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More Moments With Others Matter for Emotion Regulation and Well-Being:

A Study of First-Year College Students' Daily Life During COVID-19

By

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Presented to the Graduate Faculty of Claremont Graduate University in partial fulfillment of the requirements for the degree of Master of Arts in Positive Developmental Psychology

We certify that we have read this document and approve it as adequate in scope and quality for the degree of Master of Arts.

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More Moments with Others Matter for Emotion Regulation and Well-Being: A Study of First-Year College Students' Daily Life During COVID-19

Emerging adult, first-year college students are a uniquely vulnerable population since they are experiencing pivotal life transitions: a developmental transition from adolescence to early adulthood (Arnett, 2000) and an ecological transition from high school to a new academic and social environment in college. The transition to college and adulthood has been found to be a critical time for emerging adults with an increased susceptibility to the onset of clinical and mental health issues (Downs et al., 2017; Schulenberg et al., 2004). In an already challenging time period, a major impactful event like the COVID-19 pandemic does not bode well for the daily lives of early adults in their first year of college. Recently due to pandemic-related disruptions (e.g., campus lockdowns and quarantine measures), first-year college students have demonstrated disproportionate levels of anxiety, emotional distress, and decreased well-being (Fruehwirth et al., 2021; Son et al., 2020)—on top of the typical challenges accompanying the college and adulthood transition.

The effects of the COVID-19 pandemic bring about emotional problems that trickle down to the daily well-being of college students as they navigate new contexts (Huckins et al., 2020; Kleiman et al., 2020). Unsurprisingly, pandemic-related challenges have been associated with university students' diminished positive emotions and amplified negative emotions such as worry, anger, and anxiety (Kleiman et al., 2020; Li et al., 2020; Son et al., 2020). Furthermore, emerging young adult students navigating their first year of college have a heightened susceptibility for peak emotional and behavioral problems (Burt & Masten, 2010). Emotion regulation—the ability for people to down-regulate negative emotions and up-regulate positive emotions (Gross, 2014)—is an important psychological adaptation for the general population to

alleviate emotional distress in situations that cause an influx of negative emotions (Gross 2015). In a situation filled with pandemic-related emotional challenges and transition-related ones, first-year college students represent a particularly vulnerable population. To successfully cope with all challenges faced and with limited access to other people (due to university closures, social isolation mandates, and more), a mastery of emotional self-regulatory skills is vital for first-year students' well-being. Put simply, it is crucial to understand the types of emotion regulatory behaviors first-year students engage in that promote flourishing on a daily basis, particularly, in such dire times of a pandemic.

The current study aims to examine the adoption of emotion regulatory skills by first-year college students in everyday life in relation to aspects of their well-being in the COVID-19 pandemic context. Specifically, I aim to examine emotion regulation skills that have derived from Dialectical Behavior Therapy (DBT; Neacsiu et al., 2014) and clinical psychological science. Though originally designed to treat emotion dysregulation in clinical populations, DBT treatment programs have been efficacious in real-world settings for adults and adolescents (Flynn et al., 2018). Within the DBT framework, there are specific outlined behaviors that help individuals with emotional vulnerability and regulation called *ABC* and *PLEASE skills* — *Accumulating positives, Building mastery, Coping ahead; treating Physical iLlnesses, Eating balanced meals, avoiding mood-Altering substances, and maintaining balanced Sleep and Exercise* (Linehan, 2014; Neacsiu et al., 2014). In an especially emotionally vulnerable time period (first year of college and COVID-19 campus lockdowns), it is imperative to understand what evidence-based emotion regulation skills used by students on a daily basis are associated with buffering the negative emotional impacts of COVID-19 lockdowns and related momentary contextual stressors. Furthermore, as first-year students effectively regulate their moment-to-

moment emotions using DBT-skills (not formally trained in) during this historic transition period, would they also reap beneficial outcomes for the elements of their well-being (Seligman, 2011, 2018)?

Results from this study will shed light on what and how naturalistic emotion regulation behaviors relate to the emotional and overall well-being for this unique population (college first-years) and time period (COVID-19). Although there have been recent studies that investigate the impacts of COVID-19 on a momentary basis for college students (e.g., Huckins et al., 2020; Kleiman et al., 2020), seemingly none have investigated emotion regulatory behaviors (specifically DBT ABC and PLEASE skills) in real-time daily life through ecological momentary assessments (EMA; Stone & Shiffman, 1994). Ultimately, findings from this study can contribute ecologically valid knowledge about daily emotion regulation habits in college students' lives that relate to positive psychological factors and well-being outcomes during the COVID-19 pandemic (Waters et al., 2021). Moreover, the results from this research have potential to contribute to the development of low-cost, low-intensity initiatives to promote emotion coping skills and improved well-being that are effective, accessible, and scalable even in low-resource settings where traditional means of promoting wellness are not feasible.

Emerging Adulthood and First-Year U.S. College Students

Emerging adult first-year college students are at a junction where they experience major developmental and lifestyle changes as they emerge from adolescence into young adulthood and transition to the context of higher education. Based on Erikson's (1968) psychosocial developmental theory (specifically the adolescence period), Arnett (2000, 2004) introduced the concept of *emerging adulthood* to describe the phase in the lifespan between adolescence and young adulthood for people aged 18–25. However, critical caveats of Arnett's term *emerging*

adulthood are that there is a lack of substantive evidence that this period is a universal *developmental stage*, and it is not experienced across all social classes even within the United States (Côté, 2014). In particular, Arnett (2000) originally viewed this period to be culturally non-universal and prevalent only in industrialized societies that value higher education for success in the workforce such as the United States. Although it can be debated whether emerging adulthood is fundamentally a developmental theory, stage, or neither (Syed, 2015), traditional first-year American college students nonetheless embody prototypical emerging adult characteristics since they mostly represent a subpopulation of higher socioeconomic status in a modernized nation (Arnett, 2015). Moreover, the college context inherently provides an environment conducive for experiencing the hallmarks of the emerging adulthood period (e.g., identity exploration through declaring majors, self-focusing on a major to prepare for the workforce). For the purposes of this study, I view first-year college students generally as *emerging adults*. I acknowledge that the experiences of this population do not generalize to some universal developmental *stage* per se, especially considering non-U.S. and non-college attending young adults of similar ages.

