as a starting point for imagination and motivation.

The Model of Mental Symmetry

Extensive neurological support for this cognitive model can be found in *Natural Cognitive Theology* (Friesen, 2015). Only some of this evidence can be included within this paper.

Looking first at the big picture, it is well-known that the left hemisphere is superior at language and sequential processing and that the right hemisphere is superior at visuo-spatial processing

(Hellige, 2001). There is an equally fundamental distinction between dorsal (top) and ventral (bottom) cortex, with dorsal cortex handling spatial and sequential relations and ventral cortex involved in classification (Borst, 2011). Finally, sensory information is stored in the back of the cortex, while the frontal lobes handle planning, goals, and executive functioning (Stuss and Levine, 2002). Comparing these basic neurological divisions with the fundamental traits of the four simple cognitive styles leads to the hypothesis that each of the four simple cognitive modules corresponds to a brain system with ‘data’ in the back of the brain, a ‘processor’, and an ‘internal world’ in the front of the brain. For the Teacher and Mercy, the processor is the amygdala, which functions emotionally (Buchanan, 2001). For the Perceiver and Server, the processor is the hippocampus (Papanicolaou, 2002). This mapping is summarized in **table 1**.

Name	Perceiver	Server	Teacher	Mercy
Primary Data	Facts, maps, and objects	Sequences and movement	Words and theories	Experiences and non- verbal communication
Label attached to data	Belief and certainty	Confidence and certainty	Emotion of order-within-complexity	Good vs. bad emotion
Brain Processor	Right Hippocampus	Left Hippocampus	Left Amygdala	Right Amygdala
Core Brain Regions	Right parietal and dorsolateral frontal	Left parietal and dorsolateral frontal	Left temporal and orbitofrontal	Right temporal and orbitofrontal

Table 1

Linguistics and the Four Simple Styles

Chomsky suggested that language is ‘hardwired’ into the mind but did not provide any cognitive mechanism for this suggestion. Slobin (1973) described universal principles that are observed in the linguistic development in the child, which we suggest are universal because they reflect the functioning of cognitive modules.

Words and theories play a major role in Teacher thought and substantial work has been done relating the various aspects of speech to different areas of left inferior cortex (Teacher thought) (Friederici, 2012). Looking at this in more detail, analytical thought works with sequences; therefore, Teacher thought will naturally take words and put them into a certain order. This corresponds to Slobin's observation, "Pay attention to the order of words and morphemes" (p. 197). One does not normally associate abstract thought with emotion, but a closer examination of Teacher thought indicates that it generates emotion based upon order-within-complexity. Thus, when faced with a complexity of items, Teacher thought is emotionally driven to find order. The result is a natural tendency to overgeneralize, because a general statement feels good, and Slobin mentions that overgeneralization is probably the most widely noted feature of child speech (p. 204). Because generality is associated with positive emotion, there will be a tendency to learn general rules before rules for special cases, as Slobin notes (p. 205). When an item violates a general rule, then this leads to negative Teacher emotion, which corresponds to Slobin's principle, "Avoid exceptions" (p. 205).

Moving on, Mercy thought deals with experiences. Verbal memory is in the left temporal cortex (Teacher data) while visual memory is in the right temporal cortex (Mercy data) (Bonelli, 2010). The right temporal lobe (Mercy data) provides the experiential context for speech, making it possible to understand the overall meaning, and the Mercy person finds it difficult to understand speech that lacks concrete examples. The Mercy person often asks 'Who are you talking about?' and the right temporal lobe (Mercy data) plays a major role in person and biographical memory (Olson, 2013). The Mercy person is highly sensitive to non-verbal language, which neurology has assigned to regions within the right inferior cortex (Mercy thought) (Ross and Monnot,

2008). Tone of voice plays the greatest role in conveying emotion in speech and people use both facial expression and tone of voice to determine emotion, even when instructed to focus upon one and ignore the other, suggesting that both are being interpreted by a single cognitive module (de Gelder and Vroomen, 2000). The Mercy person is also most aware of the etiquette and politeness involved in social pragmatics and implicature.

Server thought works with sequences. Consistent with this, a single region in the left parietal cortex (Server data) handles both sequences of physical movement and sequences of words (Heim, 2012). The Server person is ‘always doing something’ and is naturally talented at copying the actions of others; the left parietal region (Server data) both remembers sequences of movement and is critical for copying sequences of movement, (Niessen, 2014), which corresponds to Slobin’s (1973) observation that word order in child speech reflects word order in the input language (p. 197). When the Server person learns a recipe or procedure, then he tends to repeat that recipe unaltered. This also occurs when a child learns language (p. 199). Server thought finds it easiest to place confidence in sequences which are repeated most often, and Slobin notes that “The standard order of functor morphemes in the input languages is preserved in child speech” (p. 197). The Server person finds it easier to come up with short-term plans than long-term projects, and Slobin mentions that a child finds it easiest to process sentences when there are no gaps between the related parts (p. 201). Finally, the Server person tends to finish one task before starting another, corresponding to a tendency to preserve the structure of the sentence as a closed entity (p. 200).

Perceiver thought works with facts, connections and maps. In simple terms, a fact is a set of connections that occur together repeatedly. Consistent with this, a single region in the right

parietal cortex (Perceiver data) handles spatial maps, temporal maps, and social maps (Parkinson, 2014).

One can see on the diagram of mental symmetry that an arrow runs from Teacher to Server, indicating a flow of information. Server thought looks for repeated sequences in the flow of Teacher words, leading to syntax. More precisely, research into dyslexia suggests that Server thought (left parietal cortex) is required when encountering new or unusual sequences whereas Teacher thought (left temporal cortex) is sufficient for recognizing known sequences (Peyrin, 2010). Similarly, Perceiver thought looks for repeated connections in the flow of Mercy experiences, leading to object categorization. More precisely, the right parietal cortex (Perceiver data) is required for visuospatial manipulation (Sack, 2012), but the temporal lobes (Mercy and Teacher data) are sufficient for recognizing objects and assigning verbal labels to objects (DiCarlo, 2012). The Perceiver person is especially aware of double meanings, puns, and hypocrisy, suggesting that an ambiguous set of experiences is being triggered within Mercy thought and Perceiver thought is being called upon to clarify the context.

