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Abstract

OPPOSING ATTITUDES IN CONTROVERSIAL DISCUSSIONS: THE ROLE OF LATENT SEMANTIC SIMILARITY AND PERSONALITY IN COMPUTER-MEDIATED DISCUSSIONS

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Several theories imply that the ability of interaction partners to develop latent semantic similarity (LSS) with each other—particularly during controversial topic computer-mediated discussions in which both partners hold opposing attitudes—should lead to less conflict and to increased perceptions of interpersonal rapport. The current study examined the development of LSS in the interactions between dyad partners who engaged in a computer-mediated discussion of a controversial topic (i.e., abortion) with a dyad partner who either agreed or disagreed with their attitude on that topic. The results suggested that higher dyad-levels of extraversion and empathy significantly predicted higher dyad-level LSS among disagreeing dyads. In addition, dyad-level LSS significantly declined over the course of the disagreeing dyads’ interaction, and follow-up analyses suggested this was due to their persisting inability to understand each other’s point of view the longer they talked about their opposing stances on abortion. These findings can be used to better understand the mechanisms that help to promote common-ground understanding among diverse individuals in contentious computer-mediated interactions.
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Chapter 1

Introduction

Discussion and debate are considered essential elements of learning and decision-making (e.g., Freeley, 1961; Pilkington, 2003; Schein, 1993). They are ways for people to express their thoughts and feelings on any topic, and to become educated on such topics, ranging from benign, everyday matters to serious societal issues. The advancement of technology, particularly the internet, in the last few decades has made it easier for people to engage in discussions and debates with people all over the world, including strangers. Today, anyone with access to the internet and a computer or smartphone can take part in computer-mediated discussions about any topic, at any time, and with anyone.

Many websites provide a platform for people to engage in computer-mediated discussions. For example, online discussion boards such as Reddit and Quora allow people to engage in discussion on a topic of their choosing, and also to create new discussion topics and moderate them. Twitter became a center for political discussion after the 2008 presidential campaign (Tumasjan, Sprenger, Dandner, 2010), and continues it to be a hub for computer-mediated discussions of current events (Honeycutt & Herring, 2009). Facebook also facilitates computer-mediated discussions by allowing people to comment on individual posts and reply to other people’s comments (see Ng, 2016). Although it is possible for people to engage in video-based computer-mediated discussions with others using Skype and similar technologies, the current proposal will focus only on text-based computer-mediated discussions.

The ease with which people can have access to and engage in computer-mediated discussions is positively regarded by some scholars for several reasons. First, it allows

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1 In the current proposal, I will use the words discussion, debate, and deliberation interchangeably, conforming to Delli Carpini, Cook, and Jacobs (2007).
discussions to be either synchronous or asynchronous, and can offer both peer-to-peer and many-to-many communication (Albrecht, 2013). Second, it should encourage people to engage in discussions who would not otherwise do so in face-to-face situations (Albrecht, 2013), resulting in more inclusivity and a greater exchange of information (Mitra, 2001). Third, easier access to computer-mediated discussions should foster more communication on important issues in society, leading to more well-informed citizens (Dryzek, 1990). Fourth, any decision-making that may stem from these discussions should be more transparent and should lead to the desired result or one that is close to it (Barber, 1995; Rash, 1997).

On the other hand, there are some acknowledged disadvantages to computer-mediated discussions. Because interaction partners are interacting with each other remotely through a computer device and cannot see each other, the lack of access to the discussion partners’ nonverbal behaviors makes it more difficult for nonverbal social cues or other affective information to be conveyed (Danet, 1998; Turkle, 1995). Anonymity in computer-mediated interactions can also invite false impersonation (Lee, 1996). Depersonalization is also more likely to occur in computer-mediated interactions, which is defined as not being aware of the background, expertise, and general characteristics of the people one communicates with through this medium. This limitation may challenge the credibility of the information that is gathered in computer-mediated discussions (Romiszowski & Mason, 1996).

Lastly, combative behaviors such as personal attacks, offensive language, and bullying are more likely to occur due to the lack of social control (i.e., the inability to enforce certain behaviors) in computer-mediated discussions (Sproull & Faraj, 1995; Kollock & Smith, 1996). One type of behavior, called flaming, is often observed in computer-mediated discussions in which interaction partners hold opposing attitudes on a controversial topic that they are
discussing (Willard, 2007). Flaming is defined as a heated, short-lived conflict and argument that occurs online and that includes behaviors such as vulgar language, offensive remarks, insults, and sometimes threats. These conflictive behaviors are not only inappropriate and unpleasant, but can also cause negative health and psychological consequences (Finkelhor et al., 2000).

Previous studies have shown that people’s impaired ability to understand one another can lead to interpersonal conflicts in general (e.g., Ensley, Pearson, & Amason, 2002; Epstein, Bishop, & Levin, 1978; Hinds & Bailey, 2003; Koerner & Fitzpatrick, 2016; Leith & Bameister, 1998). Because the ability to develop shared meaning is important in the establishment and maintenance of a variety of interpersonal relations, such as professional, romantic, familial ones, how do interaction partners develop a common-ground understanding with each other?

Many scholars have argued that interaction partners rely on language to develop a “common-ground understanding” (e.g., Abbeduto, Short-Meyerson, Benson, Dolish, & Weissman, 1998; Kecskes & Zhang, 2009) or an “intersubjective meaning context” (e.g., Gesn & Ickes, 1999; Morganti, 2008). In other words, the development of a common-ground understanding depends on the interaction partners coming to use the same words in essentially the same way. This consideration suggests that the ability of interaction partners to use language in a way that develops their latent semantic similarity — in particular, during sensitive topic computer-mediated discussions in which both partners hold opposing attitudes — may help to minimize negative outcomes during this type of computer-mediated discussion.

1.1 Theoretical Foundations

Several theories that address the role of communication in conflicts support this perspective. First, the encoding-decoding model of communication describes communication as
the transfer of information by means of a code, which is a system that corresponds a set of
signals that map onto a set of meanings (Hall, 1993; Hall, 2001). Messages are first encoded by
the speaker into the form of a signal (creating a sentence) which is then transmitted to the
receiver (through speaking). The receiver then decodes the message by mapping the signals onto
a set of meanings (listening and understanding). Having a shared set of codes—in other words,
interpreting messages in the same way as one’s interaction partner—is required for
understanding. Interaction partners can transmit and receive identical messages, but these
messages can be interpreted differently, which can lead to misunderstanding and conflict (Krauss
& Morsella, 2006).

Second, the intentionalist model of communication argues that the same words can be
understood to mean different things in different contexts and under different circumstances, and
thus requires interaction partners to recognize each other’s intended meaning in communication
(Biro, 1979; Motley, 1986). The process by which interaction partners construct each other’s
intended meanings depends on the existence of mutually shared knowledge (also known as
common ground) which is developed by speaking the same language and sharing the same
ideologies, objectives, and attitudes. Interaction partners who do not have mutually shared
knowledge cannot accurately infer each other’s intended meaning, leading to misunderstanding
and conflict.

Third, the perspective-taking paradigm of communication claims that, in addition to
having mutually shared knowledge, interaction partners must also understand and take their
interaction partners’ perspective into account when communicating and interpreting each other’s
communication (Krauss, 2002; Krauss & Russell, 1991). This perspective-taking is necessary
because interaction partners are subject to the misperception of common ground—incorrectly
assuming one’s interaction partners’ knowledge. For example, previous research has shown that people’s inferences of others’ knowledge tend to be biased in the direction of their own beliefs (Dawes, 1990; Ross, Greene, & House, 1977; Sherman, Presson, Chassin, 1984). This bias may lead one to assume more similarity in shared knowledge with an interaction partner than really exists. In addition, perceived distinctions among interaction partners tend to become more salient in conflict situations, leading interaction partners to categorize each other as members of in-groups or out-groups (Hogg, 2000; Jones, Wood, & Quattrone, 1981; Tajfel, 1974; Tajfel & Turner, 1979). Incorrect inferences of others’ knowledge may stem from inaccurate stereotypes or prejudice stemming from in-group/out-group categorization. Thus, misunderstanding and conflict are more likely to occur when interaction partners are not able to correctly infer their interaction partner’s knowledge.

Fourth, the dialogic model of communication argues that communication is a cooperative process such that interaction partners must work together to understand and be understood by each other (Clark, 1996; Clark & Brennan, 1991). Interaction partners must collaborate and create shared meaning by ensuring that they ascribe the same meaning to each message throughout their interaction (in this sense, meaning is understood only within the context of a given interaction because it is derived in large measure from the circumstances of the given interaction). Misunderstanding and conflict can result when interaction partners do not coordinate with one another to establish similar interpretations of each message across their entire interaction.

Overall, these theories highlight the importance of establishing shared meaning in communication, especially in situations in which misunderstandings have the potential to lead to

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2 Knowledge is used to represent an individual’s beliefs, attitudes, values, and other factors that interaction partners rely on to establish mutually shared knowledge (or common ground; Krauss & Morsella, 2006).
conflict and/or to escalate it. Because computer-mediated interactions involve verbal communication only, the ability to establish shared meaning through one’s verbal behaviors should be associated with fewer negative outcomes during sensitive topic computer-mediated discussions between people with opposing views. To test this prediction, researchers must be able to empirically measure the extent to which interaction partners use the same words in essentially the same way. Such a measurement exists in the form of an index that computational linguists call latent semantic similarity (LSS; Landauer & Dumais, 1997; Landauer, Foltz, & Laham, 1998).

1.2 Latent Semantic Similarity

The LSS index is calculated by the Latent Semantic Analysis (LSA) program. LSA is an automated statistical method that establishes the contextual meaning of any text by analyzing the relationship among the words that are used by the interaction partners (Landauer & Dumais, 1997; Landauer et al., 1998). More specifically, the LSA program assesses the degree of latent semantic similarity (LSS) within people’s interactions based on the words they use and how those words are used in relation to other words (Laham et al., 1997). The LSA program produces an LSS index that ranges between -1 and 1, with higher positive scores indicating greater latent semantic similarity between interaction partners.

There is evidence that the LSS index is valid as a global, summary measure of the extent to which dyadic interaction partners synchronize their language use while interacting together (Babcock, Ta, & Ickes, 2014). Ta, Babcock, and Ickes (2017) sought to determine the specific behaviors that lead to higher levels of LSS within initial, same-sex interactions and found that verbal behaviors (i.e., the amount of talking and asking questions), rather than nonverbal behaviors (i.e., the duration and frequency of mutual gazes, expressive gestures, and positive
affect), were the only unique predictors of higher levels of LSS. In other words, the development of LSS depends primarily on the behaviors that introduced words into the conversation, and that all other nonverbal dyad-level behaviors proved to be nonessential predictors when the former variables were statistically controlled. Although these other, non-language behaviors may play an important role in the nonverbal exchange that occurs in dyadic interactions (Bruder, Dosmukhambetova, Nerb, & Manstead, 2012; Manusov & Patterson, 2006; Patterson, 2014), they do not appear to play an essential role in helping interaction partners achieve high LSS, or, in other words, to “get on the same page” linguistically.

It is important to note that these results were obtained by examining initial interactions between face-to-face interaction partners. However, because the results indicated that “the words may be all you need” for the development of LSS in the initial interactions of same-sex strangers, it follows that LSS might develop as readily in computer-mediated interactions (which involve the exchange of words only) as it does in face-to-face interactions. In other words, over the course of people’s computer-mediated discussions, new acquaintances should engage in behaviors that add more words into the conversation, which should therefore enable them to increasingly sample each other’s word choices and mutually align their word choices and intended meanings, thus increasing their LSS.

To test this prediction, Ta and Ickes (under review) used the LSS measure to examine the role of LSS in the initial dyadic computer-mediated interactions (i.e., instant messaging) of same-sex strangers and found that the dyads whose members engaged in more talking behaviors did indeed achieve higher levels of LSS. However, when the trajectory of LSS was examined over time, it was found that LSS decreased, rather than increased, over the course of the average
Follow-up analyses were conducted to determine why LSS decreased over time, and two explanations were suggested and subsequently explored.

First, the results suggested that strangers are motivated to achieve high LSS at the beginning of their interaction. This motivation subsequently diminishes once the interaction partners feel that they have reached an acceptable level of LSS. The motivation to ensure a pleasant experience early in an interaction is in line with Berger and Calabrese’s (1975) uncertainty reduction theory which argues that strangers who interact for the first time are aware that they do not yet possess adequate knowledge about each other’s perspectives and prior experience. This awareness motivates them to reduce their uncertainty and increase their mutual predictability early in their interaction by asking for and providing each another with the same kinds of information at a similar pace. Once the interaction partners feel that their uncertainty has been reduced, their attentional and conversational focus shifts away from their partner and LSS declines.

Second, the results revealed that the personality trait of extraversion moderated the trajectory of LSS over the course of the dyads’ 18-minute interactions such that dyads with high dyad-level extraversion were the least likely to show a decline in the trajectory of LSS. Specifically, the LSS indices significantly declined across the 18-minute interaction period for dyads with low and medium levels of extraversion, whereas the LSS indices remained stable across the interaction period for dyads with high extraversion levels. This is consistent with Jung’s (1921) view of extraversion and introversion in which extraverts’ attention is externally-focused (i.e., focused on others), whereas introverts’ attention is internally-focused (i.e., focused on the self). This is also consistent in Cuperman and Ickes’ (2008) contemporary study of initial, dyadic interactions in which they found that extraverts made more eye contact with their
partners, used fewer first-person singular pronouns, and reported being less self-conscious than introverts did. Thus, the highly extraverted dyad members in Ta and Ickes (under review) were more likely to focus on the intent and context of their interaction partner’s words, enabling them to sustain more stable LSS indices throughout their interaction than dyads who were not as highly extraverted.

1.3 The Current Study

Because the theories that address the role of communication in conflicts (i.e., the encoding-decoding model of communication, the intentionalist model of communication, the perspective-taking paradigm of communication, and the dialogic model of communication) assume that the development of common-ground understanding depends on interaction partners coming to use the same words in essentially the same way, they all either assert or imply that the ability of interaction partners to develop LSS with each other—particularly during controversial topic computer-mediated discussions in which both partners hold opposing attitudes—should lead to less conflict and to increased perceptions of interpersonal rapport. The current study sought to test this by examining the development of LSS in the interactions between dyad partners who engaged in a computer-mediated discussion of a controversial topic (i.e., abortion) with a dyad partner who opposed their attitude on that topic (these dyads will be referred to as disagreeing dyads for the remainder of this paper). Computer-mediated discussions on the same sensitive topic—but between dyad partners who held the same attitudes on that topic—were also examined as a comparison group (these dyads will be referred to as agreeing dyads for the remainder of this paper).