All things considered, emerging adult, first-year college students are a unique and consistently large population in a transition period that can benefit from more attention and research. The majority of U.S. early adults who recently completed high school go on to enroll in college in the same calendar year (68% in 2019; National Center for Education Statistics, 2020b). Also, nearly a third (31%) of all four-year college students in 2019 were between the ages of 18 and 24 years (NCES, 2020a). The observable pre-pandemic trend of increasing college participation in the past few decades in the United States illustrates that emerging adult college students comprise a subpopulation worthy of study (Arnett, 2016). Yet, before

understanding how a major event like COVID-19 impacts college first-years, it is important to understand the context-specific details behind an already pivotal time period for these emerging and young adults—the transition-to-college experience.

Challenges in Transitioning to the College Context

While college presents a plethora of opportunities for emerging adults to connect with others and improve their psychological well-being (Bowman, 2010), the college setting also brings about unforeseen psychological challenges. For example, a study by Conley and colleagues (2014) on the psychosocial adjustment of college freshmen found that the first few months of adjusting to college marked significant decreases in psychological and socio-emotional well-being alongside increases in psychological distress and poor emotional coping strategies; also, most of these issues did not fully resolve by the end of the first academic year. In Rogers and colleagues' (2018) study of daily interactions of college students during the transition timeframe, they found that days where students had more interactions with friends were associated with increased momentary positive affect and decreased negative affect. However, in the same study, days of more conflicts and arguments with peers or parents resulted in students' increased negative affect (Rogers et al., 2018). Moreover, types of self-regulatory skills—such as thinking constructively, regulating emotions, and feeling a sense of mastery over environmental factors—demonstrated considerable variability for college students over time: some students displayed a lack of improvement (e.g., emotion regulation and constructive thinking) while others showed a decrease (sense of mastery) in self-regulation throughout their first year (Park et al., 2011).

The onset of maladaptive behaviors, mental health issues, and psychopathologies can also coincide with navigating the first year of college for emerging adult students (Schulenberg et al.,

2004). Emerging adults first starting college experience major discontinuities in their global and context-specific development, leading to potential peaks of substance use and abuse, risky antisocial behaviors, and anxiety and depression for subgroups of students who struggle to adapt successfully during this period (Nelson & Padilla-Walker, 2013; Schulenberg & Zarett, 2006). For instance, emerging adult college students experience arguably some of the greatest changes of their lives so far in terms of social roles (creating new friend networks), institutional structure (shifting from high school to college expectations), and geography (moving away from hometown) as they transition to new experiences (see Schulenberg & Zarett, 2006). Students who are naturally more resilient or have ample resources to cope with changes are likely to adapt well to novel contexts. However, new changes can be quite challenging for other students (feeling lonely or mismatched with new peers, being away from family and previous friends), which can lead to more susceptibility to worsened mental health or maladaptive behaviors such as binge drinking and illegally using marijuana (Schulenberg & Zarett, 2006). The adjustment to new developmental contexts presents new challenges, but vulnerabilities can be exacerbated in which more serious behavioral and psychological issues can accompany the transition. These challenges and issues for typical transitioning first-year college students are important to be cognizant of when investigating this population in the contemporary context of the COVID-19 pandemic.

The Effect of COVID-19 on First-Year College Students

Mass traumatic events such as the COVID-19 pandemic undoubtedly add to complications for first-year students (Fruehwirth et al., 2021). Pandemic responses such as lockdown measures, social distancing policies, and stay-at-home orders in the middle of the school year have abruptly transformed what the college experience looks like for students. For

emerging and young adults in general, COVID-19 poses unique challenges (such as inability to travel and having to return to living with parents) that may disrupt developmental milestones and social life (Gruber et al., 2021). The consensus of research on the effects of the COVID-19 pandemic on college students' mental health unsurprisingly finds increases in stress, anxiety, depression, worry, sleep disruptions, coping behaviors (positive and negative), sedentary behavior, desire to use drugs or alcohol, and overall disruption to daily life for college students (Fruehwirth et al., 2021; Huckins et al., 2020; Jackson et al., 2021; Kleiman et al., 2020; López-Valenciano et al., 2021; Saadeh et al., 2021; Son et al., 2020). To reiterate, numerous studies have found negative effects on college students' mental health due to COVID-19 stressors; for first-year students, having their first experience in college intertwined with a pandemic experience can be especially psychologically damaging.

Considering how emerging adults in their first year of college were already susceptible to negative outcomes due to the adjusting to life transitions, first-year students are prone to be disproportionately affected by the COVID-19 pandemic. More senior students may have already established sufficient social connections and support systems and adequately adjusted to the college context. In fact, research has shown that freshmen (in comparison to seniors) had worse familial interactions, adaptive coping behaviors, and overall mental health (Hall & Zygmunt, 2021). It is thus crucial to investigate first-year students during COVID-19 due to their unique placement in a developmental transition, educational-context transition that makes them particularly vulnerable in comparison to sophomores, juniors, and seniors.

Emotion Regulation

To successfully cope with transitioning to college during a pandemic while having limited options for help (due to lockdown, quarantine, distance mandates), self-regulatory skills

and a mastery of one's emotions seem vital for first-year students' well-being. Emotion regulation—the ability for people to down-regulate negative emotions and up-regulate positive emotions (Gross, 2015)—is an important psychological adaptation for the general population and especially important in the face of a pandemic. By regulating emotions, people can intentionally seek situations to minimize negative emotions and maximize positive emotions to benefit hedonic aspects of their well-being, while autonomy and regulatory control yield eudaimonic benefits (Tamir, 2016).

