Dyadic Parent-College Student Digital Interaction Styles

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Abstract

Parents and their emerging adult children are highly connected via mobile phones in the digital age. This digital connection has potential implications for the development of autonomy and sustained parent–child relatedness across the course of emerging adulthood. The present study uses the qualitatively coded content of nearly 30,000 U.S. parent–college student text messages, exchanged by 238 college students and their mothers and fathers over the course of two weeks, to identify distinct dyadic parent–emerging adult digital interaction styles across dimensions of responsiveness and monitoring. Results reveal that digital interaction styles are largely consistent across age, gender, and parent education as well as reflective (i.e., texting patterns of parents and emerging adults mirror one another), with little evidence of overparenting profiles. Results also show that those college students who are reciprocally disengaged in text messaging with their parents perceive their parents as less digitally supportive. However, no styles were associated with perceived parental pressure to digitally engage. Findings suggest that the mobile phone is likely a valuable tool to maintain connection with few risks for undermining the privacy and autonomy of emerging adults.

Keywords

parent–child communication; technology; text messaging; emerging adulthood; parenting styles

Mobile phones have become an integral part of family life, especially at the transition from adolescence to young adulthood when many emerging adults (EAs) are living outside their family home for the first time. EA mobile phone ownership rates have been at or near saturation in the US for some time (with 98% of young adults in 2015 and 100% of young adults today owning mobile phones; Anderson, 2015; Pew Research Center, 2021). Most EAs report using the mobile phone as a tool to communicate with their parents (Miller-Ott et al., 2014); college students and their parents are in frequent contact, exchanging an average of about 8 texts per day with mothers and about 3 text per day with fathers in the present data (Jensen, Hussong, & Haston, 2021).

Digital communication seems to facilitate parenting and parent–youth interactions, as evidenced by associations between more frequent parent–youth digital communication with greater parent–child closeness (Manago et al., 2020), improved health outcomes (Small et al., 2011, 2013), and better self-esteem (Weisskirch, 2011). However, a smaller body of

work also highlights the potential for excessively frequent and parent-driven phone contact to be intrusive and inhibiting of young adult autonomy (Weisskirch, 2009, 2011). Beyond these findings regarding patterns of communication, far fewer studies examine the *content* of parent–child digital interactions and the ways in which the quality of these communications may help or hinder development of the EA milestones relatedness and autonomy (Ryan & Deci, 2000).

According to neo-ecological theory (Navarro & Tudge, 2022) virtual microsystems (including the parent–child virtual microsystem assessed in the present study) are critical contexts for development. In emerging adulthood and the transition to college, when many parent–EA interactions become remote, unique features of digital communications like "24/7" availability (but also the ability to delay response until a more convenient moment) and the permanence of text messages (both sent and received) may impact EA perceptions of whether parents are virtually supportive and/or intrusive. The present study examines the ways in which parent–EA interactions within the virtual text message microsystem may be reciprocal and potentially shape EA perceptions of how parents help or hinder the development of autonomy and relatedness (as indexed by EA perceptions of their parents as supportive via text message or as exerting pressure to be available online).

Recent studies suggest that the mobile phone is a useful conduit for important parent-child interactive behaviors including responsive, warm, supportive parent-youth interactions as well as interactions that facilitate parental monitoring, control, and youth disclosures (Chen & Katz, 2009; Fletcher et al., 2018; Jensen, George, et al., 2021; Jensen, Hussong, et al., 2021; Racz et al., 2017). Past research using this same sample of parent–EA texting interactions (Jensen, Hussong, & Haston, 2021) underscored the value of objective assessment of texting frequency (as EAs were not particularly reliable reporters on texting frequency with parents) and of the role of both parents and EAs in characterizing dyadic digital communication. EAs were in more frequent contact with mothers (~ 8 texts per day) than fathers (~ 3 per day), with the most common text behaviors evincing EA disclosures and parental solicitations of information from the EA. Interestingly, the frequency of parent–EA texting did not differ by EA gender, age, or race/ethnicity, though mother-EA but not father-EA text messages were more frequent among families with higher levels of parent education.

These micro-level patterns of communication were associated with indicators of autonomy and relatedness. Specifically, the overall frequency of text messaging with mothers (but not fathers) was tied to greater perceived parental digital pressure (how much the EA perceives their parent as exerting pressure to be available or interact online) and text supportiveness (how much the EA perceives their parent as providing social support via text message). However, associations between observationally coded parent–EA texting behaviors indicative of responsiveness and monitoring and perceived parental digital pressure and text supportiveness were somewhat inconsistent and not always intuitive. Among mother-EA (but not father-EA) dyads, youth who disclosed more to mothers perceived their parents as exerting less digital pressure and those who engaged in more instrumental support seeking via text perceived *less* parental text support. EAs who perceived parents as more supportive via text messaging also engaged in more emotional/

esteem support and advice seeking and their parents engaged in more emotional/esteem support and advice provision. Thus, results varied across discrete indices of parent-EA text messaging. However, these indices do not operate in isolation and inconsistent findings may be reconciled by examining *constellations* of these different texting behaviors using a person-centered perspective which may offer more holistic insights into digital parent–child interaction styles than variable-centered approaches.

The present study seeks to extend the nascent evidence base on digital parent-child interactions to understand how parent and EA texting behaviors cluster to form distinct styles of parent–EA text message interactions and how these styles relate to digital analogues of relatedness and autonomy in the form of college students' perceptions of parents' digitally-expressed support and pressure. The present study expands the literature on parenting styles into dyadic parent–emerging adult interactions in the digital age, with emphases on observed (rather than perceived) parent-EA digital interactions and potentially distinct processes emerging in mother-EA and father-EA digital interaction styles.

