MEDIATED CHAMELEONS: AN INTEGRATION OF NONCONSCIOUS BEHAVIORAL
MIMICRY AND THE PARALLEL PROCESS MODEL OF NONVERBAL
COMMUNICATION

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This study attempted to unite two divergent bodies of nonconscious behavioral mimicry research. Researchers have argued that mimicry is a direct perception-behavior link while other researchers have argued that contextual variables mediate nonconscious mimicry. In an effort to bridge the gap between disparate arguments, this study proposed the parallel process model of nonverbal communication as a framework to explain nonconscious behavioral mimicry. The social environment and cognitive-affective mediators sections of the process model were tested in a 2 (young adult vs. older adult) x 2 (simple task vs. complex task) experimental design. Participants engaged in a matching task with a confederate. Statistical analysis revealed that participants engaged in mimicry behavior during the experiment interaction task. Statistical analysis revealed no main effect for the age of the confederate and mimicry behavior, however, analysis revealed a main effect for task-complexity and mimicry behavior. The findings suggest that the cognitive resources of participants is a significant predictor of nonconscious behavioral mimicry. The findings provide partial support for the parallel process model and pose theoretical implications for nonconscious behavioral mimicry research.
# TABLE OF CONTENTS

Page

LIST OF FIGURES ....................................................................................................................... iv

Chapters

1. INTRODUCTION ...................................................................................................1

2. REVIEW OF LITERATURE ..................................................................................6
   Nonconscious Behavioral Mimicry .............................................................6
   Parallel Process Model of Nonverbal Communication .......................15
   Rationale ....................................................................................................22

3. METHOD ..............................................................................................................26
   Participants .................................................................................................26
   Procedures .................................................................................................27
   Data Analysis .............................................................................................35

4. RESULTS ..............................................................................................................37

5. DISCUSSION ........................................................................................................39
   Theoretical Implications ............................................................................41
   Future Research and Limitations ...............................................................47
   Conclusion .................................................................................................49

APPENDICES ...............................................................................................................................52

REFERENCES ..............................................................................................................................60
# LIST OF FIGURES

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parallel process of nonverbal communication</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Parallel process of nonverbal communication and mimicry</td>
<td>51</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

Monkey see, monkey do; human see, human do. Humans and monkeys alike engage in nonconscious behavioral mimicry, a prominent nonverbal communication process. Nonconscious behavioral mimicry is the unintentional imitation of nonverbal behaviors (Chartrand & Bargh, 1999; Lakin, Jefferis, Cheng, & Chartrand, 2003; Manusov, 1992). During social interaction, communicators unconsciously adopt the nonverbal behaviors of others. Just as chameleons automatically take on the colors of their immediate environment, communicators take on the behaviors of their interactional partners (Caporeal, 1997, 2001; Chen, Chartrand, Lee Chai & Bargh, 1998; Dimberg, Thunberg, & Elmehed, 2000; Patterson, 2003). Like chameleons, humans mimic the environment unconsciously and automatically. Although humans do not consciously notice mimicry behaviors, mimicry unconsciously shapes the actions, feelings, and perceptions of interactional partners (Lakin, Chartrand & Arkin, 2008; Lafrance, 1979; Lafrance & Broadbent, 1976; van Baaren, Holland, Steenaert, & van Knippenberg, 2003). Therefore, mimicry is an influential behavior and merits attention.

Nonconscious behavioral mimicry researchers agree that mimicry serves an affiliative function (Bavelas, Black, Lemery, & Mullett, 1986; Lakin et al., 2003), increasing liking (Bavelas, Black, Lemery & Mullet, 1986; Chartrand & Bargh, 1999; Scheflen, 1964), rapport (Chartrand & Bargh; Lafortune, 1979, 1982; Lafrance & Broadbent, 1976; Lakin & Chartrand, 2003), prosocial behavior (van Baaren, Holland, Kawakami & van Knippenberg, 2004; van Baaren et al., 2003) and feelings of trust (Maddux, Mullen & Galinsky, 2008) among communicators. Consequently, mimicry behaviors prompt communicators to perceive interactional partners more positively.
While researchers agree on the nonconscious and affiliative characteristics of mimicry, researchers disagree on the mechanism behind mimicry. Early researchers (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001) have argued that mimicry is an unmediated, automatic process that results from a direct perception-behavior link. From this lens, the mere perception of nonverbal behavior causes an individual to enact the mimicry behavior. Hence, researchers (Chartrand & Bargh) termed nonconscious behavioral mimicry the “chameleon effect.” In contrast, current scholars (Bailenson & Yee, 2007; Johnston, 2002; van Baaren, Horgan, Chartrand & Dijkmans, 2004; Yabar, Johnston, Miles, & Pearce, 2006) have maintained that mimicry is not always a direct perception-behavior link. Instead, researchers have argued that mimicry is context dependent as environmental factors mediate the mimicry process. Contextual variables can prompt communicators to increase or decrease mimicry behaviors. Thus, recent researchers have argued that mimicry is mediated. I argue, however, that both points of view could potentially explain mimicry. However, few, if any theorists have included both bodies of mimicry research within a single theoretical framework.

The goal of this study is to apply the parallel process model of nonverbal communication (Patterson, 1995, 2006) as a theoretical framework to examine nonconscious behavioral mimicry. This model could potentially address and support the direct perception-behavior link as well as mimicry as mediated. First, the basic assumptions about nonverbal communication appear to coincide with nonconscious behavioral mimicry research. Patterson contended that communicators simultaneously send and receive nonverbal messages (Berger, 1997; Burgoon & Hoobler, 2002; Gregory, Dagan, & Webster, 1997) as they negotiate the parallel processes of encoding and decoding during social interaction. A web of variables, including determinants (biology, culture, gender, and personality), the social environment (partner and setting), and
cognitive affective mediators (interpersonal expectancies, affect, goals, dispositions, and cognitive resources), mediate the encoding and decoding processes of nonverbal communication (Patterson, 2006). Overall, the theoretical framework proposes that the largely automatic social cognition and behavioral processes (attentional focus, cognitive effort, action schemas, social judgments, and actor behavior) unconsciously manage nonverbal behaviors.

Second, the parallel process model of nonverbal communication unites two divergent bodies of mimicry literature. The direct perception-behavior link could fit in the social cognition and behavioral processes section of the parallel process model (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001; Patterson, 1995, 2006) and the variables that mediate mimicry are currently underscored in the determinants, social environment, and cognitive-affective mediator sections of the parallel process model (Bailenson & Yee, 2007; Johnston, 2002; van Baaren, Horgan, Chartrand, & Dijkmans, 2004; Yabar et al., 2006). This study will apply the parallel process model of nonverbal communication as a much-needed framework to examine nonconscious behavioral mimicry.

Several benefits may be gained from applying this theoretical framework to the study of nonconscious behavioral mimicry research. First, nonconscious behavioral mimicry is an influential communication behavior and merits theoretical application. When mimicry is present, communicators feel more connected to one another (Bavelas, Black, Lemery & Mullett, 1986). Mimicry initiates a variety of positive feelings during interaction including increased liking (Chartrand & Bargh; Scheflen, 1964), trust (Maddux et al., 2008), and empathy (Blairy, Herrera & Hess, 1999). In fact, the perception of mimicry can prompt communicators to engage in prosocial behavior (van Baaren, Holland, Kawakami & van Knippenberg, 2004; van Baaren et al., 2003). Therefore, nonconscious behavioral mimicry significantly shapes social interactions
and is an important communication behavior.

Secondly, the application of the parallel process model to mimicry may clarify the theoretical debate among mimicry researchers. Traditionally, researchers from two disparate bodies of mimicry research argued to identify the mechanism that causes mimicry. I argue that both mimicry perspectives, mimicry as mediated and mimicry as a direct perception-behavior link, may fit into the parallel process model (Patterson, 1995, 2006). Patterson (1995) explained that variables can mediate nonverbal behaviors (Gregory, Green Carrothers, Dagan, & Webster, 2000) and automatic perception processes can directly trigger nonverbal behaviors (Nowak, 2004). Thus, both mimicry lenses may operate within the parallel process model. The parallel process model of nonverbal communication may provide a holistic lens to understand nonconscious behavioral mimicry. A holistic lens is imperative for mimicry research because mimicry can result from a direct perception-behavior link, and can also be mediated by contextual variables. An appropriate theoretical framework must incorporate both lenses holistically in order to accurately explain nonconscious behavioral mimicry.

Lastly, the parallel process model of communication is drastically under tested (Gifford, 2006). Researchers (Berger, 1997; Gregory et al., 1997; Gregory et al., 2000; McClure & Nowicki, 2001; Patterson & Manusov, 2006) have commended Patterson for integrating social cognition and behavioral research into a single model. Additionally, researchers (Bente, Feist, & Elder, 1996; Hall, Carter, & Horgan, 2001; Jones & Guerrero, 2001; Rosenberg & Sillince, 2000) have used the parallel process model as a foundational theory to justify research. Few researchers, however, have tested the model as a whole. McClure and Nowicki used the parallel process model as a framework to examine social anxiety in preadolescents. While the findings supported the notion that limited cognitive resources affect the encoding and decoding processes
of nonverbal communication, the researchers failed to isolate and test the variables inherent within the parallel process model. Researchers must isolate variables and test causal relationships that substantiate the parallel process model.

This study will test the parallel process model as it relates to mimicry research through an experimental design. To understand how mimicry will relate to the parallel process model, I begin with an overarching research question to guide the project.

RQ: How do nonconscious mimicry behaviors function within the framework of the parallel process model?