Generally, problems with emotion regulation can lead to adverse effects on emotional well-being with prolonged negative emotions, and on physical health with increased risk of cardiovascular disease (DeSteno et al., 2013). Furthermore, disasters and collective traumatic events like the COVID-19 pandemic inevitably bring about uncertainty and amplify negative emotions (e.g., stress, fear, irritability, anger; Sanchez-Gomez et al., 2021). Past research on mass disasters has demonstrated that people who have difficulty down-regulating intensified negative emotions and up-regulating positive emotions in such events are more likely to be negatively affected by a disaster like the 9/11 attacks in the United States (Fredrickson et al., 2003). Recent longitudinal research on over 100 university students in Greece has found that adaptive emotion regulation styles were tied to increased quality of life 1 month after lockdown measures were implemented; additionally, maladaptive or restricted access to emotion regulatory styles was associated with quality-of-life deterioration in the same time span (Panayiotou et al., 2021). As discussed previously, first-year students adjusting to college vary in their emotional regulatory capabilities and those with difficulties in adjustment are more prone to psychopathologies. Thus, successful emotion regulation can be seen as a very important

psychological adaptation for first-year college students in 2020 to have developed as they navigated brand new contexts (college, adulthood, COVID-19 pandemic society).

Dialectical behavior therapy (DBT) is a form of comprehensive cognitive behavior therapy that originally was used to treat emotion dysregulation for clinical populations (Neacsiu et al., 2010) and also closely aligns with non-clinical models of emotions and emotion regulation (Gross & Thompson, 2007; Neacsiu et al., 2014). DBT recognizes that training certain skills and developing strategies for managing the contextual (*ABC*) and physiological (*PLEASE*) factors can reduce emotion vulnerability and thereby promote adaptive emotion regulation (Linehan, 2014; Neacsiu et al., 2014). Although these skills are taught and trained through therapy, the nature and use of these, naturally occurring skills can be observed in people's daily lives outside of the clinical context

Accumulating positive life events, Building mastery, and Coping ahead are three skills that specifically promote contextual emotion resiliency to enhance emotion regulation. *Accumulating positives* can be broken down into the short-term (increase daily positive experiences to increase positive emotions) and the long-term (work on important goals for building a "life worth living"; Linehan, 2014). *Building mastery* relates to engaging in activities that increase feelings of competence and self-efficacy. *Coping ahead* corresponds to anticipating a difficult situation and using successful coping strategies (imagination or rehearsal) to solve problems with the future situation. Altogether, these skills have been demonstrated to decrease vulnerability to negative emotions by strategically managing and adapting to environmental factors (Neacsiu et al., 2014). For most first-year college adults during COVID-19 (abrupt campus lockdowns), investigating these context-related regulatory skills is of interest due to

drastic context changes (ecological, developmental, and historical) that these students must emotionally endure and traverse.

The *PLEASE* skills within DBT help people manage physiological factors (homeostasis) to influence emotional reactivity (Neacsiu et al., 2014); put simply, “take care of your mind by taking care of your body” (Linehan, 2014, p. 247). These skills are outlined in Linehan’s (2014) *DBT Skills Training Handouts and Worksheets* as: treating *Physical illness* (taking care of physical body, seeing doctor, taking only prescribed medicine), *Eating balanced meals* (consuming appropriate amounts of food and avoiding intense emotion-inducing foods), *avoiding mood-Altering substances* (moderately using or completely avoiding illicit drugs, alcohol, or non-prescribed medications), *balanced Sleeping* (sleeping on a consistent schedule, getting 7–9 hours of sleep each night), and *getting Exercise* (engaging in some sort of exercise about 20 minutes per day). With the link between poor emotion regulation and negative physical health outcomes (DeSteno et al., 2013), it is unsurprising to see that maintaining physical health is thereby related to reducing poor regulation and emotion vulnerabilities. For first-year college students during COVID-19, the environmental effects of the pandemic can trickle down to physically and psychologically impact the students: decreased physical activity due to increased sedentary lifestyle (lockdown measures and physical distancing), increased desire to drink alcohol and use drugs due to poor coping with negative emotions, and disrupted sleep patterns due to raised levels of stress, anxiety, and depressive thoughts (Huckins et al., 2020; Kleiman et al., 2020; Son et al., 2020).

Thus far, the ABC and PLEASE emotion regulation skills within DBT are noteworthy when considering the uniquely vulnerable population of first-year college students during the COVID-19 pandemic. Beyond helping clinical populations with emotion dysregulation and

coping with emotionally distressing situations, can the use of unprompted, naturally occurring DBT skills help a non-clinical (but still highly vulnerable) population of new college students cope with—and possibly even flourish during—the emotional distress of the COVID-19 situation? Specifically, investigating students’ use of emotion regulatory skills in a pandemic context may elucidate useful pathways towards optimal functioning and well-being.

Well-Being in Daily Life

Well-being is a complex construct that has had various conceptualizations and definitions across the history of psychological science commonly from hedonic or eudaimonic perspectives (Diener, 1984; Ryan & Deci, 2001; Ryff & Keyes, 1995). Briefly, a hedonic view of well-being sees the ultimate goal of life as to experience the maximum amount of pleasure; on the other hand, a eudaimonic view of the goal of life is for people to live authentically in accordance with their own self-value and true potential (Ryan & Deci, 2001). More recently, Seligman (2011, 2018) has proposed a multidimensional approach that explains well-being through five building blocks: positive emotions, engagement, relationships, meaning, and accomplishment (PERMA; Seligman, 2011).

