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Let's Get Digital: Understanding Adolescent Romantic Relationships Using Naturalistic Assessments of Digital Communication

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Abstract

Adolescent romantic relationships involve complex patterns of interaction. Innovative technological advances offer opportunities to capture features and dynamics of these relationships that traditional research methods have not addressed. With the explosion of digital communication platforms (e.g., mobile texting, direct messaging, social media applications), researchers can now observe and understand adolescent relationships in vivo, offering for the first time a naturalistic lens into adolescent worlds. Recognizing this scientific opportunity, in this article, we 1) discuss the potential theoretical and methodological benefits of collecting and coding digital communication data to understand adolescent romantic relationships, 2) suggest ways to use these data to develop innovative prevention tools, and 3) address potential challenges in collecting digital communication data from adolescents.

Keywords

romantic relationships; interpersonal violence

With advances in mobile technology, digital communication has become ubiquitous in the lives of adolescents. In a survey of 21 countries across the globe, a median of 85% of participants reported having a phone, with 75% of those reporting that they text, 50% using their phones to take photos or video, and 23% using the Internet (Pew Research Center, 2012). In another recent survey, this one of U.S. 13- to 17-year-olds, 95% reported that they

had a smartphone or access to one (Anderson & Jiang, 2018). These findings suggest that rates of smartphone adoption, including use among socioeconomically and racial/ethnically diverse youth, are historically high, even compared to national rates just three years earlier (Anderson & Jiang, 2018). For our purposes, the term *digital communication* reflects the use of digital media or technology, often accessed via smartphone, to communicate or interact with one's social world (e.g., text messaging and social media applications via WhatsApp, Kik, QZone, Instagram).

Digital communication involves both private and public forums. Adolescents can share text, photos, and videos with select individuals or groups; they can also decide to make content publicly available. National surveys in the United States suggest that 80% of 12- to 17-year-olds with Internet access communicate digitally (Madden et al., 2013). Digital communication is also frequent. More than half of adolescents text with friends daily, whereas only 25% of teenagers spend time with friends in person (outside school) daily (Pew Research Center, 2015). Through smartphones, teenagers have moment-to-moment access to their peers via texting and direct messaging, as well as unlimited opportunities to check in on their peers' activities online via social media applications.

Although the perils of the Internet age are often touted, the explosion of mobile communication provides a tremendous and new opportunity for researchers to observe and understand adolescent relationships. In this article, we address the potential implications of this proliferation for adolescent relationships in three ways. First, we discuss how mobile communication data (e.g., social media, text messaging, direct messaging) may be harnessed to understand key aspects of adolescent romantic relationships. Second, we suggest ways to use these data to develop innovative prevention tools. And third, we discuss ethical considerations for research on digital communication.

Applications to Adolescent Romantic Relationships

Adolescents' adoption of smartphones and of a range of digital communication platforms permit novel approaches to studying relationships by creating a digital record of interactions as they are occurring. Naturalistic assessments of social interactions obtained via technology allow researchers to understand romantic development in adolescence through an approach centered on relationships. That is, by coding an adolescent's digital interactions with partners, we can move beyond examining relationship involvement, quality, features, and number separately, and instead develop a more comprehensive and unified understanding of romantic experiences. This approach is consistent with other technology-based advancements in research, such as collecting data from personal digital devices (e.g., accelerometers, global positioning systems [GPS], heart rate trackers, microphones) to measure behavioral patterns (Jain, Powers, Hawkins, & Brownstein, 2015; Torous, Kiang, Lorme, & Onnela, 2016). For research on romantic relationships, studies using digital communication technology can improve our understanding of relationship processes that may emerge and shift quickly, as well as change the lens through which we develop and test our theories.

Theories of adolescent romantic development focus most often on how relationships change over adolescence and young adulthood (e.g., developmental stages of relationships, changes in relationship qualities) rather than exploring trajectories of specific relationships or the processes that lead to change and development (Connolly & McIsaac, 2011). This emphasis has been in part a pragmatic one because relationships during adolescence tend to be relatively brief, whereas research on romantic relationships has relied predominantly on longitudinal survey studies with longer temporal lags. However, such traditional longitudinal approaches (e.g., temporal lags spanning 6 months to a year or longer) are impractical for capturing changes within relationships in adolescence. In this way, our methods have influenced theories of romantic development to almost exclusively emphasize changes in development. Thus, we know remarkably little about the developmental course and function of more proximal romantic experiences.