Chapter 2 highlights relevant research to nonconscious behavioral mimicry and the parallel process model of communication. Chapter 3 establishes the method for the current study. Chapter 4 reports the results of the study. Lastly, Chapter 5 discusses the implications of the findings, provide conclusions, and suggestions for future research.
CHAPTER 2
REVIEW OF LITERATURE

Nonconscious Behavioral Mimicry

Nonconscious behavioral mimicry is a nonverbal communication phenomenon that researchers have investigated for decades. Mimicry is the imitation of another’s behaviors (Chartrand & Bargh, 1999; Lakin et al., 2003). Similar to the saying “Monkey see, monkey do,” humans unconsciously imitate the behaviors of others (Chartrand & Bargh). Nonconscious mimicry is the unintentional tendency to mimic the behaviors of other people (Lakin et al., 2003). Communicators unconsciously engage in mimicry as they unintentionally take on the communicative patterns of interactional partners (Chartrand & Bargh; Manusov, 1992).

While the focus of the present study is nonconscious behavioral mimicry, researchers have conceptualized mimicry in other forms. Interpersonal coordination is a nonverbal phenomenon akin to mimicry. Individuals attain interpersonal coordination as they synchronize behaviors during interaction (Bernieri & Rosenthal, 1991; Cappella & Schreiber, 2006; Chartrand & Bargh, 1999). Researchers have studied interpersonal coordination as a combination of interactional synchrony (Bernieri, Davis, Rosenthal, & Knee, 1994), facial mimicry (Blairy et al., 1999; Meltzoff & Moore, 1977), and behavior matching (Bavelas, Black, Lemery, MacInnis, & Mullet, 1986). Interactional synchrony is the synchronization of speech patterns and body movements during interaction. The level of interactional synchrony present within an interaction determines how smoothly the conversation flows (Bernieri et al., 1994). Facial mimicry is the second component of interpersonal coordination (Blairy et al., 1999; Meltzoff & Moore, 1977). Communicators unintentionally imitate the facial expressions of interactional partners. Lastly, researchers identified behavioral matching as a genre of interpersonal coordination. Behavior
matching is the unintentional mirroring of an interactional partner’s nonverbal behaviors (Bavelas, Black, Lemery & Mullett, 1986). Behavioral matching is most similar to the focus of the present study; nonconscious behavioral mimicry.

Communicators unconsciously mimic a variety of nonverbal behaviors. Individuals unconsciously mimic the postures of others (LaFrance, 1979; LaFrance & Broadbent, 1976). Postural sharing, a form of kinesic behavioral mimicry, consistently increases ratings of involvement (LaFrance & Broadbent; LaFrance & Ickes, 1981) and rapport (LaFrance, 1979, 1982). Likewise, a lack of postural congruence prompts negative ratings of interactional partners (LaFrance & Broadbent). Gestural and facial mimicry are additional facets of nonverbal mimicry (Meltzoff & Moore, 1977). Humans consistently and unconsciously imitate the gestures and facial expressions of interactional partners (Berenbaum & Rotter, 1992; Blairy et al., 1999; Metzoff & Moore). In addition to kinesic levels of nonverbal communication, humans also mimic paralinguistic features of speech. Communicators mimic accents (Giles & Powesland, 1975), speech rhythm (Capella & Panalp, 1981), and speech rates (Webb, 1969). Thus, communicators unintentionally take on the nonverbal behaviors, facial expressions, postures, gestures, and paralinguistic styles that they perceive. In sum, behavioral mimicry scholars illustrated that communicators unconsciously mimic a broad range of behaviors.

While mimicry researchers examined various types of nonverbal behaviors, mimicry researchers agree on the basic assumption that behavioral mimicry is a nonconscious process (Bailenson & Yee, 2007; Bavelas, Black, Chovil, Lemery & Mullett, 1988; Caporeal, 1997, 2001; Chen et al., 1998; Lakin et al., 2003). Humans unconsciously mimic the behaviors they perceive. Without awareness, humans unintentionally take on the nonverbal behaviors of others. In turn, the interactional partner unconsciously perceives the mimicry behavior. The perceived
mimicry behaviors subsequently increase positive feelings during the interaction (Blairy et al., 1999; Lafrance, 1979, 1982; LaFrance & Broadbent, 1982; LaFrance & Ikes, 1981; Scheflen, 1964). While communicators reported feelings of increased closeness and affect with an interactional partner that engaged in mimicry, the communicator did not report noticing any mimicry behavior (Bailenson & Yee, 2005; Chartrand & Bargh, 1999). Thus, nonverbal behavioral mimicry operates unconsciously (Lakin, 2006).

Although communicators unconsciously decode mimicry behavior, mimicry significantly influences the interactional partner and can produce several positive outcomes. First, nonconscious behavioral mimicry increases rapport (Chartrand & Bargh, 1999; Lakin et al., 2003; Lakin et al., 2008; LaFrance, 1979, 1982; LaFrance & Broadbent, 1976). Rapport is the bonding experience of interactional partners (Tickle-Degnen, 2006). Communicators with rapport experience interpersonal closeness, harmony, and mutual affect (Tickle-Degnen, 2006). Mimicked individuals also reported shared affect (Blairy et al., 1999), harmony (Chartrand & Bargh, 1999), ratings of increased involvement (LaFrance & Broadbent, 1976; LaFrance & Ikes, 1981), increased liking (Bavelas, Black, Lemery & Mullett, 1986; Bailenson & Yee, 2005; Chartrand & Bargh, 1999; Scheflen, 1964), and feelings of trust (Maddux et al., 2008).

In addition to mimicry generating positive feelings, mimicry initiates positive behavioral outcomes (van Baaren, Holland, Kawakami, & van Knippenberg, 2004; van Baaren et al., 2003). Behavioral mimicry increases prosocial behavior (van Baaren, Holland, Kawakami, & van Knippenberg, 2004; van Baaren et al., 2003), generosity (van Baaren et al., 2003), and helpfulness (van Baaren, Holland, Kawakami, & van Knippenberg, 2004). Researchers (van Baaren et. al, 2003) found that servers received larger tips when they mimicked their clients. Mimicked participants also donated more money than non-mimicked participants (van Baaren,
Holland, Kawakami, & van Knippenberg, 2004). Furthermore, prosocial behavior was not limited towards the mimicker. Mimicked participants engaged in prosocial behavior towards individuals that did not enact the mimicry behaviors (van Baaren, Holland, Kawakami, & van Knippenberg, 2004). In sum, mimicry can stimulate outcomes of helpfulness and generosity.

Because of the positive outcomes of mimicry, researchers (Caporael, 1997, 2001; Lakin et al., 2003) have argued that the use of behavioral mimicry created an evolutionary advantage for humans. Researchers argued that mimicry was vital to the evolution of humans because mimicry fosters affiliation and rapport (Bavelas, Black, Lemery, & Mullett, 1986; Lakin et al., 2003). Consequently, early humans used mimicry to foster relationships (Lakin et al., 2003). Mimicry increased the likelihood that humans would gain entrance and acceptance in groups. As a result, researchers (Lakin et al., 2003) described behavioral mimicry as a “social glue.” Humans that did not engage in mimicry were socially isolated, and therefore, evolutionarily disadvantaged (Caporael, 1997, 2001). Socially isolated humans could not share resources or procreate. Thus, mimicry served an evolutionary advantage.

Because of the inherent affiliative function of nonconscious mimicry, researchers (Bavelas et al., 1987; Blairy et al., 1999; Lakin et al., 2003) have conceptualized mimicry as primitive empathy. According to this lens, mimicry is the physical expression of projecting oneself into another’s perspective. Lipps (1907) posited that mimicry facilitates shared affect and promotes empathy. Lipps claimed that during an interaction, the observer first perceives the behavior of the interactional partner. The perception of behavior causes the observer to enact the perceived behavior of the interactional partner. The mimicry behaviors generate the feelings and affective state of the interactional partner. The observer shares the feeling of the interactional
partner when he or she enacts the imitated behaviors. Consequently, the observer understands the interactional partner’s internal state and conveys empathy (Lipps).

Blairy et al. (1999) conceptualized mimicry’s empathetic role as perspective taking. Researchers (Blairy et al.) argued that mimicry might play a casual role in empathy (Blairy et al.). Communicators perceive mimicry as a form of perspective taking. In fact, patients rated counselors that engaged in behavioral mimicry as more empathetic than counselors who did not (Maurer & Tindall, 1983). Researchers (Blairy et al.; Maurer & Tindall) have suggested that behavioral mimicry increased the extent that one perceives another as empathetic.

Chartrand and Bargh (1999) identified an additional link between empathy and mimicry. The researchers characterized empathy as the cognitive ability to take another’s perspective. Individual differences in perspective taking influence the extent that communicators engage in mimicry. Chartrand and Bargh contended that perspective taking increases mimicry. High-perspective takers naturally manage social interactions with mimicry behaviors. As a result, high perspective takers have smoother social interactions (Chartrand & Bargh). In addition to high perspective-takers, high self-monitors engage in increased mimicry behaviors (Chen & Chartrand, 2003). High self-monitors are keenly aware of their external environments and the nonverbal behaviors of interactional partners (Snyder, 1974, 1987). Subsequently, high self-monitors engage in more mimicry than low self-monitors (Chen & Chartrand). These internal factors influence the extent that individuals mimic during social interaction.

While mimicry researchers consistently demonstrated that humans unconsciously mimic the behaviors of others, researchers disagree on the mechanism behind mimicry. Researchers from two bodies of mimicry literature have argued for the mechanism responsible for mimicry. Earlier researchers (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001) have contended that
mimicry is the result of a direct perception-behavior link, termed the chameleon effect. As mimicry research evolved, researchers (Bailenson & Yee, 2007; Chartrand, Maddux & Lakin, 2005; Johnston, 2002; Patterson, 2003; van Baaren, Horgan, Chartrand, & Dijkmans, 2004) have argued that mimicry is more complex than a direct perception-behavior link. Researchers have hypothesized that contextual and motivational variables mediate the mimicry process.