1.3.1 LSS as a Mediator of Amount of Talking and Interaction Quality

I hypothesized that, for disagreeing dyads, dyad-level LSS should mediate the
relationship between the dyad-level amount of talking and dyad-level quality of interaction (Hypothesis 1). In line with the findings from Ta et al. (2017) and Ta and Ickes (under review), dyad-level behaviors that introduce more words into the conversation (i.e., total word count and the number of messages sent) should be associated with higher dyad-level LSS. In turn, higher dyad-level LSS should lead dyad members to evaluate the perceived quality of their interaction experience more positively. Being able to get on the same page linguistically and establish a common-ground understanding—especially when engaging in a controversial topic of discussion in which interaction partners hold opposing attitudes—should help to minimize conflict and elicit a positive evaluation regarding the perceived quality of their interaction experience.

1.3.2 Trajectory of LSS Over Time

LSS index scores should remain more stable for dyads in the disagree condition than for dyads in the agree condition as the interaction partners pass through the three stages of their initial interaction (i.e., the first 6 minutes, the second 6 minutes, and third 6 minutes of interaction; Hypothesis 2). Dyad members who agree with each other should follow a trajectory similar to the one Ta et al. (under review) reported—once they achieve high LSS at the beginning of their interaction that is sufficient enough to sustain the conversation and to reduce uncertainty (i.e., once they determine that they both hold the same stance on the topic of discussion), the effort to maintain high LSS should be relaxed and LSS should consequently decrease. However, the motivation to sustain high LSS should continue throughout the interaction for dyads in the disagree condition to ensure that they have the same understanding of the content, resulting in a more stable trajectory of LSS as the interaction partners pass through the three stages of their initial interaction.
1.3.3 First Person Singular and Second Person Singular Pronouns

If the trajectory of LSS is more stable over time for dyads in the disagree condition because dyad members remain motivated to ensure that they have the same understanding of the content throughout their interaction, this should be reflected in the content of their discussion transcripts. Ta and Ickes (under review) found that motivation to synchronize word use (i.e., achieve a relatively high level of LSS) in the earliest phase of the dyads’ initial interaction was indicated by a higher percentage use of second-person singular pronouns (you) and first-person singular pronouns (I) in the first 6-minutes of interaction than in the second and third 6-minutes of interaction. This difference suggests that dyad members were directly involving their interaction partner in their conversation to maximize their level of LSS and to reduce the level of uncertainty in their interaction. Once the dyads had reached an acceptable level of LSS, they no longer needed to provide this kind of information at the same rate of exchange, leading to a decline in the percentage use of second-person singular pronouns and first-person singular pronouns.

Thus, the percentage use of second-person singular pronouns and first-person singular pronouns should be more stable over the three periods of interaction for dyads in the disagree condition but not in the agree condition (Hypothesis 3). Disagreeing dyads should be more motivated to actively ensure that they have the same understanding of the content throughout their interaction by directly involving their interaction partner in their conversation, resulting in more stable percentage use of second-person singular pronouns and first-person singular pronouns over time. This motivation should not be as strong for dyads in the agree condition, which should result in declining percentage use of second-person singular pronouns and first-person singular pronouns over time.
1.3.4 Predicting LSS with Personality Traits

Previous research has shown that personality can influence the course, and consequently, the outcome of computer-mediated discussions. For instance, people who are more introverted report feeling more prepared to participate in computer-mediated discussions (versus face-to-face discussions) than those who are more extraverted (who report being more prepared to participate in face-to-face interactions; Blau & Barack, 2012; McKenna, Seidman, Buffardi & Green, 2007). This is attributed to introverts’ disinclination to seek stimulation in the company of others (Matthews, Deary, & Whiteman, 2003) since computer-mediated discussions lack much of the interpersonal stimuli that is present in face-to-face interactions such as tone of voice, body orientation, eye gazes, gestures, etc. On the other hand, with regard to the amount of participation in computer-mediated discussions, extraverts tend to be more involved in computer-mediated discussions than introverts are (Blau & Barack, 2012).

These studies provide evidence to suggest that personality can influence behavior in computer-mediated communication. However, no study has investigated how other personality traits play a role in the development of LSS in computer-mediated discussions, specifically when interaction partners hold opposing attitudes on a controversial topic that they are discussing. I hypothesize that higher dyad-levels of openness to experience, extraversion, agreeableness, and empathy should predict higher dyad-level LSS for disagreeing dyads. On the other hand, higher dyad-levels of communication apprehension and right-wing authoritarianism should predict lower dyad-level LSS for disagreeing dyads (Hypothesis 4).

Openness to experience is characterized by broad-mindedness, higher levels of curiosity, novelty-seeking, and experimentation (McCrae & Costa, 1987). Extraversion is characterized by the tendency to exhibit more behaviors that are related to interpersonal engagement, such as
being sociable and the tendency to seek out novelty, change, and excitement (Eysenck, 1967, 1981; Eysenck & Eysenck, 1985). Agreeableness is characterized as the tendency to be friendly, cooperative, courteous, good-natured, and trusting (Barrick & Mount, 1991).

In regard to computer-mediated interactions, people who have high levels of openness to experience are more likely to use social network websites to seek out new and novel experiences (Butt & Phillips, 2008) and are also more likely to seek out diverse perspectives and information through their activities on social network websites (Kim, Hsu, & de Zuniga, 2013), suggesting that they may already have experience interacting with others with different attitudes via computer-mediated discussion. Analogously, extraverts are also more likely to participate in and are more engaged in computer-mediated discussions than are introverts (Blau & Barack, 2012), indicating that they may be more likely to engage in behaviors that add more words into a computer-mediated discussion. Agreeable individuals are more cooperative and tend to have higher quality interpersonal interactions (LePine & Van Dyne, 2001). Thus, higher levels of these traits should result in higher levels of LSS in sensitive-topic computer-mediated discussions for dyads in the disagree condition.

People with higher levels of empathy are more capable of understanding other people’s views and emotions (Rogers, 1951). Empathy comprises two main components: cognitive empathy and affective empathy (Singer, 2006; Decety & Meyer, 2008; Dziobek et al., 2008). Mazza et al. (2014) provide a concise distinction between the two concepts: Cognitive empathy involves having more complete and accurate knowledge of what others are thinking or feeling without necessarily “resonating” with that affective state. Affective empathy, on the other hand, involves the ability to emotionally “resonate” with other people’s thoughts and feelings while simultaneously understanding that they may be distinct from one’s own thoughts and feelings.
(Jones et al., 2010; Schwenck et al., 2012). Previous researchers have stressed the importance of the affective component of empathy, rather than the cognitive component of empathy, in relation to inhibiting aggressive behavior (Feshbach, 1975; Hoffman, 1982). For example, although a bully may have complete knowledge of his or her victim’s fear (cognitive empathy), the bully’s lack of affective empathy would prevent him or her from vicariously experiencing the fear that he or she induces from his or her victim. Thus, the ability to emotionally experience another person’s mental state, rather than knowing what they are experiencing, is connected with more prosocial behavior. The link between lower levels of affective empathy, rather than cognitive empathy, and cyberbullying and other antisocial behaviors online have been shown across several studies (e.g., Doane, Pearson, & Kelley, 2014; Renati, Berrone, & Zanetti, 2012; Steffgen, König, Pfetsch, & Melzer, 2011). Because people with higher levels of affective empathy should be more likely to experience and share other people’s views and emotions that are different from their own, and because higher levels of affective empathy are associated with the occurrence of fewer negative behaviors in computer-mediated discussions, higher levels of affective empathy should also lead to higher levels of LSS.

High communication apprehension (the level of fear or anxiety that is associated with real or anticipated communication with others; McCroskey, 1977) may lead to more hesitation and less engagement when interaction partners discuss a sensitive topic during a computer-mediated discussion because of the possibility that their interaction partner might react negatively towards their opinions (Ho & McLeod, 2008). A high level of right-wing authoritarianism is characterized by having a high degree of submissiveness to authority, adherence to societal norms, and aggression towards outgroup members (Altemeyer, 1981; Duckitt, 1989). People who have higher levels of right-wing authoritarianism should be more
likely to elicit negative, aggressive responses towards their interaction partner who does not hold the same attitudes as they do (an outgroup member) on the topic of discussion. Research has suggested that aggressive behavior tends to be related to conflictive interactions with others (e.g., Axelrod & Hamilton, 1981; Dodge et al., 2015), which should hinder interaction partners from achieving linguistic shared meaning with each other. Thus, higher levels of these personality characteristic should lead to lower levels of LSS.

1.3.5 Will Greater LSS Lead to Greater Attitudinal Convergence for Disagreeing Dyads?

When interaction partners with opposing attitudes achieve high LSS during their computer-mediated discussion on a controversial topic, will this facilitate greater attitudinal convergence as well? If so, which mechanism(s) would facilitate the link between high LSS and greater attitudinal convergence?

Previous research has suggested that the principle of liking can lead to attitude change—that is, a person is more likely to be influenced by their interaction partner’s attitudes if they like their interaction partner and if they believe their interaction partner likes them because the positive affect that is associated with liking tends to promote the exploration of new ideas and facilitate new ways of assessing attitudes (Cialdini, 2001; Chaiken, 1987; Isen, 2008). As predicted in Hypothesis 1, when dyad members achieve higher, rather than lower, levels of LSS, they should experience a greater sense of mutual rapport that should be associated with more positive perceived interaction quality, including the extent to which they like each other, and believe that they are liked in return. Heightened levels of liking should then be linked to more attitude convergence on the topic of discussion between interaction partners (Berscheid & Hatfield, 1978; Frenzen & Davis, 1990).
In addition, there are two personality characteristics that may influence attitude convergence: sense of self (the strength of one’s sense of self; Flury & Ickes, 2007) and inner-other-directedness (looking to others or to the self to guide one’s behaviors; Kassarjian, 1962). People with a weak sense of self tend to feel uncertain about their identity and opinions, and therefore depend on others to help them define themselves in these ways, if only “in the moment” (Cuperman, Robinson, & Ickes, 2014). Compared to those with a strong sense of self, people with a weak sense of self should be more likely to accede to an interaction partner’s position on a controversial issue (Flury & Ickes, 2006; Kernis, 2005). Along the same lines, those who are other-directed rely on others to provide a direction for their behavior, whereas people who are inner-directed tend to rely on their own inner values and standards (Kassarjian, 1962). For this reason, people with a weaker sense of self and people who are other-directed may be influenced by their interaction partner more than people with a strong sense of self and people who are inner-directed during sensitive topic discussions in which they and their interaction partner clearly disagree.

Controlling for sense of self and inner-other directedness, perceived interaction quality should mediate the relationship between dyad-level LSS and attitude convergence for disagreeing dyads. Specifically, higher dyad-levels of LSS should lead to more positive evaluations from both dyad members regarding their perceived quality of their interaction experience, which should then lead to higher levels of attitude convergence. Given these associations, higher dyad-level LSS should also be associated with higher levels of attitude convergence instead of lower or no attitude convergence (Hypothesis 5). Lower levels of LSS should not be associated with positive evaluations of perceived interaction quality or higher levels of attitude convergence.
Chapter 2

Method

Because LSS is a dyad-level measure, all variables in the proposed study were also assessed at the dyad level (i.e., the average scores of both partners within a dyad). Thus, the variables that are subsequently referred to in this study represent the dyadic measure of a given variable.

2.1 Participants and Procedure

A total of 170 same-sex dyads (120 female-female and 50 male-male dyads) were recruited using the departmental subject pool (SONA) at the University of Texas at Arlington. Two same-sex participants came into the lab at the same time but were seated in different rooms, in separate locations, that were each equipped with a computer (i.e., they did not see each other at any time before or during their online interaction). All dyad members were informed that they would be chatting with another participant via AOL Instant Messenger for 18 minutes on one of three possible controversial topics (abortion, legalization or marijuana, or capital punishment) and that their topic of discussion would be randomly assigned to them. However, all dyads were assigned to discuss the topic of abortion. The purpose of this cover story was to prevent dyad members from believing that the study was specifically examining the political issue of abortion, which could have interfered with the way in which they discussed the topic of abortion with their partner through computer-mediated communication.

Because all dyads discussed the topic of abortion in their online interaction, each dyad member was paired up with another dyad member who either (1) shared their stance on abortion (i.e., a pro-life dyad member was paired up with another pro-life dyad member, or a pro-choice dyad member was paired up with another pro-choice dyad member); or (2) did not share their
stance on abortion (i.e., a pro-life dyad member paired with a pro-choice dyad member). This information was collected ahead of time through the SONA pre-screening survey by having participants indicate their attitudes towards the following statements using a 5-point Likert-type scale (ranging from strongly disagree to strongly agree): Abortion should be legal and local healthcare providers should provide legal abortions. Participants who responded with agree or strongly agree on both statements were identified as pro-choice and participants who responded with disagree or strongly disagree on both statements were identified as pro-life. Because the current study focused on interactions between people who either clearly agree or clearly disagree on a contentious topic, participants who were neutral on the issue of abortion (i.e., participants who responded with neither agree nor disagree on one or both of the pre-screening survey items) were excluded from the current study. This method to identify pro-life or pro-choice participants was adapted from previous psychological studies that also sought to identify pro-life and pro-choice participants (e.g., Chambers, Baron, & Inman, 2006; Hartmann & Tanis, 2013).

After the informed consent was obtained from both dyad members, they completed a pre-interaction survey that included demographic questions and the following personality scales: The Ten-Item Big Five Inventory, Sense of Self Scale, Inner-Other Directedness, Personal Report of Communication Apprehension, Short Right-Wing Authoritarianism Scale, and the Toronto Empathy Questionnaire (Appendix A). Next, the dyad members were again reminded that (1) they would be talking with their interaction partner via AOL Instant Messenger for a total of 18 minutes; (2) their assigned topic of discussion was abortion—that is, the interaction partners were to discuss their respective views regarding abortion with their interaction partner; and (3) they were free to express any of their thoughts, feelings, and questions regarding this topic with their interaction partner. The participants then began their online discussion with each other.
After the 18 minutes of interaction passed, the dyad members completed a post-interaction questionnaire which assessed each dyad member’s perceptions of the quality of their interaction and also re-assessed their attitudes toward abortion (Appendix B). Last, participants were then debriefed and permission to use each participant’s chat log for data analysis was requested. All participants granted permission for their chat log to be used for data analysis.

2.2 Latent Semantic Similarity Calculation

Each chat log was saved and run through Latent Semantic Analysis (LSA; http://lsa.colorado.edu), a software program that determines each dyad’s LSS. To do this, the speaking turns within each chat log were divided into two electronic text files, each of which contained only one dyad member’s portion of the conversation. Each electronic text file were edited down into a solid block of text by deleting all indentions and line breaks, thereby enabling the submission of the text files for both participants as input into the LSA program (Laham et al., 1998).

