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Let's talk: The dual process model of supportive communication in peers

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Mississippi State University
in Partial Fulfillment of the Requirements
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in the Department of Psychology

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Supportive messages occur within most relationships. Researchers have found strong relationships between social support and various physical and psychological health outcomes, but the specific mechanisms at work have yet to be fully explored. Many factors contribute to whether a supportive interaction is processed as helpful or supportive by the recipient including relational factors, message content, past experiences, etc. For peer dyads, the context and supportive messages individuals provide their peer may inhibit or contribute to their perception of their peer's supportive behavior. The current study examined the impact of contextual factors (such as family communication patterns and relationship quality) on message content and the perception of social support within peer relationships. Emerging adult dyads (N = 127) were recruited from a large Southern university in the United States to discuss one of four topics (e.g., a stressful life event, risky sexual behavior, loss of a loved one, discuss a traumatic event) with a peer so that the processes among contextual factors, supportive message content, and supportive message processing could be examined. The association between contextual factors on how individuals processed a supportive interaction was mediated by the content of the supportive conversation. Limitations, strengths, and implications were discussed.

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CHAPTER I

INTRODUCTION

The role of social support on various psychological and physical health outcomes has been well researched. Some studies have suggested that support acts as a protective buffer (Cassel, 1976; Graff et al., 2019), whereas others claim that support facilitates coping (Lee et al., 2019), and still others report that social support is the process by which relationships influence outcomes (Baumeister & Leary, 1995; Merluzzi et al., 2019). Studies have demonstrated mixed results when examining the specific mechanisms of social support across outcomes resulting in an array of various theories across disciplines (e.g., Kothgassner et al., 2019; Lu et al., 2019; Szkody & McKinney, 2019a). A complex model that integrates various social support theories may be needed to fully understand the interactive nature of support interactions (Bámaca-Colbert et al., 2017; Burleson, 2009; Maulik et al., 2010).

Regardless of the theoretical foundation, researchers have agreed that social support plays an important role in an individual's overall health and well-being. Supportive interactions occur throughout their lifetime, but the source of support and the influence of that support may change over time. Social support researchers have focused on many psychological and physical health outcomes ranging across cardiovascular health, depression, grief, addiction, cancer, trauma, etc. (Bailey et al., 2013; Cao et al., 2017; Marroquín, 2011).

Bronfenbrenner's (1977) Ecological Systems Theory suggested that various behavioral and health outcomes are influenced by the environments that a person encounters throughout

their lifespan. During emerging adulthood, individuals begin to experience a shift in their microsystem environment from that of social support networks comprised of family and peers to one focused on peer relationships (Arnett, 2000; Bronfenbrenner, 1977). The shift from parent and peer support networks to primarily peer support has significant impacts across various health outcomes. Specifically, research has shown that the shift among social support networks in emerging adulthood also coincides with a time of increased impulsivity and risk-taking behaviors (Arnett, 2000). As emerging adults seek support from their peers, it is important to examine the role of communication interaction within peer dyads (Burleson, 2009). Thus, the current study utilized the Dual Process Model of Supportive Communication, which combined several social support theories, to examine the impact of several contextual factors in a supportive interaction between two emerging adult peers as they discussed a stressful topic (i.e., a stressful life event, risky sexual behavior, loss of a loved one, a traumatic event).

Dual Process Model of Supportive Communication Outcomes

Communication researchers have evaluated the impact of supportive message content in particular and developed a dual-process model of supportive messages that combined several of the main ideas of psychological social support theorists with research on supportive message content and health outcomes (Burleson, 2009). The Dual Process Model of Supportive Communication Outcomes suggests that the influence of successful social support communication on outcomes depends on attributions and relationship with the source of the support, message content, context, motivation, and ability (Burleson & Hanasono, 2010; Holmstrom et al., 2015). Specifically, the relationship with the source consists of variables linked to trust, intimacy, and attraction. Message content consists of word content, non-verbal cues, validation, legitimization, and contextualization of the message (Burleson & Hanasono,

2010). Context of the supportive interaction includes individual stress levels, situational factors, the help-seeking behavior of the recipient, etc. (Burleson & Holmstrom, 2008; Walen & Lachman, 2000). Specifically, the model proposes the variables of supportive communication (e.g., messages of support, relationship qualities between provider and recipient, and contextual cues) serve multiple functions on outcomes (Burleson & Holmstrom, 2008). Supportive communication variables may serve as message content, impact ability and motivation to process the communication, or impact the actual processing of the communication (Burleson, 2009; Burleson & Hanasono, 2010). Thus, the integrative model combines multiple theories of social support to explain the mechanisms of social support on outcomes.

However, as the model is extensive, researchers have examined small aspects of the overall model on vignette driven emotional support response or during supportive interactions for grief, and through the recipients' perceptions of ethnicity and culture (Burleson & Holmstrom, 2008) as well as a source of support (Burleson, 2009; Harvey-Knowles & Faw, 2018; Holmstrom et al., 2015). The dual process model was developed and extensively tested using an emerging adult (i.e., college student) sample (e.g., Bodie, et al., 2011; Burleson, 2008; Burleson et al., 2009). However, as the model is extensive, researchers have only examined small aspects of the overall model on vignette driven emotional support response or during supportive interactions for grief, and through the recipients' perceptions of ethnicity and culture (Burleson & Holmstrom, 2008) as well as source of support (Burleson, 2009; Harvey-Knowles & Faw, 2018; Holmstrom et al., 2015). Further, few studies have examined dyadic interactions within the dual process model, and those that do utilize a confederate to control for the support provided to the support recipient (e.g., Crowley & High, 2020). Thus, the current study sought to extend the literature associated with the validation of the dual process model within the dynamic

environment of a dyadic interaction with a peer. The utilization of the live supportive interaction allowed for consideration of the realistic provision of socially supportive communication as may occur outside of a laboratory or survey.

Social Support Theory

Theorists have argued over the specific mechanisms of social support. Cassel (1976) hypothesized that social support acted as a protective buffer between the negative effects of stress and health outcomes. Researchers have found mixed support for Cassel's Stress Buffering Hypothesis (Burton et al., 2004; Maulik et al., 2010; Pakenham et al., 2007; Raffaelli et al., 2013). Some researchers have found differences between the buffering strength of perceived versus received support in samples of emerging adults (Szkody & McKinney, 2019c; Thoits, 2011), whereas others have found mixed results between psychological health outcomes and physical health outcomes (Cassel, 1976; Santini et al., 2015). Additionally, other researchers have even suggested that social support acted as a buffer between the negative effects of stress and health outcomes because it facilitated coping and reappraisal mechanisms of the stressful event itself (Cao et al., 2017; Seçkin, 2013; Szkody & McKinney, 2020).

Social constructivist theorists have found that social support improved an emerging adult's self-esteem and self-efficacy, which in turn increased adaptive behaviors and improved health outcomes (Bámaca-Colbert et al., 2017; Szkody & McKinney, 2019a), whereas other theorists found that social support was a function of positive relationships which then influenced health outcomes (Richardson, 2015; Szkody & McKinney, 2022). Researchers have found that other interpersonal variables (e.g., trust, initiation, attraction, humor, conflict management skills, and intimacy) influenced how social support was perceived and received by the support recipient among emerging adults (Chow & Ruhl, 2018; Lakey & Cohen, 2000; Lakey et al., 1996).

Additional mechanisms have been suggested to explain the relationship of social support on positive and negative affect after stressful events such as social rejection (Bauriedl-Schmidt et al., 2017; Szkody & McKinney, 2018b) and researchers have found that social support may influence emotion regulation strategies (Marroquín, 2011; Szkody & McKinney, 2019b). However, these studies examining social support rely on a single individual's account of support and stress and do not examine the dynamic nature of conversation and support provision.