The Three Composite Styles

Turning now to the three composite styles, the diagram of mental symmetry shows an arrow leading from Exhorter through Contributor to Facilitator. A similar three-stage circuit exists within the brain leading from the cortex through the basal ganglia, through the thalamus, and back to the cortex.

Looking at this in more detail, basal ganglia functioning is driven and modulated by dopamine, and the traits of the Exhorter person correspond with attributes associated with dopamine: goal-directed motivation, prediction of reward or loss, emotional ‘highs’, orientation, novelty, and

learning (Arias-Carrión, 2010). The diagram of mental symmetry shows that Exhorter connects Teacher and Mercy. Consistent with this, Teacher and Mercy regions of the cortex control dopamine producing neurons via basal ganglia ‘striosomes’ (Crittenden, 2011). Teacher and Mercy generate emotion whereas Exhorter produces desire, and research has shown that these two are distinct (Berridge and Robinson, 1998). The Exhorter person tends to exaggerate, indicating the underlying presence of Teacher overgeneralization, and he sees the potential in situations and people, showing a focus upon emotional Mercy experiences. The Exhorter person is a natural ad-lib speaker, but his speech often lacks meaningful content. Instead, he tends to be the ‘instant expert’ who uses buzzwords to convey the impression of expertise. He is full of energy, and hates to be frustrated.

Contributor thought lies at the center of the diagram of symmetry and is quite complicated. Looking at neurology, the basal ganglia chooses between various options provided from the cortex (Redgrave, 2011), performs cost-benefit analysis (Hwang, 2013), and promotes optimal control of action (Graybiel 2005), all primary aspects of Contributor thought. The Contributor person is driven subconsciously by Exhorter energy, but dislikes failing or losing control to Exhorter thought, consistent with a form of thought that is being driven and modulated by dopamine. Unlike the Exhorter, Contributor persons are not natural ad-lib speakers but prefer to ‘sit down and have a talk.’

Finally, the Facilitator person is a natural observer who mixes and adjusts between people, groups, concepts, and sensory input. Similarly, the thalamus mixes and adjusts the level of functioning in the cortex (Malekmohammadi, 2014) as well as the relative levels of sensory input (Briggs and Usrey, 2008). Stating this more precisely, Perceiver facts and Server sequences set a

mental context, and Facilitator thought is aware of all the elements that exist within this current context. Anything which falls too far outside of the current context will be instinctively rejected as unreasonable. When the context is uncertain, then the Facilitator person feels muddled. However, if there is no freedom to experiment or if a subject has been fully learned, then the Facilitator person will lose all interest.

Abstract and Concrete Thought

The two diagonal lines on the diagram of mental symmetry are labeled ‘concrete thought’ and ‘abstract thought’. Wang (2010) examined a number of neurological studies that compared these two and concluded that concrete thought activates perception circuits while abstract thought activates language circuits. Saying this another way, embodiment leads to concrete thought, while language enables abstract thought. Mercy thought experiences the world, while Server thought moves through the world, making these two modes of thought naturally concrete. Teacher thought handles language while Perceiver thought looks for facts that lie behind experiences, causing these two to emphasize abstract thought. Teacher and Perceiver thought interact in two primary ways: First, Perceiver thought limits Teacher generalization by pointing out errors—facts that do not fit. Consistent with this, right dorsolateral frontal cortex (Perceiver internal world) is active in competent math students when detecting math errors (Ansari, 2011). Second, Perceiver thought expands Teacher generalization by coming up with new contexts. This interaction can be seen when telling jokes with incongruous endings. First, left inferior cortex (Teacher thought) tries to understand the sentence and fails, and then right dorsolateral frontal cortex (Perceiver internal world) expands the context making it possible for Teacher thought to understand the incongruity (Marinkovic, 2010). Similarly, Slobin (1973) noted that semantically consistent grammatical rules are acquired early and without significant error. In other words,

Teacher thought finds it easiest to discover general rules that apply without exception to a single Perceiver context. Perceiver facts and categories play the essential role of defining the domain of Teacher theory, which explains Slobin's statement that functor errors do not cross functor categories (p. 207).

Technical Thought and Normal Thought

We suggest that both abstract and concrete thought can operate in one of three ways, which we call technical thought, normal thought, and mental networks. Evidence suggests that each of these three ways of thinking are guided by a different region of the frontal cortex. Lakoff and Johnson (1980) describe the metaphor-based thinking of normal thought, in which Perceiver facts and Server sequences are partially known, and the mind is motivated by a variety of Teacher theories and Mercy goals.

“Abstract concepts are not defined by necessary and sufficient conditions. Instead they are defined by clusters of metaphors. Each metaphor gives a partial definition. These partial definitions overlap in certain ways, but in general they are inconsistent, and typically have inconsistent ontologies (p. 200).”

Frontopolar (rostral dorsolateral frontal) cortex coordinates normal thought by finding analogies that cross contexts (Watson, 2012) and brain damage in this area leads to a difficulty with multitasking, especially in the absence of external cues (Volle, 2011). This paper is an example of frontopolar directed thought, because we are examining dissimilar fields for common patterns, guided by a cognitive model rather than empirical data. Lakoff and Johnson claim that metaphor forms the basis for all human thought (1999), and they question the use of technical thought (Johnson and Lakoff, 2002). While agreeing that normal thought is guided by metaphor, we suggest that the mind can also function in a more limited, rigorous, technical manner.

Technical thought emerges when Contributor thought (which ties together Perceiver and Server) restricts thinking to a limited context of carefully defined Server sequences and Perceiver facts, and the Contributor person is naturally talented at using technical thought. This restricting of thought can be seen in the functioning of the basal ganglia, which selects cognition and behavior by letting in relevant information while keeping out distracting information (Koziol, 2014), in contrast with frontopolar cortex (normal thought), which keeps ‘distracting information’ in mind by considering and evaluating alternative plans (Boorman, 2009).

Thomas Kuhn (1962) describes the difference between normal abstract thought and abstract technical thought.

“The scientific enterprise as a whole does from time to time prove useful, open up new territory, display order, and test long-accepted belief. Nevertheless, the individual engaged on a normal research problem is almost never doing any one of these things. Once engaged, his motivation is of a rather different sort. What then challenges him is the conviction that, if only he is skilful enough, he will succeed in solving the puzzle that no one before has solved or solved so well” (p. 38).