The utility of the PERMA theory (Seligman, 2011)—which integrates both hedonic and eudaimonic well-being—is useful to capture a more holistic picture of the components that contribute to people’s well-being in daily life. This is particularly true for college students who live in the bustling college environment and encounter diverse groups of people and experiences that can influence various elements of well-being on a daily basis. Namely, college students in this phase of life may experience joy and excitement (positive emotions) entering into a stimulating new environment; enjoy feelings of engagement and flow (Csikszentmihalyi, 1990) in intellectually-challenging classrooms (Shernoff & Anderson, 2014); face opportunities to form

positive relationships with faculty (Bowman, 2010) and other peers (Barry et al., 2016); grow in their sense of meaning from their majors and career development; and feel accomplished in their academic achievements. Put simply, there are many aspects of college lifestyle and environment that can influence the various aspects of a student's well-being (i.e., PERMA building blocks), and a multidimensional approach can capture an extensively detailed picture of a good life. A recent study by Heshmati and colleagues (2020) investigated the well-being of early adult college students through network analysis of a momentary PERMA measure. The results of the network analysis revealed that the measures of momentary PERMA form a network of well-being with five unique yet closely interconnected groups, thereby supporting Seligman's (2011) argument that well-being is a multidimensional construct (Heshmati et al., 2020). Furthermore, the well-being elements of positive emotions and relationships were found to be most central to the well-being network of emerging adult college students aged 18 to 22 years old (Heshmati et al., 2020).

Despite considerable research on the well-being of college students in general, the daily well-being of specifically first-year college students (especially during a pandemic) warrants a closer examination. First impressions are important, and so too is the first year of the college experience due to the psychosocial adjustment to the novel environment and college lifestyle (Conley et al., 2014; Park et al. 2011; Rogers et al., 2018; Schulenberg et al., 2004). Meanwhile, the COVID-19 pandemic generates additional complications to the daily lives of first-year students (Fruehwirth et al., 2021; Son et al., 2020). For instance, maintaining high academic achievement in college is difficult for students struggling with distance-learning classes due to limited access to academic support (virtual tutoring, professor office hours) and less-than-ideal learning environments (e.g., finding a quiet place to work, shared space with family members at

home). First-year students may also have difficulty creating or maintaining relationships since the majority of interactions with friends, roommates, and mentors are restricted to long-distanced virtual mediums. On top of that, discovering new clubs and hobbies, engaging in sports activities, and enjoying school events and amenities are all rendered practically impossible behind an open computer screen and a closed campus. With extreme changes to the day-to-day contexts of emerging adults' transition-to-college experience, it is necessary to study how first-year students continue to flourish within these unique contexts in order to obtain a comprehensive and ecologically accurate understanding of their well-being during COVID-19.

For this purpose, experiential self-report measures and ecologically valid research methods are useful for capturing people's experiences as they live their lives in real-time and real-world contexts during the COVID-19 pandemic. Methodology such as the Experience Sampling Method (ESM; Larson & Csikszentmihalyi, 1983), rooted and first used in positive and developmental psychology research on the activities and mood of adolescent students, is useful for determining the affect and frequency of emotion regulatory activities of college students. Similarly, Ecological Momentary Assessments (EMA; Stone & Shiffman, 1994), which were developed in the health and clinical psychology literature, are a "range of methods and traditions" (p.3, Shiffman et al., 2008) that focus on capturing psychological changes in response to certain phenomena. The advantage of an EMA (or ESM) approach is the capability to account for respondents' unique naturalistic setting and history, individual differences, and contextual influences (Stone & Shiffman, 1994; Shiffman et al., 2008). Furthermore, momentary assessments of well-being demonstrate an advantage over the limitations that characterize global assessments of well-being—subject to recall bias (respondents are likely to give an inaccurate assessment of general well-being if they are in a negative mood), inadequacy to capture the

experiential nature of feelings and moment-to-moment fluctuations in well-being, and lack of attention to the influence of others and environmental interactions on one's current judgment of well-being (Clark & Teasdale, 1982; Hudson et al., 2020; Shiffman et al., 2008). For this paper, I view the terms ESM and EMA as interchangeable, but I prefer to use the term EMA. With the environmental limitations due to COVID-19 restrictions, an EMA approach is warranted as efficient, safe, reliable, and ecologically valid ways to measure well-being without researchers physically being intrusive in the measurement process.

The Current Study

The current study adopted an EMA design to assess emerging adult first-year students' emotion regulation skills in their daily lives as it relates to their daily and momentary well-being in the context of the COVID-19 pandemic. One innovation of this study is the investigation of the clinical evidence-based ER skills first-year college students employ in their daily life and how these skills are related to the various elements of students' well-being in their own ecological settings.

This led to the first research question: Is usage of ABC and PLEASE skills in daily life associated with each of the five elements of momentary PERMA (mPERMA; Heshmati et al., 2021) above and beyond person-level PERMA? Adaptive emotion regulation has previously demonstrated benefits to managing students' emotions after major historic events (Frederickson et al., 2003) and global assessments of well-being (Panayiotou et al., 2021); yet, further research is needed to determine exactly what types of emotion regulatory skills are best suited for this population for aspects of their well-being and if flourishing first-year students are more likely to use certain skills on a daily basis. Specifically, I hypothesize that usage of each individual DBT

ABC PLEASE skill will be associated with momentary well-being (mPERMA) above and beyond trait well-being (PERMA).

Secondly, the EMA design is able to capture the fine details of the emerging adult first-years' real-world contexts to understand the conditions conducive for adaptive emotion regulation and flourishing. The second primary research question explored is: Are lifestyle factors (day of the week and human interaction) related to first-year college students' likelihood of employing emotion regulatory skills (*ABC* and *PLEASE*) in a given moment? Lifestyle factors pertain to current external conditions (e.g., weekend or weekday, having a recent interaction with someone else) that are not inherently psychological or emotional dispositions. College students typically have a range of activities outside of direct study time or class time, such as significantly increased time socializing with others, playing sports, attending events, and using alcohol on weekends in comparison to weekdays (Finlay et al., 2012). Also, college students during the COVID-19 pandemic have had atypical fluctuations in their mental health and social interactions, namely decreased social interactions due to physical distancing measures (Son et al., 2020). Thus, I hypothesize that there will be patterns in frequency or types of emotion regulatory skills used based on certain external factors. Specifically, I expect that moments of human interaction (as opposed to isolation) will be related to a higher likelihood of more ER skills being used; and patterns of maladaptive ER behaviors (e.g., exhibiting poor maintenance of physical health and avoidance of substances like drugs and alcohol) would be evident on weekends, and moments with lower-than-usual human interaction.