The Direct Perception-Behavior Link

Early researchers (Chartrand & Bargh, 1999; Chartrand et al., 2005; Dijksterhuis & Bargh, 2001; James, 1890) have argued that mimicry is an unintentional, unmediated, unconscious, and purely automatic process. Researchers based the moto-mimicry argument on Carpenter’s (1874) principle of ideomotor action and James’ (1890) claims of “thinking is doing.” James argued that a passive, cognitive mechanism unconsciously triggers mimicry. Mimicry researchers (Chartrand & Bargh; Chartrand et al., 2005; Dijksterhuis, Smith, van Baaren, & Wigboldus, 2005) have adapted these arguments into the direct perception-behavior link. Chartrand and Bargh argued that the external environment directly influences the communicative behaviors of humans (Bargh & Chartrand, 1999; Chartrand & Bargh; Dijksterhuis et al.). Communicators passively encode information from the environment, and subsequently engage in mimicry behaviors (Chartrand et al.). The fundamental assumption of the direct perception-behavior link is that communicators automatically and unconsciously perform the behaviors that they perceive (Chartrand & Bargh; Dijksterhuis & Bargh).

Communicators begin the mimicry process as they perceive an interactional partner’s behaviors. Perception activates an automatic cognitive process, which causes the communicator to enact the perceived behaviors of the interactional partner. In turn, the communicator
unconsciously and automatically mimics the behaviors that they perceive (Bargh & Chartrand, 1999; Chartrand & Bargh, 1999). Communicators do not choose to engage in mimicry. Rather, communicators automatically and unconsciously mimic the behaviors of interactional partners (Bargh & Chartrand; Chartrand & Bargh; Dijksterhuis & Bargh, 2001). Chartrand and Bargh contended that mimicry is a causal relationship between perception and behavior. Perception directly causes the communicator to enact the perceived behaviors (Chartrand & Bargh; Dijksterhuis & Bargh). Chartrand and Bargh argued that this perception-behavior link is the mechanism behind nonconscious behavioral mimicry.

Chartrand and Bargh (1999) named the perception-behavior mechanism the chameleon effect. Chartrand and Bargh asserted that just as chameleons take on the colors of their direct environment, humans take on the behaviors of their environment. Chameleons do not decide to be green or gray based on the environment, instead, chameleons automatically imitate the environment. Likewise, communicators automatically imitate the behaviors of their immediate environment via unconscious mimicry (Chartrand & Bargh). Chartrand and Bargh tested the validity of the chameleon effect and found that simply the act of perceiving increased the likelihood that participants engaged in mimicry.

Chartrand and Bargh (1999) argued that because the chameleon effect is a direct, perception-behavior link, no affiliation goal is necessary for communicators to engage in mimicry. According to the chameleon effect, communicators mimic others in their environment, regardless of whether the communicator anticipates interaction with another person. In fact, individuals mimicked non-smiling strangers with whom they had no contact (Chartrand & Bargh). Participants sat in a waiting room with unacquainted individuals. As the Chartrand and Bargh hypothesized, the participants mimicked the unacquainted confederates even though they
were not interacting with them. In addition to the mimicry of strangers, communicators also engage in virtual mimicry (Bailenson & Yee, 2004). Communicators mimicked nonhuman virtual avatars online (Bailenson & Yee). The direct automatic-perception link triggers mimicry behaviors among interactional partners, strangers, and virtual avatars. Thus, the mere perception of nonverbal behaviors, virtual or in person, initiates the generation of reciprocal nonverbal behaviors (Chartrand & Bargh; Dijksterhuis & Bargh, 2001).

_Mimicry as Mediated_

Whereas past researchers argued for the direct perception behavior link as the mechanism behind mimicry (Bargh & Chartrand, 1999; Chartrand & Bargh, 1999), recent mimicry researchers (Janiszewski & Osselaer, 2005; Johnston, 2002; Lakin & Chartrand, 2003; van Baaren, Horgan, Chartrand & Dijkmans, 2004; Yabar et al., 2006) have contended that contextual variables mediate the mimicry process. Researchers (Chartrand et al., 2005; Patterson, 2003) have contended that the perception-behavior link is too simplistic to explain nonconscious behavioral mimicry. Researchers continue to advance research in mediated mimicry as mimicry research progresses (Chartrand et al.).

The first situational factor that mediates nonconscious mimicry is affiliation (Chartrand et al., 2005; Lakin & Chartrand, 2003). Humans inherently desire to affiliate with others (Baumeister & Leary, 1995; Brewer, 1991; Yabar et al., 2006). The affiliative function of mimicry provided an evolutionary advantage for humans (Lakin et al., 2003). On an unconscious level, humans strategically increase mimicry behaviors to affiliate with others (Chartrand et al., 2005; Lakin et al., 2008). Therefore, when interactional partners share the goal to affiliate, they engage in increased mimicry behaviors (Chartrand et al., 2005; Lakin & Chartrand). While direct
perception-behavior link supporters (Chartrand & Bargh, 1999) contended that an affiliation goal does not influence the extent that individuals mimic, recent researchers (Lakin & Chartrand) found that participants with an affiliation goal engaged in increased behavioral mimicry. Lakin and Chartrand argued that two unconscious, automatic processes guide behavioral mimicry. First, communicators unconsciously pursue affiliation goals. Secondly, communicators nonconsciously mimic the interactional partner in pursuit of the affiliation goal. The desire to affiliate motivates communicators to engage in mimicry (Chartrand et al., 2005; Lakin & Chartrand). Individuals increased patterns of behavioral mimicry even when the affiliation goal was at the nonconscious level (Chartrand et al., 2005; Lakin & Chartrand). Thus, affiliation goals unconsciously motivate communicators to increase mimicry behaviors (Chartrand et al., 2005; Lakin & Chartrand).

A second mediating variable is stigma (Johnston, 2002). Johnston found that negative stigma reduced nonconscious behavioral mimicry. Stigma, when associated with a given task, inhibits behavioral mimicry (Johnston). Because individuals would likely avoid affiliation with a stigmatized individual, individuals decrease behavioral mimicry when a related stigma is present (Johnston). Stigma in general does not negate the mimicry process, however, when stigma is attached to the target behavior, mimicry decreases (Johnston).

Comparable to the function of stigma as a mediator, group membership also mediates the behavioral mimicry process (Lakin et al., 2008; Yabar et al., 2006). Communicators unconsciously mimic in-group members more than out-group members (Lakin et al., 2008; Yabar et al.). Communicators nonconsciously adjust mimicry behaviors according to the group membership of interactional partners (Yabar et al.). Communicators also regulate mimicry behaviors according to their group membership status. Social exclusion poses a significant
belongingness threat. Excluded individuals strategically employ mimicry behaviors to regain affiliation with the in-group (Lakin et al., 2008). Communicators strategically and unconsciously engage in behavioral mimicry in to restore belongingness needs (Chartrand et al., 2005; Lakin et al., 2008). Therefore, social exclusion and group membership mediate mimicry.

In sum, mimicry as mediated opposes the direct perception-behavior link. Researchers (Bailenson & Yee, 2007; Johnston, 2002; Lakin et al., 2008; van Baaren, Horgan, Chartrand & Dijkmans, 2004; Yabar et al., 2006) have argued that contextual cues and variables mediate the mimicry process. Few, if any theorists have provided an inclusive explanation for the mechanism behind nonconscious behavioral mimicry. An effective framework for nonconscious behavior mimicry must incorporate both approaches simultaneously. I examined the parallel process model of nonverbal communication (Patterson 1995, 2006) as a theory which incorporates both theoretical perspectives in the same framework. Patterson maintained that communicators simultaneously perceive and enact nonverbal behaviors. Patterson’s foundational assumption underscores the direct perception-behavior link. Patterson (1995, 2006) also contended that contextual variables mediate nonverbal processes (Gregory et al., 1997). Therefore, I applied the parallel process model to nonconscious behavioral mimicry in an attempt to unite both bodies of mimicry research within the framework of the parallel process model.

Parallel Process Model of Nonverbal Communication

Patterson (1995, 2006) provided a conceptual framework to explain the simultaneous encoding and decoding processes in his parallel process model of nonverbal communication (Berger, 1997; Burgoon & Hoobler, 2002; Gregory et al., 1997; Lakin, 2006). Patterson is one of the first theorists to connect the social perception and social behavior processes in a single
Patterson contended that communicators concurrently encode and decode nonverbal behaviors during social interaction (Burgoon & Hoobler). Patterson emphasized the interdependence of the encoding and decoding processes (Burgoon & Hoobler; Gregory et al., 1997). Typically, researchers have isolated the encoding and decoding processes and examined them individually (Patterson, 1995). While most communication scholars acknowledged the interdependence of encoding and decoding, researchers can more easily control the processes independently. Patterson (1995), however, acknowledged this gap and integrated encoding and decoding in a single framework. Thus, Patterson created a holistic model to investigate the behavioral and perception processes simultaneously (Berger; Burgoon & Hoobler; Lakin, 2006; Patterson, 1995, 2006).

Patterson (1995, 2006) organized the parallel process model of nonverbal communication into four sections: (1) determinants, (2) social environment, (3) cognitive-affective mediators, and (4) social cognition and behavioral processes (see Figure 1). In the first section, Patterson underscored the individual differences that influence nonverbal communication. In the second section, Patterson accounted for the social context of the communicative interaction. Lastly, Patterson explored the automatic perception and behavioral processes of nonverbal communication in the third section of the parallel process model.