Current Study

Therefore, the current study examined aspects of the Dual Process Model (e.g., context, message content, and processing) in an exchange between two individuals in a peer dyad about a stressful life event (i.e., the loss of a loved one, traumatic event, risky sexual behavior, or a stressor of their choice). We utilized the model to examine the association among contextual factors (i.e., reflective information on the individual's views of their relationship with their partner, relationships with their parents, and the way they perceive their family communicates) on their ability to process supportive messages as mediated by the supportive messages themselves (i.e., the content of the messages) within the conversation with their peer.

The role of context within the Dual Process Model was to integrate the theory of interpersonal relationships and environmental factors to account for their impact on supportive content, motivation, ability, and processing of supportive content. Several factors may influence emerging adult communication of supportive message content with their peer. A particular focus for the current study was the relational factors between emerging adults and their parental figures and peers. Research has shown that parental figures continue to influence children's outcomes into emerging adulthood (McKinney et al., 2011; Padilla-Walker et al., 2019; Segrin et al., 2012). Positive parent-child relationship quality acts as a protective factor against peer-rejection

and the negative influence of peers, and positive parent-child relationships improve quality of life and socializes adaptive coping mechanisms, gender roles, and communication styles (Chan & Chan, 2013; Koerner & Fitzpatrick, 2006; Thoits, 2011). As parents continue to influence their children's lives during emerging adulthood, the interpersonal communication styles and patterns used within the family home may continue to influence individuals in their other close relationships (Koerner & Fitzpatrick, 2006).

Family Communication Patterns Theory suggests that family communication consists of two dimensions: the conversation orientation (i.e., the degree to which free and open communication and a large range of topics is highly encouraged) and the conformity orientation (e.g., the degree to which the family stresses that thoughts, beliefs, and attitudes are shared within the family; Koesten & Anderson, 2004). The two communication orientations impact an individual's resiliency, communication competency, social skills, conflict resolution skills, and social cognition (Koerner & Fitzpatrick, 2006; Koesten & Anderson, 2004). A meta-analysis of studies on family communication theory has shown that family communication patterns are associated with small but consistent effects on psychological health, social relationships, and cognitive processing (Schrodt et al., 2008). Furthermore, the theory has been validated between parents and their children in the digital age (Rudi et al., 2015), and on help-seeking behaviors (Keating et al., 2013). The current study examined both the quality of parent-child relationships and family communication patterns as familial contextual factors.

These communication patterns result in relational schemas that exist both within and outside the family (Koerner & Fitzpatrick, 2002). Emerging adults with families high on the conversation orientation have been shown to have more friends (Huang, 1999), develop greater interpersonal competence with managing friendships, (Koesten & Anderson, 2004), and develop

closer relationships with peers (Ledbetter, 2009). These individuals are also more likely to view social interactions as rewarding (Avtgis, 1999), discuss sensitive topics (Huang, 1999), and address conflict (Koerner & Fitzpatrick, 1997) in comparison to individuals whose families are high on the conformity orientation. Similarly, studies have found that college students whose families are higher on the conversation orientation may be more motivated to seek/receive social support than those whose families are high on the conformity orientation (High & Scharp, 2015). Thus, family communication patterns may be influencing individuals' preferences for communication and their subsequent behavior in supportive interactions.

Additionally, relationship quality between peers was examined across several relationship factors. A combination of factors such as approval, criticism, and conflict may predict other interpersonal competencies such as assertiveness within peer relationships (Agarwal & Poojitha, 2017). Thus, the current study also examined the impact of relationship quality and interpersonal attributions as contextual factors on supportive message processing. Furthermore, the message content may influence the perception of the supportiveness of interactions (Burleson, 2009). Previous studies have coded supportive messages between dyads (Cannava et al., 2018) according to the guidelines of verbal person-centeredness (VPC) messages by Samter and MacGeorge (2016). Levels of VPC in emotional support messages were determined through a latent profile analysis using a linguistic engine (SEANCE; Crossley et al., 2017) into three categories (i.e., low person-centeredness, moderate person-centeredness, and high person-centeredness; High & Dillard, 2012; Rack et. al., 2008).

Messages with low person-centeredness implicitly or explicitly deny the feelings of the distressed individual (e.g., "I know this part was really important to you, and I know you are upset because you didn't get it. However, I don't think you should be upset with anyone but

yourself because I know you didn't give it your best" and contained more personalized pronouns such as I and me and contained a large number of emotion words). Messages with moderate person-centeredness recognize the feelings of the distressed individual but fail to elaborate on those feelings or contextualize them (e.g., "Patti, I'm really sorry you didn't make the choir. However, you'll be able to audition again next year"). Messages high in person-centeredness acknowledge, elaborate, and contextualize the feelings of the distressed individual (e.g., "Patti, I am really sorry. You must be just crushed. I know how much singing means to you. And I know that being alternate just isn't good enough for you. You're probably not only hurt but angry at not having your ability recognized. I guess your choir director doesn't realize that you were so sick this past week. It would be so easy for her to assume that you just hadn't been practicing or taking care of your voice because she deals with so many irresponsible students. I know you deserve a spot in that choir;" and had low levels of personalized pronouns such as I and me, and high levels of emotion words; Cannava et al., 2018; High & Dillard, 2012; Samter & MacGeorge, 2016).

While VPC has been well-established within the literature on supportive communication (Burleson, 2009; Jones, 2004; High & Dillard, 2012), few studies have examined the content of live supportive interaction messages using the linguistical content of supportive messages (Cannava et al., 2018; Yang et al., 2017). Coded messages of VPC may be biased by common norms and beliefs of the coders and also may miss specific linguistic content markers that may demonstrate conversational content in a more accurate manner (Cannava et al., 2018). The use of linguistical tools to examine content may further elucidate real supportive conversational content that coded messages of VPC may miss (Cannava et al., 2018). Furthermore, it appears that no studies have examined the combination of familial and relational contextual factors (i.e., family

communication patterns and parent-child relationships) within the Dual Process Model of Communication on live peer supportive interactions. Thus, the current study used family and peer contextual factors, linguistical tools to examine message content, and individual perceptions of support (i.e., process) within the Dual Process Model of Supportive Communication to examine the influence of family context on supportive interactions between peers.

Hypotheses

Consistent with the Dual Process Model of Supportive Communication (Burleson 2009) and as shown in Figure 1, Hypothesis 1 stated that the construct of contextual factors (i.e., relationship quality with mother, father, and partner and family communication orientation scales) would be positively related to the processing of received support (i.e., the greater quality of contextual factors, the greater amount of perceived support reported by that person) within the supportive interaction. Hypothesis 2 stated that peers reported contextual factors would be positively related to peers' processing of received support (i.e., the greater quality of contextual factors, the greater amount of received support reported by that person's partner). Hypothesis 3 stated that the construct of contextual factors (i.e., relationship quality with mother, father, and partner and family communication orientation scales) would be positively associated with improved message content (i.e., longer support messages lower use of I and me, and higher rates of positive words) for both the self and their peer. Hypothesis 4 stated that message content (i.e., word count and affect content) would mediate the relationships between contextual factors and processing of received support for both the individual and their peer as the content of the supportive message (what is really being said) would be influenced by the relationship, and would, in turn, be associated with how supportive the message is perceived as being.