To compute the LSS index for each dyad, the two solid blocks of text that represented each dyad member’s portion of the conversation were copied into the input box provided on the LSA website. A blank line was inserted between each block of text to indicate the end of the first block of text and the beginning of the second. The program options: “Pairwise Comparison” (which allows one block of text to be semantically compared to another), “Document-to-Document” (indicating that the two blocks of text are to be semantically compared to each other as documents rather than terms), “Maximum Factors Available” (to determine LSS using the maximum number of dimensions possible), and “General Reading up to 1st Year College” were selected for each computation.
When the two blocks of text for each dyad were submitted for analysis, the LSA program generated an LSS index that ranged between -1 and 1, with a higher positive score indicating greater semantic similarity between the dyad members. Again, the LSS index represents how similar two writing samples are in the words that are used and in how those words are used in relation to other words (Laham et al., 1997). Note that this LSS index characterizes each dyad’s overall 18-minute interaction and is used to test hypothesis 1.

To test hypothesis 2, the electronic text files that contained each dyad member’s portion of the conversation across their entire interaction were divided into three sections of equal time length (6 minutes each). Specifically, using the timestamps that appeared in all of the chat logs, each dyad member’s electronic text file was divided into three sections based on when the content occurred in the interaction: the first 6 minutes (i.e., minutes 0-6), the middle 6 minutes (i.e., minutes 7-12), and the final 6 minutes (i.e., minutes 13-18). Then, three LSS indices were generated for each dyad that represented their LSS in the first 6 minutes, middle 6 minutes, and last 6 minutes of their initial interaction.

To test hypothesis 3, the content of each dyad’s discussion transcript was analyzed using the Language Inquiry and Word Count (LIWC) program. This program generates the percentage of words that represent different linguistic categories (e.g., parts of speech, personal pronouns, social concerns, and emotions) that are present in any corpora of text (Tausczik & Pennebaker, 2010). The percentage of second-person singular pronouns (you) and first-person singular pronouns (I) used in each of the three 6-minute interaction periods were obtained through LIWC.

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3 Previous studies have shown that the words individuals use to talk and write are correlated with their physical and mental health and can provide a glimpse into their current cognitive state (Gottschalk & Glaser, 1969; Rosenberg & Tucker, 1978; Stiles, 1992). For a broader view of how the LIWC software has been applied, see Campbell & Pennebaker, 2002; Fratteroli, 2007; Lepore & Smyth, 2002; Pennebaker, 1997; Pennebaker, Mayne, & Francis, 1997)
2.3 Personality Measures

2.3.1 The Big Five Inventory-10

The BFI-10 is a short 10-item scale that measures the Big Five dimensions of personality: Conscientiousness, Agreeableness, Neuroticism, Openness, and Extraversion (Rammstedt & John, 2007). Items are scored on a Likert-type scale using scale alternatives that range from 1 (strongly disagree) to 5 (strongly agree). The scale demonstrates good reliability, with alpha coefficients ranging from $\alpha = .74$ to .89 (Rammstedt & John, 2007).

2.3.2 Sense of Self Scale

The Sense of Self Scale is a 12-item scale which measures the strength of one’s sense of self (Flury & Ickes, 2007). Items are scored on a Likert-type scale using scale alternatives that range from 1 (strongly disagree) to 5 (strongly agree). The scale demonstrates good reliability, with alpha coefficients ranging from $\alpha = .83$ to .86 (Flury & Ickes, 2007).

2.3.3 I-O Social Preference Scale (I-O)

The I-O scale is a 36-item scale that measures two contrasting types of social character: inner-directedness and other-directedness (Kassarjian, 1962). Being other-directed involves relying on others to direct one’s behavior whereas being inner-directed involves relying on one’s inner values and standards to direct one’s behavior. Each scale item features two choices (A and B) such that one choice represents an inner-directed response and the other choice represents an other-directed response. Respondents indicate the extent to which they strongly agree with A, agree with A, agree with B, or strongly agree with B. Higher scores indicate a greater degree of inner-directedness. The scale demonstrated acceptable reliability in the study reported by Kassarjian (1962), $\alpha = .70$. 
2.3.4 Personal Report of Communication Apprehension-24

The Personal Report of Communication Apprehension (PRCA-24) is a 24-item scale which measures one’s level of fear or anxiety associated with either real or anticipated communication with other people (McCroskey, 1992). Items are scored on a Likert-type scale using scale alternatives that range from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate higher levels of communication apprehension. The scale demonstrated high reliability in the study reported by McCroskey (1992), \( \alpha = .90 \).

2.3.5 Short Right-Wing Authoritarianism Scale

The Short Right-Wing Authoritarianism Scale is a 15-item scale that measures the degree of willingness to submit to legitimate authorities, the degree of adherence to social norms, and attitudes towards people who do not adhere to such norms (Zakrisson, 2005). Items are scored on a Likert-type scale using scale alternatives that range from 1 (very negative) to 9 (very positive). Higher scores indicate a greater degree of right-wing authoritarianism. The scale has demonstrated acceptable reliability, varying between \( \alpha = .72 \) and \( \alpha = .80 \) (Zakrisson, 2005).

2.3.6 Toronto Empathy Questionnaire

The Toronto Empathy Questionnaire is a 16-item scale that measures the emotional (i.e., affective) components of empathy. The items represent a wide variety of affective empathy-related behaviors such as emotion comprehension, sympathetic physiological arousal, and altruism (Spreng, McKinnon, Mar, & Levine, 2009). Items are scored on a Likert-type scale using scale alternatives that range from 0 (Never) to 4 (Always). Higher scores indicate a greater degree of empathy. The scale has demonstrated high test-retest reliability (\( r = .81 \)) and good internal consistency (\( \alpha = .87 \); Spreng et al., 2009).
Chapter 3

Results

3.1 Descriptive Statistics and Zero Order Correlation

Descriptive statistics are reported in Table 1 and zero-order correlations between all variables are reported in Tables 2 and 3.

Table 1. Means and Standard Deviations of All Variables by Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Agree</th>
<th>Disagree</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LSS</td>
<td>.72(.08)</td>
<td>.73(.08)</td>
<td>.73(.08)</td>
</tr>
<tr>
<td>2. PIQ</td>
<td>4.34(.40)</td>
<td>3.87(.49)</td>
<td>4.11(.50)</td>
</tr>
<tr>
<td>3. WC</td>
<td>261.04(82.33)</td>
<td>246.74(76.31)</td>
<td>254.14(79.57)</td>
</tr>
<tr>
<td>4. # of messages sent</td>
<td>15.92(9.24)</td>
<td>13.51(7.30)</td>
<td>14.76(8.42)</td>
</tr>
<tr>
<td>5. Extraversion</td>
<td>3.20(.71)</td>
<td>2.98(.72)</td>
<td>3.09(.72)</td>
</tr>
<tr>
<td>6. Agreeableness</td>
<td>3.62(.55)</td>
<td>3.67(.49)</td>
<td>3.64(.52)</td>
</tr>
<tr>
<td>7. Openness</td>
<td>3.59(.51)</td>
<td>3.44(.54)</td>
<td>3.52(.53)</td>
</tr>
<tr>
<td>8. Empathy</td>
<td>4.11(.26)</td>
<td>4.12(.31)</td>
<td>4.12(.28)</td>
</tr>
<tr>
<td>9. CA</td>
<td>2.73(.57)</td>
<td>2.93(.61)</td>
<td>2.82(.59)</td>
</tr>
<tr>
<td>10. RWA</td>
<td>3.16(.69)</td>
<td>3.39(.51)</td>
<td>3.27(.62)</td>
</tr>
<tr>
<td>11. SOS</td>
<td>1.92(.37)</td>
<td>1.96(.30)</td>
<td>1.94(.34)</td>
</tr>
<tr>
<td>12. IO</td>
<td>2.72(.15)</td>
<td>2.69(.13)</td>
<td>2.70(.14)</td>
</tr>
<tr>
<td>13. Attitude convergence</td>
<td>.67(.80)</td>
<td>.82(.79)</td>
<td>.74(.79)</td>
</tr>
</tbody>
</table>

Note. Numbers not in parentheses are means; Numbers in parentheses are standard deviations; LSS = latent semantic similarity; PIQ = perceived interaction quality; WC = word count; RWA = Right-Wing Authoritarianism; CA = Communication Apprehension; SOS = sense of self; IO = inner-other directedness. Attitude convergence = smaller numbers indicate higher levels of attitude convergence.
Table 2. Correlations of All Variables Among Agreeing and Disagreeing Dyads

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LSS</td>
<td>-</td>
<td>.26*</td>
<td>.34**</td>
<td>.29**</td>
<td>.08</td>
<td>.04</td>
<td>.07</td>
<td>.21</td>
<td>-.12</td>
<td>-.002</td>
<td>-.09</td>
<td>.06</td>
<td>.25*</td>
</tr>
<tr>
<td>2. PIQ</td>
<td>.04</td>
<td>-</td>
<td>.38***</td>
<td>.22*</td>
<td>.22*</td>
<td>-.05</td>
<td>.03</td>
<td>.24*</td>
<td>-.15</td>
<td>-.14</td>
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<td>-.19</td>
</tr>
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<td>.71***</td>
<td>.35**</td>
<td>.02</td>
<td>.13</td>
<td>.11</td>
<td>-.22*</td>
<td>-.25*</td>
<td>-.05</td>
<td>-.11</td>
<td>-.03</td>
</tr>
<tr>
<td>4. # of messages sent</td>
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<td>.06</td>
<td>.63***</td>
<td>-</td>
<td>.20</td>
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<td>.18</td>
<td>.02</td>
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<td>.19</td>
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<td>-.12</td>
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<td>.14</td>
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<td>.09</td>
</tr>
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<td>7. Openness</td>
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<td>.12</td>
<td>-.10</td>
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<td>.09</td>
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<td>-.21</td>
<td>.16</td>
<td>-.13</td>
<td>.07</td>
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<td>.14</td>
<td>.18</td>
<td>.05</td>
<td>.19</td>
<td>.50***</td>
<td>.09</td>
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<td>-.06</td>
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<td>.28*</td>
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<td>-.13</td>
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<td>.03</td>
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</table>

*Note.* Numbers above the diagonal represent correlations of dyads in the agree condition and numbers below the diagonal represent correlations of dyads in the disagree condition; LSS = latent semantic similarity; PIQ = perceived interaction quality; WC = word count; RWA = Right-Wing Authoritarianism; CA = Communication Apprehension; SOS = sense of self; IO = inner-other directedness. Attitude convergence = smaller numbers indicate higher levels of attitude convergence; *p < .05; **p < .01; ***p < .001.
Table 3. Correlations of All Variables Among All Dyads

<table>
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<td>.24**</td>
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<td>.68***</td>
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<td>-.10</td>
<td>-.05</td>
<td>-.26**</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>13. Attitude convergence</td>
<td>.10</td>
<td>-.12</td>
<td>-.05</td>
<td>-.07</td>
<td>-.22**</td>
<td>.003</td>
<td>-.01</td>
<td>-.10</td>
<td>.08</td>
<td>.14</td>
<td>-.04</td>
<td>.01</td>
<td>--</td>
</tr>
</tbody>
</table>

*Note.* LSS = latent semantic similarity; PIQ = perceived interaction quality; WC = word count; RWA = Right-Wing Authoritarianism; CA = Communication Apprehension; SOS = sense of self; IO = inner-other directedness. Attitude convergence = smaller numbers indicate higher levels of attitude convergence; *p < .05; **p < .01; ***p < .001.
3.2 Factor Analysis of Post-Interaction Questionnaire Items

Before conducting the tests of the research hypotheses, a factor analysis was conducted on the post-interaction questionnaire items to determine if the items loaded on one, or more than one, factor as suggested by Tabachnick and Fiddell (2007). The results of this analysis are reported in Table 4. Two factors emerged from the analysis. All but two items (*The interaction seemed awkward, forced, and strained to me; The interaction seemed awkward, forced, and strained to my partner*) loaded on the first factor, which accounted for 64.32% of the variance. Factor 2 consisted of the following items: *The interaction seemed awkward, forced, and strained to me; The interaction seemed awkward, forced, and strained to my partner*, which only accounted for 6.90% of the variance. Because Factor 2 did not account for a substantial amount of variance, a factor score was only computed for Factor 1 and this was used as the measure of perceived interaction quality in the current study.

Table 4. Factor Loadings of the Post-Interaction Questionnaire Items

<table>
<thead>
<tr>
<th>Factor</th>
<th>Items</th>
<th>Factor loadings</th>
<th>% of variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Perceived Interaction Quality</td>
<td>The interaction seemed smooth, natural, and relaxed to me.</td>
<td>.80</td>
<td>64.32%</td>
</tr>
<tr>
<td></td>
<td>The interaction seemed smooth, natural, and relaxed to my partner.</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I felt accepted and respected by my partner,</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My partner felt accepted and respected by me.</td>
<td>.83</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I felt put down, patronized, or rejected by my partner.</td>
<td>-.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My partner felt put down, patronized, or rejected by me.</td>
<td>-.76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I liked my partner.</td>
<td>.86</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My partner liked me.</td>
<td>.88</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I wouldn’t mind interacting more with my partner in the future.</td>
<td>.79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My partner wouldn’t mind interacting more with me partner in the future.</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I understood my partner.</td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td></td>
<td>My partner understood me.</td>
<td>.82</td>
<td></td>
</tr>
</tbody>
</table>
3.3 Manipulation Check of the Dyad Type (Agreeing vs. Disagreeing) Variable

Using LIWC, the frequency of assent words (words that express approval or agreement) were compared for the agreeing versus disagreeing dyads as a manipulation check. A t test indicated that, as expected, the agreeing dyads used more assent words in their interaction than the disagreeing dyads, \( t(162.33) = 3.69, p < .001, 95\% \text{ CI [.19, .63].} \)

3.4 Personality Differences between Agreeing and Disagreeing Dyads

Independent samples \( t \) tests were conducted to determine whether there were any significant personality differences between agreeing dyads who supported the legalization of abortion and dyads who did not support the legalization of abortion (Table 5). The results revealed that dyads who did not support the legalization of abortion scored significantly higher on right-wing authoritarianism than dyads who supported the legalization of abortion. This is in line with previous research showing that individuals who report higher levels of right-wing authoritarianism tend to endorse more conservative-leaning policies (i.e., pro-life) whereas individuals who report lower levels of right-wing authoritarianism tend to endorse more liberal-leaning policies (i.e., pro-life; Benjamin, 2018). Because the focus of the current study investigates dyad-level LSS between dyad members who either agree or disagree on the topic of legalization of abortion, rather than the extent to which they endorse the legalization of abortion,
this observed difference in right-wing authoritarianism was not considered a confound in the study. No other differences emerged.