Method

The data used for this study derives from a sample of first-year, private university students from southern California. Students participated in the research during COVID-19

remote learning measures in the late Spring 2020 semester after the mid-semester spring break; specifically, data analyzed in this study was collected between April 5, 2020 and May 20, 2020. This period was after the first COVID-19 stay-at-home order preventative measure was issued for the state of California on March 19, 2020. Also, with widespread cases of COVID-19, the United States was the country with the most reported cases by mid-April 2020 (CDC, 2022). The study was reviewed by the Institutional Review Board (IRB) at Claremont Graduate University and received the “exemption verified” status.

Participants

Participants came from a sample ($N = 76$) of first-year, college-attending emerging adults (at least 18 years old; age range of 18–20, $M_{age} = 18.61$) from the five Claremont Colleges. The participants represented a diverse demographic spread across genders (71% female, 24% male, 4% non-binary, 1% preferred not to answer), ethnicity (46% White, 36% Asian or Pacific Islander, 14% Hispanic or Latinx, 13% Black or African-American, 13% mixed, 1% Native American or Eskimo Aleut, 4% did not specify), and majors or intended majors *not limited to psychology or social sciences* (28% social sciences or international studies, 22% life sciences or pre-med, 21% math or economics, 17% undecided/undeclared, 11% arts/performance, media, or languages, 8% engineering or computer sciences). Additionally, participants reported their current living situation (55% at home with family, 37% on campus, 8% off campus) and the number of people they were currently living with at the time of the survey (no one: $n = 2$, one person: $n = 8$, two people: $n = 20$, three people: $n = 28$, four people: $n = 13$, five or more: $n = 5$).

For multivariate linear regression models, a sample size of $N = 76$ was found to be sufficient for a moderately small-sized effect with 80% power detection and $\alpha = 0.05$ (Cohen, 1988) based on power analyses run using *pwr* package in R.

Procedure

Participants were recruited via digital flyers sent out to various classes and campus-organizations composed of first-year students (e.g., introductory courses), as well as through word of mouth and social media (e.g., Facebook groups). To participate, students first read an overview about the study, verified their eligibility (first-year undergraduate student *and* at least 18 years old), and signed an online consent form. Then, participants completed a battery of questionnaires on trait-level measures and demographic information (one-time, 20- to 30-min survey) on Qualtrics. Upon completion of these steps, consenting participants were then invited to an online (Zoom) 20-min interview session with a research assistant to discuss the study design, payment, and technical requirements for the participant's personal smartphone. Once participants set up the free smartphone app, PIEL (Participation in Everyday Life Survey; Jessup et al., 2012), on their personal phone, they then completed a sample momentary survey with all items (not counted in data analyses). After completion of the sample, research assistants offered clarification for any survey items, though no participant expressed any major issues with survey item wordings or phrasings. Examples of the PIEL App user interface can be found in Appendix A, and all momentary survey items can be found in Appendix B. After the interview session, participants officially entered into the data collection period the following day.

During the data collection period (participants' individual start dates varied, but all EMA collection began the following day after their interview session), brief surveys (2- to 3-min long) were administered via push notifications (i.e., signal-contingent survey) on a participant's personal smartphone at random time points within four intervals (morning = 9:00–11:00 a.m., afternoon = 12:00–2:00 p.m., late afternoon = 3:00–5:00 p.m., and evening = 6:00–9:00 p.m.) for seven consecutive days (max possible = 28 EMAs). Once a push notification was received,

participants had a time limit of 20 minutes to open the notification and load the survey on the PIEL app. Once a survey was loaded, participants had a 15-min time limit to fully complete the survey items. Failure to open notifications or complete the survey in the time allotted was treated as a nonresponse for that momentary assessment. At the end of the entire study, students were provided a debrief document detailing the purpose of the study as well as contact information for further questions or desire to be dropped from data analyses. Lastly, participants were compensated up to a maximum of \$30 (USD): \$15 for completing baseline trait-level measures and demographic information, and \$15 for completing at least 90% completion rate of all EMAs that week. Students who completed less than 90% of EMAs were compensated proportionately to the nearest dollar for what they completed (e.g., 23 EMAs = \$12). Students were included in the sample for data analyses if they were compensated and had both: (a) about 80% compliance rate (per guidelines from Stone and Shiffman, 2002) for complete EMA survey data available for 1 week; and (b) a complete (100%) set of one-time, trait-level measures.

Measures

Within-Person Measures

Momentary PERMA (mPERMA). mPERMA (Heshmati et al., 2020, 2021) is the momentary-adapted version of the PERMA Profiler (Butler & Kern, 2016), capturing participants' multifaceted well-being (Seligman, 2011) in the moment. To emphasize that participants were answering questions about their momentary well-being, participants were prompted with the message: "please answer how much the statement currently describes you in this exact moment by moving the red circle on the slider towards either end." Participants answered three items based on each facet of PERMA for a total of 15 items: positive emotions (e.g., "I am feeling joyful"), engagement (e.g., "when I noticed this survey, I was absorbed in

what I was doing”), relationships (e.g., “I feel helped and supported by others”), meaning (e.g., “I have a sense of direction in my life”), and accomplishment (e.g., “I am making progress towards accomplishing my goals”). Each item appeared in a randomized order on the PIEL app on a slider scale ranging from 0–1.00 (*not at all–extremely*), with the average of the three items per facet comprising the total score for one “block” of PERMA well-being. Though the original scaling of the PERMA Profiler was on a 0–10 scale, the PIEL app automatically converted the scale to 0–1.00. The Cronbach’s alpha measures for the five facets of mPERMA, $mP = .90$, $mE = .84$, $mR = .88$, $mM = .90$, $mA = .86$, indicated excellent internal consistency.