CHAPTER II

METHOD

Procedure

Upon IRB approval, emerging adults (individuals between the ages of 18 and 25) and a peer were recruited at a large Southern United States university through the SONA system and offered 2 credits per individual sign up (i.e., the participant must sign up for the study on the system and bring a peer as a volunteer for the study). If both participants in the dyad were eligible for credit, both received 2 credits through the SONA system.

When participants arrived at the study, they met with a researcher who explained the purpose of the study and the participants read and signed an informed consent form. After consenting to participation, dyads were separated into private rooms where they completed initial survey measures on demographics, contextual factors, and behavior on a private computer. When the initial surveys were complete, the dyad was reunited in a private room and filmed completing three interactions. In the first interaction, the dyad was instructed to complete a 5-minute story building task designed to get them comfortable talking in front of the camera. The dyad was given 5 minutes to write a short story together, one paragraph long, using keywords provided (i.e., a list of random words from which they generated the story). During the second and third interactions, the dyad was asked to pick one of four possible prompts to discuss (i.e., a stressful life event, risky sexual behavior, loss of a loved one, a traumatic event). The dyad was asked to spend 6 minutes where one partner was randomly selected to speak first as the primary speaker

and discussed their experiences and concerns with their partner before switching for another 6 minutes to focus on the other partner. The secondary speaker (i.e., the one who was not the focus of the time frame) was told they can comment or ask questions as felt natural during the conversation. After the three interactive events, the dyad was separated to complete the last round of survey materials in private rooms, be debriefed about the study, and sign for and receive compensation in the form SONA credit as described above. Participants were treated in accordance with the APA Code of Ethics.

Participants

A power analysis was conducted using a medium effect size with $p < .05$ for 4 predictor variables. G*Power (Faul et al., 2007) indicated a sample size of 65 was required for actor effects in an actor-partner interdependence mediation model (APIMeM). Additionally, a power analysis was run using the Actor-Partner Interdependence Model Power application (Ackerman & Kenny, 2016), which indicated a sample size of 150 dyads was necessary to power a medium effect size for partner effects in the model. Thus, an initial sample of 150 emerging adult dyads was planned to be recruited for the study; unfortunately, due to the coronavirus pandemic (i.e., COVID-19), recruitment only reached 127 dyads (*M* age = 19.08, *SD* age = 1.33; 67.5% female). Data collection was concluded once COVID-19 was declared a pandemic by the World Health Organization on March 11th (2020). The majority of the sample identified as White or Caucasian (76.9%) or Black/African American (15.3%), and 7.8% identified as another racial or ethnic identity.

Additionally, the majority of the sample reported that they were a first-year college student (65.5%), 12.2% reported they were 2nd-year students, 11.8 % as 3rd-year students, 8.2% reported having 4 or more years of college education, and 2.4% reported having no college

education. Similarly, a large portion of the sample reported that their mother received a 2-year college degree or higher (76.8%), or a high school degree or equivalent (19.6%). Participants reported that 69.41% had a father who received a 2-year college degree or higher, and 27.1% reported that their father received a high school degree or equivalent. When asked about their childhood home, 83.1% reported that their father lived in their home as a child and 76.9% listed their father as a primary caregiver growing up. Additionally, 96.9% reported that their mother lived in their home as a child and 94.5% listed their mother as a primary caregiver growing up. Participants reported that only 11.1% have talked to their fathers daily over the last 30 days, but 51.0% have talked to their mother daily over the past 30 days. Participants and their partners were asked to report how long they have known each other, and, on average, students reported knowing their peer for 1.23 years (*SD* = 2.46).

Measures

Context

Positive and negative relationship quality with parental figures and partner along with family communication pattern orientations subscales were loaded onto a construct of message context as shown in Figure 2. All context variables were collected before the conversation interaction. See Table 1 for alphas found in the current study for all measures.

Family communication patterns

The Revised Family Communication Patterns Scale (R-FCPS; Ritchie & Fitzpatrick, 1990) is a 26-item measure that was developed to measure two dimensions of family communication patterns: conversation orientation (e.g., I can tell my parents almost anything) and conformity orientation (e.g., My parents feel that it is important to be the boss). Items were

scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Previous studies have demonstrated a good internal consistency within each subscale with Cronbach's alphas ranging from .82 to .92 (Curran & Allen, 2017).

Relationship quality

The Network of Relationship Inventory-Relationship Quality Version (NRI-RQV; Buhrmester, & Furman, 2008) consists of items related to two sub-dimensions of relationship quality pertaining to the participant's relationship with their mother, father, and their peer (i.e., the individual they interact with in the study) over the last 30 days. For each person, they rated the items on a scale between 1 (Never or hardly at all) and 5 (Always or extremely much). Positive relationship quality consisted of items from companionship (e.g., how often do you spend fun time with this person?), disclosure (e.g., how often do you tell this person things that you don't want others to know?), emotional support (e.g., how often do you turn to this person for support with personal problems?), approval (e.g., how often does this person praise you for the kind of person you are?), and satisfaction (e.g., how happy are you with your relationship with this person?) scales. Negative relationship quality consisted of items from conflict (e.g., how often do you and this person disagree and quarrel with each other?), criticism (e.g., how often does this person criticize you?), pressure (e.g., how often does this person push you to do things that you don't want to do?), exclusion (e.g., how often does this person not include you in activities?), and dominance (e.g., how often does this person get their way when you two do not agree about what to do?) scales. Good construct validity has been demonstrated (Buhrmester, & Furman, 2008). Positive and negative subscales for each relationship were scored for each person of interest (i.e., positive and negative relationship with mother, father, and their peer).

Message content

Word count and word content of messages (i.e., positive and negative) were loaded onto a construct of message content as shown in Figure 2. Message content variables were collected from the transcribed messages between the couples during the interaction. Messages were transcribed by two volunteer undergraduate students (i.e., one student will watch the video and transcribe the video, followed by a review from the second student to improve reliability for the transcription) from the video recorded supportive interaction. Messages transcribed from the position of the "listener" were used to measure VPC and linguistical content (as described below).

Word count, and linguistical content

To examine linguistical and word content of supportive messages, transcribed messages were run through the Sentiment Analysis and Social Cognition Engine (SEANCE; Crossley et al., 2017), a sentiment analysis software, to determine lexical differences in supportive messages. SEANCE conducted a principle component analysis to form 20 component lists from assorted databases (i.e., negative adjectives, social order, action, positive adjectives, joy, affect for friends and family, fear and disgust, politics, polarity nouns and verbs, virtue adverbs, positive nouns and verbs, respect, trust verbs, failure, well-being, economy, certainty, positive verbs, and objects). Previous studies have utilized similar linguistic engines to establish the content of supportive messages (Alpers et al., 2005; Cannava et al., 2018; Rains et al., 2016; Saha & Agarwal, 2015; Szkody & McKinney, 2021) in dyadic interactions. Thus, the component lists for negative and positive adjectives, affect for relationships, social processes, self-referencing pronouns, the respect component, affiliation, and social standing components were collected to determine the overall word content of supportive messages.

Processing

After the interaction, current perceptions of support during the lab interaction were obtained using a measure of perceived comfort during an interaction as supplied by Jones (2004). Scales related to supportiveness, affective improvement, helper competence, involvement in conversation, and conversation management were loaded onto the construct of processing (see Figure 2). The scale utilized items from the 13-item Comforting Responses Scale (CRS; Clark et al., 1998) and the 27-item Rating of Alter Competence Scale (RAC; Cupach & Spitzberg, 1981). All scales were rated on a 7-point scale from 1 (very strongly disagree) to 7 (very strongly agree). Five items were taken from the CRS to indicate affective improvement as suggested by Jones (e.g., My conversational partner made me feel better about myself; Jones, 2004). Similarly, 5 items were taken from the CRS to indicate helper competence (e.g., The way my conversational partner talked to me irritated me). For supportiveness, 11 items were taken from the RAC (e.g., She or he was supportive), seven items were taken for the conversation management scale (e.g., She or he appeared sleepy or tired), and five items to rate the general dynamics of the conversation (e.g., She or he was trustworthy). All scales have demonstrated good validity and internal consistency with Cronbach alpha's ranging from 77 to .95 in previous studies (Jones, 2004).