Course, Characteristics, and Adjustment of Romantic Relationships

The form, function, and impact of adolescent romantic relationships shift dramatically from early adolescence to young adulthood (Connolly, Nguyen, Pepler, Craig, & Jiang, 2013; Furman & Winkles, 2011). Traditional longitudinal and concurrent research has documented developmental differences in length of relationships, practices of partner selection, relationship quality, and the prevalence of risk in romantic relationships (e.g., unprotected sex, dating aggression; Collibee & Furman, 2015; Giordano, Flannigan, Manning & Longmore, 2009; Johnson, Giordano, Manning, & Longmore, 2015; Marín, Coyle, Gómez, Carvajal, & Kirby, 2000). Even in the context of sweeping developmental change, important short-term shifts may remain undiscovered. For example, the onset and dissolution of romantic relationships can occur quickly and can significantly affect teenagers' concurrent and distal (e.g., 6 months or longer) mood and mental health (Furman, McDunn, & Young, 2008; Larson, Clore, & Wood, 1999; Monroe, Rohde, Seeley, & Lewinsohn, 1999). Currently, researchers view these events through a broad lens, but the moment-to-moment social interactions that surround the events may be important for understanding how a teenager adjusts over time. In addition, digital communication data provide an opportunity to examine social interactions that take place over the full course of an adolescent's romantic relationships.

Furthermore, social media data allow us to examine more precisely qualities of romantic relationships (e.g., support, negative interactions), which have been linked globally with concurrent romantic satisfaction (Collibee & Furman, 2015). In a large study of Facebook users that evaluated interpersonal warmth and compassion by coding the language qualities of Facebook posts (Park et al., 2016), gender differences in linguistic qualities emerged, with females using warm and compassionate language more frequently than males. Researchers can now use similar methods to ask questions about how romantic qualities emerge and change over time, the impact of the dissolution of a romantic relationship, and what romantic experiences adolescents find most rewarding.

Although many teenagers navigate nascent romantic relationships with ease, for others, the road is rocky and can contribute to lower levels of psychosocial adjustment. Indeed, research on adolescent romance has paid significant attention to the processes, developmental course,

and moderators of the concurrent and distal links between romantic experiences and psychosocial adjustment (Davila, 2008; Joyner & Udry, 2000; Furman & Collibee, 2018; Vujeva & Furman, 2011). Despite these efforts, we still lack an understanding of the temporality and proximal processes of these associations. Naturalistic assessment of digital communication offers an opportunity to understand more fully how, when, and for whom romantic experiences may be related to psychosocial adjustment. The potential benefits of these approaches can be seen in some early digital communication research. Marion Underwood and colleagues first described links between teenagers' experiences and mood in their Blackberry project (Ehrenreich, Underwood, & Ackerman, 2014; Underwood & Ehrenreich, 2017; Underwood, Ehrenreich, More, Solis & Brinkley, 2013; Underwood, Rosen, More, Ehrenreich, & Gentsch, 2012). The authors collected naturalistic digital communication data using adolescents' text messaging, e-mails, and instant messages, and they used momentary micro-coded interactions to examine links between digital content and a variety of symptoms. Among their findings were associations between negative content and overall internalizing symptoms, as well as anxious depression. Thus, studying evolving social media technologies allows researchers to observe links between patterns of social communication in teenage relationships and expressions of distress. Studies with daily within-person designs can examine potential proximal links between digital interactions and offline experiences.

Dyadic Processes

Adolescent romantic relationships come in many shapes and sizes, including steady partners, casual partners, hook-ups, and friends with benefits. Involving a variety of romantic partners in a lab-based study is not feasible, and in many cases, inviting partners such as these into the lab would change the nature of the relationship itself. For example, a teenager's request that her partner participate in a study on romantic relationships may send a message about her perceived commitment and interest. Thus, we need methods that are ecologically valid and capture naturalistic romantic experiences more effectively. Digital communication data are ideal for studying dyadic processes. Research on couples, including both partners and their digital data, offers the most insight into romantic experiences. However, an individual's digital communication can also yield rich information of dyadic processes through the coding of digital communication with others (e.g., Wall Posts). Research on couples in romantic relationships has also uncovered maintenance behaviors designed to keep a relationship intact (e.g., positivity, openness). In one study, strategies to maintain relationships that were communicated through text messages fostered satisfaction in the relationship (McEwan & Horn, 2016). Furthermore, the emotional valence of couples' communication affects the quality of the romantic relationship (e.g., Gottman & Levenson, 1999), and dyadic communication processes involving emotional expression (e.g., co-rumination) can be observed using digital communication data (Underwood & Ehrenreich, 2017).