Momentary-Level DBT ABC and PLEASE Skills. To assess whether participants in the moment have recently (since last signal) engaged in behaviors or used skills that have been demonstrated to help coping and regulating emotions, 10 items were created based on handouts and worksheets on “*Reducing Vulnerability to Emotion Mind*” from the *DBT Skills Training Manual* (Linehan, 2014, pp. 291–294). Participants were prompted with the phrase “since the last time I have completed this survey I have been...” and then were asked if they engaged in each emotion regulatory skill. Each item was answered as the presence (0 = *false*, 1 = *true*) of each skill since the previous momentary assessment (i.e., signal): *accumulate positives* in the short term (“doing things that lead to positive emotions NOW”), *accumulate positives* in the long-term (“doing things that will lead to positive emotions in the FUTURE”), *build mastery* (“doing challenging things that make me feel competent”), *cope ahead* (“planning ahead to cope with a difficult situation”), *treating physical illnesses* (“staying physically healthy, e.g., treating illness and taking necessary medications”), *balanced eating* (“eating a balanced diet, e.g., healthy foods, not too much or too little”), *avoid mood-altering substances* (“avoiding mood-altering substances, e.g., alcohol and illicit drugs”), *balanced sleep* (“in the last 24 hours, I have

been getting balanced sleep, e.g., not too much/little and keeping a consistent sleep schedule”), and *exercise* (“getting some exercise”). In lieu of formal observation by a clinical psychologist, these items were created for the purpose of the contexts of this study. To the best of my knowledge, no other measure of these DBT skills has previously existed for non-clinical student populations in real-time, ecological momentary assessments.

Lifestyle Measures. Additional lifestyle items regarding social interaction and day of the week were included to contextualize analyses. Due to the unique context of COVID-19 quarantine and lockdown measures, a single item (*true* or *false*) assessing *interaction with others* in the moment (“since the last time I completed this survey, I have been...interacting with people, including chat, phone, or video”) was included. Conceptually, this item was included to investigate a single naturalistic environmental factor (recent interaction with other people) and its relationship with momentary well-being and ER skills. Information about the day of week per moment was collected via the smartphone app (using respondents’ smartphone internal clock).

Between-Person Measures

PERMA Profiler. Well-being was assessed using 15 items from the PERMA Profiler (Butler & Kern, 2016) that focused only on the five PERMA building blocks (i.e., excluding loneliness, health, negative emotions, and overall happiness items), retained the original wording (e.g., “in general, to what extent do you live a purposeful and meaningful life?”, “in general, how often do you feel positive?”), and retained the original scaling (0–10; *not at all–extremely*, or *never–always*). The Cronbach’s alpha measures for the five facets of PERMA (P = .85, E = .63, R = .84, M = .85, A = .77) were similar to patterns of university students from previous research (Butler & Kern, 2016) and had moderately acceptable internal consistency. As a note, Engagement had a slightly low value below .70, yet some samples from the original PERMA

profiler scale development study also demonstrated lower Cronbach's alpha values less than .70 (e.g., Samples 3, 7, 8, and 11; Butler & Kern, 2016).

Sociodemographic Information. Items included gender (male, female, non-binary, other, prefer not to answer), primary racial or ethnic group (white/Caucasian, Black/African American, Hispanic/Latinx, Asian or Pacific Islander, Native American/Eskimo, Aleut, prefer not to answer, other), relationship status, age (in years), current or intended major/field of study, living situation (on campus, off campus, off campus with family, other) and number of people currently living with (1–6+).

Data Analysis

To test my hypotheses, a multilevel modeling (MLM) approach was used due to the nested nature of the EMA data (momentary data nested within a person). Level 1 data (momentary) pertained to responses to momentary items (momentary well-being, affect, DBT skills) on the smartphone app, while Level 2 (person-level) pertained to the persons from whom 7 days of momentary data was collected. All data cleaning and analyses were conducted using *R* (open-source, programming language for statistical computations) through the latest version of *RStudio* (2020) with packages designed for psychology (*psych*; Revelle, 2017) and multilevel data (*lme4*; Bates et al., 2015).

To further validate the multilevel modeling approach to test the association between daily usage of DBT emotion regulation skills and mPERMA, the intraclass correlation (ICC) was calculated for each momentary element (mP = .36, mE = .26, mR = .61, mM = .63, mA = .42). The ICC explains the proportion of mPERMA variance that can be explained by mean differences across people, thus indicating the amount of remaining variance that is yet to be explained at the within-person level (64%, 74%, 39%, 37%, and 58% for each element,

respectively). Based on acceptable ICC measures and proportions of unexplained within-person variances, multilevel models were constructed.

To test the association between DBT skills with each momentary PERMA while controlling for trait PERMA (RQ1), a series of five random-intercepts multilevel models were specified for each element of momentary PERMA. Specifically, for each model, each individual element of mPERMA (Level 1) was specified as the outcome variable (e.g., engagement at the momentary level), all nine momentary DBT ABC PLEASE skills (Level 1) were entered as predictor variables, and lastly trait-level PERMA (Level 2) was entered as a control variable. Other demographic information (age, gender, living situation, number of people in household) were added as covariates. I chose a random-intercepts model because while I expected for participants to demonstrate different starting levels in their reported DBT skills and behaviors, I did not expect any theoretically systematic or substantial change in momentary DBT usage due to time over one week across the individuals. Moreover, based on preliminary data analyses, there was little variability (low variance) in the within-moment measures of DBT across persons that would have necessitated a random-slopes model. Also, for the second research question (RQ2), I did not expect systematic change in human interaction due to time over one week across the individuals for this specific context (during the COVID-19-related lockdown).