Styles of Parenting

"Parenting styles" have long been of interest to developmental and family scientists (e.g., Baumrind, 1966; Maccoby & Martin, 1983) and represent distinct patterns of parenting behaviors, attitudes, and beliefs that contribute to the overall climate of parent–child relationships and childrearing (Darling & Steinberg, 1993). The most common conceptualization of parenting styles models two dimensions of parenting: *responsiveness* (which subsumes positive connection constructs like warmth, support, and sensitivity) and *demandingness* (which subsumes constructs including structure, limit setting, monitoring, and control; McKee et al., 2008). Together, these orthogonal dimensions yield four parenting styles: (a) authoritative (high responsiveness, moderate to high demandingness), (b) authoritarian (low responsiveness, high demandingness), (c) indulgent (high responsiveness, low demandingness), and (d) uninvolved (low responsiveness, low demandingness; Baumrind, 1966; Maccoby & Martin, 1983).

Parenting Styles and the Transition to Adulthood

Most research on parenting styles has focused on childhood and adolescence, with research generally suggesting that of the four styles, authoritative parenting is the most robustly linked with positive child adjustment outcomes across domains, with some cultural variation (Pinquart, 2017; Pinquart & Kauser, 2018). Compared to adolescence, less is known about what parent–child interaction styles look like in emerging adulthood and which styles are most strongly linked to positive development of emerging adults' autonomy and relatedness. Emerging adulthood is a unique liminal period between adolescence and adulthood characterized by evolving parent–child interaction styles, which must accommodate shifting EA and parent priorities as well as balance the emerging adult's increasing need for autonomy alongside the continued need for relatedness and support from parents (Mullendore et al., 2018). Indeed, 34% of parents and 47% of emerging adults have mixed feelings about whether these youth are in fact full-fledged "adults" (Arnett & Schwab, 2013), highlighting the need for evidence-based guidance about what parent–

emerging adult interaction strategies can most effectively ease the transition through this potentially tumultuous time.

Parental responsiveness continues to be important across emerging adulthood (Swartz et al., 2011), with parental supportiveness increasing over historical time (Eggebeen, 1992). Parental support can take different forms, including offering emotional, informational (i.e., advice), and tangible (i.e., instrumental) support (House, 1988). For instance, nearly 75% of modern parents of EAs provide some financial support to their EA child whereas only 40% of these parents received such support from their own parents in their own emerging adulthoods (Arnett & Schwab, 2013). For the most part, parental responsiveness, warmth, and support are linked to healthier parent–EA relationships and adjustment outcomes (Barry et al. 2008; Padilla-Walker & Nelson 2019), and may be of particular importance during transitional periods (e.g., moving out of the family home, starting college; Fingerman et al., 2012).

The role of demandingness during emerging adulthood is more fraught given that, in line with stage-environment fit (Eccles et al., 2013), parents should be easing off of demanding behaviors, like monitoring, in order to allow for the normative development of independence. Yet, trends indicate that parents remain involved in more active monitoring and control over their EA's activities, whereabouts, and behaviors than in the prior decades (Collishaw et al., 2012), aided by smartphones, GPS tracking, and social media. Most EAs report that their parents have the right to keep track of what they are up to and to guide their behavior in at least some domains of life (Padilla-Walker et al., 2014).

Relatively few studies have taken a parenting styles approach (as opposed to understanding distinct parenting behaviors in isolation) in emerging adulthood, though those that have (largely in the past 15 years) are informative for the present study of *digital* parent-EA interaction styles. These studies have used hierarchical clustering analysis (Nelson et al., 2011; Garcia Mendoza et al., 2019) and latent profile analysis (Padilla-Walker et al., 2019) to explore the co-occurrence of responsiveness and demandingness behaviors in the parents of emerging adult children, with results that mostly (though not entirely) overlap with traditional parenting styles in adolescence. Points of divergence include the emergence of a unique combination of high control and high indulgence but low levels of other types of responsiveness (Nelson et al., 2011), highlighting the importance (and utility) of modeling potential heterogeneity within dimensions, such that indicators of responsiveness or demandingness may not *always* cluster together.

The Importance of Observational Methods that Capture Reciprocal Parent–EA Interaction Styles

Although the child plays a role in shaping parent–child interactions throughout development (Paschall & Mastergeorge, 2016), EAs are particularly dynamic actors within the parent–child dyad (Padilla-Walker & Nelson, 2019). Empirical research on EA interactions with their parents is somewhat sparse (Padilla-Walker & Nelson, 2019), but what research does exist points to the importance of distinguishing between what *parents do* and what *EAs do* to shape the overall parent–EA interaction style, within both the demandingness

and responsiveness domains. As first highlighted by Stattin and Kerr (2000) in their studies of adolescents, measures of demandingness must consider the *dyadic* nature of monitoring and control in parent–youth relationships by parsing out parental solicitations for knowledge about youth behaviors from youth disclosures about their own behaviors. This distinction is especially relevant during this developmental period as EAs have greater social distance from their parents and thus have more control over parental knowledge about their experiences (via disclosures, or lack thereof) (Wood et al., 2018). EAs who disclose more information about their lives to their parents tend to also perceive their parents as more supportive of their autonomy development (Son & Padilla-Walker, 2021). EAs tend to have higher parent–child relationship satisfaction when levels of received and desired informational support are congruent (and high), with support surpluses (with parents providing more support than the child reports wanting) for nurturant supports associated with more relationship satisfaction (Wang, 2019). These findings underscore the importance of focusing on both interactors within the dyad in shaping styles of parent-EA digital interactions.

Despite the origins of research on parenting styles in intensive family observation (Baumrind, 1966), more research has focused on perceived than observed parenting. Indeed, very few studies exist on observed parenting styles, and those that do exist tend to focus on younger children (Domenech RodrÍguez et al., 2009; Hill et al., 2008; Rhee et al., 2015), with some studies suggesting that there is generally low concordance between perceived and observed parenting (Cheung & Delany, 2022). The present study is strengthened by its ability to move beyond self-report (and the biases inherent therein) to focus on observable indicators of digital responsiveness and demandingness as enacted by both the parent and EA within a dyad.