Table 5. Differences between Pro-Life and Pro-Choice Dyads in Agree Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Condition</th>
<th>Pro-Life (N = 20)</th>
<th>Pro-Choice (N = 68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. LSS</td>
<td></td>
<td>.71(.08)</td>
<td>.73(.08)</td>
</tr>
<tr>
<td>2. PIQ</td>
<td></td>
<td>4.18(.46)</td>
<td>4.38(.38)</td>
</tr>
<tr>
<td>3. WC</td>
<td></td>
<td>246.23(85.06)</td>
<td>265.40(81.64)</td>
</tr>
<tr>
<td>4. # of messages sent</td>
<td></td>
<td>13.28(6.87)</td>
<td>16.70(9.73)</td>
</tr>
<tr>
<td>5. Extraversion</td>
<td></td>
<td>3.04(.53)</td>
<td>3.25(.75)</td>
</tr>
<tr>
<td>6. Agreeableness</td>
<td></td>
<td>3.69(.41)</td>
<td>3.59(.59)</td>
</tr>
<tr>
<td>7. Openness</td>
<td></td>
<td>3.51(.53)</td>
<td>3.61(.51)</td>
</tr>
<tr>
<td>8. Empathy</td>
<td></td>
<td>4.08(.16)</td>
<td>4.13(.29)</td>
</tr>
<tr>
<td>9. CA</td>
<td></td>
<td>2.97(.51)</td>
<td>2.65(.57)</td>
</tr>
<tr>
<td>10. RWA</td>
<td></td>
<td>3.84(.68)</td>
<td>2.96(.56)***</td>
</tr>
<tr>
<td>11. SOS</td>
<td></td>
<td>1.89(.37)</td>
<td>1.93(.37)</td>
</tr>
<tr>
<td>12. IO</td>
<td></td>
<td>2.70(.14)</td>
<td>2.72(.15)</td>
</tr>
<tr>
<td>13. Attitude convergence</td>
<td></td>
<td>0.00(.86)</td>
<td>0.00(.86)</td>
</tr>
</tbody>
</table>

Note. ***p < .001; df = 86; To correct for multiple comparisons, a Bonferroni correction was applied and only p values less than .004 are marked; Numbers not in parentheses are means; Numbers in parentheses are standard deviations; LSS = latent semantic similarity; PIQ = perceived interaction quality; WC = word count; RWA = Right-Wing Authoritarianism; CA = Communication Apprehension; SOS = sense of self; IO = inner-other directedness. Attitude convergence = smaller numbers indicate higher levels of attitude convergence.

3.5 Hypothesis Tests

3.5.1 Hypothesis 1

A specialized form of moderated mediation, known as conditional process analysis modeling (Model 59 in the PROCESS macro for SPSS; Hayes, 2013) was used to examine the relationship between the behaviors that added more words into the conversation (X; word count and the number of messages sent) and perceived interaction quality (Y) via dyad-level LSS (M) at various levels of condition (W; agreeing dyads vs. disagreeing dyads). This allowed me to test the moderating effect of condition on all paths simultaneously (see Figure 1). This analysis
generates bias-corrected 95% confidence intervals with 5000 bootstrapped samples for the estimated indirect effects in both conditions. The indirect effect is significant if the upper and lower bounds of the bias-corrected 95% confidence intervals do not contain zero, thus indicating significant mediation (Preacher & Hayes, 2008). Because PROCESS only allows one independent variable to be tested at a time, two conditional process analyses were run: one with dyad-level word count as the predictor, and another with dyad-level number of messages sent as the predictor. Both models are reported in Table 6.
Figure 1. Conditional Process Analysis Models for Hypothesis 1. Both models test the moderating effect of condition (W) on all paths of the mediation model simultaneously.

<table>
<thead>
<tr>
<th>Paths a and d</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word count</td>
<td>.0001(.0002)</td>
<td>29</td>
<td>[-.0004, .001]</td>
</tr>
<tr>
<td>Condition</td>
<td>-.06(.04)</td>
<td>-1.49</td>
<td>[-.13, .02]</td>
</tr>
<tr>
<td>Word count*Condition</td>
<td>.0003(.0001)</td>
<td>1.81</td>
<td>[.00, .001]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paths b and e</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSS</td>
<td>1.59(1.45)</td>
<td>1.10</td>
<td>[-1.27, 4.45]</td>
</tr>
<tr>
<td>Word count</td>
<td>.003(.001)</td>
<td>1.83</td>
<td>[-.0002, .005]</td>
</tr>
<tr>
<td>LSS*Condition</td>
<td>-.83(.94)</td>
<td>-.88</td>
<td>[-2.69, 1.02]</td>
</tr>
<tr>
<td>Condition</td>
<td>.41(.62)</td>
<td>.66</td>
<td>[-.81, 1.63]</td>
</tr>
<tr>
<td>Word count*Condition</td>
<td>-.001(.001)</td>
<td>-1.04</td>
<td>[-.003, .001]</td>
</tr>
</tbody>
</table>

Conditional Direct Effects (paths e' and f)

<table>
<thead>
<tr>
<th>Agree</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.002(.001)</td>
<td>2.64</td>
<td>[.0004, .003]</td>
</tr>
<tr>
<td></td>
<td>.001(.001)</td>
<td>.79</td>
<td>[-.001, .002]</td>
</tr>
</tbody>
</table>

Conditional Indirect Effects

<table>
<thead>
<tr>
<th>Agree</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.0002(.0002)</td>
<td></td>
<td>[-.0001, .001]</td>
</tr>
<tr>
<td></td>
<td>.00(.0004)</td>
<td></td>
<td>[-.001, .001]</td>
</tr>
</tbody>
</table>

Model 2

<table>
<thead>
<tr>
<th>Paths a and d</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td># of messages sent</td>
<td>.002(.002)</td>
<td>0.92</td>
<td>[-.002, .01]</td>
</tr>
<tr>
<td>Condition</td>
<td>.003(.03)</td>
<td>0.11</td>
<td>[-.05, .05]</td>
</tr>
<tr>
<td># of messages sent*Condition</td>
<td>.0004(.002)</td>
<td>0.3</td>
<td>[-.003, .003]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paths b and e</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSS</td>
<td>2.04(1.41)</td>
<td>1.44</td>
<td>[-.75, 4.83]</td>
</tr>
<tr>
<td># of messages sent</td>
<td>.01(.01)</td>
<td>.79</td>
<td>[-.02, .04]</td>
</tr>
<tr>
<td>Condition</td>
<td>.28(.63)</td>
<td>.45</td>
<td>[-.95, 1.52]</td>
</tr>
<tr>
<td>LSS*Condition</td>
<td>-.95(.89)</td>
<td>-1.07</td>
<td>[-2.70, .80]</td>
</tr>
<tr>
<td># of messages sent*Condition</td>
<td>-.003(.01)</td>
<td>-.38</td>
<td>[-.02, .01]</td>
</tr>
</tbody>
</table>

Conditional Direct Effects (paths e' and f)

<table>
<thead>
<tr>
<th>Agree</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.01(.01)</td>
<td>1.28</td>
<td>[-.004, .02]</td>
</tr>
<tr>
<td></td>
<td>.004(.01)</td>
<td>.51</td>
<td>[-.01, .02]</td>
</tr>
</tbody>
</table>

Conditional Indirect Effects

<table>
<thead>
<tr>
<th>Agree</th>
<th>B(SE)</th>
<th>t</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.003(.002)</td>
<td></td>
<td>[-.0002, .01]</td>
</tr>
<tr>
<td></td>
<td>.0004(.002)</td>
<td></td>
<td>[-.004, .01]</td>
</tr>
</tbody>
</table>

Note. Model 1 = word count as predictor. Model 2 = number of messages sent as predictor. B = standardized coefficient; SE = standard error; t = t value; CI = confidence interval
For both models, none of the individual paths, including the direct and indirect effects, were significant for either condition. Taken together, the results of both conditional process analysis models indicated that dyad-level LSS did not mediate the relationship between behaviors that introduce more words into the conversation (i.e., word count and perceived interaction quality) and perceived interaction quality. Additional mediation models were also run with Factor 2 as the outcome variable and the individual items that measured perceived interaction quality as the outcome variables. However, dyad-level LSS did not emerge as a significant mediator in any of these mediation models either.

3.5.2 Hypotheses 2 and 3

A mixed model repeated-measures analysis of covariance (ANCOVA) was used to examine the trajectory of dyad-level LSS across the three 6-minute time periods. In this model, the dyad’s condition (agree vs. disagree) was analyzed as a between-dyad factor and the dyad’s LSS score for each of the three time periods was analyzed as a within-dyad factor. The main effects of time period and condition, and the time period X condition interaction, were tested in this model. The difference in the number of words used in each interaction period was statistically controlled by using total word count per period as a covariate. Bonferroni post-hoc analyses were conducted to probe the significant effects.

The results are reported in Table 7. The covariate was significant, indicating that total word count per time period had an effect on dyad-level LSS over the three time periods. Controlling for the covariate, there was a significant main effect of time such that LSS was significantly higher at Time 1 than at Time 2 ($p < .001$) and Time 3 ($p < .001$; Figure 2). LSS at Time 2 was not significantly different from LSS at Time 3. This decline of over the course of
each dyad’s interaction, and also declined at the same rate regardless of whether the dyad
members interacted with someone who agreed or disagreed with them on the controversial topic.
None of the other main effects or interactions were significant.

Figure 2. Trajectory of LSS across the Three Periods of Interaction by Condition.

Table 7. Mixed Model Repeated-Measures ANCOVA

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LSS across time</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>2, 368.28</td>
<td>42.76***</td>
</tr>
<tr>
<td>Condition</td>
<td>1, 165.80</td>
<td>.25</td>
</tr>
<tr>
<td>Time*Condition</td>
<td>2, 333.26</td>
<td>.04</td>
</tr>
<tr>
<td>Word count</td>
<td>1, 422.94</td>
<td>252.25***</td>
</tr>
<tr>
<td><strong>Frequency of first person singular</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pronouns across time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>2, 364.89</td>
<td>51.87***</td>
</tr>
<tr>
<td>Condition</td>
<td>1, 166.94</td>
<td>.77</td>
</tr>
<tr>
<td>Time*Condition</td>
<td>2, 334.07</td>
<td>.97</td>
</tr>
<tr>
<td>Word count</td>
<td>1, 495.27</td>
<td>2.13</td>
</tr>
<tr>
<td><strong>Frequency of second person</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Two ANCOVA models were run to determine if there were differences in the observed percentage use of second-person singular pronouns (you) and first-person singular pronouns (I) between any of the three 6-minute interaction periods controlling for word count in each of the three periods of interaction (Table 7). The percentage use of second-person singular pronouns was entered into the first model as the outcome variable, and the percentage use of first-person singular pronouns was entered into the second model as the outcome variable. In the first model, there was a main effect of time such that the percentage use of second-person singular pronouns at Time 1 ($M = 3.28, SE = .22$) was significantly higher than the percentage use of second-person singular pronouns at Time 2 ($M = 2.07, SE = .26; p < .001$) and at Time 3 ($M = 1.79, SE = .19; p < .001$). The percentage use of second-person singular pronouns at Time 2 and Time 3 were not significantly different from each other. The interaction between time and condition was not significant, indicating that the percentage use of second-person singular pronouns declined significantly over the course of the interaction equally and that this rate of decline did not differ between agreeing and disagreeing dyads.

The second model yielded the same pattern of results. There was a main effect of time such that the percentage use of first-person singular pronouns at Time 1 ($M = 5.75, SE = .36$) was significantly higher than the percentage use of first-person singular pronouns at Time 2 ($M = 3.47, SE = .43; p < .001$) and at Time 3 ($M = 3.59, SE = .31; p < .001$). The percentage use of first-person singular pronouns at Time 2 and Time 3 were not significantly different from each
other. The interaction between time and condition was not significant, indicating that the decline in percentage use of first-person singular pronoun use did not differ between agreeing and disagreeing dyads.

On the surface, these results may suggest that, similar to agreeing dyads, disagreeing dyads were also motivated to achieve high LSS at the beginning of the interaction. And, once they achieved this, their motivation to maintain high LSS by directly involving their interaction partner in their conversation waned over time, thus leading to a decline in LSS. However, it is also possible that the decline in dyad-level LSS for disagreeing dyads may be due to the dyad members’ inability to understand each other’s point of view, which may have become more evident the longer they talked about their opposing stances on abortion.

If the latter were the case, there should be more evidence of dyad members expressing their understanding and awareness of their partner’s stance on abortion at the beginning of the interaction than at the end of the interaction for disagreeing dyads but not for agreeing dyads. This hypothesis can be tested by analyzing each discussion transcript using the LIWC program.

Using a higher frequency of words that represent perceptual processes (e.g., seeing, hear) indicates greater awareness of information and is used to express what one has come to realize or understand (e.g., I see what you mean; I hear you; Bond, & Lee, 2005; Hamilton-West, 2007). In this case, if dyad-level LSS and the motivation to maintain high dyad-level LSS declined across time for disagree dyads due to their persisting inability to understand each other’s point of view across their interaction, the frequency of perceptual process words should also decline across the interaction for dyads in the disagree condition but not for dyads in the agree condition.

To test this hypothesis, a repeated measures ANCOVA was run to determine the trajectory of perceptual process words across the three 6-minute time periods. The dyad’s
condition (agree vs. disagree) was analyzed as between-dyads factor and the dyad-level frequency of perceptual processes words for each of the three time periods was analyzed as a within-dyads factor. The main effects of time period and condition, as well as the time X condition interaction, were tested. The difference in the number of words used in each interaction period was statistically controlled by using total word count per period as a covariate. Bonferroni post-hoc analyses were conducted to probe the significant effects.

There was a main effect of time, $F(2, 369.25) = 6.20, p = .002$, such that there was a higher frequency of perceptual process words at Time 1 ($M = .60, SE = .09$) than Time 2 ($M = .36, SE = .11$) and Time 3 ($M = .38, SE = .08$). There was no significant difference between Time 2 and Time 3. There was also a significant time X condition interaction, $F(2, 334.50) = 3.26, p = .04$, such that the frequency of perceptual process words significantly declined across time for dyads in the disagree condition, but remained stable for dyads in the agree condition (Figure 3). These results suggest that the decline of dyad-level LSS among disagreeing dyads was related to the dyad members’ persisting inability to understand their partner’s stance on abortion across their interaction, and the effect of that inability to understand on their motivation to maintain high dyad-level LSS across their interaction.

4Because virtually all of the LIWC variables represent the percentage of words that belong to a particular linguistic category, LIWC variables already correct for the number of words used. Given this correction, it is possible that including word count as a covariate in any models that include LIWC variables might result in some degree of over-correction for the total number of words used. To avoid any such over-correction, ANOVA models with first-person singular pronouns, second-person singular pronouns, and perceptual processes words as the outcome variables were re-run without word count as a covariate. The results did not change when word count was removed from the models as a covariate, suggesting that inclusion of word count in the ANOVA models did not result in an over-correction of the effects (see Appendix C for more details).
3.5.2.1 Word Count. Because word count emerged as a significant covariate in each of the ANCOVA models, an ANOVA model was conducted to investigate the trajectory of word count across each of the three 6-minute interactions. The dyads’ condition (agree vs. disagree) was analyzed as between-dyads factor and the dyad-level word count for each of the three time periods was analyzed as a within-dyads factor. The main effects of time period and condition, as well as the time X condition interaction, were tested. There was a significant main effect of time, \( F(2, 334) = 90.92, p < .001 \), such that word count at Time 2 (\( M = 106.15, SE = 2.69 \)) was significantly higher than at Time 1 (\( M = 82.98, SE = 2.69; p < .001 \)) and at Time 3 (\( M = 65.17, SE = 2.69; p < .001 \)). Word count was also significantly higher at Time 1 than at Time 3, \( p < .001 \). Condition did not emerge as a significant main effect, \( F(1, 167) = .93, p = .34 \), and the interaction between time and condition was also not significant, \( F(2, 334) = 1.73, p = .18 \). The
results indicated that, for all dyads, the amount of talking was highest during the middle portion of their interaction and lowest towards the end of their conversation.