**Determinants**

The first component of the parallel process model is the determinants (Lakin, 2006; Patterson, 1995, 2006). Determinants are factors that communicators bring into an interaction. Unlike contextual factors that differ according to the specific interaction, determinants remain fairly constant internal influences. Determinants are unique to each individual and predetermine
how individuals communicate throughout their lives (Patterson, 1995, 2006). Moreover, both partners bring specific determinants to the interaction. Patterson (1995, 2006) included biology, culture, gender, and personality as determinants in the parallel process model of nonverbal communication. These determinants influence the cognitive and behavioral processes that regulate encoding and decoding (Lakin, 2006; Patterson, 1995, 2006). Patterson (2006) rationalized that one’s biology, culture, gender, and personality guide communication patterns consistently over time. For example, one’s personality (i.e. extroverted vs. introverted) will influence her or his nonverbal behaviors. The combination of Patterson’s (1995, 2006) determinants produce distinctive nonverbal communication patterns.

**Social Environment**

Patterson (1995, 2006) argued that determinants influence one’s choice of social environment. Thus, determinants influence one’s nonverbal communication patterns via two channels in the parallel process model. In the social environment component of the model, Patterson underscored the contextual factors that mediate nonverbal communication behaviors. Setting and partner influence the interpretation and generation of nonverbal behaviors (Gregory et al., 2000; Patterson, 1995, 2006). Communicators adjust nonverbal behaviors to the specific interactional partner (Gregory et al., 2000; Patterson, 2006). Similarly, the setting of the interaction mediates one’s nonverbal behaviors. Patterson (1995, 2006) also argued that individuals select certain social environments according to similarity. Communicators might opt for a social setting with people similar in race, political affiliation, values, gender, or religion. Thus, the selection process increases homogeneity among groups in a particular setting. This increased similarity among communicators increases the likelihood that people make accurate
judgments about one another. Increased homogeneity also increases interactional synchrony in interactions (Patterson, 1995 & 2006).

**Cognitive-Affective Mediators**

In the third component of the parallel process model, cognitive-affective mediators, Patterson (2006) underscored the cognitive processes that steer communicative behaviors (Hall, Halberstadt, & O’Brien, 1997; Hall et al., 2001; McClure & Nowicki, 2001). Patterson (1995, 2006) identified five cognitive-affective mediators: interpersonal expectancies, affect, goals, dispositions and cognitive resources. Interpersonal expectancies concurrently regulate nonverbal behavior and social judgment processes. Individuals often expect that an interactional partner might behave in a certain way. When individuals have expectations of interactional partners, they perform expected nonverbal behaviors in reciprocation. Likewise, individuals might engage in self-fulfilling processes by behaving in ways that people expect of them (Patterson, 1995, 2006). Conversely, communicators might be sensitive to nonverbal cues that actually signal underlying dispositions. Observant communicators may accurately perceive subtle social cues that represent hidden dispositions (Patterson, 1995, 2006). Therefore, interpersonal expectancies affect both nonverbal behavior and social judgment processes (Patterson, 1995, 2006).

Affect is the second cognitive-affective mediator in the parallel process model. Affect is the combined product of an individual’s dispositions, goals, the communicator’s relationship to interactional partner, and response to the contextual environment (Patterson, 1995, 2006). Affect influences both the encoding and decoding processes. Nonverbal researchers (Burgoon, Dillman, & Stern, 1993; Burgoon, Stern, & Dillman, 1995; Patterson, 1995, 2006) have argued that positive affect increases reciprocity of nonverbal behaviors, while negative affect increases
patterns of compensation. Positive affect also increases nonverbal involvement behaviors (Patterson, 2006). In addition to influencing the encoding processes of nonverbal communication, affect also influences social judgments of interactional partners (Patterson 1995, 2006).

Goals are the third cognitive-affective mediator in the parallel process model. Unconscious and conscious goals regulate the encoding and decoding processes of nonverbal behaviors (Patterson, 1995). External factors can automatically and unconsciously activate goals and goal-directed behaviors during interaction (Lakin, 2006; Patterson, 2006). While individuals may be consciously unaware that goals exist within an interaction, the goal unconsciously influences the individuals’ nonverbal behaviors. The type of goal, (i.e. to make a good impression) determines the level of cognitive resources one needs during an interaction (Patterson, 1995). For example, when interactional partners share an affiliation goal, they engage in increased mimicry behaviors (Chartrand et al., 2005; Lakin & Chartrand, 2003). The kind of goal also determines the type of informational stimuli a communicator selects and perceives during interaction (Patterson, 1995). Communicators might pay special attention to certain details and nonverbal behaviors based on the interactional goal. Goals therefore mediate the enacted nonverbal behaviors as well as the attention one pays to the interactional partner’s behaviors.

Dispositions, the third cognitive-affective mediator, influence behavior and cognition during interactions (McClure & Nowicki, 2001; Patterson, 1995). The cognitive state of an individual in a given context comprises disposition (Patterson, 1995). The partner, social environment, circumstances of the interaction, and other cognitive-affective mediators shape one’s disposition. Disposition greatly influences the encoding and decoding processes during
interaction. Anxiety, for example, is a common disposition that affects communicators (McClure & Nowicki; Patterson, 1995, 2006). The actor’s anxious disposition regulates the expressed nonverbal cues in the interaction. For example, anxious communicators make less eye contact and maintain greater proxemic distances between interactional partners (Patterson, 1995). Furthermore, anxiety influences one’s decoding processes during interactions (McClure & Nowicki; Patterson, 1995). Anxiety can cause increased errors in the decoding of nonverbal messages (McClure & Nowicki) and can increase negative perceptions of interactional partner’s judgments and behaviors (Patterson, 1995). Therefore, disposition regulates encoding and decoding processes during interactions.

The final cognitive-affective mediator is one’s available cognitive resources (Hall et al., 1997; Hall et al., 2001; Patterson, 1995, 2006). Patterson (1995, 2006) defined cognitive resources as the total cognitive resources available to encode and decode messages in a given interaction. Communicators do not solely attend to encoding and decoding processes. Rather, communicators distribute resources among a variety of stimuli (Hall et al., 2001; Patterson, 2006). Communicators allocate cognitive resources to internal feelings, mental to-do lists, external stimuli, the topic of conversation, and self-consciousness. When individuals distribute cognitive resources away from generating and interpreting messages, the individual has decreased cognitive resources to devote to the production and interpretation of nonverbal messages (Hall et al., 1997; Hall et al., 2001; Patterson, 1995, 2006). Within a given interaction, individuals have finite cognitive resources to send and receive nonverbal cues. Thus, cognitive resources regulate one’s capacity to encode and decode nonverbal messages.
Social Cognition and Behavioral Processes

Patterson (1995, 2006) assigned social cognition and behavioral processes as the final section of the parallel process model (Patterson 1995, 2006). Patterson (2006) argued that both the social cognition and behavioral processes function in pursuit of a common goal. The social cognition and behavioral processes require little cognitive effort (Patterson, 2006). Because communicators must allocate some cognitive resources elsewhere during an interaction, automatic processes unconsciously manage nonverbal behaviors (Cappella & Schreiber, 2006; Lakin, 2006; Patterson, 1995, 2006). Contextual factors also trigger automatic cognitive processes. For example, communicators spontaneously increase nonverbal involvement behaviors in response to positive interpersonal affect (Patterson, 1995, 2006). Likewise, over learned behaviors and patterns require little cognitive effort and thus operate automatically (Patterson, 1995). Additionally, individuals frequently form social judgments unconsciously and automatically (Lakin, 2006; Patterson, 2006). In situations in which individuals may be operating strategically, however, individuals may use more cognitive resources to encode and decode nonverbal behaviors. Most often the social cognition and behavioral process complement one another (Patterson, 2006). Moreover, Patterson underscored the automatic processes that regulate nonverbal communication in the social and behavioral processes section (Lakin, 2006).

In sum, Patterson (1995, 2006) provided an excellent framework to explore the automatic encoding and decoding processes of interactions (Berger, 1997; Lakin, 2006). Patterson posited that communicators simultaneously, and often automatically, send and interpret nonverbal messages (Berger; Lakin). The encoding and decoding processes are not separate, independent processes. In contrast, the encoding and decoding process are inextricably linked, parallel processes. Communicators concurrently send and receive nonverbal messages (Berger; Gregory
et al., 1997; Gregory et al., 2000; Lakin; Patterson, 1995, 2006). Patterson’s holistic explication of nonverbal behavior appropriately explains the underlying processes of nonverbal production and interpretation (Berger; Gregory et al., 1997; Gregory et al., 2000; Lakin).

Patterson’s (1995, 2006) model seems to have offered insight to the mechanism behind nonconscious behavioral mimicry. The parallel process model’s close link between perception and behavior is similar to nonconscious behavioral mimicry (Lakin, 2006; Patterson & Manusov, 2006). As mimicry researchers (Chartrand & Bargh 1999; Lakin, 2006) have contended, communicators simultaneously perceive nonverbal behaviors and enact the perceived behaviors. The parallel process model may incorporate both mimicry perspectives into one theoretical framework. Patterson seems to have emphasized the direct perception-behavior link in the automaticity of social cognition and behavioral process. Moreover, Patterson may have illustrated the contextual variables that mediate nonconscious behavioral mimicry in the social environment and cognitive-affective mediators sections of the parallel process model. Therefore, the parallel process model of nonverbal communication (1995, 2006) seems to incorporate both bodies of mimicry literature into a single model to provide a much-needed framework for nonconscious behavioral mimicry.