Data Analyses

Structural equation modeling and an actor-partner interdependence mediational model (APIMeM) were conducted using AMOS 26.0. This method allowed for the examination of both actor and partner direct and indirect effects in a mediational model (Ledermann et al., 2011). As shown in Figure 2, a latent construct for context was indicated by positive and negative relationship quality with mother, father, and peer (i.e., the average score among the subscales

was used) as well as family conversation and conformity orientation. This construct was created for both members of the dyad.

As shown in Figure 2, a latent construct for content was indicated by self-related pronouns, positive and negative words, social and relationship processes, affect for relationships with family and friends, affiliation (supportiveness), respect, and social standing for both partners to determine the level of supportiveness during the dyadic conversation as utilized by Cannava et al. (2018) and Saha and Agarwal (2015). As shown in Figure 2, a latent construct for processing was indicated by supportiveness, affective improvement, helper competence, involvement in conversation, and conversation management.

A two-stage modeling approach as suggested by Barry and Stewart (1997) was taken to decrease poor construct measurement. First, a single measurement model was conducted with the constructs of context, content, and process as shown in Figure 2, allowing all variables to correlate freely. Upon identification of appropriate construct measurement, variables were then included in a structural model testing direct and indirect effects among context, content, and processing in both partners. Variables for race, age, gender, parental education, family structure, and length of relationship with peer were controlled for within the model. The maximum likelihood method of covariance structure analysis was used. Given the recommended two-index presentation strategy by Hu and Bentler (1999), the model fit will be examined with the standardized root mean square residual (SRMR) in combination with the comparative fit index (CFI); in combination, SRMR values less than or equal to .09 and CFI values greater than or equal to .90 indicate good model fit.

An APIMeM with indistinguishable partners was conducted as shown in Figure 1 using the statistical method outlined by Ledermann et al. (2011). Direct effects were used to test

hypotheses 1 through 3, and indirect effects were used to test hypotheses 4. The model consisted of four pathways that can have indirect effects, which was estimated with bootstrapping using 2,000 iterations (Hayes, 2009). Serial mediation estimands (an AMOS program that is specifically designed to test unique indirect pathway effects and p values) were used to examine specific mediational pathways throughout the model (Gaskin, 2016). Dyadic pairs were indistinguishable as gender, race, and age were controlled for within the model. To treat interdependence within the model, each pair was coded within the data set as "one individual" and their residuals correlated to account for the influence of their peer within the model as suggested by Kenny et al. (2006). Specifically, each peer dyad was coded as a unit with separate variables for each individual within that unit (see method for more information on how each variable was calculated).

Additionally, as the dyad was indistinguishable, invariance was examined between partner A and partner B by constraining parameter estimates to equality across the model as suggested by Fitzpatrick et al. (2016; i.e., configural invariance was achieved by constraining free and fixed loadings to be similar between partner A and partner B constructs of context, content, and process; metric invariance was achieved by constraining factor loadings to be equal on each construct between partner A and partner B; scalar invariance was achieved by constraining the intercepts of loadings to be equal between each partner; uniqueness invariance was achieved by constraining the variance of residual items across partners). Given that the dyad was indistinguishable and the model was constrained so that partner A mirrored partner B, analysis resulted in the examination of three actor effects (i.e., the within-individual effects) and three partner effects (i.e., the between individuals' effects).

CHAPTER III

RESULTS

Descriptives of all scales are shown in Table 1. An initial model was created with AMOS in which all hypothesized factors were loaded onto context, content, and process resulted in an inadmissible model (e.g., a non-positive definite covariance matrix). Each construct was run on its own to isolate the problem. The content construct demonstrated the same error, whereas the process and context models did not. The factors on the content construct were removed one by one from the construct to establish an identified model with a positive definite covariance matrix. The content construct was then added back to the model with the surviving factor loadings (i.e., the social order component, the affect for family and friend's component, the positive noun component, and the respect component).

The resulting model demonstrated poor model fit (e.g., CFI < .90). Scales that loaded poorly onto context and process were removed (i.e., negative relationship quality with mom, dad, and friend, and positive relationship quality with friend were removed from context; negative adjectives, self-pronouns, affiliation, and social processes were removed from content; and helper competence was removed from process) and residuals within content were correlated (i.e., residuals between social order and positive nouns, social order and affect, and positive nouns and respect) to establish a uniqueness invariance model with good model fit (CFI = .91 and SRMR = .08). Factor loadings and surviving scales are shown in Table 2. Invariance statistics are shown in Table 3. Kenny et al. (2006) support the use of a fully constrained model (i.e., the uniqueness

model) to examine invariance across dyads in an APIMeM (i.e., they do not recommend the need to test other levels of invariance since uniqueness invariance is the strictest and required for APIMeM with indistinguishable partners). Nonetheless, configural, metric, and scalar invariance were tested in the current study to be thorough.

However, the configural model did not identify, possibly due to the use of a small sample (Brown, 2006), although the required constraints for the APIMeM resolved the issue; metric and scalar invariance were supported in addition to uniqueness variance. No missing data was present in the current study, however, due to concerns about adequate power due to a smaller sample size than indicated in a priori power analyses, latent constructs were calculated by imputing the uniqueness model using a regression imputation to establish observed variables for context, content, and process for each partner in the dyad so that they could be used in a standard APIMeM with the large number of control variables (e.g., race, age, relationship length with peer). Correlations between these variables are shown in Table 4.

The constrained structural model with control variables (i.e., race, age, gender, parental education, family structure, and length of relationship with peer) demonstrated poor model fit with CFI = 0.80 and SRMR = 0.07. Length of relationship with peer did not share significant variance and was removed from the model to improve model fit. The final model as shown in Figure 3 along with direct and indirect effects demonstrated good model fit with CFI = 0.90 and SRMR = 0.06. In support of Hypothesis 1, which stated that an individual's contextual factors would be positively associated with their own processing of the supportive interaction, the direct actor effects of context were positively associated with process within individuals (i.e., partner A's context was positively associated with partner A's processing of the supportive message). Contrary to Hypothesis 2, which stated that an individual's context would influence their

partner's processing of the supportive interaction, the direct partner effect of their context on their partner's processing was not significant.

Hypothesis 3, which stated that contextual factors would be positively associated with content for both the individual (i.e., the way the partner spoke) and the content for their partner (i.e., the way the individual talked to their partner) was supported. The direct actor effects of context were positively associated with the content they used to talk to their partner and the way that their partner offered support. Similarly, the way an individual spoke to their partner was positively associated with the way they processed messages of support from their partner. The way an individual spoke was not significantly associated with how their partner perceived the message of support. Standardized regression coefficients of direct effects are shown in Figure 3.

Lastly, in support of Hypothesis 4, which stated that content would mediate the association between contextual factors on process, an individuals' own contextual factors on their own process was significantly mediated by content from actors and partners (i.e., the association between partner As' context on partner As' processing of the interaction was mediated by content from both partners of the discussion, although it should be noted that partner effects from content to process were not significant, whereas actor effects were), $b = 0.05$, $p < .01$. Additionally, the association between individuals' contextual factors and their partners' processing was also mediated by content of the interaction, again noting that partner effects from content to process were not significant, whereas actor effects were, $b = 0.05$, $p < .01$. These two indirect effects are the total indirect effects. That is, these effects are the total indirect effect of individuals' context on process through both mediator variables (i.e., actors' and partners' content).