3.5.3 Hypothesis 4

A multiple regression analysis was run to determine if higher dyad-level agreeableness, openness to experience, extraversion, affective empathy, but lower dyad-level communication apprehension and right-wing authoritarianism, significantly predicted dyad-level LSS. All personality variables were mean centered and entered into a multiple regression model to determine if they significantly predicted dyad-level LSS. In addition, I sought to determine if condition (agree or disagree) moderated the relationship between each of the personality variables and dyad-level LSS. Word count was also entered into the model as a covariate.

Table 8 reports the full results of the regression model. There was a main effect of dyad-level empathy such that higher dyad-level empathy predicted higher dyad-level LSS. However, the dyad-level empathy X condition interaction was not significant, indicating that higher dyad-level empathy predicted higher dyad-level LSS for all dyads, regardless of which condition they were in.

Table 8. Results of Multiple Regression

<table>
<thead>
<tr>
<th>Variable</th>
<th>b(SE)</th>
<th>β</th>
<th>t</th>
<th>sr²</th>
<th>95% CI for b</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>.003(.01)</td>
<td>.02</td>
<td>.27</td>
<td>.0004</td>
<td>[-.02, .02]</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.01(.01)</td>
<td>-.04</td>
<td>-.50</td>
<td>.001</td>
<td>[-.03, .02]</td>
</tr>
<tr>
<td>Openness</td>
<td>-.002(.01)</td>
<td>-.02</td>
<td>-.22</td>
<td>.0002</td>
<td>[-.02, .02]</td>
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<tr>
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<td>.10</td>
<td>1.33</td>
<td>.01</td>
<td>[.01, .03]</td>
</tr>
<tr>
<td>Empathy</td>
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<td>.19</td>
<td>2.40*</td>
<td>.03</td>
<td>[.01, .10]</td>
</tr>
<tr>
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<td>-.04</td>
<td>-.44</td>
<td>.001</td>
<td>[.03, .02]</td>
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<tr>
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<td>-.61</td>
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<tr>
<td>Word Count</td>
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<td>5.42***</td>
<td>.14</td>
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<tr>
<td>Extraversion</td>
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<td>-2.53</td>
<td>.03</td>
<td>[-.14, -.02]</td>
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<td>-.01</td>
<td>-.10</td>
<td>.0001</td>
<td>[-.04, .04]</td>
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<tr>
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<td>Standardized</td>
<td>p-value</td>
<td>95% CI</td>
<td></td>
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<td>--------------</td>
<td>---------</td>
<td>--------------</td>
<td></td>
</tr>
<tr>
<td>Openness</td>
<td>-.01 (.02)</td>
<td>-.06</td>
<td>.61</td>
<td>.02 [-.04, .02]</td>
<td></td>
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<tr>
<td>RWA</td>
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<td>.06</td>
<td>.45</td>
<td>.01 [-.03, .04]</td>
<td></td>
</tr>
<tr>
<td>Empathy</td>
<td>.04 (.03)</td>
<td>.15</td>
<td>1.40</td>
<td>.01 [-.02, .11]</td>
<td></td>
</tr>
<tr>
<td>CA</td>
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<td>.08</td>
<td>.67</td>
<td>.02 [-.02, .04]</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
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<td>-.05</td>
<td>-.63</td>
<td>.02 [-.02, .01]</td>
<td></td>
</tr>
<tr>
<td>Extraversion*Condition</td>
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<td>.76</td>
<td>2.71**</td>
<td>.04 [-.02, .09]</td>
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</tr>
<tr>
<td>Agreeableness*Condition</td>
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<td>-.01</td>
<td>-.07</td>
<td>.0003 [-.05, .05]</td>
<td></td>
</tr>
<tr>
<td>Openness*Condition</td>
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<td>.09</td>
<td>.84</td>
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<td></td>
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<tr>
<td>RWA*Condition</td>
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<td>.08</td>
<td>.62</td>
<td>.02 [-.03, .06]</td>
<td></td>
</tr>
<tr>
<td>Empathy*Condition</td>
<td>.03 (.05)</td>
<td>.08</td>
<td>.72</td>
<td>.02 [-.06, .12]</td>
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</tr>
<tr>
<td>CA*Condition</td>
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<td>.08</td>
<td>-.145</td>
<td>.03 [-.08, .01]</td>
<td></td>
</tr>
<tr>
<td>Word Count</td>
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<td>.43</td>
<td>5.55***</td>
<td>.01 [.00, .001]</td>
<td></td>
</tr>
</tbody>
</table>

Note. b = unstandardized coefficient; ß = standardized coefficient; SE = standard error; t = t value; CI = confidence interval; *p < .05; **p < .01; ***p < .001; CA = Communication Apprehension; RWA = Right-Wing Authoritarianism.

There was also a significant dyad-level extraversion X condition interaction. To probe this interaction, the relationship between dyad-level extraversion and LSS was examined among agreeing dyads and disagreeing dyads. The relationship between dyad-level extraversion and dyad-level LSS was positive and significant for disagreeing dyads, b = .04, ß = .35, SE = .02, t = 2.54, p = .01, sr² = .04, 95% CI [.01, .07], but not for agreeing dyads, b = -.01, ß = -.09, SE = .02, t = -.62, p = .54, sr² = .002, 95% CI [-.04, .02]. The ability to sustain externally-focused attention on one’s interaction partner in a controversial conversation facilitates greater linguistic shared meaning, particularly when one’s interaction partner holds an opposing attitude on the topic of discussion. This ability does not seem to facilitate greater linguistic shared meaning when one’s interaction partner holds the attitude on the topic of discussion. None of the other main effects or interactions were significant.

In addition to assessing the personality variables as an average score between both interaction partners, I also examined personality difference scores among dyad partners to determine if absolute differences in their personality scores significantly predicted dyad-level
LSS. Personality difference scores were calculated by first standardizing all variables, then subtracting one dyad member’s score on a given personality variable from their partner’s score on a given personality variable, and then taking the absolute value. This procedure allowed me to determine if larger differences in personality between the interaction partners predicted dyad-level LSS—an effect that is not captured in dyad-level (i.e., averaged) personality scores. The same multiple regression was conducted with the personality difference scores. Results are reported in Table 9.

<table>
<thead>
<tr>
<th>Variable</th>
<th>b(SE)</th>
<th>ß</th>
<th>t</th>
<th>sr²</th>
<th>95% CI for b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block 1</td>
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<td></td>
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<tr>
<td>Extraversion</td>
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<td>.01</td>
<td>.08</td>
<td>.00003</td>
<td>[-.02, .02]</td>
</tr>
<tr>
<td>Agreeableness</td>
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<td>.02</td>
<td>.26</td>
<td>.0003</td>
<td>[-.02, .02]</td>
</tr>
<tr>
<td>Openness</td>
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<td>.01</td>
<td>.08</td>
<td>.00004</td>
<td>[-.02, .02]</td>
</tr>
<tr>
<td>RWA</td>
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<td>-.02</td>
<td>-.29</td>
<td>.0004</td>
<td>[-.02, .02]</td>
</tr>
<tr>
<td>Empathy</td>
<td>-.03(.02)</td>
<td>-.15</td>
<td>-1.92</td>
<td>.02</td>
<td>[-.06, .01]</td>
</tr>
<tr>
<td>CA</td>
<td>.01(.01)</td>
<td>.10</td>
<td>1.27</td>
<td>.01</td>
<td>[-.01, .04]</td>
</tr>
<tr>
<td>Condition</td>
<td>-.002(.01)</td>
<td>-.02</td>
<td>-.30</td>
<td>.001</td>
<td>[-.01, .01]</td>
</tr>
<tr>
<td>Word Count</td>
<td>.00(.00)</td>
<td>.42</td>
<td>5.27</td>
<td>.15***</td>
<td>[.00, .001]</td>
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<tr>
<td>Extraversion*Condition</td>
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<td>-1.93</td>
<td>.02</td>
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<td>Agreeableness*Condition</td>
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<td>-.12</td>
<td>.0001</td>
<td>[-.03, .02]</td>
</tr>
<tr>
<td>Openness*Condition</td>
<td>.01(.01)</td>
<td>.03</td>
<td>.44</td>
<td>.001</td>
<td>[-.02, .03]</td>
</tr>
<tr>
<td>RWA*Condition</td>
<td>.01(.01)</td>
<td>.06</td>
<td>.78</td>
<td>.003</td>
<td>[-.01, .03]</td>
</tr>
<tr>
<td>Empathy*Condition</td>
<td>.003(.02)</td>
<td>.01</td>
<td>.13</td>
<td>.0001</td>
<td>[-.04, .05]</td>
</tr>
<tr>
<td>CA*Condition</td>
<td>-.02(.01)</td>
<td>-.16</td>
<td>-1.78</td>
<td>.02</td>
<td>[-.05, .002]</td>
</tr>
</tbody>
</table>
There was a main effect of empathy such that smaller difference scores predicted higher dyad-level LSS. In other words, dyad members who were more similar in terms of their levels of empathy achieved higher dyad-level LSS. Dyad members with larger discrepancies in terms of their levels of empathy achieved lower dyad-level LSS. None of the other main effects or interactions were significant.

This main effect of empathy would also suggest that dyad members who both report low levels of empathy, as well as dyad members who both report high levels of empathy, achieve higher dyad-level LSS. The former effect contradicts the previous results showing that higher dyad-level LSS predicts higher dyad-level LSS. However, it is important to note a limitation of difference scores: when assessing the relationship between difference scores and other variables, only one portion of the difference score could be driving the observed relationship (Laird & Weems, 2011; Stern & West, 2018). In other words, the observed relationship could solely be due to the relationship between dyad members who both report high levels of empathy and higher dyad-level LSS, and not the relationship between dyad members who both report low levels of empathy and higher dyad-level LSS. The previous results linking higher dyad-level empathy with higher dyad-level LSS provides support for this conclusion.

3.5.4 Hypothesis 5

3.5.4.1 Did Dyad Members’ Attitudes Become More Similar After Their Interaction?

Before their online interaction, each dyad member’s attitudes towards the legality of abortion and the availability of abortions through local healthcare providers were measured via the following items on a Likert-type scale (1 = strongly disagree, 5 = strongly agree): *Abortion should be legal*
and *Local healthcare providers should provide legal abortions*. These two items were averaged together to represent each dyad member’s attitude towards abortion at *pre*-interaction. Each dyad member’s attitudes towards the legality of abortion and the availability of abortions through local healthcare providers using the same two items were assessed a second time immediately after their online interaction. These two items were averaged together to represent each dyad member’s attitude towards abortion at *post*-interaction. Attitude difference scores were calculated by subtracting one dyad member’s attitude towards abortion from their partner’s attitude towards abortion and then taking the absolute value. For example, if one dyad member’s abortion attitude score was 1 and their partner’s abortion attitude score was 5, then their difference score on abortion would be 4. This was calculated for each dyad member’s pre-interaction abortion attitude score as well as their post-interaction abortion attitude score, resulting in two attitude difference scores for each dyad. Smaller scores indicated greater attitude similarity.

A repeated-measures ANOVA was run to determine if the dyad partners’ attitudes became more similar after their interaction. The degree of similarity between the dyad partners’ attitude toward abortion at pre-interaction and at post-interaction was analyzed as a within-dyads factor, and the dyad’s condition (agree vs. disagree) was analyzed as a between-dyads factor. Overall, the dyad members’ attitudes did become more similar from pre-interaction (*M* = 1.71, *SE* = .05), to post-interaction. (*M* = 1.51, *SE* = .08), *F*(1, 168), Pillai’s Trace = .30, *p* = .02. This convergence also varied by condition, *F*(1, 168), Pillai’s Trace = .03, *p* = .02. Dyad partners’ attitudes became more similar from pre-interaction (*M* = 2.88, *SE* = .08) to post-interaction (*M* = 2.49, *SE* = .11; *p* = .00) for disagreeing dyads (*p* = .001). The dyad partners’ attitudes did not become more similar from pre- to post-interaction for agreeing dyads (*p* = 1.00).
However, this convergence could be due to a statistical artifact known as regression toward the mean (RTM) in which extreme values that were observed during pre-test tend to be followed by measurements that are closer to the mean when taken at post-test (Trochim, 2006). This potential artifact required me to determine if the attitude changes observed between pre- and post-interaction were due to RTM or if they were due to real changes in attitude. The technique that was used in Cuperman, Robinson, and Ickes (2012) to control for RTM in dyadic data was used in the current study (see Appendix D). This technique involved calculating a value for each dyad that reflected the amount of RTM from pre-test to post-test.

The same analysis was run again, except the values reflecting the amount of RTM from pre-test to post-test was entered into the model as a covariate. After controlling for RTM, the previous results were no longer significant. The dyad members’ attitudes no longer significantly converged from pre-interaction to post-interaction, $F(1, 167)$, Pillai’s Trace = .002, $p = .59$, and this convergence no longer varied by condition, $F(1, 167)$, Pillai’s Trace = .02, $p = .09$. These results after controlling for RTM suggested that any convergence in attitude was due to RTM rather than any real changes in attitude.

3.5.4.2 Did Greater LSS Lead to Greater Attitude Convergence Via Perceived Interaction Quality for Dyads in the Disagree Condition? Next, each dyad’s pre-interaction similarity scores were subtracted from their post-interaction similarity scores. This result represented the extent to which the dyad members’ attitudes toward abortion converged after their interaction, with smaller numbers indicating higher levels of attitude convergence. Figure 4 illustrates the frequency distribution of attitude convergence rates among disagreeing dyads. Out of 82 dyads in the disagreeing condition, 34 dyads exhibited no change in attitude, 29 dyads exhibited a numerical convergence in attitude, and 19 dyads exhibited a numerical divergence in attitude.
Additional analyses exploring the relationship between attitude polarization and perceived interaction quality suggest that more negatively perceived interactions are associated with higher levels of attitude polarization at the end of discussion (see Appendix E for more information).

![Figure 4. Frequency distribution of attitude convergence rates among disagreeing dyads.](image)

Last, I assessed if greater LSS (X) was associated with greater attitude convergence (Y) via perceived interaction quality (M) for dyads in the disagree condition (W) using a conditional process analysis (Model 59 in PROCESS; Hayes, 2013). Again, this analysis allowed me to compare the direct effects and indirect effects among the agreeing and disagreeing dyads. Dyad-level sense of self, dyad-level inner-other directedness, and values reflecting the amount of RTM in attitude change from pre-test to post-test were entered into the model as covariates (Figure 5). The results are reported in Table 10. None of the paths were significant. Dyad-level LSS did not lead to greater attitudinal convergence via dyad-level perceived interaction quality for dyads in either condition.
Figure 5. Conditional Process Analysis Model for Hypothesis 5.