The Present Study

The present study examines a ubiquitous context in which parent–EA interactions occur in the digital age—the virtual microsystem of an ongoing text message exchange between college students and their parents. The current study utilizes nearly 30,000 coded text message interactions among 238 parent-EA dyads collected over two weeks. First, we identify *which dyadic parent–EA digital interaction styles best characterize constellations of texting behaviors between the EA and parents in our sample.* Based on prior work, we expected to identify four *reciprocal parent-EA interaction styles* that roughly mapped onto traditional parenting styles with the addition of the EA's role in shaping these interactions: *reciprocal engagement* (high on parent and EA indices of digital monitoring and responsiveness, similar to traditional authoritative parenting style), *reciprocal disengagement* (low on all indices of parent and EA digital monitoring and responsiveness, similar to traditional uninvolved parenting style), *reciprocal responsiveness* (high on parent and EA indices of digital responsiveness but low on parent and EA indices of digital monitoring, similar to traditional permissive parenting style), and *reciprocal monitoring* (high on parent (solicitation and control) and EA (disclosure) indices of digital monitoring but low on parent and EA indices of digital responsiveness, similar to traditional authoritarian parenting style).

We also expected to identify two less reciprocal and more mismatched overparenting parent-EA interaction styles, consistent with more recent literature on helicopter parenting and overparenting in emerging adulthood (Cui et al., 2022; Padilla-Walker & Nelson, 2012) and studies on the importance of dyadic reciprocity within parent-EA interactions in the digital age (Wang, 2019; Weisskirch, 2009, 2011). These included *excessive parental monitoring* (characterized by relatively higher occurrence of parent codes of solicitation and control and lower occurrence of EA disclosures within the monitoring domain; perhaps indicative of parental intrusive monitoring) and *excessive parental responsiveness* (characterized by a relatively higher occurrence of parental warmth and support provision and lower occurrence of EA warmth and support seeking; perhaps indicative of intrusive support). We expected that similar styles would emerge in both the mother–EA and father–EA samples, though we also expected that fathers were likely to be over-represented in the reciprocally disengaged profile due to less frequent communication overall.

We also explored *whether these dyadic parent–EA digital interaction styles captured differences in EAs* across age, gender, and socioeconomic status – though prior research suggests greater demographic similarity than difference (Jensen, Hussong, et al., 2021; Padilla-Walker et al., 2021). Finally, we tested associations between dyadic parent–EA digital engagement styles and EA *perceptions of parental digital pressure and parental text supportiveness.* We hypothesized that those profiles characterized by high digital responsiveness (e.g., the reciprocally engaged, reciprocally responsive, and excessive parent responsiveness styles) would be tied to stronger perceived parental text supportiveness, whereas the hypothesized excessive parental monitoring and excessive parental responsiveness styles (characterized by mismatches in parent and EA behaviors) would be linked with higher perceived parental digital pressure.

Method

Sample and Procedures

As detailed in our past work in this sample (Hussong et al., 2021), participants were drawn from the Real-U Study of College Life (approved by IRB #14–0360; N=854), recruited through email invitations sent to randomly sampled undergraduates at a southeastern U.S. university in 2014–2015 (with oversampling for males and African American students) and through word-of-mouth (Hussong et al., 2021). The present study focuses on a subsample of students from this larger study who were invited to participate in the Text Messaging Study if they met the eligibility criteria of having an Android or an iPhone with them at the time of data collection. This study occurred at the conclusion of two lab-based visits separated by two weeks in which participants completed computerized surveys. Participants consented to have their smartphone directly connected to a secure computer and to the download all text messages (no images) exchanged over the past two weeks with all communicants with whom they had texted. Consistent with North Carolina law (N.C. Gen. Stat. Ann. § 15A-287; Rasmussen, Komperda, and Baldino 2012), the IRB waived consent for these communicants. Participants entered a drawing for four $100 cash prizes. Phone numbers and contact names were stripped upon download and replaced with unique identifiers (e.g., Mother, Father).

The present study of parent–EA text messages includes only the subset of the text message sample (N=267) who exchanged at least one text message with at least one parent in the prior two weeks, leaving a sample of 238 students (89%), 215 of whom exchanged 21,381 text messages with mothers and 182 of whom exchanged 6,358 text messages with fathers. Group text messages were excluded for the purposes of these dyadic analyses. Our past work examining potential selection effects showed that, other than being more likely to have an iPhone, participants in the text message sample did not differ substantially from others in the overarching study on demographic and risk factors (Hussong et al., 2021). The students in the present parent-EA text sample (n=238) did not differ relative to those in the full text message sample (N=267) on the outcomes of interest including parent digital pressure (t(28.77)=.71, p=.483) or text supportiveness (t(32.53)=−.57, p=.570). The students in the parent-EA text sample were 19.8 years old on average (SD=1.39), 61% female, and from highly educated family backgrounds (with nearly 80% having at least one parent with a college degree). The sample is 57% White (not Hispanic/Latino), 21% Black, (including one Afro-Latino EA who endorsed Black race and Hispanic/Latino ethnicity, 7% Hispanic/Latino, 5% Asian, 3% multiracial, and .84% American Indian/Alaska Native.

Measures

Demographics—Demographic covariates were chosen due to past research which suggests potential differences in parent–EA dynamics and digital communication based on EA age, gender, and highest level of parent education, which is used here as an indicator of socioeconomic status (1.26% less than high school; 4.2% high school graduates; 14.71% some college or technical school; 28.15% college graduates; 3.78% some graduate, medical, or professional schools; 47.9% completed graduate, medical, or professional school).