In other words, the scientist does not usually use normal abstract thought in which one acquires Perceiver facts and constructs general Teacher theories, but rather spends most of his time in technical abstract thought. According to Kuhn, when a paradigm falls apart, then normal science gives way to revolutionary science. This crisis “loosens the rules of normal puzzle-solving in ways that ultimately permit a new paradigm to emerge” (p. 80), telling us that science uses normal abstract thought as a backup when technical abstract thought fails.

Because Server thought handles both sequences of actions and sequences of words, there is a concrete form of technical thought that connects Server actions with Perceiver facts and an

abstract form that connects Server syntax with Perceiver facts. Business and games are examples of concrete technical thought, in which some experiential Mercy-based goal is being pursued, guided by the rules and allowable actions of some limited playing field. Consistent with this, dorsolateral frontal neurons (Perceiver and Server internal world) encode rules of behavior (Mian, 2014), and planning involves the cooperation of left and right dorsolateral cortex (Kaller, 2011). Logic and mathematics are examples of abstract technical thought, which uses a limited set of carefully defined terms guided by the Teacher theory of some paradigm. Consistent with this, abstract reasoning uses both left and right parietal as well as right prefrontal cortex (Server and Perceiver thought) (Brzezicka, 2011). Technical thought excels at learning more about some limited context and finds the analogies of normal thought scattered and non-rigorous, however using analogies to explain technical thought leads to increased student comprehension (Dilber, 2008).

O'Donnell (2003) compares the normal thought of Community of Practice (CoP), a phrase originally coined by Lave and Wenger (Lave and Wenger, 1991), with the technical concrete thought that guides the typical business team:

Teams are tightly integrated units driven by deliverables, defined by managerially allocated tasks and bound together by collective commitment to results or goals. This teleological, means-end or goal-oriented nature of a team is what categorises it as driven by an instrumental logic. Teams often have clear boundaries, set rules and memberships (p. 4).

Here behavior is restricted to a limited playing field and the parameters are carefully defined, both characteristics of technical thought—in this case concrete technical thought. In contrast, O'Donnell's description of CoP corresponds with what we call normal abstract thought. CoPs are defined by opportunities to learn, share, and discover (p. 4). The members and topics of a CoP

are only partially defined, and the ‘hot topics’ in a CoP shift over time as existing members leave and new people join (p. 4). A CoP works with partial certainty; learning occurs as sense is made from experience and as contradictions, doubts, dilemmas, and possibilities are exposed (p. 5). A CoP is capable of coming up with new solutions and not just optimizing existing ones; members frequently help each other to solve problems and develop new approaches or tools for their field (p. 5). A CoP also finds value in the diverse day-to-day exchanges of data, information, know-how and fellowship (p. 4).

Technical thought has several inherent limitations. First, it works within an existing paradigm and leads to specialization rather than universal understanding. Second, it improves and optimizes, and thus finds it difficult to discover solutions which lie ‘around the corner’. Third, it is built upon an inadequate foundation, because it demands total (digital) certainty while existing within a mind and world of partial (analog) certainty. Thus, we suggest that the overuse of abstract technical thought leads inevitably to some form of epistemological crisis, in which abstract technical thought breaks down and the existing paradigm is shown to be inadequate. A linguistic example can be found in Noam Chomsky’s generative grammar. As Ellis (1998) points out, “Generative grammar...come[s] from formal linguistic models of often elegantly abstract mathematical structure” (p. 632). Ellis adds that this “concentrates the study of language on grammar, ignoring such areas as lexis, fluency, idiomaticity, pragmatics and discourse” (p. 634). In other words, Noam Chomsky is using abstract technical thought to attempt to analyze linguistics, but most normal speech falls outside the realm of abstract technical thought, because words are defined vaguely, grammatical rules are broken, topics are changed, meaning is implied, and politeness often guides speech. Analyzing these elements leads to an

epistemological crisis in the study of language. Similarly, the focus of L2 (second language) instruction has traditionally been upon learning grammar, memorizing lists of vocabulary, and reciting tables of conjugation, all symptoms of technical abstract thought. When Krashen (1982) pointed out the distinction between language learning and language acquisition he helped free language instruction from the straitjacket of abstract technical thought.

Mental Networks (MNs) and Pragmatics

Moving from technical thought and normal thought to emotional thought, we suggest that what we call *mental networks* can provide an explanation for five different facets of pragmatic communicative competence: implicature, Theory of Mind, personal identity, politeness, and culture. The distinction between technical and emotional thought (MNs) is supported by neurological evidence. Not only do technical physics problems activate a different brain region than social dilemmas involving MNs, but physics problems also suppress the brain region used in social dilemmas while social dilemmas suppress the brain region used for physics problems (Jack, 2012). Extending this distinction to linguistic pragmatics, one can see that implicature is an aspect of normal speech which obviously goes beyond technical thought, but it is too fragmented and incomplete to be an expression of normal thought. However, analyzing Grice's (1989) four maxims of conversation used to describe implicature reveals the familiar characteristics of technical thought. The maxim of manner says that well-formed Server sequences should be used; the maxim of quality states that only Perceiver facts which are known above a threshold of certainty should be used; the maxim of relation states that a conversation should stay within a restricted playing field, while the maxim of manner says that speech should be guided by Teacher emotions of order-within-complexity. Finally, the cooperative principle assumes that speech occurs within the confines of a given paradigm. When technical thought is

used to describe something that does not involve technical thought, then this will lead to an epistemological crisis. Thus, more recent researchers have concluded that what Grice noted is significant, but his explanation is inadequate. For instance, Lindblom (2001) points out that Grice is not including social interaction, while Davies (2007) notes that Grice has a logical bias. Sperber and Wilson (2002) observe that children can perform implicature even though they are incapable of technical thought. Furthermore, Arundale (1999) states, “The Gricean model of communication makes it difficult to look beyond the cognitive processes by which one individual produces or interprets a single, isolated utterance act” (p. 147).

We suggest that *mental networks* (MNs) can provide a possible explanation for implicature using a mechanism which exists within the mind of the child. We saw earlier that Mercy experiences come with an emotional label. One could represent a pleasant Mercy experience as a dot with an arrow pointing up, and a painful experience as a dot with an arrow pointing down (**Figure 3**). If a number of similar emotional memories connect together, then these isolated memories will turn into an MN, which one can illustrate as a collection of interrelated emotional memories. The concept

Figure 3: Mental Networks

of an MN is quite similar to the idea of *schema* (Piaget, 1926), in which children and adults organize knowledge about the world into frameworks. When a schema is triggered, then the structure of that schema will predetermine how a person interprets or responds to the situation

that triggered that schema. An MN goes beyond a schema by adding an emotional dimension along with a proposed mechanism of how schema form, interact, and fragment.