Table 10. Results of Conditional Process Analysis for Hypothesis 5

<table>
<thead>
<tr>
<th>Paths a and d</th>
<th>$\beta(SE)$</th>
<th>$t$</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSS</td>
<td>2.57(1.39)</td>
<td>1.85</td>
<td>[-.17, 5.30]</td>
</tr>
<tr>
<td>Condition</td>
<td>.49(.65)</td>
<td>.76</td>
<td>[-.79, 1.77]</td>
</tr>
<tr>
<td>LSS*Condition</td>
<td>-1.27(.88)</td>
<td>-1.44</td>
<td>[-3.01, .47]</td>
</tr>
<tr>
<td>SOS</td>
<td>-.14(.11)</td>
<td>-1.31</td>
<td>[-.35, .07]</td>
</tr>
<tr>
<td>IO</td>
<td>.21(.25)</td>
<td>.83</td>
<td>[-.29, .71]</td>
</tr>
<tr>
<td>RTM</td>
<td>-.05(.08)</td>
<td>-.62</td>
<td>[-.21, .11]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paths b and e</th>
<th>$\beta(SE)$</th>
<th>$t$</th>
<th>95% CI</th>
</tr>
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<tr>
<td>Perceived interaction quality</td>
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<td>.64</td>
<td>[-.81, 1.58]</td>
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<tr>
<td>LSS</td>
<td>-.80(3.25)</td>
<td>-.25</td>
<td>5.62</td>
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<tr>
<td>Condition</td>
<td>.89(1.90)</td>
<td>.47</td>
<td>4.65</td>
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<tr>
<td>Perceived interaction quality*Condition</td>
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<td>-1.61</td>
<td>[-1.31, .13]</td>
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<tr>
<td>LSS*Condition</td>
<td>1.40(2.05)</td>
<td>.69</td>
<td>5.44</td>
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<td>SOS</td>
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<td>-.15</td>
<td>[-.51, .44]</td>
</tr>
<tr>
<td>IO</td>
<td>.65(.57)</td>
<td>1.14</td>
<td>[-.48, 1.78]</td>
</tr>
<tr>
<td>RTM</td>
<td>-.53(.19)</td>
<td>-2.78</td>
<td>[-.90, -.15]</td>
</tr>
<tr>
<td>Conditional direct effects (paths c', f)</td>
<td>Effect(SE)</td>
<td>t</td>
<td>95% CI</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------</td>
<td>----</td>
<td>----------</td>
</tr>
<tr>
<td>Agree</td>
<td>.60(1.44)</td>
<td>.42</td>
<td>[-2.25, 3.44]</td>
</tr>
<tr>
<td>Disagree</td>
<td>2.00(1.39)</td>
<td>1.44</td>
<td>[-.75, 4.75]</td>
</tr>
<tr>
<td>Conditional indirect effects</td>
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<td></td>
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<tr>
<td>Agree</td>
<td>-.26(.39)</td>
<td></td>
<td>[-1.28, .35]</td>
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<tr>
<td>Disagree</td>
<td>-.02(.65)</td>
<td></td>
<td>[-1.38, 1.30]</td>
</tr>
</tbody>
</table>

*Note.* Model 1 = word count as predictor. Model 2 = number of messages sent as predictor. β = standardized coefficient; SE = standard error; t = t value; CI = confidence interval. SOS = Sense of Self. IO = Inner-Other Directedness. RTM = regression towards the mean.
Discussion

This is the first study, to my knowledge, to examine the trajectory and personality predictors of latent semantic similarity in initial computer-mediated discussions between dyad members with opposing views. Overall, the results provide important insights regarding the nature and dynamics of the establishment of linguistic shared meaning in online political discourse.

4.1 Hypothesis 1

Because previous studies have shown that dyad-level behaviors that introduce more words into the conversation are associated with higher dyad-level LSS, and because getting on the same page linguistically (especially when engaging in a controversial topic of discussion) should elicit a positive evaluation regarding the perceived quality of the interaction experience, I predicted that dyad-level LSS would mediate the relationship between behaviors that added more words into the interaction (i.e., the number of messages sent and word count) and perceived interaction quality. However, the results revealed no support for this prediction. Using more words and sending more messages in the interaction did not predict higher dyad-level LSS, and higher dyad-level LSS did not predict a more positive perception of interaction quality. These results were surprising considering previous findings by Ta et al. (2017) and Ta and Ickes (under review) which revealed that dyad-level behaviors that introduce more words into the conversation (i.e., total word count and the number of messages sent) were associated with higher dyad-level LSS.

It is possible that the topic of discussion in the current study played a role in these unexpected null findings. In the previous studies (Ta et al., 2017; Ta & Ickes, under review),
dyad partners could talk about any topic of their choosing, whereas dyad partners in the current study were instructed to talk about a very specific politically-contentious issue (i.e., their views on the political issue of abortion). This difference in conversation topic suggests that the relationship between behaviors that add more words into the interaction and dyad-level LSS may only apply to certain topics or types of conversations.

The structured and political conversations in the current study differ from the unstructured and non-political ones in previous studies in many important ways. Interaction partners in the current study were constrained to a very specific and limited subject, which likely prevented them from easily taking the conversation into a direction that would have allowed them to increase their dyad-level LSS (e.g., by switching to a different topic of conversation). Political discussions (especially between political opponents) are also generally considered more unpleasant, stressful, and frustrating than non-political discussions (Pew Research Center, June, 2016). Studies conducted by the Pew Research Center (August, 2016; October 2016) have shown that most people tend to avoid engaging in any sort of political discussions online due to this reason. The potential for the conversation to become antagonistic, along with the preexisting negative views of political discussions, could have further prevented dyad members from being able to get on the same page linguistically with one another.

The complexity of political discussions in general could be another reason for these null findings. Several scholars have indicated that measuring the quality of political discussions is difficult because there is a high amount of variability in how individuals conceptualize the quality of a political discussion compared to other types of discussions (Benson, 2011; Jamieson, Volinsky, Weitz, & Kenski, 2017; Massaro & Stryker, 2012). For example, some individuals may rate the quality of a political conversation based on its degree of civility whereas others may
rate the quality of a political conversation based on the extent to which interaction partners agree on the political topic. As Ferre, Gamson, Gerhards, and Rucht (2002) indicated regarding political discussions: “What is normal in public discussion in some places is rude in others; and what is considered a normal way of showing respect in some venues seems mannered and arid in others.” Scholars even disagree on how to define positive and negative interactions in the context of political conversations (Brooks & Geer, 2007; Coe, Kenski & Rains, 2014; Fridkin & Kenney, 2004, 2008, 2011; Jamieson & Falk, 2000; Massaro & Stryker, 2012; Mutz & Reeves, 2005; Mutz, 2007; Papacharissi, 2004; Sobieraj & Berry, 2011). This complex nature of political conversations suggests that achieving high dyad-level LSS during politically-contentious conversations may not necessarily lead interaction partners to view their interaction as a positive one.

4.2 Hypothesis 2 and 3

I predicted that dyad-level LSS scores should remain more stable for disagreeing dyads than for agreeing dyads as the interaction partners pass through the three stages of their online interaction. Agreeing dyad members should follow a trajectory that is similar to the one reported in Ta et al. (2017)—once they achieve high dyad-level LSS at the beginning of their interaction that is sufficient enough to sustain the conversation, this effort should be relaxed and LSS should consequently decrease. However, disagreeing dyads should be more motivated to ensure that they have the same understanding of the issue throughout their interaction. This would result in a more stable trajectory of LSS across the three stages of their online interaction. However, the results revealed a significant decline in LSS, along with a significant decline in the percentage use of first-person singular pronouns (I) and in the percentage use of second-person singular pronouns (you), over the course of each dyadic interaction in both conditions.
On the one hand, the decline of LSS, the percentage use of first-person singular pronouns, and the percentage use of second-person singular pronouns among both agreeing and disagreeing dyads suggest that disagreeing dyads experienced the same decline in motivation to maintain high dyad-level LSS over time, just as the agreeing dyads had experienced. However, it was also possible that the decline in dyad-level LSS for disagreeing dyads was due to their persisting inability to understand each other’s point of view the longer they talked about their opposing stances on abortion. In other words, the dyad members’ attitudinal differences on abortion may have become increasingly apparent as the interaction progressed, subsequently influencing their ability and motivation to maintain high dyad-level LSS throughout their interaction.

Follow-up analyses provided support for the latter interpretation. A significant decrease in the frequency of perceptual process words (i.e., words that are commonly used to portray greater awareness of information and express what one has come to realize or understand) was observed over the course of the disagreeing dyads’ interaction, but not the agreeing dyads’ interaction. This pattern of results also implies that seemingly similar patterns of dyad-level LSS across an interaction can be due to different underlying processes. A decline in LSS can indicate a lack of motivation to maintain high LSS over time (as observed in agreeing dyads), or it can indicate an increasing lack of understanding on the topic of discussion (as observed in disagreeing dyads).

4.3 Hypothesis 4

Because higher dyad-level openness to experience, extraversion, agreeableness, empathy, and lower dyad-level communication apprehension and right-wing authoritarianism should lead to behaviors that facilitate a common-ground understanding, I predicted that these traits would
account for some of the variance in dyad-level LSS. The results revealed that only two of these traits—extraversion and empathy—significantly predicted higher dyad-level LSS. Specifically, higher dyad-level extraversion positively and significantly predicted higher dyad-level LSS, but this effect was present for disagreeing dyads only. This effect suggests that the ability to sustain externally-focused attention on one’s interaction partner in a controversial conversation facilitates greater linguistic shared meaning, particularly when one’s interaction partner holds an opposing attitude on the topic of discussion.

Previous studies have suggested that extraverts do tend to be more engaging, communicative, and articulate, particularly when interacting with someone who does not share their views on a given topic (e.g., Caldwell & Burger, 1997; Lobel, 1987; Weaver, 2005). This could be a possible reason why the relationship between extraversion and LSS was not present for agreeing dyads—they already share the same attitude on the topic of discussion and therefore have no need to be as engaging, communicative, and articulate compared to disagreeing dyad members. Thus, being able to sustain externally-focused attention on one’s interaction partner may not contribute anything significant to agreeing dyad members’ ability to get on the same page linguistically, as they are already on the same page to begin with (i.e., they already share the same stance on abortion).

In addition, higher dyad-level affective empathy positively and significantly predicted higher dyad-level LSS and this effect did not differ by condition. The ability to “resonate” with another person’s thoughts and feelings while understanding that they are distinct from one’s own allowed all dyads to achieve higher linguistic shared meaning, regardless of whether they interacted with someone who agreed or disagreed with their stance on abortion. Thus, common-ground understanding can just as easily develop among those who disagree (compared to those
who agree on the same topic) when dyad members have higher levels of affective empathy. Rather, it is the ability to emotionally experience and understand another person’s internal states that seems to be essential in the development of common-ground understanding.

In addition, previous research provides support for the association between affective empathy and more prosocial behaviors in general. For instance, higher affective empathy is linked with less conflict (Cramer & Jowett, 2010), more constructive responses to interpersonal conflict, and less verbal aggression (Richardson et al., 1994). Empathic responsiveness and high affective empathy is positively related to prosocial behaviors and negatively related to bullying behaviors (Eisenberg & Fabes, 1998; Jolliffe & Farrington, 2006b; Miller & Eisenberg, 1988), including verbal aggression (Olweus, 1994). Low affective empathy is also related to Dark Triad traits (narcissism, Machiavellianism, and psychopathy), which are linked to verbally destructive behaviors over the internet and other various forms of online antisociality (Buckels, Trapnell, & Paulhus, 2014; Lenhardt, 2013). Thus, affective empathy seems to foster more desirable and cooperative social behaviors.

The personality difference scores among dyad partners were also assessed to determine if absolute differences in personality scores significantly predicted dyad-level LSS. This revealed that dyad partners with more similar levels of empathy (i.e. dyad members who both report low levels of empathy and dyad members who both report high levels of empathy) achieved higher dyad-level LSS. However, given that higher dyad-levels of empathy were linked to higher dyad-level LSS in the first multiple regression model, and given the known limitations of difference scores, these results taken together suggest that dyad partners with more similar and higher levels of empathy are better able to get on the same page linguistically than dyad partners with less similar and lower levels of empathy.
But why did openness to experience, agreeableness, communication apprehension, and right-wing authoritarianism not emerge as significant predictors of dyad-level LSS? Although openness to experience has been shown to be related to more online political participation, a study by Roets, Cornelis, and Van Hiel (2014) suggests that this association depends on several factors, including the geo-political context and political orientation of the interaction partners. In other words, scoring high on openness to experience does not automatically mean that one will achieve high LSS in political conversations online. It may depend on the specific issue, the temporal and geographic relevancy of the issue, and the political orientation of the people involved. Regarding agreeableness, it has been found to correlate with lower levels of political participation because one of its facets, conflict avoidance, hinders people from being active in political interactions (Blais & Labbé-St-Vincent, 2011; Mutz, 2002; Ulbig & Funk, 1999). Thus, dyads who were high in agreeableness may have been more restrained and subdued in the interaction, resulting in the non-significant relationship between agreeableness and dyad-level LSS.

Previous studies have shown that, although people can have high communication apprehension in face-to-face interactions, this apprehension may not apply in the same way in computer-mediated interactions. For instance, high communication apprehension scores may only reflect high communication apprehension in face-to-face interactions rather than computer-mediated interactions. In fact, those who are high in face-to-face communication apprehension often experience much less communication apprehension via computer-mediated interactions and thus prefer this mode of interaction over others (Caplan, 2003; Hertel et al., 2008; Joinson, 2004; Saunders & Chester, 2008; Stritzke et al., 2004). Those with higher communication apprehension are also more willing to disclose less socially desirable information in computer-
mediated interactions compared to equivalent face-to-face ones (Joinson, 2004) due to the
distance and anonymity that is provided through the cover of computer-mediated interactions,
and the reduced non-verbal cues in computer-mediated interactions compared to face-to-face
ones (Caplan & Turner, 2007; Wizelberg, 1997; Wright, 2002). Thus, the differential effect of
communication apprehension in face-to-face interactions versus computer-mediated interactions
may have contributed to the lack of a significant relationship between communication
apprehension and dyad-level LSS.

A possible reason for the lack of association between right-wing authoritarianism and
dyad-level LSS could be the range restriction of dyad-level right-wing authoritarianism scores in
the current sample. The current sample reported very low levels of right-wing authoritarianism,
with dyad-level scores ranging from 1.67 to 5.03 (with a maximum score of 9). Most of the
dyad-level right-wing authoritarianism scores were below the scale midpoint of 5. Only one dyad
scored above the scale midpoint with a dyad-level score of 5.03. This restriction of range
suggests that there simply was not enough variation in right-wing authoritarianism scores to
detect a relationship with dyad-level LSS, as it has been demonstrated that a restricted range of
values can reduce correlations or result in no correlation (Bland & Altman, 2011). Note that all
the other personality variables tested in this study did not show the same degree of range
restriction as right-wing authoritarianism.