EA Perceived Parental Digital Pressure—In order to assess the ways in which parent–EA text messaging might be associated with perceived parental intrusiveness (relevant to autonomy), EAs responded to ten items adapted from Hall & Baym's (2012) measure of digital "entrapment" at the second lab visit. Items queried the extent to which EAs perceived intrusiveness, pressure, and stress around parent–EA contact by phone or online and perceptions that parents were annoyed when EAs were unavailable. We directed EAs to: "Please answer each of the questions below for your parent." Thus, we cannot distinguish between perceptions of mothers and fathers. Response options ranged from 0 ("Not at all true") to 4 ("Extremely true"). Here we use four items to specifically tap *parental digital pressure* (e.g., "I feel pressured to text or post online to tell this person what I am doing") which have been shown in our past study in this sample (Jensen, Hussong, & Haston, 2021) to be good fit to the data. EA perceived parental digital pressure was modeled here using a factor score derived from the previously published latent variable model (Jensen, Hussong, & Haston, 2021).

EA Perceived Parental Text Supportiveness—To assess the ways in which parent–EA text messaging is associated with perceived parent–EA relatedness, EAs responded to three items developed by the study team which queried the extent to which they use texting to seek or receive parent support (e.g., "To get support from your parents for dealing with personal problems"). Participants were told that: "The following are reasons why some

people may use text messaging. Please indicate how true each reason is for you with regard to your text messaging using the following scale": "0 ("Not at all true") to 4 ("Extremely true"). Our past work with this sample (Jensen, Hussong, & Haston, 2021) has shown that these three items load strongly onto a single factor. The items asked about parents in general and did not distinguish between perceptions of mother and father separately. EA perceived parental supportiveness via texting was modeled here using a factor score derived from the previously published latent variable model (Jensen, Hussong, & Haston, 2021).

Parent–Child Text Interaction Coding Scheme (PCTICS).

Coding Procedures.: The development and initial validation of the Parent–Child Text Interaction Coding Scheme is described in detail in Jensen, Hussong, & Haston (2021). Briefly, the PCTICS sought to identify theoretically relevant dimensions of parent–EA interactions across domains of monitoring (parent *solicitations* and *control*, EA *disclosures*) and responsiveness (parent and EA warmth, EA *seeking* and parent *provision* of *emotional/ esteem support*, *instrumental support*, and *advice*). Table 1 includes code definitions, which were adapted to fit the text-message medium from existing observational coding systems and/or survey measures (i.e., Hussong et al., 2001; Melby & Conger, 2001; Shadur et al., 2015; Stattin & Kerr, 2000).

Coding occurred at the level of a single text and indicated the presence (1) or absence (0) of each code in each text message. Codes were neither mutually exclusive nor exhaustive. Parent–EA text messages were coded using Microsoft Access by an undergraduate coder who was trained to acceptable inter-rater reliability (IRR, Cohen's kappa>.80) on an initial subset of the text message database with the first author (and code developer) for all PCTICS codes. Once baseline reliability was reached, previously coded text messages were re-coded by the newly reliable coder. As detailed in Jensen, Hussong, & Haston (2021), ongoing inter-rater reliability was determined by double coding of 20% of messages, with most codes meeting Landis and Koch's (1977) benchmarks for substantial (Ks .61 to .80) to near perfect (Ks .81 to 1.0) reliability, though one code (parental instrumental support provision) fell into the moderate range (Ks .41 to .60). When we consider interrater agreement at the level of the parent–EA dyad over the course of the two-week study period (the level of analysis in the current study) interrater agreement rates (correlations) between raters for each code were exceedingly high (> 0.98).

There was considerable variability *between* codes — with average frequency per code ranging from only .30 texts over two weeks for the least frequent code (father advice provision) to 19.33 texts over two weeks for the most frequent code (EA disclosures to mothers) — and *within* code (reflected by large standard deviations). In order to put each code on a standard metric that would allow us to compare each dyad's frequency of engaging in each coded text message behavior relative to the other dyads in the sample and to aid in interpretation of latent profile analyses and visualizations, we recoded the frequency of parent–EA text messages in each code (e.g., EA disclosure, parent solicitation) into a variable with five categories reflecting relative frequency (0 = *no text messages sent or received*, 1 = *first quartile (excluding 0)*, 2 = *second quartile*, 3 = *third quartile*, 4 = *fourth*

quartile). These recoded scores were then used as the inputs in subsequent latent profile analyses.

Data Analysis

To identify dyadic parent–EA digital interaction styles, we conducted separate latent profile analyses (LPA) in *M*Plus 8.6 (Muthén & Muthén, 2017) to identify sub-groups of mother–EA and father–EA dyads who might be different in their relative frequency of 11 types of parent–EA text message codes. All analyses utilized the MLR estimator to account for non-normality and missing data were handled using FIML. To avoid local maxima or local solutions, we used 10,000 random sets of start values, 500 iterations, and retained 250 solutions for final stage optimizations. LPA models were estimated in a stepwise fashion with increasing numbers of classes until the models failed to converge. Both statistical and substantive criteria were used to identify the optimal enumeration of profiles for both mother-EA and father-EA dyads (separately). Statistical criteria included: (a) the Akaike Information Criterion (AIC), (b) the Bayesian Information Criterion (BIC), the sample-size adjusted BIC (ABIC), (c) the Integrated Classification Likelihood BIC (ICL-BIC), (d) the Vuong–Lo–Mendell–Rubin (VLMR), the Adjusted Lo, Mendell and Rubin's (aLMR), and the Parametric Bootstrapped (BLRT) likelihood ratio tests (Morin & Wang, 2016). Lower AIC, BIC, ABIC, and ICL-BIC values suggest a better fit to the data and were plotted to identify the elbow of the plot (i.e., the number of profiles after which the plotted fit indices flatten out). Likelihood ratio tests were used to compare a model with k profiles to a model with $k-1$ profiles to determine if the k profile had a significantly better fit (i.e., p .05). We also examined entropy, which is a gauge of how distinct profiles are from one another; higher entropy values are better, with 0.6 and 0.8 for the cutoffs for moderate and high classification accuracy, respectively (Morin & Wang, 2016). In addition, we considered the substantive meaning, interpretability, and size of the profiles in deciding how many profiles were optimal.