Rationale

After examining mimicry as a function of the parallel process model, I tested the two paths within the parallel process model; the automatic cognitive processes that generate nonverbal behavior outcomes, and the contextual factors that mediate nonverbal behaviors. Testing both paths within the model was important because the integration of both cognitive and behavioral processes distinguishes the parallel processes model (Berger, 1997; Gregory et al.,
Patterson claimed that some cognitive processes automatically manage nonverbal communication (Burgoon & Hoobler, 2002; Nowak, 2006; Patterson, 1995, 2006). The automaticity of cognitive nonverbal processes appears to relate to mimicry research that characterized mimicry as a direct perception-behavior link (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001). The second path within the parallel process model seems to underscore the variables that mediate nonverbal behaviors (Patterson, 1995, 2006). Factors present within the unique interaction influence the encoding and decoding of nonverbal behaviors. The second path seems to justify mimicry as a mediated process (Bailenson & Yee, 2007; Johnston, 2002; Lakin & Chartrand, 2003; van Baaren, Horgan, Chartrand & Dijkmans, 2004; Yabar et al., 2006). Thus, both the automatic and mediated channels of the parallel process were examined individually. If context variables partially mediate the direct relationship between the participants and the nonverbal mimicry behavior, then the model would support both automatic and mediated processes in nonverbal mimicry behaviors. Therefore, the following hypothesis was proposed:

H1: Within the framework of the parallel process model of nonverbal communication, mimicry will have a partially mediated effect: variables will mediate the mimicry process and a direct perception-behavior link will guide mimicry.

The cognitive path of the nonverbal parallel process model was examined to test the automatic perception-behavior link. Patterson (1995) argued that one’s available cognitive resources affect the automaticity of the generation of nonverbal behaviors. Cognitive resources are the total amount of resources an individual has to attend to the nonverbal cues during an interaction (Patterson, 1995, 2006). If an individual is thinking about work deadlines, personal dilemmas, or errands that he or she needs to run, the individual will subsequently have less cognitive resources available to generate nonverbal messages and to interpret their partner’s
nonverbal cues. When individuals have less cognitive resources to devote to an interaction, automatic processes cognitively negotiate the nonverbal encoding and decoding processes (Hall et al., 2001; Hall et al., 1997; Patterson, 1995, 2006). Moreover, if partners engage in a demanding task during an interaction, they will have less cognitive resources to devote to sending and receiving nonverbal cues. Consequently, the individual is less likely to perceive the interactional partner’s nonverbal behaviors. According to the direct perception-behavior link, if communicators do not perceive nonverbal behaviors, they cannot imitate the behaviors (Chartrand & Bargh, 1999; Dijksterhuis & Bargh, 2001). Individuals with limited cognitive resources may be less likely to mimic the behaviors of interactional partners. Therefore, the second hypothesis was proposed:

H2: Participants with ample cognitive resources will mimic the behaviors of the confederate more than participants with limited cognitive resources.

Secondly, the mediated path of the parallel process model of nonverbal communication was tested. Patterson (1995, 2006) argued that the social environment, a combination of partner and setting, mediate the nonverbal communication process (Gregory et al., 2000). One’s interactional partner influences the encoding and decoding processes of nonverbal behaviors (Gregory et al., 2000; Patterson, 1995, 2006), and therefore influences the extent that one mimics an interactional partner. To test how interactional partner type mediates the mimicry process, the age of the interactional partner was manipulated. The manipulation of age created an in-group/out-group effect with the participants. Mimicry researchers (Lakin et al., 2008; Yabar et al., 2006) demonstrated that group membership mediates mimicry. Communicators mimic in-group interactional partners more than out-group partners (Lakin, et al.; Yabar et al., 2006). Therefore, the final hypothesis was proposed:
H3: Participants will mimic in-group interactional partner more than out-group interactional partners.
CHAPTER 3

METHOD

A 2 (task complexity: simple vs. complex) x 2 (group membership: young adult vs. older adult) experimental design was employed to examine nonverbal mimicry behaviors within the context of the parallel process model of nonverbal communication (Patterson, 1995, 2006).

Participants

A convenience sample of college students was used in the present study. One hundred sixty four undergraduate students were recruited from communication courses at a large southwestern university. Communication instructors compensated participants with extra credit points, class participation, or fulfillment of a course assignment. Sixty percent (n= 98) of participants were female, 40% male (n= 66). The participant pool was reflective of the university composition, 64% European-American (n= 105), 12% African-American (n= 20), 13% Latin-American (n= 21), 5% Asian-American (n= 8), 3% international (n= 5), and 3% multiracial (n= 5). The participants average age was 20.46 years (SD=.1.76). One hundred forty seven participants were characterized as young adults (ages 18-25), seventeen as middle-aged adults, and zero participants were characterized as older adults. In order to address the in-group, out-group effects of age on nonconscious behavioral mimicry, middle aged adults were eliminated from the data-set. Thus, the data set was reduced to young-adult participants (n=146), age 18-25. The participants were randomly assigned to one of the four conditions: condition 1, (young adult, simple): n=44; condition 2, (young adult, complex): n= 49; condition 3, (older adult, simple): n= 30; condition 4 (older adult, complex): n= 24.
Procedures

The participants completed two sets of questionnaires and a matching task. Upon arrival to the experiment, participants completed a series of questionnaires. After the participant completed the first set of questionnaires, the experiment coordinator took the participant to a different room to meet their partner. The interaction partner was a trained confederate. The experiment coordinator explained the task, and clarified questions regarding the task. Participants were primed to maintain eye-contact throughout the interaction so that they would perceive the face touching behavior of the confederate. The experiment coordinator recorded the interaction. Together, the participant and confederate engaged in a matching task. After the interactants completed the five-minute interaction task, the coordinator stopped recording and returned the participant to the questionnaire room to complete the second series of questionnaires.

Task

Participants engaged in a matching task with either the young adult or older adult confederate. Participants were given a complex, or simple matching task in which they had to match a series of cards with shapes and figures on them. For both tasks, participants were assigned as the “director.” As the director, participants described the shape on the index card to the confederate, named the “matcher.” The simple task had easily recognizable figures as shapes such as stars, triangles, and stick people. In contrast, the complex task had a serious of ambiguous tangrams or abstract shapes. The participants had 5 minutes to complete the matching task. The participants will be encouraged to work together throughout the matching task (see Appendix A).
Independent Variables

In order to examine how mimicry functioned within the parallel process model, two sections of the parallel process model were manipulated: social environment and cognitive-affective mediators. Thus, two independent variables were manipulated: age of the partner and participant cognitive resources. Researchers (Gregory et al., 2000; Patterson, 1995, 2006) have argued that individuals adjust nonverbal to their interactional partner. Therefore the age of the interaction partner was manipulated to test the social environment portion of the model. Age had two conditions: young adult vs. older adult, which subsequently created an in-group/ out-group effect with participants. Researchers (Lakin et al., 2008; Yabar et al., 2006) have argued that group membership mediates the mimicry process. The young adult condition created an in-group effect, while the older adult condition created an out-group effect. To manipulate the age of the partner, two female confederates were recruited and trained. The young adult confederate was 22, and the older adult confederate was 72. The purpose of only recruiting female confederates was to maintain sex as a constant variable.

The second independent variable was cognitive resources. Cognitive resources are the total cognitive capacity accessible to manage routine tasks and social interactions (Hall, et al., 2001; Patterson, 1995, 2006). In addition to attending to the nonverbal cues in a given interaction, individuals spend cognitive resources thinking about errands that need to be completed, working on a difficult task, and worrying about personal dilemmas. The available cognitive resources determine the resources one has to attend to the interaction, and consequently determine the level of automaticity of encoding and decoding nonverbal behaviors (Hall, et al., 1997; Hall, et al., 2001; Patterson, 1995, 2006). An individual with ample cognitive resources can to pay more attention to nonverbal cues during an interaction, and can subsequently dedicate
more energy to creating and interpreting messages. In contrast, communicators with few cognitive resources cannot devote adequate attention to nonverbal cues during interaction, and therefore must rely on automatic communication processes that require little cognitive effort (Patterson, 1995). By manipulating cognitive resources, the automatic aspects of the mimicry process will be manipulated. In order to manipulate cognitive resources, task complexity was manipulated. Cognitive resources had two conditions: simple vs. complex. As described earlier, the simple task was designed to require very little cognitive resources, and the complex task was designed to require significant cognitive resources. Thus, participants in the simple condition had more cognitive resources available to attend to nonverbal cues than participants in the complex condition.

Manipulation Check

Because the confederates varied in age drastically, no formal manipulation check was required. Prior to the experiment, I conducted a manipulation check to ensure the validity of the task complexity manipulation. To test the task complexity manipulation I administered a questionnaire to measure perceived difficulty of each task condition (see appendix B). Pairs of 18-25 year old young adult students completed the simple and complex tasks. After young adult students complete the task, they reported the perceived difficulty of the task. The perceived difficulty reflected the level of cognitive resources that the young adults spent on the task. The complex task, \( m = \; SD = \) was significantly more difficult than the simple task \( m = \; SD = \), \( t(7) = 11.9, p = .000 \).
Confederate Nonverbal Behaviors

Mirroring Lakin and Chartrand’s study (2003), the two confederates were trained to engage to engage in face-touching behaviors during the second half of the five minute interaction. To create a baseline effect (Manusov, 1992; Guerrero & Le Poire, 2005), the confederated only engaged in face-touching behaviors during the last two and a half minutes (time 2). Therefore, the first part of the videotaped interaction did not include nonverbal behavioral manipulations (time 1). The difference in the amount of time the participant touched her or his face during time 1 and time 2 represented the amount of mimicry during the interaction.

Dependent Measures

The dependent variable was the amount of time the participant engaged in mimicry behavior. Face touching was the target mimicry behavior for all four conditions. Four coders were trained to measure the mimicry behavior (White & Sargent, 2005) and practiced coding face touching behaviors on sample data sets (Guerrero, 2005). Coders recorded the time participants spent face touching in time 1 and time 2. A significant advantage of coding for a single nonverbal behavior is that the coding produces higher reliability scores than coding for multiple behaviors (White & Sargent). All four coders evaluated 14% of the data set, coding 20 of the same interactions to establish reliability. Krippendorff’s alpha was employed to determine intercoder reliability (ratio alpha= .75).