4.4 Hypothesis 5

Fourth, because previous research has shown that a person is more likely to be influenced
by their interaction partner’s attitudes if they like their interaction partner and if they believe
their interaction partner likes them (Cialdini, 2001; Chaiken, 1987), I hypothesized that dyad
members who achieved higher, rather than lower, dyad-levels of LSS should experience a greater
sense of mutual rapport that should be associated with a more positive perceived interaction experience (which includes the extent to which they liked each other, and believe that they are liked in return by their dyad partner). Heightened levels of liking should then lead to more attitude convergence on the topic of discussion between interaction partners (Berscheid & Hatfield, 1978; Frenzen & Davis, 1990). Although the dyad members’ attitudes towards abortion did initially appear to significantly converge after their online interaction, this effect was no longer present after controlling for attitude scores that simply regressed towards the mean. In addition, perceived interaction quality did not mediate the relationship between dyad-level LSS and attitude convergence. Dyad-level LSS was not linked to interaction quality (a result that was also observed in Hypothesis 1), and neither dyad-level perceived interaction quality nor dyad-level LSS were linked to attitude convergence. These null findings suggests that neither the principle of liking nor achieving high linguistic shared meaning were enough to change dyad members’ political attitudes.

However, many scholars argue that political attitudes function somewhat differently than many other types of attitudes and are thus subject to different attitude change processes. Political attitudes (like one’s stance on the legality of abortion) tend to be generally deep-seated, intransigent, and driven by ideological factors rather than affective ones (Halperin, Porat, Tamir, & Gross, 2012). Political attitudes are not completely stable across time and vary in different contexts, such as current political climate, saliency of political events, etc. In addition, changes in political attitudes not only stem from changes in the environment or one’s unique experiences, 

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5 In Cuperman et al. (2014), dyad members with a weak sense of self engaged in an interaction with a dyad partner with a strong sense of self. It was found that dyad members with a weak sense of self changed their post-interaction personality ratings in the direction of their dyad partner’s pre-interaction personality ratings, but not vice versa. This significant effect still emerged after the same technique to control for RTM was used. In addition, a second and different technique was also used to correct for RTM in the present study (see Appendix D) which yielded the same results as the previous technique. This suggests that the methods used in the current study adequately controlled for RTM and did not overcorrect for RTM.
but also stem from differential gene expression at different stages of the life cycle (Hatemi, & Verhulst, 2015). Links between political ideology and brain structure have also been found (Kanai, Feilden, Firth, & Rees, 2011; Oxley et al., 2008). For instance, Kanai et al. (2011) found that conservatives have larger amygdalae than liberals, which may explain why conservatives are especially reactive to fearful stimuli compared to liberals. This suggests that conservatives and liberals have different neural processes that are implicated in the formation of political attitudes, thus requiring different pathways to political attitude change (Kanai et al., 2011). Other studies have found fundamental moral, personality, and individual differences that are related to political ideology (e.g., Amodio, Jost, Master, & Yee, 2007; Carney, Jost, Gosling, & Potter, 2008; Graham, Haidt, & Nosek, 2009). Thus, although high linguistic shared meaning and the principle of liking may induce attitude change for non-political attitudes, political attitude change seems to transcend orthodox principles and techniques of attitude change.

4.5 Strengths, Limitations, and Future Research

The current investigation has several notable strengths. This study is, to my knowledge, the first to examine the trajectory of dyad-level LSS and the dyad-level personality correlates in initial controversial computer-mediated discussions. It is also the first study to examine the contribution of dyad-level LSS in attitude change. Unlike previous initial dyadic interaction studies (Babcock et al., 2014; Ta et al., 2015; Ta & Ickes, under review), all dyads were instructed to talk about the same topic (abortion) instead of any topic of their choosing. This feature enabled me to make meaningful group comparisons (i.e., between agreeing and disagreeing dyads) and assess how dyad-level LSS develops in controversial discussion without having to control for all the possible topics of conversation, especially as the various topics may each have their own unique properties and thus influence LSS separately. Although the
participants were specifically prompted to discuss their stance on the issue of abortion with their partner, they were also informed that they could interact with their partner as much or as little as they chose. This allowed the dyad members to determine their level of engagement in the interaction.

Last, the current study investigated controversial computer-mediated interactions between dyad members who share the same attitude on the topic of conversation, as well as between dyad members who did not share the same attitude on the topic of conversation. This allowed me to compare how agreement and disagreement impacts the trajectory of dyad-level LSS in contentious computer-mediated interactions.

However, there are several limitations in this study. First, the participants were only aware that they would be engaging in an online conversation with another participant when they signed up to take part in the study. They were informed that they would be specifically engaging in a politically-contentious conversation with a stranger (who may or may not share their views on the topic of conversation) only when they arrived in the lab. People who engage in politically-contentious discussions and debates on the internet self-select into these interactions, and this population may be ideologically, affectively, and behaviorally different than the one represented in the current sample. Thus, the current sample may have a different LSS trajectory and overall interaction experience than those who self-select into these interactions on the internet. Future studies should analyze politically-contentious interactions that appear on websites (such as Reddit and Twitter) to assess LSS among those who are already engaging in this behavior.

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6 It is important to note that all participants were aware that they could cease participate in the study at any point in time without penalty.
Second, although abortion is a contentious topic, it is not the only contentious topic. Other contentious topics may evoke different responses from different people, and these responses may also vary based on time and contexts. Future studies should examine LSS in other contentious topics of conversations, such as gun control, immigration, health care, and others. Future studies should also examine how the topic’s degree of polarization influences the development of LSS, and if the development of LSS fluctuates as a function of current events (e.g., is LSS in conversations regarding gun control higher or lower one week out from a major mass shooting versus six weeks out from the same major mass shooting?).

Third, although the total interaction period in this study was considerably longer than in previous studies that investigated LSS in initial dyadic interactions (Babcock et al., 2014; Ta et al., 2015), a singular and synchronous (i.e., an online interaction in which both dyad members are online simultaneously) 18-minute interaction of a politically-contentious discussion will not capture any potential changes in LSS or changes in attitudes that may result from a longer interaction. Interactions on social media websites are often asynchronous (i.e., an online interaction in which all online participants are not necessarily online simultaneously, resulting in staggered responses) and thus can often take place over a period that is longer than 18-minutes. In addition, interaction partners on social media websites may have access to other information about their interaction partner that may influence their development of LSS, such as attractiveness (via a profile picture or avatar), location, occupation, age, and other basic demographic information that is commonly featured on social media profiles. Future studies should investigate the trajectory of LSS in contentious computer-mediated interactions using longitudinal study designs and examine how the amount and type of information that dyad members have about each other prior to their interaction can affect the development of LSS. This
investigation would answer several questions: for example, does LSS cease to decline, stabilize, or increase at any point of interaction, and if so, why? Can long-term computer-mediated interactions facilitate political attitude change? Would perceived similarities between interaction partners (e.g., if both interaction partners were aware that they went to the same school or share the same hobbies) impact their development of LSS?
Chapter 5

Conclusions

The current research identified important factors that influence the development of LSS in initial dyadic contentious computer-mediated interactions. First, it extends previous research by providing evidence of the significance of extraversion in the development of LSS, particularly among political opponents. Second, this study identifies a new characteristic—empathy—that is correlated with the development of LSS. Third, it also provides evidence that similar patterns of LSS over time can be indicative of different underlying processes, as indicated by the different trajectories of perceptual process words between disagreeing and agreeing dyads. Collectively, the results help to inform theories of conflict communication by implicating certain characteristics (i.e., extraversion and empathy) that subsequently influence the development of common-ground understanding in contentious conversations. These findings can be used to better understand the mechanisms that help to promote common-ground understanding among diverse individuals in contentious computer-mediated interactions.
Appendix A

Pre-Interaction Questionnaire
1. Please type in your unique 8-digit code. This code is written on a piece of paper next to the computer.
2. What is your age? Please enter the number of years.
   Other (please specify)
3. What is your gender?
   Female
   Male
4. What best reflects or represents your racial or ethnic background?
   White
   Black
   Hispanic/Latino
   Asian
   Native American or Alaskan Native
   Native Hawaiian or Pacific Islander
   Other/Multiracial
5. Which of the following best describes your father’s (or legal guardian’s) level of education?
   No high school diploma or GED
   A high school diploma or GED
   Some college or university education but no degree
   A two-year degree from a community college or university
   A four-year (bachelor's) degree from a college or university
   A master's degree from a college or university
   A doctoral (Ph.D) degree from a college or university
6. Which of the following best describes your mother’s (or legal guardian’s) level of education?
   No high school diploma or GED
   A high school diploma or GED
   Some college or university education but no degree
   A two-year degree from a community college or university
   A four-year (Bachelor's) degree from a college or university
   A master's degree from a college or university
   A doctoral (Ph.D) degree from a college or university
7. In which of the following ranges is your family’s [or your legal guardian’s] annual household income?
   Less than $30,000
   $30,000 to $49,999
   $50,000 to $69,999
   $70,000 to $89,999
   $90,000 to $109,999
   $110,000 to $129,999
   More than $130,000
8. What is your political ideology?
   Strongly liberal
   Mostly liberal
   Moderate
   Mostly conservative
   Strongly conservative
9. How religious are you?
   Not at all religious
   Slightly religious
   Somewhat religious
   Moderately religious
   Strongly religious

10. Please indicate your attitude towards the following statements (1 = strongly disagree, 5 = strongly agree):
    Abortion should be legal.
    Local healthcare providers should provide legal abortions.
    Marijuana should be legal.
    Local dispensaries should provide legal marijuana.
    Capital punishment should be legal.
    All states should allow capital punishment.

11. Overall, how much contact do you have with people who do not agree with your attitude towards the following topics (0 = none at all, 4 = a great deal):
    Legalization of abortion
    Availability of abortion
    Legalization of marijuana
    Availability of legal marijuana
    Legalization of capital punishment
    Availability of capital punishment

12. How would you rate the quality of contact that you have with people who do not agree with your attitude towards the following topics (1 = very negative, 5 = very positive):
    Legalization of abortion
    Availability of abortion
    Legalization of marijuana
    Availability of legal marijuana
    Legalization of capital punishment
    Availability of capital punishment

**Big Five Inventory-10**
(1 = strongly disagree, 5 = strongly agree)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please choose a response below each statement to indicate the extent to which you agree or disagree with that statement.

I see myself as someone who is...

is reserved
is generally trusting
tends to be lazy
is relaxed, handles stress well
has few artistic interests
is outgoing, sociable
tends to find fault with others
does a thorough job
gets nervous easily
has an active imagination

Short Right-Wing Authoritarianism Scale

(1 = strongly disagree, 7 = strongly agree)

Please indicate the extent to which you disagree or agree with the following statements.

1. Our country needs a powerful leader, in order to destroy the radical and immoral currents prevailing in society today.
2. Our country needs free thinkers, who will have the courage to stand up against traditional ways, even if this upsets many people.
3. The ‘old-fashioned ways’ and ‘old-fashioned values’ still show the best way to live.
4. Our society would be better off if we showed tolerance and understanding for untraditional values and opinions.
5. God's laws about abortion, pornography and marriage must be strictly followed before it is too late, violations must be punished.
6. The society needs to show openness towards people thinking differently, rather than a strong leader, the world is not particularly evil or dangerous.
7. It would be best if newspapers were censored so that people would not be able to get hold of destructive and disgusting material.
8. Many good people challenge the state, criticize the church and ignore ‘the normal way of living’.
9. Our forefathers ought to be honored more for the way they have built our society, at the same time we ought to put an end to those forces destroying it.
10. People ought to put less attention to the Bible and religion, instead they ought to develop their own moral standards.
11. There are many radical, immoral people trying to ruin things; the society ought to stop them.
12. It is better to accept bad literature than to censor it.
13. Facts show that we have to be harder against crime and sexual immorality, in order to uphold law and order.
14. The situation in the society of today would be improved if troublemakers were treated with reason and humanity.
15. If the society so wants, it is the duty of every true citizen to help eliminate the evil that poisons our country from within.

Sense of Self Scale

(1 = very uncharacteristic of me, 4 = very characteristic of me)
Below are a number of statements concerning your personal attitudes and characteristics. Please read each statement and consider the extent to which it is characteristic of you. Then respond to the statements as accurately as possible to indicate how much it is characteristic of you.

1. I wish I were consistent in my feelings.
2. It's hard for me to figure out my own personality, interests, and opinions.
3. I often confuse my own thoughts and feelings with those of others.
4. I often think how fragile my existence is.
5. I have a pretty good sense of what my long-term goals are in life.
6. I sometimes wonder if people can actually see me.
7. Other people's thoughts and feelings seem to carry greater weight than my own.
8. I have a clear and definite sense of who I am and what I'm all about.
9. My opinions and values can change almost as quickly as my moods.
10. It bothers me that my personality doesn't seem to be well-defined.
11. I'm not sure that I can understand or put much trust in my thoughts and feelings.
12. I find it difficult to distinguish my beliefs and perspectives from other people's beliefs and perspectives.
13. "Who am I?" is a question that I ask myself a lot.
14. I need other people to help me understand what I think or how I feel.
15. My beliefs and values can change from day to day.
16. I tend to be very sure of myself and stick to my own preferences even when the group I am with expresses different preferences.

**Toronto Empathy Questionnaire**

(0 = never, 4 = always)

Below is a list of statements. Please read each statement carefully and rate how frequently you feel or act in the manner described. Circle your answer on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

1. When someone else is feeling excited, I tend to get excited too.
2. Other people's misfortunes do not disturb me a great deal.
3. It upsets me to see someone being treated disrespectfully.
4. I remain unaffected when someone close to me is happy.
5. I enjoy making other people feel better.
6. I have tender, concerned feelings for people less fortunate than me.
7. When a friend starts to talk about his/her problems, I try to steer the conversation towards something else.
8. I can tell when others are sad even when they do not say anything.
9. I find that I am “in tune” with other people's moods.
10. I do not feel sympathy for people who cause their own serious illnesses.
11. I become irritated when someone cries.
12. I am not really interested in how other people feel.
13. I get a strong urge to help when I see someone who is upset
14. When I see someone being treated unfairly, I do not feel very much pity for them.
15. I find it silly for people to cry out of happiness.
16. When I see someone being taken advantage of, I feel kind of protective towards him/her.