To describe whether demographic characteristics differed across the profiles of parent–EA digital interaction style, we utilized Vermunt's three-step procedure to explore the probability of profile membership based upon demographic variables (Asparouhov & Muthén, 2014). This approach avoids altering the size or structure of the profiles when auxiliary variables are included in the model. Finally, we tested whether EAs with different perceptions of digital relatedness (text supportiveness) and autonomy (digital pressure) with their parents were more likely to be in certain dyadic parent-EA digital interaction style profiles. We estimated a regression auxiliary model combined with latent profile estimation using a three-step manual BCH approach. We included model constraints to test for differences in how profiles were associated with perceived parental text supportiveness and digital pressure, over and above controls (age, gender, and parent education).

Analyses were not pre-registered. We report here how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the present study. Given the highly personal nature of text message communications and the fact that the participants did not consent to public data sharing, raw data is not publicly available. To encourage research reproducibility and transparency, all Mplus output files (including syntax and

variance/covariance matrices that allow for replication) are available on the Open Science Framework (https://osf.io/n8yd6/?view_only=b0dd931597a24be1ab24a329be62d7bb).

Results

Separate mixture models for mother–EA and father–EA dyads revealed that they did not have the same optimal profile enumeration (see Table 2 for fit indices). For mother–EA dyads ($N = 215$), we accepted the four-profile solution, because: (a) the VLMR and a-LMR likelihood ratio tests showed that the four profile solution was significantly better than the three profile solution and that the five profile solution was not significantly better, (b) the plot of fit indices indicated an elbow at four, and (c) the four profile entropy was highest. The posterior classification probabilities of the four-profile solution were also high, ranging from 0.962 to 0.986. For father–EA dyads ($N = 180$), we accepted the two-profile solution as the VLMR and a-LMR likelihood ratio tests indicated the two-profile solution was a significantly better fit to the data than the one profile solution and the fit indices plot indicated the two profile solution was optimal. The classification probabilities for these two profiles were also high (1.00 and 0.996).

Figure 1 depicts the 4 Mother–EA and 2 father–EA profiles of dyadic digital interactions. A *reciprocal disengagement* profile (characterized by dyads who text infrequently across all coded domains) emerged as the most common profile for both mother–EA dyads (40% of dyads; solid blue line) and father–EA dyads (88% of dyads; dashed blue line). Three additional mother–EA profiles emerged. Mother–EA dyads evidenced a clear *reciprocal engagement* profile (13% of dyads; solid red line) with high frequencies across all codes (i.e., above the 75th percentile for nine codes and above the 50th percentile for EA Instrumental Support and Advice Seeking). Among mother–EA dyads, two additional profiles which overlapped somewhat (though not entirely) with the hypothesized reciprocal monitoring and responsiveness profiles emerged. One mother–EA profile, was characterized by high levels of parent solicitation and EA disclosure and moderate levels of parent and EA warmth but was distinguished by relatively lower (below the 50th percentile) occurrences of codes indexing parental control and all types of support seeking and provision. Thus, we called this profile (33% of dyads; dark purple line) the *Reciprocal Informational Exchange* profile. The final mother-EA profile (termed *Reciprocal Informational Exchange & Practical Support*; 13.6% of dyads; solid light purple line), was characterized by above average to high levels of most codes tapping both monitoring (parent solicitation and control, EA disclosure) and responsiveness (parent and youth warmth, seeking and provision of instrumental aid and advice) except for those capturing emotionally supportive text message interactions (emotional support provision and emotional support seeking, which both fell below the 25th percentile).

In addition to the *Reciprocal Disengagement* profile, one additional father–EA dyad profile emerged (again sharing some but not all features of the hypothesized reciprocal monitoring and responsiveness profiles) which was characterized by above average frequency of several codes indexing both monitoring and support (parent solicitation, EA disclosure, parent advice provision and EA advice seeking), with frequencies in the 25th-50th percentiles for parent warmth, parent control, parent instrumental support provision, and EA instrumental

support seeking. Fathers in this profile evidenced lower frequency (below the 25th percentile) of codes indexing EA warmth, parent emotional/esteem support provision, and EA emotional/esteem support seeking. As a result, we termed this the *Reciprocal Informational Exchange & Advice* profile (12% of dyads; dashed light purple line). The bottom panel of Figure 1 displays the profile indicator means for all four mother and two father profiles. Contrary to hypotheses, no mismatched/overparenting profiles (characterized by high levels of parent codes but low EA codes) emerged.

As seen in Table 3, students were not significantly more or less likely to be in the different profiles of dyadic parent–EA digital interaction styles based on gender, age, and parent education. As seen in Table 4, mother–EA results indicate that, compared to being in the Reciprocal Disengagement profile, students in the *Reciprocal Informational Exchange & Practical Support*, *Reciprocal Informational Exchange*, and *Reciprocal Engagement* profiles all perceived their parents to be significantly more supportive via text message ($p = .009$, $p = .011$, $p = .005$, respectively). Similarly, for the father–EA profiles, students in the *Reciprocal Informational Exchange & Advice* profile perceived their parents to be more supportive via text message than those in the *Reciprocally Disengaged* profile at a level that approached significance ($p = .051$). Contrary to hypotheses, EAs tended to perceive their parents' level of digital pressure similarly across all mother- and father–EA digital interaction styles.