Parallel Process Model of Nonverbal Communication

The parallel process model lacks two important confounding variables in the
determinants section. Patterson (1995, 2006) accounted for biology, culture, gender, and personality. Patterson (1995, 2006) argued that determinants are individual differences that influence the encoding and decoding of nonverbal behaviors. Likewise, the inherent determinants of individuals influence the extent that one engages in nonconscious behavioral mimicry. Patterson’s list of determinants, however, lacks two important characteristics that influence the extent that one engages in mimicry: cognitive complexity and perspective taking.

Cognitive complexity refers to the system of one’s cognitive structures (Burleson & Caplan, 1999), and subsequently influences depth of one’s total cognitive resources. Researchers (Burleson & Caplan) argued that cognitive complexity affects a variety of communication skills including social interaction proficiency, social perception, and message interpretation and production. Therefore, one’s cognitive complexity would likely influence nonconscious behavioral mimicry behavior. While Patterson (1995, 2006) accounted for cognitive resources (the amount of cognitive resources available to attend to a social interaction), the model fails to account for one’s initial cognitive complexity (total cognitive structures) (Burleson & Caplan). One’s available cognitive resources changes according to the specific interaction (Patterson, 1995, 2006; Hall et al., 2001). Cognitive complexity, however, remains constant (Burleson & Caplan). Individuals with high cognitive complexity have a larger cognitive resource pool than those with low cognitive complexity. Therefore, cognitive complexity should be added to the determinants section of the parallel process model.

In addition to cognitive complexity, perspective taking should be added to the parallel process model’s list of determinants. Perspective taking is the cognitive ability to understand another’s perspective (Chartrand & Bargh, 1999). High perspective takers experience heightened perceptions of social interactions, and consequently engage in more mimicry behaviors than low
perspective takers (Chartrand & Bargh). Perspective taking is an individual difference that influences the extent that individuals engage in nonconscious behavioral mimicry, and thus should be included in the parallel process model’s list of determinants. Cognitive complexity and perspective taking are important characteristics that individuals bring into an interaction (Patterson 1995, 2006). Previous researchers have demonstrated the influence of cognitive complexity on communication processes (Burleson & Caplan, 1999) and perspective taking on nonconscious behavioral mimicry (Chartrand et al., 2005; Chartrand & Bargh). Therefore cognitive resources and perspective taking are important determinants that predetermine nonverbal communication patterns of individuals (see Figure 2).

While only two variables from the parallel process model (age of partner and cognitive resources) were manipulated, the rest of the sections were accounted for by measuring some variables and holding other variables constant. To account for the determinants section of the parallels process model, participants completed a basic demographic questionnaire to identify gender, and cultural background. Participants also completed the perspective-taking portion of the Interpersonal Reactivity Index (IRI) (Davis, 1980). Chartrand and Bargh (1999) administered the IRI scale to measure perspective taking. Therefore, the IRI was appropriate to measure perspective taking reached acceptable levels of reliability (Krippendorf’s $\alpha=.74$).

The participants completed a role category questionnaire (RCQ) (see Appendix C) to calculate the inherent cognitive complexity that participants bring to the interaction (Crockett, 1965). The RCQ consists of two open ended questions. Thus, coders were trained to assess the RCQ and achieved reliability ($\alpha=.94$).

Participants also completed a simple personality scale to measure introversion vs. extroversion for the personality portion of the determinants section. Introversion and
extroversion is a salient personality dimension related to social interaction. The introversion/extroversion dimensions analyze how individuals relate to others during social interaction. Because an interactive task was employed, the introversion/extroversion scale was most relevant. Moreover, one’s level of introversion and extroversion influences communicator style (Opt & Loffredo, 2003) and therefore is a valid measure of personality as it relates to the determinants of the parallel process model of nonverbal communication ($\alpha=.71$).

The social environment section of the parallel process model was also measured and controlled. Because confederate age was one of the independent variables, the partner component of social environment was manipulated. The setting, however, was held constant. The setting for the experiment was in an academic building. Academic rooms functioned as a questionnaire station and a separate interaction task room.

Patterson (2006) identified four variables in the cognitive-affective mediators section of the model: interpersonal expectancies, affect, goals, dispositions, and cognitive resources. When participants first arrived for the study, they read a detailed set of instructions that explicitly described the task. The instructions prepared the participants for the study so that all participants had the same interpersonal expectancies for the task interaction. Affect during the interaction remained neutral. Confederates were trained to maintain neutral appearance and approachability. The goal of the interaction was kept constant by using a matching task for the experiment. Participants dispositions were measured using the positive affect portion of Dillard and Peck’s (2001) mood measure. Previous attempts to test the model (McClure & Nowicki, 2001) implemented a modification of the social anxiety scale to measure children’s dispositions. The social anxiety scale, however, measures an individual’s level of social anxiety in general, rather than the current anxiety of the participant in the given interaction. Therefore, Dillard’s mood
measure most accurately captured participants’ situational dispositions ($\alpha=.83$). Lastly, cognitive resources were manipulated as an independent variable.

Finally, the specific components of the social cognition and behavioral processes component of the parallel process model were accounted for. Attentional focus and cognitive effort of participants were assessed with self-reflective measurement scales. After participants completed the task, they completed the interactional involvement scale (IIS) (Cegala, 1981; Rubin, Palmgreen, & Sypher, 2004) to assess attentional focus. Cegala (1981) formulated the IIS scale to measure participant attentiveness, perceptiveness, and responsiveness during interaction. Patterson (1995) defined attentional focus as the level of attention an individual devotes to an interactional partner’s nonverbal cues. Therefore, Cegala’s IIS scale accurately measured attentional focus ($\alpha=.79$). The scale is composed of perceptiveness, attentiveness, and responsiveness. Because perceptiveness and attentiveness best capture Patterson’s description of attentional focus, responsiveness was omitted from the questionnaire. To estimate the cognitive effort expended during the interaction, participants reported how many tangrams they completed during the task. Participants who reported completing few tangrams likely had little cognitive effort to generate and interpret nonverbal cues. In contrast, participants who reported finishing all tangrams applied more cognitive effort to the encoding and decoding processes. Patterson maintained that the final components of the model, action schemas and social judgments, operate automatically and unconsciously, and therefore will not be measured or held constant (Patterson, 1995).
Data Analysis

Regression analysis was used to interpret the data. This study modeled a 2 (age: young adult vs. older adult) x 2 (task: simple vs. complex) factorial design. A series of multiple regression procedures was proposed to examine the Research Question and Hypotheses. In order to determine if context variables served as a partial mediator between the determinants and the mimicry behavior, a three-step regression procedure as described by Baron and Kenny (1986) and Judd and Kenny (1981) was used. This process determined if a “mediator variable” mediated the predictive relationship of a set of “initial variables” with an “outcome variable.” The first regression procedure examines the direct relationship between the initial variables, the determinants of the parallel process model, the outcome variable, and mimicry behavior. The second regression procedure establishes the initial variables and the determinants as predictors of the contextual mediated variables of the parallel process model. The third regression procedure tests the mediated relationship. The predictor variables are the determinants, the mediated variables are the contextual mediated variables identified in the parallel process model, and the outcome variable is the mimicry behavior. If the relationship between the determinants and mimicry behavior is partially mediated, then the results would support the contention that nonconscious mimicry behavior is both an automatic process and mediated by contextual variables. The results would indicate partial mediation if direct relationship of the determinants and mimicry behavior is still significant but the strength of the relationship as measured by the beta weights decreases.

In the first regression procedure, however, no direct relationship between the initial variables (the determinants of the parallel process model), and the outcome variable (mimicry
behavior) was established. Therefore, the second and third regression procedures were not conducted. Thus, univariate Anova was conducted to answer Hypotheses 1 and 2.
CHAPTER 4
RESULTS

Data was analyzed to answer RQ1 and the hypotheses. The main goal of data analysis was to examine how mimicry operates within the parallel process model, and to determine if cognitive resources and the partner of the interaction affected the extent that participants engaged in mimicry behavior.

To assess whether mimicry occurred during the interaction, face touching behaviors were compared in time one and time two. Time 1 was considered the baseline for the experiment. The confederate did not touch her face during the first two and a half minutes. When time 2 began, the confederate engaged in face touching behaviors throughout the second half of the interaction. Paired sample t-tests were conducted to assess the level of time participants spent face touching in time one and time two. Results indicated a significant increase in face touching from time one ($M=3.17; SD=9.74$) to time two ($M=9.28; SD=22.37$), $t(146)=3.83, p=.000$.

After establishing the occurrence of mimicry, a regression analysis was conducted to answer the research question and H1. The regression analysis revealed no direct relationship between the initial variables of the proposed parallel process model of nonverbal communication (cognitive complexity, perspective taking, personality, age of participant, and gender) and the outcome behavior (mimicry behavior), $R^2=.013; p=.84$. Consequently, the mediating analysis using regression procedure was not completed. Thus, H1 was not supported. Moreover, because no direct link was established between the determinants and mimicry behavior, the parallel process model does not provide a holistic depiction of mimicry behavior. Therefore, analysis revealed that mimicry does not function within the parallel process model, answering RQ1.
To address Hypotheses 2 and 3, univariate analyses of variance (univariate ANOVA) were conducted to examine the effects of group membership and task complexity on nonconscious mimicry behavior, $F(1, 146) = 12.37, p = .001, \eta^2 = .08$. The interaction effect of group membership and task complexity was not significant, $F(1, 146) = 1.37, p = .24$. The main effect for cognitive resources was significant, $F(1, 146) = 10.04, p = .002, \eta^2 = .07$. Participants in the simple task condition ($M = 10.64; SD = 2.19$) engaged in significantly more mimicry than participants in the complex task condition ($M = .55; SD = 2.31$). Thus, H2 was supported. The main effect for group membership was not significant, $F(1, 146) = 2.09, p = .15$. Thus, H3 was not supported.
CHAPTER 5
DISCUSSION

The goal of the present study was to examine nonconscious behavioral mimicry within the framework of the parallel process model. Statistical analysis revealed a direct relationship between cognitive resources and mimicry behavior. Theoretical implications, limitations, and avenues for future research are explored.