To test the specific indirect effects through a unique pathway (e.g., the specific indirect effect of individuals' context on process through only one mediator), serial mediation estimands were used as described in the data analysis section. A significant indirect effect was found for actors, with individuals' own context having an indirect effect on their own processing through their own content (i.e., context A → content A → process A, also mirrored or constrained to be identical to context B → content B → process B), b = .04, p < .05. The indirect effect of an individuals' own context on their own processing through their partners' content was not significant (e.g., context A → content B → process A), b = .01, p = .40. Similarly, the indirect effect of an individuals' own context on their partners' processing through the individuals' content was not significant (e.g., context A → content A → process B), b = .01, p = .38. These indirect effects were not significant as a result of the non-significant partner effect between content and process (see Figure 3). Lastly, the indirect effect of individuals' own context on their partners' processing through their partners' content was significant (context A → content B → process B), *b* = .05, *p* > .05.

CHAPTER IV

DISCUSSION

The current study successfully demonstrated that use of the Dual Process Model of Supportive Communication in a supportive interaction between peers using individual and peer contextual factors (i.e., actor and partner contextual factors) to predict how an individual processes support in an interaction with a peer, as mediated by the message content. Consistent with previous literature and Hypothesis 1 and 3, contextual factors (i.e., positive relationships with parents and family communication patterns) were significantly associated with how supportive an individual rated the supportive interaction with their peer, how they communicated support to their partner, and how their partner communicated support to them (e.g., Burleson & Hanasono, 2010). These results are similar to previous research which have found that relationships with parents and family communication patterns continue to influence an emerging adult in their peer relationships (e.g., Padilla-Walker et al., 2019). Additionally, the influence of past relational contextual factors on current processing and communication with peers gives further evidence that the relationship of the family has long-lasting consistent effects on social relationships, cognitive processing, and well-being (e.g., Chan & Chan, 2013; Koerner & Fitzpatrick, 2006; Schrodt et al., 2008).

Hypothesis 2, that contextual factors would be associated with the way the partner processes the supportive interaction, was unsupported in the current study. Similarly, the way that an individual communicated support to their friend was associated with their own

processing, but not how their friend processed the support. The partner effect of context on processing may not be significant for a number of reasons. For example, the current study did not examine the partners' knowledge of the contextual factors, levels of empathy for contextual family factors, etc. Furthermore, it may be, that beyond a lack of knowledge or empathy, an individual's own contextual factors may be a more salient feature when processing a supportive interaction as individuals may be using interpersonal schemas or scripts developed from their personal contextual factors to compare the supportive quality of the interaction itself (Fitzpatrick & Ritchie, 1994). Similarly, motivation, ability, individual stress levels, or another unmeasured construct from the Dual Process Model may also have played a role in how the partner processed the messages (Burleson & Hanasono, 2010).

Lastly, as Hypothesis 4 stated, message content mediated the path between contextual factors and processing for both partners providing further evidence in support of the Dual Process Model of Supportive Communication. Significant mediation of this model lends further support for the Dual Process Model, which stated that in order for supportive messages to be perceived as supportive both the relationships and contextual factors of the individual and the message itself must be taken into account. Specifically, contextual factors (i.e., the relationship with parents and the communication patterns in the home) from both partners was associated with how an individual processed the supportive interaction (i.e., did they process the interaction as supportive), in part, because of the content of the message to and from their partners, which was also influenced by those same contextual factors. Notably, the impact of individuals' contextual factors on their own processing of supportive messages was not mediated by the content of supportive messages provided by their peer due to the non-significant pathway between content and process (i.e., non-significant partner effect between content and process).

This finding suggests that while contextual factors may influence the way we talk to others, the way our peers communicate support (i.e., the content of their support) to us may not change how individuals process the supportive interaction when not taking into account peers' contextual factors as well, further emphasizing the importance of personal context and the supportive content within supportive communication.

Limitations, Strengths, and Implications

Within the current study, there were several limitations and strengths. Most notably, the initially proposed structure of the constructs examined in the study resulted in poor model fit, and factors were dropped from analysis on each construct. Specifically, on the context construct, relationships with friends (both positive and negative) and negative relationship quality with mother and father, were dropped from the construct due to poor factor loadings and high error correlations with factors on the process construct. The low factor loadings suggest a poor relationship with the underlying construct (Kline, 2016). This finding may suggest that these variables were poorly associated with the relationship with family, or that negative qualities (i.e., dominance, pressure, criticism, exclusion, and conflict) were poorly associated with the positive relational structure of the construct. Moreover, several of the dropped contextual variables were associated with the errors in the process construct in some cases. The helper competence scale was removed from the processing construct for similar reasons.

In relation to the content construct, many of the subscales were removed from the construct in order for the construct to have a positive definite covariance matrix. There are several possible explanations for the poor fit of the content construct. One example being that content subscales were scored on a cumulative scale from 0 to 100 percent of words used in the interaction. Although their variance inflation factors were not problematically high, the nature of

the words adding up to or close to 100% might have created a situation that AMOS could not handle. Another possible explanation lies in assumptions about the use of content as a representation of the conversation and communication between peers in the interaction. Several other content factors such as non-verbal communication during the interaction, reference management (i.e., the ability of the speaker to make it clear who is being referenced throughout the conversation; Garnham, 2001), how often the conversation rotates between the dyad or turn-based conversation patterns, etc., were not addressed by the use of word content alone.

Moreover, sarcasm, laughter, or mention of previous conversations on the topic were not coded in the interaction. The resulting construct, after establishing model fit, was one that captured a latent construct of word content of the conversation but may not have accurately captured all aspects of the conversation. However, the findings associated with the content construct are consistent with the literature on politeness and authority between college students (e.g., Goldsmith & MacGeorge, 2000; MacGeorge et al., 2002). Namely, when individuals are offering social support, they may act as an authority figure on specific topics placing them at a different social level than that of the support recipient. Furthermore, support givers may be following guidelines for politeness when discussing sensitive topics with a peer and thus, use more words associated with respect and social standing. Thus, content, or the mechanics of the conversation, may require more complex analysis using conversation analysis techniques that may provide a more comprehensive picture of communication content within dyadic interactions (Hutchby & Wooffitt, 2008). Furthermore, it is important to note that these factors of politeness and social structure may also be culture-specific. Specifically, the current study utilized a sample of emerging adults from a Southern United States University and the sample may be displaying communication patterns that are specific to that region. However, studies comparing supportive

conversations across regional samples (i.e., comparing Eastern and Southwestern college student samples) found no significant differences in the past (e.g., Cannava et al., 2018).

Other limitations were present within the current study. Several additional variables may have played a role within the model but were not examined including, but not limited to, partners knowledge of the contextual factors, levels of empathy for contextual family factors, history of supportive interactions with peers and friends, motivation to process the supportive message, ability to process the message, sarcasm, and non-verbal communication. Further, the current study did not code for the specific topics of conversation, although many conversations centered around distress surrounding relationships or academics, which should also be considered in future research. The examination of more complex contextual and content features, as well as possible moderators of supportive communication in future studies, would provide a further explanation of the results of the current study and help elucidate the mechanisms present in the Dual Process Model of Supportive Communication.