Naturalistic observation of digital communication also enables researchers to examine how dyadic interactions with family, peers, and romantic partners change, interact, and function across the course of a romantic relationship. Indeed, although it is well established that parents and peers play important roles in distal romantic experiences across development

(Furman & Collibee, 2018; Holland & Roisman, 2010), we understand less about the proximal function of these relationships for romantic development, how they vary developmentally, and the processes through which parents' and peers' impact is sustained across partnerships. Collecting and coding digital communication data allows us to expand our theoretical conceptualization of adolescents' interpersonal relationships. It also provides insight into how parents, peers, and romantic partners contribute proximally to changes across development. Such contributions will allow researchers to more precisely test and update our theories of romantic development among adolescents.

Romantic Aggression

Although adolescent romantic relationships benefit teenagers both normatively and developmentally (Connolly & McIsaac, 2011), they can also be linked with negative social and health outcomes. The benefits of naturalistic assessment in research on adolescent romantic relationships are amplified when we consider how it can contribute to our understanding of dating aggression. Much of our knowledge about adolescent dating aggression comes from studies of self-reported victimization and perpetration behaviors. This approach assumes that teenagers know when an interaction is aggressive or coercive and are willing to acknowledge the interaction in a survey. As with research of other sensitive topics, teenagers who take part in studies of dating aggression are not always forthcoming (Brenner, Billy, & Grady, 2003). Similarly, the lack of dyadic data is noteworthy in this domain, where each partner may play a role in the potential emergence or escalation of dating aggression (Capaldi, Knoble, Shortt, & Kim, 2012). Researchers have long pointed to the significance of the dyadic context and dyadic risk factors (e.g., communication difficulties, relationship conflict, power dynamics) in the emergence of intimate partner violence (Connolly, Friedlander, Pepler, Craig, & Laporte, 2010; O'Keefe, 1997; O'Leary & Smith Slep, 2003; Schumacher, Feldbau-Kohn, Smith Slep, & Heyman, 2001). We can use digital communication data to understand how adolescents' communication patterns with their partners shape their own and their partners' relationship behaviors.

Digital communication data also allow us to observe and code complex interactional patterns, such as controlling behaviors. As these behaviors emerge over time rather than occurring as isolated incidents (Johnson, 2008), naturalistic digital communication offers a rare opportunity to capture those interactional patterns. Research that features naturalistic observation of partners' communication via technology may reveal coercive processes that would otherwise be unreported. Digital communication also serves as the backdrop for in-person interactions. Both public (i.e., social media) and private (i.e., texting, direct messaging) forms of digital communication can be used to attenuate a conflict, providing a platform for reparation and public displays of affection, as well as a source of peer and family support. Conversely, partners may use technology to amplify a conflict by publicly humiliating their partners or stalking them virtually. In fact, digital communication sometimes becomes a vehicle for bullying, harassment, stalking, and intimidation. Data on these behaviors can also highlight the role of peers, who are frequently bystanders to online abuse. Naturalistic assessments of digital communication allow researchers to observe behaviors involved in digital dating abuse *in vivo* to understand how this type of abuse unfolds and connect online behaviors with in-person interactions.

Translational Opportunities

Research with digital communication provides innovative, low-burden, naturalistic methods for characterizing and understanding the interactions that unfold between adolescents in romantic relationships, including in unhealthy and dangerous circumstances. Because these data allow us to observe many types of relationships simultaneously, they may also be used to understand the potential protective or destructive function of digital communication with peers or parents. An additional benefit to this approach is that findings from observational and theory-building research can be translated into cost-effective approaches to screening and intervening with high-risk groups. For example, digital communication patterns may be used to help predict when teenagers behave aggressively and identify the most optimal time to provide helpful feedback. A mobile intervention using machine learning algorithms could then be used to interrupt aggression before it starts. Relatedly, this research may highlight proximal features of healthy romantic relationships, such as indicators of satisfaction with the relationship, autonomy, and balance. This information could inform the development of a mobile intervention that reminds and encourages teenagers who have had disruptions in their relationships, such as a recent disconnection from peers, to reconnect. These data may also be used to support healthy relationships by helping researchers understand proximal predictors of relevant behaviors, such as the decision to use a condom or offer support. While other health-related fields have adopted mobile interventions (Heron & Smyth, 2010; Levine, McCright, Dobkin, Woodruff, & Klausner, 2008), a dynamic and personalized mobile intervention that supports healthy dating relationships has not been developed.