Statistical analysis revealed support for Hypothesis 2, confirming a direct relationship between task complexity and nonconscious behavioral mimicry. Participants in the simple task condition engaged in significantly more mimicry than those in the complex task condition. The main effect for task-complexity and mimicry behavior is significant because Hypothesis 2 substantiates Patterson’s (1995, 2006) claim that cognitive resources influence nonverbal communication. This study is one of few to validate the cognitive resources portion of the parallel process model of nonverbal communication (Patterson, 1995). Because few researchers have empirically tested the parallel process model, these findings significantly bolster Patterson’s claims regarding the influence of cognitive resources on nonverbal communication.

In the present study, the cognitive resources of participants were manipulated by implementing two tasks of varying complexity. The difficult task was expected to exhaust significant cognitive resources of the participant, while the simple task was expected to expend little cognitive effort. Confirming predictions in Hypothesis 2, participants in the simple task condition had ample cognitive resources to devote to sending and receiving nonverbal cues. The participants often finished the task early and spent the remainder of the five minutes chatting. The cognitive resources of participants were not allotted to the task. Rather, the participants appeared to devote the majority of cognitive resources to sending and receiving nonverbal cues.
Consequently, participants in the simple task condition engaged in significantly more mimicry than participants in the complex task condition. These results are not surprising, as an abundance of cognitive resources increases the likelihood that communicators will perceive a specific nonverbal behavior, and thus enact the perceived behavior (Bargh & Chartrand, 1999; Chartrand & Bargh, 1999).

Also confirming hypothesis 2, participants in the complex task condition had few cognitive resources to attend to nonverbal cues because they were immersed in the task. The participants appeared to devote the majority of cognitive resources to completing the complex task. The lack of cognitive resources available for sending and receiving nonverbal cues appears to have nullified mimicry behavior in the complex task condition. Therefore, little mimicry occurred in the complex task condition. The overall support for hypothesis 2 confirmed that the cognitive load of participants determined the extent that participants engaged in nonconscious behavioral mimicry.

While this study identified a strong link between cognitive resources and nonconscious behavioral mimicry, cognitive resources could potentially influence an array of nonverbal communication activity beyond mimicry. A significant body of nonverbal communication research addresses the influence of cognitive resources. Researchers have found that increased cognitive load causes communicators to engage in increased self-touching behaviors (Heaven & McBrayer, 2000), maintain less eye contact (Kendon, 1967), and increase audible pauses during speech (Schachter, Christenfeld, Ravina, & Bilous, 1991; Schachter, Rauscher, Christenfeld, & Crone, 1994). The available cognitive resources of communicators shape a variety of nonverbal behaviors beyond nonconscious behavioral mimicry. Thus, significant research coincides with the present findings.
While many researchers have identified the effects of cognitive resources on nonverbal communication, researchers have not agreed upon a theoretical framework to explain this process. While cognitive resources appear to inform nonverbal communication, this notion is only portion of Patterson’s larger model. Therefore, the entire parallel process model does not effectively explain the nonverbal mimicry behaviors in the present study. Only the cognitive resources section of Patterson’s model elucidates the present findings. Because extensive research suggests that cognitive resources influence a variety of nonverbal behaviors (Kendon, 1967; Schachter et al., 1991; Schachter et al., 1994), the role of cognitive resources in nonverbal communication must be further explored (Lakin, 2006) and clarified within a more concise theoretical framework. Thus, researchers should continue to explore the role of cognitive resources in nonverbal communication.

Theoretical Implications

Nonconscious Behavioral Mimicry

The theoretical implications of this study significantly extend previous mimicry research. Few, if any, mimicry researchers have explored the relationship between cognitive resources and nonconscious behavioral mimicry. The findings in the present study build on previous research that bolsters the influence of cognitive resources on nonverbal communication (Kendon, 1967; Schachter et al., 1991; Schachter et al., 1994). While researchers have established the impacts of perspective taking (Chartrand & Bargh, 1999), affiliation (Chartrand et al., 2005; Lakin & Chartrand, 2003), stigma (Johnston, 2002), and group membership on mimicry behavior, (Lakin et al., 2008; Yabar et al., 2006), researchers have largely ignored the effects of cognitive
resources on nonconscious behavioral mimicry. Thus, cognitive resources is an important, new addition to mimicry research.

In light of the present findings, mimicry researchers must begin to account for cognitive resources in mimicry research. Cognitive resources significantly affected the extent that communicators engaged in mimicry behavior. Because communicators allot limited cognitive resources to an array of stimuli during interaction, communicators have limited resources available to attend to nonverbal cues during interaction. Therefore, available cognitive resources directly influence nonverbal behavior, specifically nonconscious behavioral mimicry. Limited resources may inhibit communicators from perceiving nonverbal behaviors, and thus inhibit communicators to enact perceived behaviors. Consequently, decreased cognitive resources resulted in decreased nonconscious behavioral mimicry. Because cognitive resources significantly affect the extent that communicators engage in mimicry, researchers must begin to account for cognitive resources in mimicry research. By accounting for cognitive resources, researchers can more effectively explore variables that mediate nonconscious behavioral mimicry.

Moreover, the inclusion of cognitive resources in mimicry research shifts the influence of contextual variables to a cognitive focus. Contextual variables cognitively influence mimicry behavior. For example, the complexity of the interaction task affected the amount of cognitive resources available to participants. In turn, cognitive resources influenced the extent that the participants engaged in nonconscious behavioral mimicry. Thus, the present findings highlight the importance of cognitive processing on nonconscious behavioral mimicry.
Parallel Process Model of Nonverbal Communication

Because the parallel process model of nonverbal communication (Patterson, 1995, 2006) is drastically under tested, little empirical research supports the model as a whole (Gifford, 2006). Thus, the central purpose of this study was to examine nonconscious behavioral mimicry within the framework of the parallel process model of nonverbal communication. The results, however, do not substantiate the fundamental assumptions of the parallel process model. In contrast, the results indicate that the proposed determinants of the model do not directly influence the outcome behavior, in this case, mimicry. Biology, culture, gender, personality, cognitive complexity, and perspective taking did not impact the extent that participants engaged in nonconscious behavioral mimicry. These findings are surprising given that previous researchers (Chartrand & Bargh, 1999; Chen & Chartrand, 2003) have documented the influence of inherent characteristics (i.e. perspective taking) on nonconscious behavioral mimicry. This study, however, does not support Patterson’s contention that inherent determinants directly influence nonverbal communication outputs.

The lack of validation for Patterson’s determinants has theoretical implications for the parallel process model of nonverbal communication. The relationship between the determinants and nonverbal action is unclear. Perhaps specific determinants link to specific nonverbal behavior outputs. A vast body of research supports Patterson’s general claim that communicators bring determinants into a given interaction that subsequently influence nonverbal communication. For instance, researchers (Gifford, 2006; Lippa, 1998) have argued that personality type influences nonverbal behavior. Lippa (1998) also found that extraverts used more animated facial expressions, gestures, and hand movements than introverts. Additionally,
women with agreeableness traits used more open body postures and were more attentive during interaction than less agreeable women (Berry & Hansen, 2000).

Furthermore, the personality influences communicators encoding ability, or nonverbal sensitivity (Riggio, 2006). Personality characteristics such as empathy and being other oriented influence one’s ability to interpret another’s nonverbal behaviors (Losoya & Eisenberg, 2001; Riggio, 2006). Therefore, the personality portion of the determinants is supported by significant nonverbal research.

In addition to personality’s documented influence on nonverbal communication, researchers have argued that culture influences the encoding (Andersen & Guerrero, 1998) and decoding (Hall, 1966; Matsumoto, 2006) processes of nonverbal communication. One’s culture influences the use of gaze, interpersonal space, body postures, gestures, and vocal characteristics (Matsumoto, 2006). Nonverbal researchers (Buck, & Renfro Powers, 2006; Floyd, 2006) have also supported the notion that biology influences nonverbal communication. Evolution has shaped hardwire nonverbal communication patterns that guide interaction (Buck et al., Floyd). Lastly, significant research has documented the vast effects of gender on nonverbal communication (Hall, 2006). Overall, men are less nonverbally involved than women (Hall). Women consistently exhibit more direct, warm, and animated nonverbal communication behaviors.

Given this brief synthesis of research, previous findings appear to support Patterson’s (1995, 2006) general link between determinants and nonverbal communication. Few researchers, however have examined this link within the framework of the parallel process model. This link between the determinants of the parallel process model and nonverbal communication must be clarified in order to empirically test the model and confirm Patterson’s (1995, 2006) contentions.
Moreover, this study attempted to test and provide support for the determinants of the model. However, the link between determinants and nonconscious behavioral mimicry remains unsupported within the framework of the parallel process model. Based on the contradiction between the results of the present study and previous nonverbal research, future researchers should further examine the link between the determinants and nonverbal communication. Furthermore, Patterson’s link between the determinants and nonverbal action behaviors must be clarified in order for the model to be empirically substantiated.