An MN has properties which are not possessed by individual emotional memories. An MN remains dormant if no memory within that network is accessed. However, triggering one memory within an MN will activate the entire network. Input which is compatible with the structure of an MN will lead to a new form of emotion which we refer to as hyper-pleasure, while input which is incompatible will lead to hyper-pain. If an MN continues to experience incompatible input, then the integrity of that MN will become threatened, leading to a deep sense of unease, possibly combined with various physical symptoms. Providing a threatened MN with compatible input will remove the sense of unease, while continuing the incompatible input will cause the sense of unease to grow. Eventually, though, incompatible input will cause an MN to fragment, reverting to being merely a collection of disconnected emotional memories (Friesen, 2012). The behavior of an MN can be seen in the formation and breaking of a habit. When a habit forms, then a person will find himself automatically performing some action, indicating that an MN has formed. Suppressing a habit results in an urge to perform that habit, but a habit will be broken if a person continues to suppress this urge. This summarizes the approach that is taken by Cognitive Behavior Therapy (CBT), in which a person endures the anxiety that is caused by suppressing a habit until the level of anxiety starts to drop. CBT is used to treat many conditions including depression, substance abuse, anxiety, panic attacks, obsessive-compulsive disorder and phobias, suggesting that MNs play a key role in guiding thought and behavior, via mechanisms such as the guilt cycle and other cognitive distortions (Burns, 2009, pp. 203-228).

Implicature

As noted earlier, an explanation for implicature must use a cognitive mechanism that is present in the mind of the child. In addition, as Sperber and Wilson (2002) point out, implicature is cognitively efficient; it happens quickly and automatically with a minimum of mental effort. Schema are cognitively efficient, because the trigger brings to mind a pre-programmed packaged response. Thus, MNs, as a form of schema, provide a valid possible explanation for implicature. We suggest that MNs can also explain the social aspect of implicature described by Sperber and Wilson (2002). In order to understand the nature of social interaction, we need to look at the relationship between people and MNs. People and animals live in physical bodies, generate experiences, and emote. Thus, emotional experiences with living beings will lead naturally to the formation of MNs, causing the mind to represent people and animals as MNs. This similarity between MNs and living beings extends further. Both respond with emotional distress if they are not treated as integrated units; both want freedom to express themselves; both expect to be ‘fed’ with the appropriate ‘diet’; and both will ‘die’ if they are starved of input.

Thus, we suggest that most ‘social interaction’ is actually occurring internally as mental networks that represent people are interacting within the mind of each participant. This must be the case because of memory and bandwidth. First, true social interaction would require the existence of ‘social memory’, which does not exist. Instead, each person is responding to MNs that exist within his own mind. Second, social interaction contains far too much information to be transmitted from one person to another in real time. Thus, a large portion of social interaction involves triggering MNs that already exist within people’s minds. Putting this another way, most social interaction is not occurring between a person and other people, but rather between a person and his memories of other people. However, because memories of other people are being

stored as MNs that behave like people, it feels as if direct social interaction is occurring between individuals. This can be illustrated with the following hypothetical exchange: Jack is browsing the Internet and sees the picture of a pizza, bringing to mind an MN composed of memories of stringy melted cheese and fried bacon. He then asks Jill, “What about making pizza?” For her the word ‘pizza’ brings to mind the culinary crisis in which they left pizza in the oven and burned the crust. She starts to respond, “The last time ...” bringing to his mind memories of eating hard, burnt crust, and he immediately interrupts, “Don’t worry, I’ll order pizza.” Notice that Jill is actually communicating with Jack at three different levels: she is interpreting the words that are being spoken by him; the MN within her mind that represents him is predicting what he will say and how he will respond; and the MNs within her mind that are being triggered by the conversation are also predicting various responses. As a result, she may focus upon his words, she may ignore what he is saying and focus instead upon what her mind predicts he will say, or she may hear one or two words and then focus upon the MN which these words trigger. Thus, we are dealing with a juxtaposition of several different MNs. The MN which predominates will depend upon the context as well as the emotions and choices of the listener.

Theory of Mind and Identity

Moving further, we suggest that implicature and social interaction relate to Theory of Mind. Mental symmetry suggests that it is a category mistake to view Theory of Mind as one person constructing a theory of another person’s mind, because this interpretation uses technical thought to explain something that does not involve technical thought. Rather, one person is using the MNs triggered in his own mind to guess which MNs are currently active within the mind of the other person. We suggest that Theory of Mind involves an interaction between two cognitive modules: MNs themselves are stored within Mercy thought, while Perceiver thought uses facts to

define, compare, and access these MNs. Examining Piaget's theory of child development from this perspective, we conclude that children's minds become populated with MNs during Piaget's pre-operational stage, while the ability to consciously observe and access MNs emerges later, during Piaget's concrete operational stage (Piaget, 1972). Neurological evidence indicates that when Theory of Mind involves emotions the ventromedial prefrontal cortex is required (Shamay-Tsoory and Tibi-Elhanany, 2006), with the right ventromedial—the internal world for Mercy thought—being more critical than the left (Shamay-Tsoory and Tomer, 2005).

Looking first at the formation of MNs, Piaget states that pretense plays a major role in the child. In pretense, some MN representing a person or animal is being triggered and the behavior of the child is being determined by the structure of that MN. However, we suggest that childish pretense goes further. First, MNs will also form when a child has emotional experiences with inanimate objects such as teddy bears, making it possible for a child to have 'social interaction' with inanimate objects. Second, because MNs are driving 'social interaction', nearby physical objects will tend to be interpreted in the light of the current MN. For instance, a block of wood may be treated by the child as a racing car. The connection between pretense and Theory of Mind was pointed out by Leslie (1987), who suggests that children can distinguish between their personal identity and the various people they are pretending to be by using a decoupler to distinguish between reality and fantasy. We propose simply that the pre-operational child who is pretending cannot tell between reality and pretense, and does not really know whether he is a child, a fireman, or a teddy bear. Instead, it is only because he lives in the physical body of a child that his mind returns from being a fireman or a teddy bear to being a child. Thus, the child

who is within Piaget's pre-operational stage lacks a unified sense of identity; there are functioning MNs, but no way of controlling which MNs are active.