Discussion

EA college students and their parents are in frequent digital contact, with distinct styles of text message interactions emerging within this corpus of about 30,000 text messages exchanged over two weeks. Results indicated that mother–EA dyads clustered into four, largely reciprocal, styles of digital interactions: *Reciprocal Disengagement* (comprising 40% of mother–EA dyads), *Reciprocal Engagement* (13%), *Reciprocal Informational Exchange* (33%), and *Reciprocal Informational Exchange & Practical Support* (13.6%). Father–EA dyads, who communicated much less via text message overall, were less nuanced and clustered into two clusters: *Reciprocal Disengagement* (comprising 88% of father–EA dyads) and *Reciprocal Informational Exchange & Advice* (comprising 12% of father-EA dyads).

These profiles were only somewhat consistent with what we would have expected based on the extensive parenting styles literature based on face-to-face parent–child interactions (Baumrind, 1966; McKee et al., 2008). From that literature, we expected to find at least four profiles with different combinations of high/low responsiveness and monitoring (authoritative, authoritarian, permissive, uninvolved). However, we found neither authoritarian nor permissive styles of digital parenting, though the mother–EA *Reciprocal Engagement* profile could be thought of as capturing some elements of an authoritative digital parenting style in that those dyads saw high levels of indicators of both responsiveness and monitoring. In contrast, we did find clear evidence for a *Reciprocal Disengagement* profile (a potential dyadic digital analogue of a traditional uninvolved parenting style) in both mother–EA and father–EA dyads, with these profiles making up far larger proportions of the sample (40% of mother–EA and 88% of father–EA dyads) than offline uninvolved parenting styles in other recent studies of self-reported /perceived

parenting styles in emerging adulthood (García Mendoza et al., 2019; Nelson et al., 2011; Padilla-Walker et al., 2021). This underscores the importance of remembering that text message interactions represent only one aspect of parent-EA communication and interaction and do not capture the totality of the ways in which parents and EAs interact and relate. It may be that those dyads in the reciprocal disengagement profiles find other ways to connect (online and offline), that the text message medium is but a supplement to broader strategies for maintaining relatedness at the transition to adulthood, or even that digital disengagement could be supporting autonomy development in ways not fully captured here.

We also hypothesized, based on the helicopter and overparenting literatures (Cui et al., 2022) and the importance of dyadic reciprocity in digital parent–child interactions during emerging adulthood (Wang, 2019; Weisskirch, 2009, 2011), that we might see "mismatch" profiles characterized by higher levels of parent relative to EA engagement. However, these did not emerge. Rather, the dyadic text interactions captured here appeared to be quite reciprocal such that parent- and EA- driven monitoring (characterized by both parent solicitation and EA disclosures) and responsiveness (characterized by parent and EA warmth, parent support provision and EA support seeking) tended to co-occur within styles. This underscores the importance of considering the EA's role in parent–EA interactions, and the fact that many high-intensity interactions may be welcomed and participated in by the EA rather than a reflection of parent intrusion. The lack of support for mismatched profiles (with high parental engagement and low EA engagement) and for a link between any one profile and EAs' perceptions of greater parental digital pressure align with variable-centered findings in prior analyses of this sample showing few associations between any parent–EA text behaviors and perceived parental digital pressure (Jensen, Hussong, & Haston, 2021). In addition, these findings present a significant reframing of the parenting literature, which often assumes that high levels of "helicopter parenting" behaviors (e.g., parental decision making or intervening to solve problems) are excessive, developmentally inappropriate, and autonomy inhibiting. Results highlight the importance of situating parent–EA interactions within the current macrotemporal moment, when many behaviors that perceived by adults who grew up in earlier generations as developmentally inappropriate (e.g., texting a parent for feedback on one's resume, a parent texting for updates about a student's progress towards their final project) may no longer be perceived as such by young people or their parents today. Despite societal concerns about the mobile phone as a tether to developmentally inappropriate amounts of connection, in the digital age, parent text messaging appears to be fairly normative and positively perceived by young people (Miller-Ott et al., 2014).

Associations (and lack thereof) between styles of parent–EA digital interactions and digital analogues of relatedness and autonomy help shed light on the ways in which digital parent-EA interaction styles may strengthen EA perceptions of parental support or be perceived as intrusive and potentially autonomy inhibiting. EAs in dyads that fell into the mother-EA and father-EA *Reciprocal Disengagement* styles tended to perceive parents as less supportive via text messaging relative to all other profile types. This suggests that these digital interaction profiles are indeed capturing aspects of parent-EA interactions and that these objectively coded interaction styles overlap, at least to some extent, with EA perceptions of the parent–EA text message microsystem. The marginally significant association in father-EA dyads

may be due (at least in part) to lower statistical power, where there were both fewer dyads and a much more uneven distribution across the two father-EA dyadic digital interaction styles.

Interestingly, EAs in the mother–EA *Reciprocal Engagement* style did not perceive their parents as any more supportive via text message than EAs in either *Reciprocal Informational Exchange* style even though the latter did in fact provide less frequent observed support (especially of the emotional/esteem). This could suggest that perhaps that there is some baseline level of digital supportiveness that is needed to sway EA perceptions above which increasingly higher levels of support have little impact, or even that mothers' engagement in other text message behaviors (e.g., solicitations) could also be perceived as supportive.

The results here also highlight the ways in which subjective (self-reported) and objective (observed) experiences of parent-EA digital interactions differ; it may be that the same text message interaction is perceived as supportive by one emerging adult but as neutral (or even intrusive) by another. It may also be that the same types of behaviors may be perceived differently when delivered face-to-face vs. virtually. Since subjective perceptions of digital interactions often better predict self-reported adjustment than objective assessments (Chase et al., 2022), future research would do well to explore EA's perceptions of naturalistic text message and face-to-face interactions alongside objective text content (e.g., through mixed methods qualitative interviews; Fletcher et al., 2018) and in-person interaction tasks in order to better inform interventions targeting parenting behaviors.