Challenges

Naturalistic assessments offer exciting and extensive opportunities to address theoretical and methodological limits in studying adolescent romantic relationships. However, they also introduce challenges. Although the problems inherent in collecting and analyzing text, e-mail, instant messaging, and social media data have been addressed more thoroughly elsewhere (see Underwood, 2015), our goal is to describe the specific challenges of examining these data to study adolescent romantic relationships. First, digital communication involves both public and private forums that have their own strengths and limits, so differences between public and private data sources need to be reconciled. Second, social media and messaging applications are constantly evolving, as are the preferences of adolescent users. Researchers who want to gather digital communication data need to use a data extraction tool that can be updated as users' behavior changes (see Torous et al., 2016, for sensor data extraction). Third, researchers should be aware of the possibility of gender, racial/ethnic, and regional differences in teenagers' preferences for applications (NORC at the University of Chicago, 2017), as well as differences in mobile technology that may affect the type of applications used by adolescents.

Fourth, as the public becomes aware of companies using social media data for nefarious purposes, they may also become wary of their data being used for scientific research. This may make it more difficult for researchers conducting studies of digital communication to obtain informed consent from parents and guardians. Indeed, this work is likely to generate many questions about the coding itself (e.g., how to reflect interaction processes over time,

such as controlling behavior) that may require approaches involving mixed methods to disentangle. Fifth, these research methods generate enormous volumes of data, and advanced analytic approaches leveraging intensive analysis of longitudinal data are needed for interpretation. Although the costs of data collection itself are quite low, managing and coding this data will likely be both time consuming and costly for researchers—though costs can decrease as automated coding techniques are generated based on the initial coding process. Finally, the short-term (e.g., moment-to-moment or day-to-day) fluctuations in behavior observed via digital data need to be integrated with other forms of longitudinal data for researchers to take advantage of digital data's full potential. This may require new study designs, such as multiple timescales, that are currently underused.

In addition to the technological challenges, research involving social networking also involves ethical considerations (Gleibs, 2014). As researchers have begun to describe, studying digital communication can result in violations of privacy and confidentiality (Ayers, Caputi, Nebeker, & Dredze, 2018). Research ethics assure that participants are informed of how and when their digital communication data are captured, how the data are stored, and how participants' privacy will be protected. However, in this research, individuals who communicate with those taking part in a study cannot be notified that their communication will be captured. Even if a researcher immediately removes screen names, handles, or other identifying information, the peer, family member, or friend involved in the communication would not have consented to their data being used for research. Thus, researchers must be thoughtful in explaining procedures to participants, including how data will be de-identified and what information will be collected. Additionally, unforeseen circumstances may arise in studying digital communication, such as disclosures of crimes, occurrences that require mandated reporting, thoughts of suicide/homicide, or sexting behaviors. In the case of sexting, researchers can implement strategies to bypass collecting sexually explicit material by not collecting video or photos, as the content of these files is often reflected in the accompanying messages. In all cases, procedures must be put in place to assure that these data are handled properly, in accordance with standards or research ethics and Institutional Review Board policies.

Despite its challenges, digital communication provides a rich source of data that can be captured and coded to answer many questions regarding adolescent romantic relationships. The dyadic nature of this data allows researchers to observe the dynamic ways in which adolescents interact with romantic partners, as well as how these interactions capture or influence romantic development. These data can also be harmonized with information from mobile sensors, GPS, and activity trackers so real-time intra- and interpersonal experiences can be understood together. Unlike using traditional forms of assessment involving self-reports, collateral informants, or even lab-based observation, harnessing digital communication data provides a methodological approach to understanding adolescent communication that is naturalistic, readily available, and passive. This approach to data collection is also suited to investigating topics that may change rapidly or be prone to reporting bias, such as adolescents' behaviors in romantic relationships. Collecting and assessing digital communication can help researchers understand the full range of experiences in adolescents' romantic relationships.

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