Researchers such as Lakoff and Johnson (1999) and Damasio (1994) emphasize the embodied nature of the human mind. However, being 'embrained' is even more basic than being embodied. The physical body programs the mind with its most fundamental MNs, while cognitive modules define the mind and how it functions. We suggest that the inherent tension between being embodied and being embrained provides an adequate foundation for explaining topics such as linguistic and cognitive development as well as religious thought (Friesen, 2015). One can tell that the child who has entered Piaget's concrete operational stage can choose which MN will be active because he is able to view situations from another person's perspective (Piaget, 1972). Such a child also stops thinking magically and starts thinking logically, another indication that Perceiver thought is beginning to function independent of MNs. In general terms, we suggest that personal identity can be defined as the set of MNs that repeatedly come to mind. In a young child, the physical body continually brings to mind the MN of being a young child. In the older child or adult, knowledge and skills will also repeatedly bring to mind certain MNs, leading to an internal sense of personal identity. There are also repeatable aspects to a person's speech which make it possible to identify who is talking. Evidence suggests that MNs play a major role in this identification. Young infants will recognize and prefer their mother's voice, provided that mother uses normal intonation (Mehler, 1978). In an experiment with adults, speakers familiar to a listener were identified correctly 98% of the time, whereas only 33% of unfamiliar speakers were correctly identified (Hollien, 1982).

Politeness Theory

Looking now at politeness, we suggest that Theory of Mind focuses upon the structure of an MN, whereas politeness is driven by the emotions that are present within an MN. Recent evidence from neurology supports the concept that Theory of Mind and politeness involve different aspects of the same underlying cognitive mechanism. When simple testing scenarios are used, then Theory of Mind and empathizing will activate different brain areas. However, when faced with more natural social scenarios, then these two brain areas will both become active and function in an integrated manner (Zaki and Ochsner, 2012). Examining the TESOL field and the development of politeness theory, one finds later researchers pointing out that earlier researchers made the error of using technical thought to explain mechanisms which go beyond technical thought. As Arundale (1999) noted,

“Although Sperber and Wilson made major revisions to the inferential aspects of Grice’s framework, they retained the Gricean cognitively based account of communication as recognition of the speaker’s intentions in producing isolated, bounded speech acts. These same aspects of the Gricean encoding/decoding account underlie Brown and Levinson’s politeness theory, and their critique is another in the set of critiques of this model that has accumulated over four decades” (p. 124).

In response, Arundale presented a co-constituting model for communication in which each partner is continually interpreting what the other person says and adjusting what he says in response. Arundale’s comments make sense, except that we suggest that the co-constituting is occurring within the mind of each participant; each person is responding to the MN within his mind that represents the other person, and each person is using his own MNs to try to guess which MNs are currently active within the mind of the other. It is interesting to note that the example which Arundale mentions in his paper (and the illustration given in this paper) involves

communication between family members. Co-constituting communication works between family members because they share many similar MNs. In contrast, implicature, politeness, and Theory of Mind all tend to misfire when interacting with people who do not share similar MNs.

Accurate communication will then require technical thought with its encoding and decoding.

Words will be chosen carefully, full sentences will be used, and the speaker will look for confirming feedback. When speaker and listener lack both similar MNs and a common language, then communication becomes reduced to pointing at physical objects or carrying out physical movements, because it is the only common ground that remains.

Looking at politeness theory more specifically, we suggest that MNs can provide an explanation for the various aspects of politeness described by Brown and Levinson (1987). Three key principles are involved: First, personal identity is represented as a collection of MNs. Second, when MNs interact, one MN will attempt to impose its structure upon the other. Third, an MN with stronger emotions will impose its structure upon an MN with weaker emotions. Thus, a person senses positive face either when an MN of personal identity is free to function, or when another MN acts in a way that is consistent with an MN of personal identity. In contrast, an individual senses negative face either when an MN of personal identity is suppressed or when another MN imposes an incompatible structure upon personal identity. By stating a request indirectly or walking around a subject, politeness is a way of activating an MN of personal identity without imposing structure upon that MN.

Culture

Politeness occurs within a cultural context. We can define culture as a set of MNs which a group of people hold in common, most of which have been acquired in childhood. A cross-cultural

encounter happens when people interact who do not share common MNs. When this occurs, then one MN will attempt to impose its structure upon another. This explains why social interaction is often viewed as a power struggle, because a battle is occurring within the minds of individuals as incompatible MNs are jockeying for position. Major cultural misunderstanding can happen when one individual acts in a way that violates an MN which only exists within the mind of another person. The outsider is often mystified by the emotional reactions of the insider, while the insider finds the callous remarks of the outsider to be emotionally threatening. This type of emotional response is common when a secular individual analyses religion or when a Westerner analyzes a culture with many strong MNs, such as Japanese culture (Kubota, 1999).

Mental networks are similar to the Member's Resources (MR) of Fairclough (1989). Like mental networks, MR are mental constructs that attempt to impose their structure when triggered, they act as schemata to guide discourse, and they provide the missing content for implicature.

Fairclough focuses upon the societal struggles that result when mental networks collide, however we suggest that the real power struggle is occurring within people's minds as colliding mental networks are vying for relative status.

When a person is immersed within another culture, then there is usually an initial honeymoon period before the hyper-pain of culture shock hits. This happens because MNs that experience inconsistent input do not immediately fall apart, while the novelty provides immediate excitement for Exhorter thought. It typically takes several months before inconsistent cultural input begins to threaten the integrity of core MNs, which then expresses itself as a strong desire to withdraw from the unfamiliar and retreat to the familiar. Stating this another way, culture shock is the result of a mismatch between cognitive structure and physical reality. However,

culture shock does not occur when the physical reality is changed, but rather when the cognitive structure begins to crumble.