For the first research question, at level 1 (momentary-level) the final random-intercept model is specified as:

$$mPERMA_{it} = \beta_{0i} + \beta_{1i}A_{longit} + \beta_{2i}A_{shortit} + \beta_{3i}B_{it} + \beta_{4i}C_{it} + \beta_{5i}PL_{it} + \beta_{6i}E_{it} + \beta_{7i}A_{it} + \beta_{8i}S_{it} + \beta_{9i}E_{it} + \epsilon_{it}, \quad (1)$$

where $mPERMA$ indicates the well-being for person i for moment t ; β_{0i} indicates the expected $mPERMA$ for a prototypical moment for individual i ; β_{1-9} indicate the within-person differences

in mPERMA associated with differences in moment's usage of ABC PLEASE *skills* for person i ; and ε_{it} indicates moment-specific residuals.

Additionally, person-specific intercepts and associations (from Level 1) for Level 2 are specified in Equation 2 as:

$$\begin{aligned} \beta_0 &= \gamma_{00} + \gamma_{01}A \textit{ long}_i + \gamma_{02}A \textit{ short}_i + \gamma_{03}B_i + \gamma_{04}C_i + \gamma_{05}PL_i + \gamma_{06}E_i + \gamma_{07}A_i + \gamma_{08}S_i + \gamma_{09}E_i + \\ &\gamma_{010}PERMA_t + u_{0i} , \\ \beta_1 &= \gamma_{10}, \\ \beta_2 &= \gamma_{20}, \\ &\dots \\ \beta_{10} &= \gamma_{100}, \end{aligned} \tag{2}$$

where γ indicates sample-level parameters and u indicates residuals for between-person differences. Parameters γ_{01} to γ_{010} indicate how between-person differences in emotion regulatory skills and trait-level PERMA vary at the intercept γ_{00} ; parameters γ_{10} to γ_{100} are specified with fixed slopes.

To test the association between external factors—human interaction and day of the week—with ABC PLEASE skills, a series of nine generalized linear mixed (binomial) models were specified for each of the DBT emotion regulatory skills. Specifically, each Level 1 ER skill was entered as an outcome variable (e.g., avoid substances) where 0 = no behavior and 1 = presence of behavior. Momentary external variables were entered as predictor variables: current interaction with another person (0 = false, 1 = true), and current day of the week (Sunday used as reference day). Other demographic variables (age, gender, living situation, number of people in household) were added as covariates. Results from analyses would indicate logit scores (American Psychological Association, n.d.), which can be used to calculate odds and probability

values. Models would provide likelihood scores for interacting with a person (while controlling for day of week) engaging in a skill on a particular day (while controlling for interaction with others). Logit can be interpreted as positive or negative, where positive values indicate a greater likelihood of that behavior occurring in the moment and vice versa.

The final random-intercepts, multilevel binomial models for the second research question are specified for Level 1 in Equation 3 as:

$$ABCPLEASE_{it} = \beta_{0i} + \beta_1 InteractPeople_{it} + \varepsilon_{it}, \quad (3)$$

where $ABCPLEASE_{it}$ indicates the binary outcome in logit (likelihood to do skill); β_{0i} indicates the expected average likelihood to be using $ABCPLEASE$ in a prototypical moment for individual i ; and $\beta_1 InteractPeople_{it}$ represents the within-person differences for respondents i having interacted with another person in the moment (Level 1) at time t .

Additionally, person-specific intercepts and associations (from Level 1) for Level 2 are specified in Equation 4 as:

$$\begin{aligned} \beta_0 &= \gamma_{00} + \gamma_{01} InteractPeople_i + \gamma_{02} Mon_i + \gamma_{03} Tue_i + \gamma_{04} Wed_i + \gamma_{05} Thu_i + \gamma_{06} Fri_i + \gamma_{07} Sat_i + u_{0i}, \\ \beta_1 &= \gamma_{10}, \\ \beta_2 &= \gamma_{20}, \\ &\dots \\ \beta_7 &= \gamma_{70}, \end{aligned} \quad (4)$$

where γ indicates sample-level parameters and u indicates residuals for between-person differences. Parameters γ_{01} to γ_{07} indicate how between-person differences in human interaction and day of week vary at the intercept γ_{00} . Parameters γ_{10} to γ_{70} are specified with fixed slopes.

Data Cleaning and Missing Data

Out of a potential of 2,128 momentary assessments for 76 participants (4 moments x 7 days x 76 participants), 1,848 (86%) EMAs were available. From those 1,848 momentary surveys, 52 unusable entries (blank row of answers, partial completion, PIEL App glitch, or technical issues) were removed via listwise deletion for that time point. These data points were determined to be missing at random, since unusable or blank entries were not systematically tied to a particular participant (due to errors occurring for less than 5% of the sample) or time period (due to staggered study start dates). Also, the flagged data points were not directly related to specific survey items (due to randomized presentation of questions). After data cleaning, the final yield for analyses consisted of 1,796 (84% of total possible) momentary assessments from 76 participants. Participants completed an average of 23.63 ($SD = 4.13$, Range = 12–28) momentary assessments across one week. The compliance rate for the current study is 84% across all participants (23.63 out of a possible 28 moments), which is deemed acceptable (at least 80%) per EMA guidelines by Stone and Shiffman (2002).

When assessing compliance per each momentary assessment within days, participants completed fewer momentary assessments in the morning (21% of all usable responses) compared to afternoon (26%), late afternoon (27%), and evening (26%). Yet, based on assumptions of equal-fitted proportions (25%) for each time interval, the lowered response rate for participants in the morning EMA was not found to be significantly different from the other times of day, $\chi^2(3) = 0.88$, $p = .830$. Although I purposely designed the morning EMAs to be administered randomly between 9am–11am (traditional workday starts at 9 a.m.), I cannot pinpoint the reason for the lower morning response rates (class/work scheduling, not being awake in the morning, etc.). Since this was a nonsignificant goodness-of-fit test, data analyses proceeded, nonetheless.