**Communication Apprehension Scale**

(1 = strongly disagree, 5 = strongly agree)

1. I dislike participating in group discussions.
2. Generally, I am comfortable while participating in group discussions.
3. I am tense and nervous while participating in group discussions.
4. I like to get involved in group discussions.
5. Engaging in a group discussion with new people makes me tense and nervous.
6. I am calm and relaxed while participating in group discussions.
7. Generally, I am nervous when I have to participate in a meeting.
8. Usually I am calm and relaxed while participating in meetings.
9. I am very calm and relaxed when I am called upon to express an opinion at a meeting.
10. I am afraid to express myself at meetings.
11. Communicating at meetings usually makes me uncomfortable.
12. I am very relaxed when answering questions at a meeting.
13. While participating in a conversation with a new acquaintance, I feel very nervous.
14. I have no fear of speaking up in conversations.
15. Ordinarily I am very tense and nervous in conversations.
16. Ordinarily I am very calm and relaxed in conversations.
17. While conversing with a new acquaintance, I feel very relaxed.
18. I'm afraid to speak up in conversations.
19. I have no fear of giving a speech.
20. Certain parts of my body feel very tense and rigid while giving a speech.
21. I feel relaxed while giving a speech.
22. My thoughts become confused and jumbled when I am giving a speech.
23. I face the prospect of giving a speech with confidence.
24. While giving a speech, I get so nervous I forget facts I really know.

**Inner-Other Directedness Scale**

(Strongly agree with A, Agree with A, Agree with B, Strongly agree with B)

A number of statements or questions with two options are given below. Answer every item as it applies to you. Indicate your preference by indicating whether you agree or strongly agree with either option A or B. You may equally agree or strongly agree with both options in some of the statements or questions. Nevertheless, please make a real attempt to choose the option that you agree or strongly agree with more.

1. With regard to partying, I feel
A. the more the merrier (25 or more people present).
B. it is nicest to be in a small group of intimate friends (6 or 8 people at most).

2. If I had more time
A. I would spend more evenings at home doing the things I'd like to do.
B. I would more often go out with my friends.

3. If I were trained as an electrical engineer and liked my work very much and would be offered a promotion into an administrative position, I would
A. accept it because it means an advancement in pay which I need quite badly;
B. turn it down because it would no longer give me an opportunity to do the work I like and am trained for even though I desperately need more money.

4. I believe that
A. it is difficult to draw a line between work and play and therefore one should not even try it.
B. one is better off keeping work and social activities separated.

5. I would rather join
A. a political or social club or organization.
B. an organization dedicated to literary, scientific or other academic subject matter.

6. I would be more eager to accept a person as a group leader who
A. is outstanding in those activities which are important to the group.
B. is about average in the performance of the group activities but has an especially pleasing personality.

7. I like to read books about
A. people like you and me.
B. great people or adventurers.

8. For physical exercise or as a sport I would prefer
A. softball, basketball, volleyball, or similar team sport.
B. skiing, hiking, horseback-riding, bicycling, or similar individual sport.

9. With regard to a job, I would enjoy more
A. one in which one can show his skill or knowledge.
B. one in which one gets in contact with many different people.

10. I believe
A. being able to make friends is a great accomplishment in and of itself.
B. one should be concerned more about one's achievements rather than with making friends.

11. It is more desirable
A. to be popular and well-liked by everybody.
B. to become famous in the field of one's choice or for a particular deed.
12. With regard to clothing
A. I would feel conspicuous if I were not dressed the way most of my friends are dressed.
B. I like to wear clothes which stress my individuality and which not everybody else is wearing.

13. On the subject of social living
A. a person should set up his own standards and then live up to them
B. one should be careful to live up to the prevailing standards of the culture.

14. I would consider it more embarrassing
A. to be caught loafing on a job for which I get paid.
B. losing my temper when a number of people are around of whom I think a lot.

15. I respect the person most who
A. is considerate of others and concerned that they think well of him.
B. lives up to his ideals and principles.

16. A child who has had intellectual difficulties in some grade in school
A. should repeat the grade to be able to get more out of the next higher grade.
B. should be kept with his age group though he has some intellectual difficulties.

17. In my free time
A. I'd like to read an interesting book at home.
B. I'd rather be with a group.

18. I have
A. a great many friends who are, however, not very intimate friends.
B. few but rather intimate friends.

19. When doing something, I am most concerned with
A. "what's in it for me" and how long it will last.
B. what impression others get of me.

20. As leisure-time activity I would rather choose
A. woodcarving, painting, stamp collecting, photography, or a similar activity.
B. bridge or other card game, or discussion groups.

21. I consider a person most successful when
A. he/she can live up to his own standards and ideals.
B. he/she can get along with even the most difficult people.

22. One of the main things a child should be taught is
A. cooperation.
B. self-discipline.

23. As far as I am concerned
A. I am only happy when I have people around me.
B. I am perfectly happy when I am left alone.

24. On a free evening
   A. I like to go and see a nice movie.
   B. I would try to have a television party at my (or a friend's) house.

25. The persons whom I admire most are those who
   A. are very outstanding in their achievements.
   B. have a very pleasant personality.

26. I consider myself to be
   A. quite idealistic and to some extent a "dreamer".
   B. quite realistic and living for the present only.

27. In bringing up children, the parents should
   A. look more at what is done by other families with children.
   B. stick to their own ideas on how they want their children brought up regardless of what others do.

28. To me it is very important
   A. what one is and does regardless of what others think.
   B. what my friends think of me.

29. I prefer listening to a person who
   A. knows his subject matter real well but is not very skilled in presenting it interestingly.
   B. knows his subject matter not as well but has an interesting way of discussing it.

30. As far as I am concerned
   A. I see real advantages to keeping a diary and would like to keep one myself.
   B. I'd rather discuss my experiences with friends than keep a diary.

31. Schools should
   A. teach children to take their place in society.
   B. be concerned more with teaching subject matter.

32. It is desirable
   A. that one shares the opinions others hold on a particular matter.
   B. that one strongly holds onto his opinions even though they may be radically different from those of others.

33. For me it is more important to
   A. keep my dignity (not make a fool of myself) even though I may not always be considered a good sport.
   B. be a good sport even though I would lose my dignity (make a fool of myself) by doing it.

34. When in a strange city or foreign country I should have no great difficulty because
A. I am interested in new things and can live under almost any conditions.
B. people are the same everywhere and I can get along with them.

35. I believe in coffee breaks and social activities for employees because
A. it gives people a chance to get to know each other and enjoy work more.
B. people work more efficiently when they do not work for too long a stretch at a time and can look forward to special events.

36. The greatest influence upon children should be
A. from their own age group and from educational sources outside the family since they can be more objective in evaluating the child's needs.
B. from the immediate family who should know the child best.
Appendix B

Post-Interaction Questionnaire
To what extent do you agree or disagree with the following statements?

1. Abortion should be legal.
   - Strongly disagree (abortion should not be legal)
   - Disagree
   - Neither agree nor disagree
   - Agree
   - Strongly agree (abortion should be legal)

2. Local healthcare providers should provide legal abortions
   - Strongly disagree (local healthcare providers should not provide legal abortions)
   - Disagree
   - Neither agree nor disagree
   - Agree
   - Strongly agree (local healthcare providers should provide legal abortions)

To what extent do you think your interaction partner agrees or disagrees with the following statements?

3. Abortion should be legal.
   - Strongly disagree (abortion should not be legal)
   - Disagree
   - Neither agree nor disagree
   - Agree
   - Strongly agree (abortion should be legal)

4. Local healthcare providers should provide legal abortions
   - Strongly disagree (local healthcare providers should not provide legal abortions)
   - Disagree
   - Neither agree nor disagree
   - Agree
   - Strongly agree (local healthcare providers should provide legal abortions)

Please rate the following statements based on the interaction you just had with your partner. Your partner is the person you were chatting with via instant messenger (1 = strongly disagree, 5 = strongly agree).

5. The interaction seemed smooth, natural, and relaxed to me.
6. The interaction seemed smooth, natural, and relaxed to my partner.
7. The interaction seemed awkward, forced, and strained to me.
8. The interaction seemed awkward, forced, and strained to my partner.
9. I felt accepted and respected by my partner.
10. My partner felt accepted and respected by me.
11. I felt put down, patronized, or rejected by my partner.
12. My partner felt put down, patronized, or rejected by me.
13. I felt comfortable with my partner.
14. My partner felt a comfortable with me.
15. I liked my partner. My partner liked me.
16. I wouldn't mind interacting more with my partner in the future.
17. My partner wouldn't mind interacting more with me in the future.
18. I understood my partner.
19. My partner understood me.
20. I enjoyed the interaction with my partner.
21. My partner enjoyed the interaction with me.
Appendix C

ANOVA Models without Word Count as Covariate
An ANOVA model with first-person singular pronouns as the outcome measure, time as a main effect, condition as a main effect, and the interaction between time X condition was conducted without word count included as a covariate. This analysis yielded the same results as previously reported. There was a main effect of time, $F(2, 334) = 51.07, p < .001$, such that there was significantly more first-person singular pronouns during Time 1 ($M = 6.18, SE = .21$) than Time 2 ($M = 4.02, SE = .21; p < .001$) and Time 3 ($M = 3.93, SE = .21; p < .001$). First-person singular pronouns did not differ between Time 2 and Time 3 ($p = 1.00$). There was not a significant main effect of condition, $F(1, 167) = .90, p = .34$, nor was there a significant interaction between time and condition, $F(2, 334) = .90, p = .41$.

The same ANOVA model was conducted except with second-person singular pronouns as the outcome measure. Again, this analysis yielded the same results as previously reported. There was a main effect of time, $F(2, 334) = 47.67, p < .001$, such that there was significantly more second-person singular pronouns during Time 1 ($M = 2.72, SE = .13$) than Time 2 ($M = 1.36, SE = .13; p < .001$) and Time 3 ($M = 1.35, SE = .13; p < .001$). Second-person singular pronouns did not differ between Time 2 and Time 3 ($p = 1.00$). There was not a significant main effect of condition, $F(1, 167) = 1.09, p = .30$, nor was there a significant interaction between time and condition, $F(2, 334) = 1.14, p = .32$.

The same ANOVA model was conducted except with perceptual process words as the outcome measure. Again, this analysis yielded the same results as previously reported. There was a main effect of time, $F(2, 334) = 6.13, p = .002$, such that there was significantly more perceptual process words during Time 1 ($M = .67, SE = .06$) than Time 2 ($M = .45, SE = .06; p = .01$) and Time 3 ($M = .43, SE = .06; p = .01$). Perceptual process words did not differ between Time 2 and Time 3 ($p = 1.00$). There was a significant interaction between time and condition,
$F(2, 334) = 3.12, p = .04$, such that the frequency of perceptual process words significantly declined across time for dyads in the disagree condition, but remained stable for dyads in the agree condition. For disagreeing dyads, perceptual process words were significantly higher during Time 1 ($M = .76, SE = .08$) than Time 2 ($M = .45, SE = .08; p = .01$) and Time 3 ($M = .33, SE = .08; p < .001$). Perceptual process words did not differ between Time 2 and Time 3.

Overall, the results did not change when word count was removed from the models as a covariate, suggesting that inclusion of word count in the ANOVA models did not result in an over-correction of the effects.
Appendix D

Regression Towards the Mean
Using the departmental pre-screening data, all responses on the abortion pre-screen items were averaged together to obtain the average abortion attitude score (\( M = 3.44 \)). Note that this average includes scores from individuals who did participate in the current study, as well as individuals who did not participate in the current study. Then, the average abortion attitude score was subtracted from each dyad member’s actual abortion attitude score that was taken both at pre-interaction as well as post-interaction:

\[
\begin{align*}
\text{Dyad member 1’s abortion attitude at pre-interaction} & - 3.44 = X1 \\
\text{Dyad member 2’s abortion attitude at pre-interaction} & - 3.44 = X2 \\
\text{Dyad member 1’s abortion attitude at post-interaction} & - 3.44 = Y1 \\
\text{Dyad member 2’s abortion attitude at post-interaction} & - 3.44 = Y2
\end{align*}
\]

Each dyad member’s new pre-interaction values were averaged together, and their new post-interaction values were also averaged together. The new dyad-level post-interaction values were then subtracted from the new dyad-level pre-interaction values while taking the absolute value:

\[
\left| \frac{X1 + X2}{2} - \frac{Y1 + Y2}{2} \right|
\]

The result is a value that reflects the amount of regression towards the mean from pre-test to post-test.

To ensure that this was a valid technique to control for RTM, I applied another technique that is commonly used to control for RTM as reported by Nielsen, Karpatschof, and Kreiner (2007). This technique involves correcting the post-test values for RTM (\( x_2^{\text{corrected}} \)), and then testing whether there is a significant difference between the pre-test values (\( x_1 \)) and \( x_2^{\text{corrected}} \) using a t-test for related samples. A significant outcome of the t-test would denote a significant change (i.e., correcting for RTM, there is a significant difference between pre- and post-test values)
whereas a non-significant outcome would denote no change (i.e., correcting for RTM, this is not a significant difference between pre- and post-test values).

The formula to correct the post-test values for RTM is:

\[ x_2(\text{corrected}) = x_2 + (1 - r) \times (x_1 - m_1) \]

where

- \( x_1 \) = observed values at pre-test
- \( x_2 \) = observed values at post-test
- \( m_1 \) = mean of \( x_1 \)
- \( r \) = coefficient of correlation between \( x_1 \) and \( x_2 \)
- \( x_2(\text{corrected}) \) = observed values at post-test corrected for RTM

To determine whether there is significant change between the two points of measurement, a t-test for related samples was run to compare the observed values at pre-test and the corrected values at post-test for disagreeing dyads. The results indicated that, after correcting for RTM, there was no significant difference between pre- and post-test values, \( t(81) = .19, p = .85 \). This is consistent with the outcome reported in the first technique used to control for RTM.
Appendix E

Attitude Divergence and Perceived Interaction Quality
Additional analyses were conducted to examine if attitude divergence (a pre- to post-interaction increase in the difference between the partners’ attitudes) was associated with low perceived interaction quality among disagreeing dyads. There was a significant correlation between attitude convergence and perceived interaction quality, \( r(80) = -0.31, p = .004 \). A scatterplot of this association, along with the line of best fit, is illustrated below. These results suggest that an interaction that is more negatively perceived by interaction partners is related to interaction partners exhibiting higher levels of attitude polarization by the end of their online discussion.
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Biographical Information

During her time at UT Arlington, Vivian developed a program of research that investigates how language and other social psychological factors influence the development common-ground understanding in initial interactions. This program of research spans both face-to-face and computer-mediated interactions. Her secondary area of research examines the sociodemographic factors, personality traits, and evolutionary mechanisms that impact the dynamics of interpersonal relationships. Vivian has received various awards for her research, including the Foundation for Personality and Social Psychology’s Heritage Dissertation Award, the American Psychological Association’s Dissertation Research Award, and the Southwestern Psychological Association’s Graduate Research Competition. She also received a 2-year fellowship from the National Science Foundation’s LSAMP BD program.

While in graduate school, she also interned at Match.com headquarters in Dallas, Texas as a market research intern, served as President of UT Arlington’s Graduate Student Senate, and attended the 2015 Summer Institute in Social Psychology and Personality. After earning a PhD in Experimental Psychology, Vivian began her position as Assistant Professor of Psychology at Lake Forest College in Chicago’s North Shore.