



The Theory of MindTime and the relationships between thinking perspective and the Big Five personality traits [☆]

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ABSTRACT

This manuscript introduces a theory of individual differences based on the arguably unique ability of human beings to engage in mental time travel (Suddendorf & Corballis, 1997). The Theory of MindTime posits that the ability to engage in mental time travel gave rise to the development of three distinct patterns of thinking: Past thinking, Future thinking, and Present thinking, and that measurable individual differences exist in the extent to which each of the three thinking perspectives are utilized. In this manuscript, we present an overview of the theory and examine the construct validity of a three-dimensional measure of thinking based on the theory by examining relationships between scores on this measure with scores on Costa & McCrae's (1992) Five-Factor Inventory (FFI). Data were collected from 819 undergraduate students (59.6% female; 83.3% Caucasian). In general, the results supported our hypotheses that Future, Past, and Present thinking would differentially relate to scores on subscales of the FFI.

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1. Introduction

The ability to conceptualize and localize human experience temporally (i.e., engage in mental time travel) is considered one of the most important evolutionary advancements of consciousness in *Homo sapiens* (e.g., Suddendorf & Corballis, 1997, 2007). Mental time travel refers to the ability to mentally project oneself forwards and backwards in time to either imagine possible future events or to re-live or experience events that have already occurred (Suddendorf & Corballis, 2007). No longer limited to reacting to immediate sensory and physiological input, early hominids developed the behavioral flexibility to draw upon past experiences, envision future possibilities, seek out additional relevant information, set goals, develop strategies, and plan and organize current activities, all for the purpose of increasing one's chance of personal and reproductive survival (e.g., Suddendorf & Busby, 2003, 2005).

Originally proposed by Furey (1994), Furey & Stevens, 2004, we posit that three distinct patterns of thinking evolved in concert with the ability to engage in mental time travel. We refer to these

as Past, Future, and Present thinking. Moreover, we propose that (a) individual differences exist in the extent to which the three thinking perspectives are utilized, (b) these differences can be measured, and (c) the extent to which individuals utilize each of the three thinking styles, separately and in combination, influences how individuals perceive and interact with the world and others. In this manuscript, we present a brief synopsis of our model as well as evidence supporting the construct validity of a three-dimensional measure of thinking based on the model. We do so by examining relationships between scores on the Past, Future, and Present thinking with scores on Costa and McCrae's (1992) Five-Factor Inventory.

1.1. Mental time travel

According to Suddendorf (1999), the evolution of higher-order cognitive functions began less than 1.5 million years ago when *Homo erectus/ergaster* first began to dissociate mentally from primary perceptions and response tendencies. First, ancestors of modern humans developed the ability to create accurate symbolic (primary) representations of real world objects that have certain properties at a given point in space and time. Second, early hominids developed the ability to decouple those representations from the present and place them into different temporal locations (secondary representations). Third, early hominids developed the ability to mentally and symbolically represent relationships among

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those secondary representations (i.e., metarepresentations). Metarepresentations involve the ability to understand that a representation of an object or event is just that: a representation of an object.

The ability to dissociate from primary perceptions and entertain multiple representations of an object allowed for the creation of a new level of mental executive control over actions, referred to as metamind. As summarized by Suddendorf (1999), the concept of metamind includes the reflective self-referencing of the 'inner eye'; the ability to understand, reflect on, and predict the mental states of others; the use of 'second-order' instrumentalities in the development of action plans; and the ability to engage in mental time travel. Mental time travel involves the ability to disengage from the present, the active reconstruction of both past and future events based on the information contained in both episodic and semantic memory (e.g., Suddendorf, 1999; Tulving, 1993), and the ability to temporally locate those reconstructions as belonging to the past or to the future.

1.2. The Theory of MindTime

It is our supposition that the ability to engage in mental time travel gave rise to the development of three distinct patterns of thinking and the variations observed today in how individuals utilize each of the three thinking perspectives. According to the Theory of MindTime (Furey, 1994; Furey & Stevens, 2004), three thinking perspectives – Past thinking, Future thinking, and Present thinking – exist as a part of human consciousness because each provided an evolutionary advantage to *Homo sapiens*. Past thinking refers to the pattern of thinking associated with the ability to mentally time travel into the past to access past experiences and knowledge stored in memory. Future thinking refers to the pattern of thinking associated with the ability to mentally time travel into the future to imagine future possibilities. Present thinking refers to the pattern of thinking that is associated with the ability of consciousness to organize its own actions and mental states as well as manipulate the environment.