As we saw earlier the MN that represents a person can be triggered by hearing that person talk, which makes it possible to recognize familiar people from their personal ‘accents’. We have also seen that culture reflects common MNs. As a result, accent is intimately tied to both speaker identity and group membership (Levis, 2005). At the personal level, enhancing ego permeability increases pronunciation flexibility (Guiora, 1980), and accent can be changed by altering elements of personal identity (Acton, 1984). At the group level, speaking with a native accent is often viewed as a doorway to cultural acceptance (Momenian, 2010), and a person may choose to hold on to a certain accent in order to avoid becoming identified with the dominant culture (Ibrahim, 2008). A person will naturally connect a language with the MNs of the associated culture, thus the way a person views a culture will affect motivation for learning the language of that culture. If the MNs of a culture are regarded as inferior, incompatible, or overpowering, then the primary motivation will be to avoid triggering these MNs. However, if personal wellbeing depends upon speaking the language, or if a person forms bonds of friendship with members of that culture, then the MNs of personal identity may override the MNs of culture, giving a person the motivation to learn the language. If a person regards the MNs of a culture as insignificant or spends only a short time in that culture, then there will be a general lack of motivation. Finally, if a person regards the MNs of a target culture as good, compatible, or attractive, then this will express itself as a motivation to learn the language, as iterated in Schumann’s Acculturation Model (1976).

Facts vs. Emotions in Personal Development

The suggestion was made earlier that Perceiver thought compares and defines the MNs that reside within Mercy thought. Habermas' analysis of the public sphere describes the relationship between rational facts—the realm of Perceiver thought, and people with emotional status—the realm of MNs. Habermas (1989) tells us that Europe before the 18th century was ruled by representative publicity; each lord would overawe his subjects with an aura of majesty as he proclaimed truth to the public. Habermas interprets this interaction socially, but as before, we suggest that most of this interaction is occurring within the mind of each person. In simple terms, truth is being imposed by MNs; Perceiver thought is being overwhelmed by emotional pressure to blindly accept the structure of a specific MN as universal truth. This describes rote learning or blind faith, in which a fact is believed to be true because it is either spoken or written by a person with emotional status. It appears that all education begins with some form of rote learning, because MNs form in the childish mind before Perceiver thought gains the ability to manipulate these MNs (Friesen, 2012). In contrast, during Habermas' second stage of the bourgeois public sphere, the rule of law replaced the monarch's edict, demonstrating that Perceiver thought was being applied to MNs rather than being manipulated by MNs. Trade, travel, news, and an independent press all provided facts for Perceiver thought, while Perceiver thought learned to handle emotional pressure in coffee house debates (Habermas, 1989). In educational terms, this describes critical thinking, which higher education attempts to develop in its students. Cognitively speaking, Perceiver thought is acquiring facts, using this information to search for repeated connections, and then using this knowledge to reassemble MNs.

Obviously, MNs will respond with hyper-pain if Perceiver thought attempts to reassemble them. Thus, Perceiver thought has to gain the ability to function under emotional pressure, which could

be compared to a weightlifting program. What is needed is an optimal level of emotional stress. A situation that is too emotional will overwhelm Perceiver thought, while insufficient emotional intensity will not develop Perceiver confidence. Building Perceiver confidence is not done by ‘trying hard’ to think rationally, but rather by acknowledging emotions while recognizing that facts are independent of feelings (Friesen, 2012). For instance, an English exam may generate emotional stress, but this emotion has no bearing upon the basic rules of grammar. Finally, it is very difficult for Perceiver thought to manipulate core MNs, but rational thought can still emerge if core MNs are played against one other.

Love and Guthrie (1999) analyzed and synthesized several systems of cognitive development (including Perry, 1970; Belenky, 1986; and Baxter Magolda, 1992) and came up with four stages. First, knowledge is acquired through blind faith in authority figures. Second, there is mental uncertainty, which we would interpret as Perceiver thought being ‘half-awake’—no longer emotionally overwhelmed but lacking the confidence and ability to function effectively. The third stage begins with the realization that Perceiver facts are ultimately based in normal thought with its partial certainty, while during the final stage the focus is upon learning how to work with partially certain information. This is where a cognitive meta-theory such as mental symmetry becomes particularly useful.

Turning now to the specific theories, Baxter Magolda (1992) compared male and female cognitive development, and her findings imply that the typical male mind learns to use Perceiver thought in less emotional areas while the typical female mind remains within the realm of MNs.ⁱ Other researchers have suggested that female cognitive development cannot occur outside of connected relationship (Gilligan, 1991). If social interaction is guided by MNs, then this also

indicates that the developing female mind remains within the realm of MNs. Consistent with this, Belenky's stages of female development (1986) all involve MNs. During the first stage of silence, MNs of personal identity are being suppressed, and a woman feels that she has no right to exist. In the second stage of received knowledge, MNs of personal identity function, but other MNs impose their structure upon personal identity. Next, the emotional hierarchy shifts and MNs of personal identity assert their independence. In the succeeding stage of procedural knowledge, MNs of personal identity are compared with other MNs, indicating that Perceiver thought is beginning to function. During the final stage, Baxter Magolda and Belenky both state that male and female development converge, suggesting that Perceiver thought is now able to operate in the presence of MNs.

Personal Identity

Having examined the relationship between Perceiver thought and Mercy emotions, let us look more closely at personal identity, which we defined earlier as the MNs that repeatedly come to mind, and compare this with Higgins' concept of possible selves (1987). We suggest that identity involves a cooperation between Mercy thought, which contains the MNs of identity, and Perceiver thought, which defines identity by determining which MNs actually are repeated. In areas where Perceiver thought is functioning, self will consist of the MNs that *are* repeatable and inescapable. This corresponds to Higgins' actual self. The core of the actual self will be based upon the physical body for three reasons: First, emotional experiences from the physical body will form MNs. Second, these MNs will be repeatedly triggered because a person's physical body is always present. Third, in order to avoid physical harm, Perceiver thought will need to gain sufficient confidence to acknowledge facts about the physical body. In contrast, we suggest that Higgins' ought self will emerge in areas where emotional pressure overwhelms Perceiver

thought. This pressure will come from the MNs with the strongest emotions, such as those which represent parents, culture, and authority figures, and this emotional pressure will fool Perceiver thought into believing that these MNs form a permanent part of identity—but only as long as these MNs are being triggered. The result will be a conflict between MNs that are repeated (actual self) and MNs that have sufficient emotional power to make Perceiver thought think that they are repeated (ought self). When a person is surrounded by his culture, his family, and authority figures, the ought self will tend to predominate. In contrast, when a person leaves his culture, family and authority figures, the actual self will eventually emerge. Going further, the actual self will tend to be integrated, because it forms where Perceiver thought is functioning, while the ought self will vary depending upon the social context. When the actual self predominates, then motivation will tend to be intrinsic, while the ought self will lead to extrinsic motivation because MNs representing authority figures are imposing structure upon personal identity.