In addition to a lack of support for the determinants of the parallel process model, the present study does not support the social environment sector of the model. The social environment portion of the model accounts for two primary contextual variables, partner and setting, that influence nonverbal communication in social interaction. Patterson (1995, 2006) argued that the social environment shapes the interpretation and generation of nonverbal behaviors. Furthermore, Patterson contended that individuals adapt nonverbal behaviors to each interaction partner. In an effort to test Patterson’s assertion, the age of the interaction partner was manipulated to create an in-group/ out-group effect with the participant. Thus, Patterson might argue that participants would adjust nonverbal behaviors according to group membership of the interaction partner. The present findings, however, do not suggest a direct relationship between group membership and nonconscious behavioral mimicry. The group membership of the interaction partner did not significantly influence the extent that participants engaged in mimicry. Thus, the social environment sector of the parallel process model remains unsupported.

The absence of a correlation between group membership and mimicry contradicts previous research (Lakin et al., 2008; Yabar et al., 2006) that identified group membership as an influential mediator of nonconscious mimicry. Yabar et al. argued that communicators mimic in-
group members more than out-group members. Given the strong findings of previous mimicry research, the lack of support for group membership as a mediating variable in the present study is unexpected.

A possible explanation for non-significant results may be that the group membership manipulation was not salient enough to influence mimicry behavior. Because the participant pool was quite diverse, ethnicity or other unknown factors could have been perceived as more salient group membership cues. Another explanation is that the low number of young adult participants in the older-adult condition \( (n=54) \) may have contributed to the type II error. Conceivably, a higher \( n \) in the older adult condition might yield a significant main effect for age. Further investigation could validate the social environment section of the parallel process model. Moreover, while the present study did not support the parallel process model as a whole, the findings did support Patterson’s contention that one’s amount of cognitive resources influences nonverbal behavior. Therefore, the present study provides support for the cognitive resources section of the parallel process model.

Given the lack of overall support for the parallel process model of nonverbal communication (Patterson 1995, 2006) in the present study, the parallel process model should be re-assessed. While Patterson’s model appears to explain the complex and nuanced factors that inform nonverbal communication, the model lacks empirical support. Patterson’s model, while ambitious, is difficult to test and support (Berger, 1997; Lakin 2006). The very intricacies that make the model comprehensive also make the theory difficult to test. Perhaps a holistic model of nonverbal communication is too big and unrealistic to apply to nonverbal research. The loops and links between each portion of the model are difficult to track and verify. Therefore, the model remains unconfirmed.
Future Research and Limitations

The present study has several limitations and avenues for future research. First, no perceived affect scale was included in the questionnaire packet. In the present study, affect of the interaction partner was assumed to be held constant. Confederates were trained to behave and dress in a neutral manner. While this tactic held intended affect constant among confederates, the perceived affect of interaction partners was not considered. The perception of affect could have been very different from intended affect. Regardless of intended affect, participants could have perceived confederates affect positively or negatively. For example, the older-adult confederate could have reminded one of the participants of her or his grandmother. Thus, the participant might have felt increased positive affect towards the older-adult confederate, and therefore might have engaged in increased mimicry behavior. Similarly, the confederate could have reminded a participant of someone he or she disliked, therefore creating a negative perceived affect. Therefore, the variety of perceived affect could have influenced mimicry behavior. Unfortunately, these feelings of affect were not collected, and therefore, not considered during data analysis. Thus, future research should include affect scales to account for perceived affect.

Second, the sample size of young adult participants in the older-adult condition was less than ideal (n = 54). External influences (i.e. weather, illness) negatively impacted the final number of participants in this condition. Therefore, the influence of group membership, and how the social environment portion of the parallel process model functions with mimicry could not be fully explored. Future research should extend the present study to include more young adult participants in the older-adult condition. With an increased participant pool, future researchers may find a direct relationship between group membership and nonconscious behavioral mimicry within the parallel process model.
Third, researchers must continue to explore the relationship between cognitive resources and nonverbal communication. Cognitive resources impact a wide range of nonverbal behaviors beyond nonconscious behavioral mimicry. Researchers should explore how nonverbal cues are generated and interpreted cognitively. Through extensive cognition research, communication researchers can better examine of the automatic and cognitive processes that guide nonverbal communication.

Furthermore, future research should aim to clarify how Patterson’s (1995; 2006) determinants affect the encoding and decoding processes of nonverbal communication. No connection between the determinants of the parallel process model and mimicry behavior was identified. While researchers have identified inherent factors that influence mimicry behavior (Chartrand & Bargh, 1999; Chen & Chartrand, 2003), researchers have not effectively explored these factors within the framework of the parallel process model. Therefore, researchers should aim to clarify this fundamental link within the parallel process model. In addition, researchers might isolate nonverbal behaviors in addition to mimicry to clarify the determinants role in communication.

Lastly, future research might suggest whether the parallel process model provides an accurate depiction of nonverbal communication. Few, if any researchers have conducted empirical research to support the model as a whole. Researchers should continue to test the model. If researchers continue to find non-significant links within the parallel process model, the model may not accurately describe the encoding and decoding processes of nonverbal communication. If this is the case, researchers should refine the parallel process model so that it can accurately inform nonverbal processes, or work towards a new model of nonverbal communication.
communication. Nonverbal communication research needs a working model that highlights the importance of contextual variables and cognitive processing in nonverbal communication.

Conclusion

The goal of this study was to unite two divergent bodies of nonconscious behavioral mimicry research. The social environment and cognitive-affective mediators sections of the process model were tested in a 2 (young adult vs. older adult) x 2 (simple task vs. complex task) experimental design. Two key components of the parallel process model were manipulated: cognitive resources (task complexity) and interaction partner (age of confederate). Confederates enacted face touching behaviors during the second half (time 2) of the matching task. Statistical analysis of the data revealed a significant increase in face-touching participants of participants in time 2. No main effect was found for the age of the confederate and mimicry behavior. However, a main effect was established for task-complexity and mimicry behavior such that cognitive resources influenced the extent that participants engaged in mimicry behavior. Future research should continue to test the parallel process model of nonverbal communication and further examine the role of cognitive resources in nonconscious behavioral mimicry.
Figure 1. Parallel process of nonverbal communication.
Figure 2. Parallel process of nonverbal communication and mimicry.
APPENDIX A

TASK INSTRUCTIONS
Interaction Task:

Next, you will engage in a figure matching task with another participant. The experiment coordinator will bring you to another room to meet the other participant for the task.

The purpose of the task is to have an interaction with another participant. As a team, your goal is to match a series of abstract shapes. Each participant will have a stack of index cards with tangrams (abstract shapes). Both stacks will have the same series of shapes. Once you arrive in the task room, you will be designated as the “director,” or the “matcher.” As a team, you must match the series of tangrams in order.

If you are assigned as the director, you will have a fixed order of tangrams. You will describe each tangram to your partner so that your partner can put them in the correct order. Once your partner thinks he or she has identified the correct tangram, you may proceed to the next tangram. MAINTAIN EYE CONTACT throughout the task.

If you are assigned as the matcher, you will try to identify the tangrams that your partner describes. Be sure to place the tangrams in the order that your partner describes. You are encouraged to ask your partner questions to help identify the tangrams. MAINTAIN EYE CONTACT throughout the task.

You will have 5 minutes to complete the task. MAINTAIN EYE CONTACT throughout the task, and try to interact as much as possible. Please put as many tangrams in order as possible. If you finish before the end of the task, you may chat until the end of the 5 minute session.

Please ask questions, use hand gestures to describe the tangrams, and interact with your partner as much as possible. Please try to MAINTAIN EYE CONTACT with your partner throughout the task.
APPENDIX B

TASK COMPLEXITY MANIPULATION CHECK
Instructions:

You will complete two brief matching tasks. Please rate the difficulty of each task on the scales below.

Task 1: How difficult would you rate this task?

1---------2---------3---------4---------5---------6---------7

very easy                               extremely difficult

Task 2: How difficult would you rate this task?

1---------2---------3---------4---------5---------6---------7

very easy                               extremely difficult
APPENDIX C

ROLE CATEGORY QUESTIONNAIRE: COGNITIVE COMPLEXITY MEASUREMENT
Our interest in this portion of the questionnaire is to learn how people describe others whom they know. Our concern here is with the habits, mannerisms - in general, with the personal characteristics rather than the physical traits - which characterize a number of different people.

In order to make sure that you are describing real people, we have set down a list of two different categories of people. In the blank spaces beside each category below, please write the initials for a person of your acquaintance who fits into that category. Be sure to use a different person for each category.

1. A person your own age whom you like    

2. A person your own age whom you dislike 

Spend a few moments, mentally comparing and contrasting the people you have in mind. Think of their habits, their beliefs, their mannerisms, their relations to others, any characteristics they may have, which you might use to describe them to people.

If you have any questions about the kinds of characteristics we are interested in, please ask us.
Please look back to the previous page and place the initials you have used to designate the person in **category 1** (a person your own age whom you like) here.

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Now describe this person as fully as you can. Write down as many defining characteristics as you can. Do not simply put down those characteristics that distinguish her/him from the other person on your list, but include any characteristics that he/she shares with the other person as well as characteristics that are unique to her/him. Pay particular attention to her/his habits, beliefs, ways of treating others, mannerisms, and similar attributes. Remember, describe him/her as completely as you can, so that a stranger might be able to determine the kind of person he/she is from your description. Use the back of this page if necessary. Please spend only about five (5) minutes describing him/her.

The person is:

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Please look back to the previous page and place the initials you have used to designate the person in category 2 (a person your age whom you dislike) here.

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Now describe this person as fully as you can. Write down as many defining characteristics as you can. Do not simply put down those characteristics that distinguish him/her from the other people on your list, but include any characteristics that he/she shares with the other person as well as characteristics that are unique to her/him. Pay particular attention to her/his habits, beliefs, ways of treating others, mannerisms, and similar attributes. Remember, describe her/him as completely as you can, so that a stranger might be able to determine the kind of person he/she is from your description. Use the back of this page if necessary. Please spend only about five (5) minutes describing her/him.

This person is:

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