Furthermore, the use of a convenience sample of emerging adult college students may limit the generalizability of the current study's findings and the use of a random sample of emerging adults throughout the United States may provide a clearer picture of the nature of support beyond this population. Similarly, the current study requested that participants discuss a stressful life event or similarly related topic, however, participants may not have discussed the most stressful topic occurring in their lives, and thus, the topic may not be particularly salient to them at the time of the study. Additionally, participants may have discussed the topic in a previous conversation with partners which may have biased the results of the analysis. One last notable limitation includes the period of data collection. Data collection was terminated in March of 2020 days after COVID-19 was declared a worldwide pandemic. Communication between

emerging adult college students and their parents may have changed as a result of the pandemic and as students prepared to leave for spring break or return home which was not controlled for in the study due to the unexpected nature of the event. Furthermore, due to the termination of recruitment, less data was collected than initially anticipated. Future data collections may help to adequately power the proposed analyses, which also might resolve the identification problem found in the content construct.

Despite the limitations, the current study demonstrated several notable strengths. The study utilized a novel method to examine communication in an interpersonal interaction between peers. The use of word content allowed for an unbiased measurement of communication content free from the use of a researcher's personal bias towards a specific attribution of what is or is not supportive as used in previous studies with VPC coding (e.g., Cannava et al., 2018). The study also examined a combination of contextual factors in regard to the Dual Process Model to further explore the way in which these factors influence communication and processing of supportive messages. Previous studies focused on only one or two contextual factors such as family communication patterns alone (e.g., Koerner & Fitzpatrick, 2006). Furthermore, the use of dyadic data and the APIMeM allowed for the dual analysis of both actor and partner effects of contextual factors on communication and processing within the interaction, beyond the examination of a singular individual's processes. Thus, allowing for the examination into the role of the partner on how an individual expresses and processes support. Lastly, the study also further demonstrated that parents and family relationships continue to have an impact on emerging adults in their relationships and interactions with peers.

The results of the current study further highlight the importance of contextual factors within the communication of supportive messages between peers. Results suggest that the

relationship with parents and communication within the family continue the ways in which emerging adults communicate support to each other and process supportive interactions. Past research has shown that feeling supported improves an individual's physical and psychological well-being (e.g., Szkody & McKinney, 2019a). Thus, even in emerging adulthood, it is important to address the relationship with family and how families communicate to improve these outcomes.

Moreover, it important to foster a positive relationship and open communication patterns within the family, as these results suggest than these contextual factors translated to feelings of support and communication of support with individuals beyond the family environment. Targeting these contextual factors may then improve the quality of life or well-being of individuals through their impact on the processing of supportive messages. Similarly, the content of supportive messages may also be an area for intervention in the processing of support, as the current study found that the supportive message content was also associated with the processing of support, within individuals. Specifically, since content of messages was positively associated with outcomes for both individuals in the dyad, when messages were both received and when messages were provided, communication with peers may be another possible target for interventions aimed at improving quality of life and perceptions of support. Future research may endeavor to examine these possible targets (e.g., contextual factors and the content of supportive communication) in more detail to further understand the specific mechanisms and optimal factors for improving the processing of support within peer dyads.

Tables

Table 1

Descriptives and properties of study variables and hypothesized construct components

	M	*SD*	Range	Cronbach's α
Context Construct				
Conversation Orientation	3.41	0.83	1.00 – 5.00	.93
Conformity Orientation	3.09	0.69	1.00 – 5.00	.82
Positive RQ with Mother	3.76	0.95	1.00 – 5.00	.91
Negative RQ with Mother	2.44	0.75	1.00 – 4.70	.80
Positive RQ with Father	3.37	1.09	1.00 – 5.00	.93
Negative RQ with Father	2.30	0.74	1.00 – 4.70	.76
Positive RQ with Friend	3.84	0.85	1.00 – 5.00	.91
Negative RQ with Friend	2.01	0.65	1.00 – 4.10	.83
Content Construct				
Positive Nouns	0.14	0.01	0.00– 0.87	N/A
Negative Nouns	0.11	0.95	0.00 – 0.16	N/A
Affect for Relationships	0.30	0.13	0.00 – 0.95	N/A
Social Processes	0.06	0.05	0.00 – 0.16	N/A
Self-Pronouns	0.00	0.01	0.00 – 0.17	N/A
Respect	0.07	0.06	0.00 – 0.38	N/A
Affiliation	0.08	0.03	0.00 – 0.16	N/A
Social Standing	0.48	0.16	0.00 – 0.99	N/A
Processing Construct				
Affective Improvement	28.61	5.18	5.00 – 35.00	0.86
Helper Competence	23.00	2.80	12.00 – 32.00	0.57
Supportiveness	57.33	7.33	16.00 – 66.00	0.87
Involvement in Conversation	22.59	3.53	6.00 – 28.00	0.68
Conversation Management	20.08	5.95	7.00 – 43.00	0.56

Note. RQ = relationship quality.

Table 2

Standardized factor loadings

	b
Context Construct	
Conversation Orientation	0.96
Conformity Orientation	- 0.35
Positive RQ with Mother	0.69
Positive RQ with Father	0.64
Content Construct	
Positive Nouns	0.49
Affect for Relationships	- 0.12
Respect	0.24
Social Standing	0.68
Processing Construct	
Affective Improvement	0.78
Supportiveness	0.94
Involvement in Conversation	0.73
Conversation Management	- 0.54

Note. RQ = relationship quality. Partner A and B loadings were identical within the model due to constraints across dyads.

Table 3

Invariance

Model	χ^2 (*df*)	CFI	RMSEA (90% CI)	SRMR	Model Compared	$\Delta\chi^2$ (Δ *df*)	ΔCFI	ΔRMSEA	ΔSRMR	Decision
Model 1: configural invariance	Unidentified	--	--	--	--	--	--	--	--	
Model 2: metric invariance	283.74(228)	.93	.044 (.024, .060)	.075	N/A	--	--	--	--	Accept
Model 3: scalar invariance	289.50(237)	.94	.042 (.021, .058)	.076	Model 2	0.24(9)	.01	.02	.00	Accept
Model 4: uniqueness invariance	330.18(252)	.91	.049 (.033, .064)	.076	Model 3	40.68(15)	.03	.007	.00	Accept