1.2.1. Past thinking

Mental time travel into the past provided human beings with the ability to access past experiences stored in episodic memory through reflection and contemplation and the active reconstruction and recoding of information stored in semantic memory. Past thinking, in turn, provided *Homo sapiens* with the ability to consciously access stored information in order to minimize the risks involved when interacting with current and anticipated environmental and situational events. Thus, Past thinking occurs when individuals actively retrieve past experiences and knowledge and reconstruct, analyze, and critically evaluate information stored in memory for its relevance to the current situation. In brief, Past thinking is reflective thinking oriented toward risk reduction.

1.2.2. Future thinking

Mental time travel into the future provided human beings with the ability to creatively imagine an infinite set of hypothetical future possibilities and as a result provided *Homo sapiens* with the cognitive flexibility to foresee and adapt to ever-changing environmental circumstances. Thus, Future thinking is imaginative thinking: It involves the ability to see gaps in existing knowledge and of patterns and trends that diverge from prevailing schemas. It also involves creative problem solving, divergent thinking, and the generative process of combining and recombining items into virtually infinite numbers of novel sequences (Suddendorf & Corballis, 1997). In brief, Future thinking is "big picture" thinking.

1.2.3. Present thinking

The ability to essentially step out of time mentally and conceptualize and observe sensory input, mental processes, and behavioral output from the point of view of a self-aware observer corresponds with a pattern of thinking we refer to as Present thinking. Present thinking provided *Homo sapiens* with the ability to integrate current needs with the products of Past and Future thinking and to organize and structure the world accordingly. Thus, Present thinking, is organized thinking involving the development of action plans and the ability to organize resources to achieve those plans by the most efficient means possible. In brief, Present thinking is oriented toward getting things done.

1.2.4. Summary

According to Darwin (1859), individual variation in abilities formed the foundation of natural selection with an important principle being that a species will exhibit variations in physical, behavioral, emotional, and cognitive characteristics. Over time, individuals who present characteristics that are adaptive for survival will be more likely to survive and pass those characteristics on to their offspring. Thus, variations in human characteristics can be understood as being a function of the process of evolution in which those characteristics that are most adaptive will increase the probability of survival. It is our supposition that three distinct thinking styles evolved in concert with the ability of human beings to engage in mental time travel because each increased chances of personal and reproductive survival. In addition, we posit that as a result of the same process, natural variations exist in the extent to which individuals utilize each of the three thinking perspectives and that these differences, in part, influence how individuals perceive and interact with the world and others.

1.3. Personality

Although many different personality taxonomies exist, one of the most popular is that of the Five-Factor Model (also known as the Big Five: neuroticism, extraversion, agreeableness, openness, and conscientiousness). According to Costa and McCrae (1992), Eysenck (1998) and Goldberg (1993), for example, neuroticism is the tendency to experience a heightened sensitivity to negative stimuli and negative emotionality, such as worry and anxiety; Extraversion is the tendency for being concerned with or responsive to things external to oneself and to engage in social activities; Agreeableness is the tendency to be pleasant and accommodating in social situations as well as a general orientation towards experiencing empathy, warmth, and generosity toward others; Openness is the tendency toward being imaginative, open to new experiences, and having a broad range of interests; Conscientiousness is the tendency toward having good impulse control, being dependable, reliable, organized, and mindful of details.

1.4. Hypotheses

Because Past thinking involves the ability to access past experiences stored in episodic memory through reflection and contemplation and because Past thinking is oriented toward minimizing the risks involved when interacting with current and anticipated environmental and situational events, we believe that Past thinking will manifest as (a) a natural tendency toward being introspective and (b) a heightened sensitivity toward the presence of negative environmental stimuli. Thus, we hypothesize that Past thinking will correlate negatively with extraversion and positively with neuroticism.

Because Future thinking involves the ability to creatively imagine an infinite number of future scenarios and because future thinking is oriented toward open-ended big picture thinking, we believe that Future thinking will manifest as a natural tendency to

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