Conclusions

Overall, the current study indicated dyadic parent–EA digital interaction styles are largely reciprocal, similar across demographic groups, and somewhat linked to perceptions of parental text supportiveness but not digital pressure. The study is strengthened by its use of rich, dyadic, and observational text message data, a relatively population representative sample, and attention to interactions with both mothers and fathers. However, there are shortcomings to this innovative method which must be considered.

First, it cannot be overlooked that, despite the presence of intensive longitudinal data on parent–EA text interactions, the associations tested here between digital parent-EA interaction profiles and perceived digital supportiveness/pressure are cross-sectional, and thus we cannot draw firm conclusions about whether more digitally engaged styles drive EA perceptions of parental supportiveness, or rather if broader parental supportiveness serves to facilitate the digital enactment of this connection. Second, although this study captured many types of parent-EA text message interactions (indicative of both responsiveness and monitoring), the current study does not shed light on interactions that occur outside this two-week slice of the parent–EA text message microsystem (e.g., via phone call, on other social media platforms, or face-to-face over longer periods of time). Third, we unfortunately did not measure our outcomes of parental digital pressure and text message supportiveness separately for mothers and fathers, which constrains our ability to parse mother-father differences in associations between parent-EA digital interaction styles and these analogues of digital relatedness and autonomy. Fourth and finally, it is important to remember that the sample of college students here (though fairly representative

from the University itself) is largely from a highly educated and high socioeconomic background, from a single university, collected in 2014–2015; thus findings might not extend to more economically diverse families, non-college going EAs, or post pandemic parent-EA interactions. All limitations can and should be addressed in future longitudinal, multi-method, multi-informant research which combines the strengths of observational text message data with the strengths of traditional longitudinal survey or in-person observational designs equipped to capture how objective and subjective features of the mother- and father-EA relationship change over time.

We leveraged the content of nearly 30,000 coded parent–EA text messages exchanged over a two-week period to yield valuable insights into the roles of mothers, fathers, and EAs in co-constructing styles of parent–EA interactions via text message. Results underscore the importance of extending the study of "parenting styles" from childhood and adolescence into emerging adulthood, from solely offline to co-constructed online and offline parent–EA microsystems, from solely parent-driven to increasingly dyadic and dynamic conceptualizations that account for the EA's role in shaping interactions, and from largely self-report to increasingly observational study designs. Findings have implications for parents, EAs, and practitioners who seek guidance about what level of digital engagement is most likely to promote a healthy balance of EA autonomy and relatedness. Our results suggest that, for the most part, the mobile phone is a valuable tool to maintain connection with few risks for undermining EA privacy and autonomy.

Acknowledgments:

Data Availability:

Given the highly personal nature of text message communications and the fact that the participants did not consent to public data sharing, raw data is not publicly available. To encourage reproducibility and transparency of this research, Mplus output files (including syntax and variance/covariance matrices that allow for replication) are available on the Open Science Framework (https://osf.io/n8yd6/?view_only=b0dd931597a24be1ab24a329be62d7bb). Portions of this work were presented at the 2023 Society for Research on Adolescence conference in San Diego, CA.

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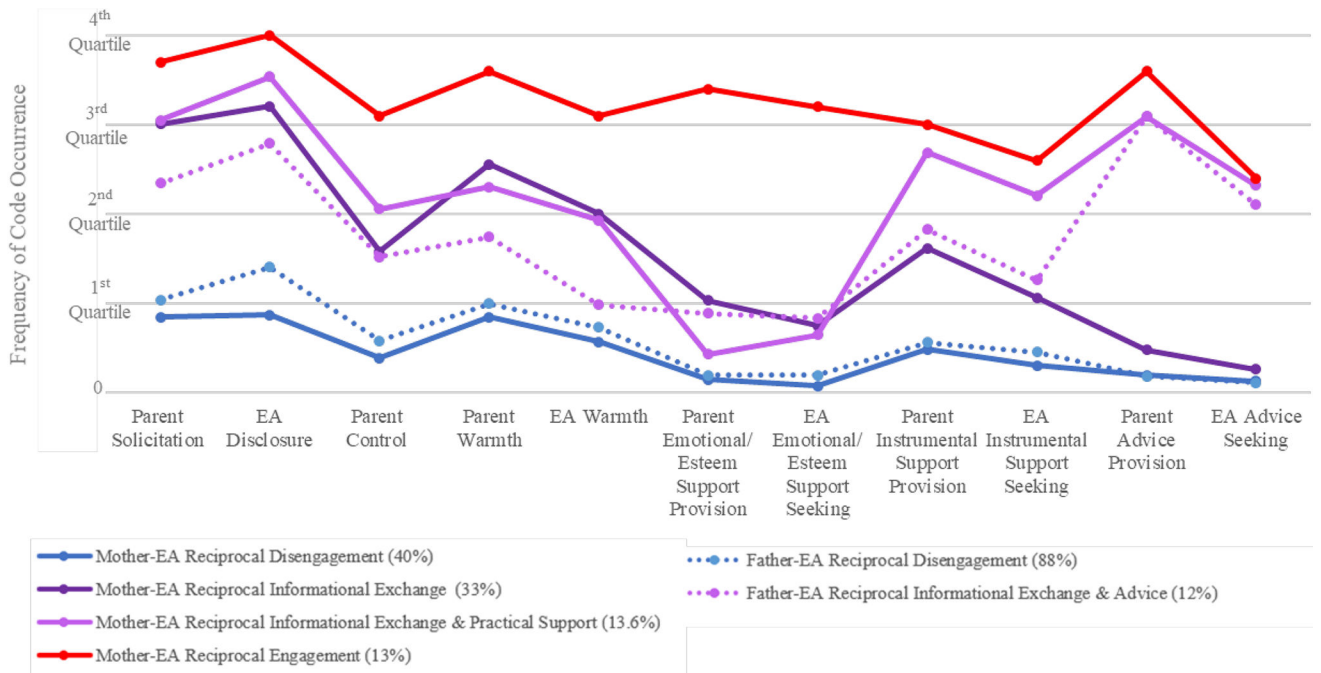
Figure 1.
Dyadic Parent-EA Digital Interaction Styles among Mother-EA and Father-EA Dyads