Teacher Mental Networks (TMN)

So far we have assumed that all MNs form out of emotional Mercy experiences. This describes the majority of MNs. However, a Teacher theory generates emotions of order-within-complexity, and it will turn into a Teacher MN (TMN) if sufficient time is spent working with it. A person will then feel the urge to use that theory to explain any situation that falls within its domain, and will feel hyper-pain whenever this theory is threatened by an inconsistent incident or theory. This explains Thomas Kuhn's claim that a scientist cannot exist without a paradigm, tends to belittle or ignore competing explanations, and can only let go of one theory if he is given an alternative (1962). It appears that this type of emotional attachment is inevitable and unavoidable. Even when technical thought with its rigorous logic is being emphasized, a TMN will still eventually

form. Thus, it appears that the only solution is to become emotionally attached to a meta-theory that can bridge these various aspects of human thought.

It is obvious that learning a language will also lead to the formation of a TMN, because words form the basic building blocks for Teacher thought. We suggest that TMNs also play a role in implication. This happens, for instance, when one person uses common sense to guess what another person is saying, because common sense is based on the order-within-complexity of nature, and repeated interaction with nature will cause this understanding to turn into a TMN. Applying this principle to the learning environment, the formation of a TMN within the mind of the student will lead to a strong form of intrinsic motivation, because he is driven by hyper-emotion to add to the order-within-complexity of his understanding.

TMN vs. MMN

Culture shock occurs when there is a conflict between Mercy MNs (MMNs). A paradigm shift results from a conflict between TMNs. When a TMN encounters an MMN, then as with all colliding MNs, each will attempt to impose its structure upon the other; however, this type of mental collision will be different because of two major factors. First, an MMN is composed of specific experiences while a TMN results from a general theory. Second, MMNs are acquired naturally during Piaget's preoperational stage, while TMNs only become prominent later during Piaget's formal operational stage—in a mind that is already integrated around MMNs.

One way to respond to the existing MMNs is to construct TMNs in regions of thought that are free of MMNs. Historically, science has attempted to follow this option by remaining objective in order to prevent theories from being influenced by the MMNs of personal identity and culture. This option typically leads to inhumanity and a lack of personal meaning, because the MMNs of

personal identity are not being included. There will also be growth for the sake of growth, in order to increase Teacher feelings of order-within-complexity. However, as Bonny Norton (1997) has pointed out, some linguists may assume, as Noam Chomsky does, that questions of identity are not central to theories of language; however, L2 educators must deal simultaneously with the TMNs of language and the MMNs of culture and identity (p. 409). Another option is to prevent TMNs from forming, which can be done by maintaining that Mercy experiences are too complicated to be summarized by a general Teacher theory. For instance, after examining five articles on the topic of language learning and identity, Norton comments, “The authors appear to have very consistent conceptions of identity. First, they all see it as complex, contradictory, and multifaceted and reject any simplistic notions of identity” (1997, p. 419).

It is also possible for MMNs to impose their structure upon TMNs. Fairclough describes one way that this can occur in *Language and Power* (1989). He says that power groups (based in MMNs) use their dominant status to displace alternative structures, leading to a monopoly that gives the appearance of universality. Fairclough adds that this process of ‘naturalization’ will fool the average individual into thinking that imposed ideology is actually universal structure, which implies that it is *possible* for the mind to approach a situation from the TMN vantage of universality rather than the MMN viewpoint of specific experiences and groups. Fairclough’s approach illustrates another way in which this can occur, because he is portraying power struggles between MMNs as a universal theory of human thought and behavior, again implying that it is possible for the mind to think in terms of universal theory.

The final alternative is to allow the TMN of a general theory to reshape existing MMNs.

Semantic shifting provides a partial illustration of what this involves. We have suggested that

Perceiver thought organizes Mercy experiences into categories which provide the initial meanings for words in Teacher thought and that these meanings are extended through analogy and metaphor. Teacher thought then uses words constrained by their Perceiver meanings to construct general theories, which may turn into TMNs. However, each culture has its own collection of objects and experiences, many of which are emotionally backed up by MMNs. This leads to an interplay between three cognitive forces: First, MMNs are attempting to arrange experiences in specific ways, which influences the Perceiver categories that are being used to define words. For instance, a German may view a vehicle as a modern car—associated with the esteemed German automobile industry, whereas a Vietnamese defines a vehicle primarily as a motor scooter, mentally connected with the drone of a small engine and the smell of polluted air. Second, Perceiver thought is attempting to determine categories more accurately. However each culture has its own set of Perceiver categories, therefore learning exactly what a word means in a foreign language may require a subtle shift in categories, which will question underlying cultural MMNs (Citron, 1995). Obviously, shaky MMNs will make it easier to adjust Perceiver categories. As Acton (1979) has stated, language acquisition improves when people perceive that they are socially distant from both their home and target cultures. When one becomes fluent in a new language, then these semantic shifts in Perceiver categories will be mentally held together by the TMN of the new language, which explains why Lambert (1972) discovered that FSL students who reached the level of thinking and dreaming in French started to feel ‘anomie’. Third, TMNs are attempting to modify the meanings of words in order to increase feelings of generality. This influence occurs most strongly with the general theories of science.ⁱⁱ Thomas Kuhn’s (1962) concept of incommensurability tells us that when a scientist acquires a new paradigm, he actually views his environment in subtly different ways. We suggest that this

cognitive mechanism is responsible for Platonic forms. A Platonic form is the imaginary Mercy image that results when Teacher thought modifies Perceiver categories in order to increase feelings of generality. For instance, the Platonic form of a circle is based upon Perceiver facts about real circles, but these facts have been simplified and idealized by Teacher thought, leading to the internal image of a perfect circle that is based upon real circles but does not exist in real life.