Table 4

Correlations among observed construct variables

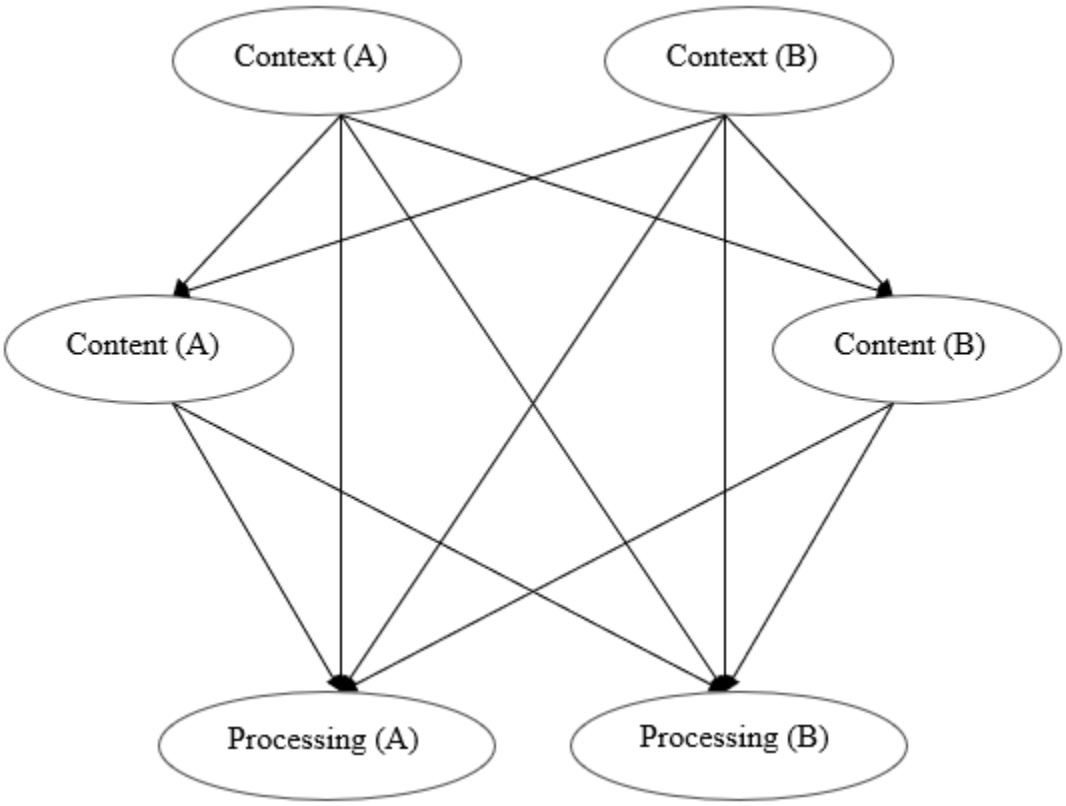
	1.	2.	3.	4.	5.	6.
1. Context A	--					
2. Content A	0.22*	--				
3. Process A	0.21*	0.29*	--			
4. Context B	0.32*	0.23*	0.09	--		
5. Content B	0.23*	0.50*	0.29*	0.22*	--	
6. Process B	0.09	0.20*	0.30*	0.21*	0.21*	--

Note. * indicates $p < 0.05$.

Figures

Figure 1

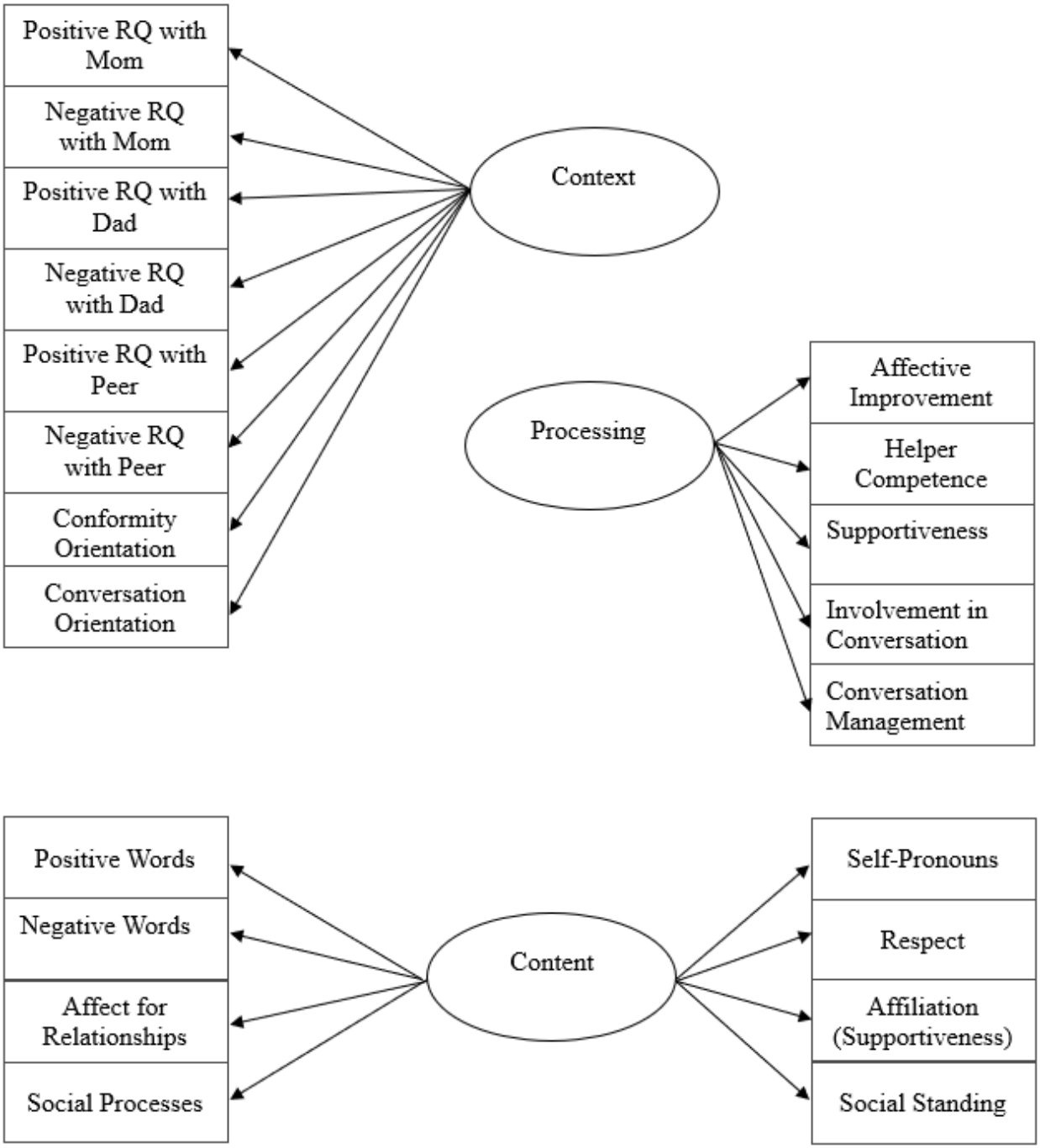
Conceptual Model



Note. (A) indicates contextual factors (i.e., relationship quality with mother, father, and peer, and family communication orientation scales), message content (i.e., positive words, negative words, affect for relationships, social processes, self-pronouns, respect, affiliation, and social standing), and processing of partner A (i.e., how supportive the interaction was perceived). (B) indicates contextual factors, message content, and processing of partner B.