Table 1

PCTICs Codes and Definitions

	Code	Definition
Monitoring	EA Disclosure	Discloses information about behavior, wellbeing, activities, relationships, whereabouts.
	Parent Solicitation	Asks questions about behavior, wellbeing, activities, relationships, whereabouts
	Parent Control	Reminders of expectations and rules for behavior. Usually directive, actionable, and/or unsolicited.
Responsiveness	EA Warmth	Expressions of care, concern, support, or encouragement. Facilitates a positive connection. May include endearments,
	Parent Warmth	expressions of affection and love, warm greetings, and compliments.
	EA Emotional/Esteem Support Seeking	Conveys desire for emotional or esteem support. Includes disclosure of distressing emotions, requests for emotional/esteem support.
	Parent Emotional/Esteem Support Provision	Discusses provision of emotional or esteem support. Occurs in the context of a need or support seeking.
	EA Instrumental Support Seeking	Includes requests or disclosures that seem intended to elicit tangible support (including favors, money, or goods).
	Parent Instrumental Support Provision	Discusses provision of tangible aid. May include favors, gifts, money. Occurs in context of need or support seeking.
	EA Advice Seeking	Solicits advice or guidance.
	Parent Advice Provision	Demonstrates provision of advice or guidance. Usually solicited, non-directive, or teaching.

Table 2

Model Fit Statistics and Profile Enumeration

		Mother-EA Dyads (N = 215)				Father-EA Dyads (N = 182)		
		2 profile	3 profile	4 profile	5 profile	1 profile	2 profile	3 profile
Info. Criteria	Akaike (AIC)	7546.86	7183.37	6991.74	6845.35	5852.33	5383.89	5134.35
	Bayesian (BIC)	7661.46	7338.42	7187.24	7081.29	5922.82	5492.83	5281.73
	Adjusted BIC (ABIC)	7553.72	7192.65	7003.45	6859.48	5853.14	5385.15	5136.04
Clustering criteria	Entropy	0.946	0.946	0.958	0.956	–	0.991	0.995
	NEC	0.02	0.02	0.02	0.04	–	0.00	0.00
	Both: ICL-BEC	7680.83	7363.93	7212.27	7111.74	–	5495.10	5283.73
Sample sizes	Profile 1	117	88	85	82	182	161	154
	Profile 2	98	77	73	51	–	21	18
	Profile 3	–	50	29	34	–	–	10
	Profile 4	–	–	28	24	–	–	–
	Profile 5	–	–	–	24	–	–	–
Likelihood Ratio Tests		1 vs. 2	2 vs. 3	3 vs. 4	4 vs. 5	–	1 vs. 2	2 vs. 3
	VLMR LRT	< .001	0.535	0.018	0.311	–	0.019	0.218
	LMR a-LRT	< .001	0.538	0.019	0.317	–	0.020	0.223
	Bootstrap LRT	< .001	< .001	< .001	< .001	–	< .001	< .001

Table 3.

Multinomial Logistic Regressions with Demographic Characteristics Predicting Profile Membership

	Mother-EA Dyads											Father-EA Dyads	
	Ref: Reciprocal Informational Exchange & Practical Support						Ref: Reciprocal Disengagement				Ref: Reciprocal Informational Exchange		Ref: Reciprocal Informational Exchange & Advicee	
	Reciprocal Disengagement		Reciprocal Informational Exchange		Reciprocal Engagement		Reciprocal Informational Exchange		Reciprocal Engagement		Reciprocal Engagement		Reciprocal Disengagement	
	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI	OR	CI
Male	2.74	0.98–7.72	2.76	0.97–7.91	1.20	0.32–5.52	1.01	0.51–2.00	0.44	0.15–1.22	0.43	0.15–1.22	0.94	0.36–2.46
Age	0.99	0.71–1.37	0.82	0.59–1.13	0.79	0.52–1.19	0.83	0.65–1.06	0.80	0.56–1.14	0.96	0.68–1.36	1.09	0.77–1.56
Parent education	0.78	0.57–1.07	0.96	0.68–1.35	0.99	0.70–1.41	1.23	0.96–1.59	1.28	0.97–1.68	1.03	0.77–1.38	.75	0.51–1.12

Note: Demographic predictors estimated simultaneously in separate models for mother-EA versus father-EA dyads. No contrast was statistically significant at p .05.

Table 4.

Associations between Digital Parent-EA Interaction Profiles and Perceived Parental Digital Pressure and Text Supportiveness

	Mother-EA Dyads				**Father-EA Dyads**	
	Reciprocal Informational Exchange & Practical Support	Reciprocal Disengagement	Reciprocal Informational Exchange	Reciprocal Engagement	Reciprocal Informational Exchange & Advice	Reciprocal Disengagement
Pressure	1.59	1.37	1.61	1.41	1.49	1.25
Supportiveness	1.06^b	0.69^a	1.03^b	1.19^b	1.92^c	1.60^d

Note. Means adjusted for age, gender, and parent education.

[a] superscript for mother-EA dyads indicates that value was significantly different (p .05) than

[b] values, which did not differ significantly from one another.

[c] superscript for father-EA dyads indicates that value was marginally significantly different (*p*=.051) than

[d] value.