EFL, EIL and World English

The interplay between MMNs and TMNs can be seen in the current controversy involving EFL, EIL, and World English. While EFL associates English with the MMNs of British or American culture, EIL views English as a lingua franca associated with the TMN resulting from the order-within-complexity of a globally interconnected society (Alcón Soler, 2007). Teaching EIL will minimize the aspects related to MMNs, such as accent, motivation, and pragmatics and replace them with equivalent TMNs. Intelligibility and universality provide a possible replacement for accent. Instead of having students adopt the accent of a native speaker, the goal becomes achieving comprehensibility for the largest possible audience (Momenian, 2011). Similarly, instructors can focus upon the pragmatics of cross-cultural interaction rather than the MMNs of some specific culture (Aguilar, 2007), and a language can avoid being identified with the MMN of some specific cultural group if it becomes identified with TMNs of order-within-complexity such as higher education, cross-cultural communication, or international trade. Kumaravadivelu (2012) notes that L2 learners naturally view English as an international language of communication that is separate from local language and culture.

Advocates of World English point out, as Fairclough does, that EIL is actually a form of ideology that has the appearance of universality but is being imposed by inner circle countries (Matsuda, 2012). This is an accurate historical description, but we suggest that what really matters is how one chooses to treat the appearance of universality. When the TMN of a universal standard collides with the MMN that is the source of this TMN, does the MMN submit to the TMN or is the MMN placed above the TMN? In other words, is the lawmaker subject to his own laws or is he above the law? Similarly, do expanding circle citizens view English as based in the MMNs of inner circle cultures, or is English mentally connected with the TMN of globalization and the MMN of the Platonic form of the ‘ideal international citizen’ (Lamb, 2004)? Stated simply, is the goal ‘moving to America to live the American life’, or is America viewed as a partial realization of an imaginary ideal that all societies are striving to reach? If English is viewed as a form of ideology, then expanding circle citizens will struggle to have their MMNs recognized as legitimate sources of English (Sharifian, 2012). Furthermore, if each culture defines its own standard of English, then English will fragment and no longer function as an international language. The expanding circle citizen may be linguistically disadvantaged in terms of language fluency and accent, but the inner circle citizen has the cognitive disadvantage of tending to associate English with the MMNs of his culture rather than the TMN of globalization and the MMN of the ideal international citizen.

Third Culture Kids

Third Culture Kids (TCK) illustrate what happens cognitively when MMNs are guided by a TMN. A TCK spends childhood years in more than one culture, leading to fragmented, incompatible MMNs of culture and identity, and most TCKs are also subject to the TMN of a ‘sending organization’ that provides for their needs and regulates their behavior. Pollock (2009)

has studied TCKs and concludes that they exhibit ‘uneven maturity’. Peripherally, they are developmentally advanced global citizens who think cross-culturally, make friends easily, and enjoy traveling, illustrating flexible MMNs. 81% of American TCKs earn at least bachelor’s degrees, compared with 21% of the general population (Cottrell and Unseem, 1993), demonstrating the prominent role played by TMNs. TCKs form a meta-culture that is independent of the specific cultures in which they were raised, indicating the mental presence of Platonic forms that have formed MMNs. However, core MMNs of childhood usually remain fragmented and hidden. TCKs typically feel like ‘chameleons’ who lack a sense of personal identity, and they often go through a ‘teenage rebellion’ in their 30s or 40s. Thus, one sees the cognitive benefits of globalization as well as the emotional repercussions of limiting global thinking to the objective and the empirical. Pollock emphasizes naming the TCK background and recognizing that it is shared by others, illustrating the therapeutic benefit of placing childhood MMNs within the structure of the TMN of a general understanding.

The Ideal Self

Higgins (1987) defined the *ideal self* as the attributes that a person would ideally like to possess. We suggest that the ideal self emerges naturally as Platonic forms apply to personal identity. This relationship can be explored by examining Dörnyei’s requirements for an effective ideal self (2009) in the light of the cognitive mechanisms behind Platonic forms. First, an ideal self should be seen as a future version of the actual self, and a person should be aware simultaneously of present and future selves, which means mentally bridging these with a structure that involves time. Teacher thought works with sequences and a TMN will naturally activate an entire sequence whenever one stage is triggered, effectively turning the various images of self into a ‘movie’. Second, an ideal self must be reachable through a series of plausible steps, which

requires an understanding of natural law as well as cognitive mechanisms. If this understanding forms a TMN, then there will be an emotional drive to think of plausible steps and avoid wishful thinking. Third, an ideal self should provide sustained motivation, which requires the presence of an emotional structure. An MMN can motivate a person to reach a goal, whereas a TMN can provide motivation for the process of reaching the goal. Both are necessary. Fourth, an ideal self should provide intrinsic motivation. A structure becomes intrinsic when it is mentally taken apart and reassembled. In simple terms, this means ‘saying it in your own words’. This requires a mental framework within which to fit the disassembled pieces, backed up by a TMN potent enough to classify incoming MNs while remaining intact. Constructing this framework will involve reassembling the MMNs of the ‘ought’ self. Finally, because Teacher thought brings order to complexity by looking for essential elements, a TMN will naturally modify concepts of self to be more ideal, just as geometry replaces the crooked lines and circles of reality with idealized lines and circles.

Because the mind of the child is held together by MMNs, each generation must be taught anew how to acquire and respect TMNs. Without this ‘higher education,’ international languages will tend to fragment into cultural dialects, cross-cultural interactions will be replaced by power struggles, and ideal selves will regress into ought selves. Thus, those who grow up speaking only an international language will naturally view it as an ethnic language and associate it with the MMNs of their native culture. However, as Deardorff (2006) has identified in assessing intercultural competence, it is possible to transcend cultural bias with internationalization.

Conclusion and Implications

We have seen that TESOL theory is fractured into a number of competing paradigms that emphasize different aspects of thought and behavior. We have also seen the tendency to emphasize social interaction rather than the cognitive mechanisms that cause this interaction. This paper has introduced a cognitive meta-theory that might allow understanding of language learning and teaching, research, culture, identity and motivation to be reshaped to reflect an ordered complexity based upon cognitive mechanisms. The implications for teaching and research are numerous as practitioners seek to identify the underlying mechanisms guiding subjective social intercultural pragmatics. As researchers and practitioners attempt to incorporate an understanding of students' subjective motivations and needs with the more objective and technical aspects of language learning and instruction, a single integrated framework can help to increase the consistency and effectiveness of research, teaching and learning in the TESOL field.

ⁱ Cognitive style modifies this. A female Mercy person, for instance, would be more likely to focus upon MNs than a female Perceiver person.

ⁱⁱ Science is based in the correspondence between the syntax of math and the physical sequences of natural process. Integrating these two involves Server thought. This interaction is not being discussed in this paper.

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