Figure 2

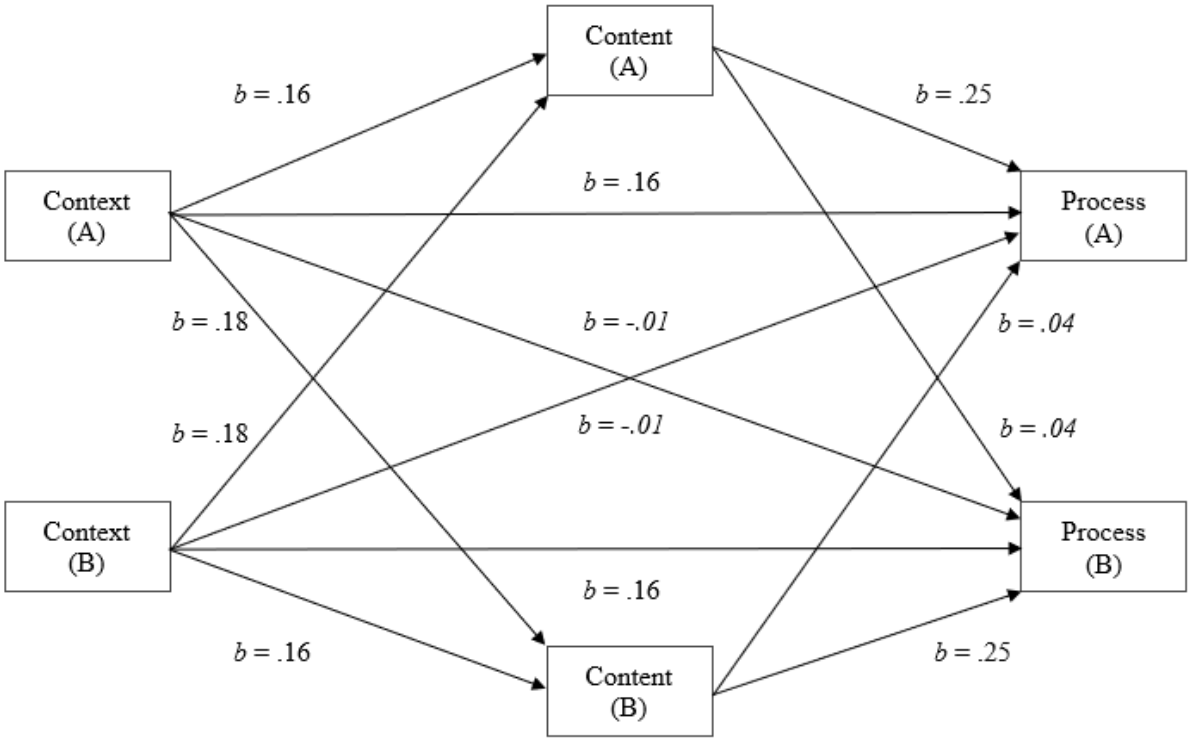
Constructs of context, content, and processing.



Note. Constructs were freely correlated and included these constructs for both actor and partner. RQ = Relationship Quality.

Figure 3

Standardized direct effects within the APIMeM



Note. Variables for race, age, gender, parental education, family structure, and length of relationship with peer were controlled for within the model. Italics represent non-significant paths with $p > .05$.

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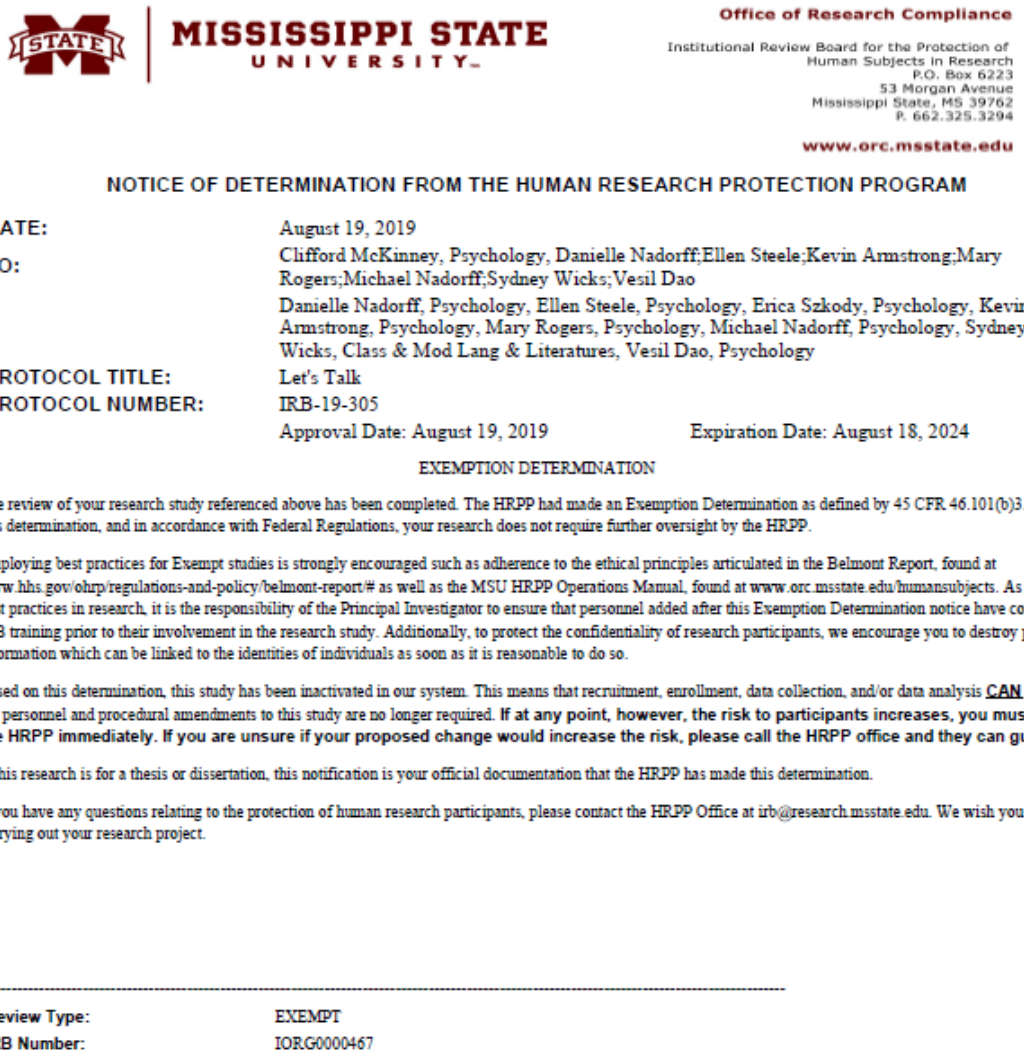
APPENDIX A

IRB APPROVAL LETTER

Figure A1.

IRB approval letter



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NOTICE OF DETERMINATION FROM THE HUMAN RESEARCH PROTECTION PROGRAM

DATE:	August 19, 2019
TO:	Clifford McKinney, Psychology, Danielle Nadorff;Ellen Steele;Kevin Armstrong;Mary Rogers;Michael Nadorff;Sydney Wicks;Vesil Dao
	Danielle Nadorff, Psychology, Ellen Steele, Psychology, Erica Szkody, Psychology, Kevin Armstrong, Psychology, Mary Rogers, Psychology, Michael Nadorff, Psychology, Sydney Wicks, Class & Mod Lang & Literatures, Vesil Dao, Psychology
PROTOCOL TITLE:	Let's Talk
PROTOCOL NUMBER:	IRB-19-305
	Approval Date: August 19, 2019 Expiration Date: August 18, 2024

EXEMPTION DETERMINATION

The review of your research study referenced above has been completed. The HRPP had made an Exemption Determination as defined by 45 CFR 46.101(b)3. Based on this determination, and in accordance with Federal Regulations, your research does not require further oversight by the HRPP.

Employing best practices for Exempt studies is strongly encouraged such as adherence to the ethical principles articulated in the Belmont Report, found at www.hhs.gov/ohrp/regulations-and-policy/belmont-report/# as well as the MSU HRPP Operations Manual, found at www.orc.msstate.edu/humansubjects. As part of best practices in research, it is the responsibility of the Principal Investigator to ensure that personnel added after this Exemption Determination notice have completed IRB training prior to their involvement in the research study. Additionally, to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so.

Based on this determination, this study has been inactivated in our system. This means that recruitment, enrollment, data collection, and/or data analysis **CAN** continue, yet personnel and procedural amendments to this study are no longer required. **If at any point, however, the risk to participants increases, you must contact the HRPP immediately. If you are unsure if your proposed change would increase the risk, please call the HRPP office and they can guide you.**

If this research is for a thesis or dissertation, this notification is your official documentation that the HRPP has made this determination.

If you have any questions relating to the protection of human research participants, please contact the HRPP Office at irb@research.msstate.edu. We wish you success in carrying out your research project.

Review Type:	EXEMPT
IRB Number:	IORG0000467