Results

Descriptive statistics and correlations for the variables used in analyses are provided for within-person variables (Tables 1 and 2) and between-person variables (Table 3).

Within-Person Descriptive Statistics and Correlations

For descriptive statistics for within-person variables (Table 1), the range of momentary PERMA elements in this study (range $M = .62-.71$, measured on a 0–1.00 scale) was generally comparable to previous studies on mPERMA and college students (range $M = 58.00-76.46$, measured on 0–100 scale; Heshmati et al., 2021). As for the DBT ABC and PLEASE skills (where 1.00 = usage of specific skill across all periods between signals in a day), the least frequent skill implemented was exercising ($M = 0.40$) while the most frequent emotion regulatory activity was avoiding mood-altering substances (e.g., alcohol, excessive caffeine; $M = 0.93$). For the time period since the previous EMA signal or during a 24-hour period (for Sleep), most respondents had engaged in over half of the total amount of ER skills (or had recently interacted with a person), as indicated by an average of 7.19 (where 10 = having done all ten skills in the time period since the previous signal). Compared to other ER skills, sufficient sleep (S) had a relatively high standard deviation (indicating more variance in scores). Lastly there were no multicollinearity issues with the momentary DBT skills (all VIF were less than 2.00).

Table 1

Descriptive Statistics for Within-Person PERMA and ER Skills (N = 1,796)

(Abbreviation) Variable	M	SD	Range	Skew	Kurtosis
(mP) Positive Emotions	0.66	0.12	.40–.93	0.21	-0.34
(mE) Engagement	0.63	0.13	.29–.93	0.16	0.17

(mR) Relationships	0.71	0.14	.29–.95	-0.58	0.82
(mM) Meaning	0.67	0.15	.28–.95	-0.29	0.29
(mA) Accomplishment	0.62	0.13	.29–.95	0.10	0.55
(A short) Accumulate Positives Short	0.81	0.19	.20–1	-1.13	1.01
(A long) Accumulate Positives Long	0.72	0.25	0–1	-0.72	-0.27
(B) Build Mastery	0.65	0.25	.04–1	-0.36	-0.66
(C) Coping Ahead	0.59	0.31	0–1	-0.31	-1.11
(PL) Treat Physical Illnesses/Body	0.85	0.23	0–1	-2.06	3.94
(Eat) Eat a Balanced Diet	0.77	0.24	0–1	-1.43	1.80
(A) Avoid Mood-Altering Substances	0.93	0.15	.28–1	-2.89	8.29
(S) Balanced Sleep	0.63	0.37	0–1	-0.47	-1.38
(Exer) Exercise	0.40	0.30	0–1	0.66	-0.62
(People) Interact with People	0.85	0.21	.04–1	-1.81	2.95

Note. Momentary PERMA variables were derived by averaging all the momentary assessments (slider scale of 0–1.00, with 1.00 indicating higher well-being) per person across one week.

Individual ABC PLEASE skills and interacting with people variables were created by taking the average of the total frequency (0–1, where 1.00 indicates presence of more behaviors) for each respective skill per person across one week.

Considering the relationships between the within-person variables (see Table 2), each momentary well-being element was positively and highly correlated with each other (r range .52 to .86). As for most Total ABC PLEASE Skills, there is a consistent moderate, positive correlation with each mPERMA. In other words, the more ABC PLEASE Skills a person has

engaged in since the last signal, the more they will (on average) also have higher mPERMA scores. The exception to the previously mentioned observation is avoiding mood-altering substances (Avoid), which was not uniquely significantly associated with any mPERMA. Avoiding mood-altering substances was also not associated with a majority of other ABC and PLEASE skills except for treating physical illnesses and managing their physical body ($r = .31, p < .001$).

Table 2*Correlations for Within-Person Measures of PERMA and ER Skills (N = 1796)*

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. mP	–													
2. mE	.66***	–												
3. mR	.79***	.48***	–											
4. mM	.86***	.49***	.79***	–										
5. mA	.75***	.52***	.63***	.80***	–									
6. A short	.48***	.41***	.32**	.43***	.47***	–								
7. A long	.39***	.42***	.21	.41***	.53***	.63***	–							
8. B	.33**	.27*	.21	.37**	.41***	.42***	.65***	–						
9. C	.32**	.30**	.29*	.41***	.53***	.40***	.75***	.72***	–					
10. PL	.28*	.18	.34**	.40***	.32**	.46***	.48***	.40***	.38***	–				
12. Eat	.31***	.22	.19	.37*	.37*	.33*	.48***	.41***	.31**	.61***	–			
13. A	-.01	-.004	-.04	-.04	-.04	.22	.16	.12	.13	.31**	.23*	–		
14. S	.33**	.30**	.14	.29*	.36**	.46***	.40***	.23*	0.21	.31**	.60***	.14	–	

14. Exer	.34**	.30**	.15	.28*	.31**	.46***	.52***	.54***	.43***	.28*	.40***	-.11	.47***	–
15. People	.24*	.15	.29*	.26*	.24*	.38***	.40***	.40***	.37**	.56***	.54***	0.13	.37***	.36**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Between-Person Descriptive Statistics and Correlations

For full details on the descriptive statistics and correlations among the trait PERMA elements, see Table 3. There was no missing data for trait-level PERMA measures. The range of trait PERMA elements in this study (range $M = 6.33$ – 7.04 , measured on 0–10 scale) was generally comparable to another private university (Harvard University) student sample (range $M = 6.67$ – 7.25 ; Butler & Kern, 2016).

For the between-person variable to be tested in the second research question (day of the week), the frequency count for the day of the week for all 1,796 moments was assessed. Out of an expected n of 257 (i.e., $1,796 \div 7$), the number of moments counted per day are as follows: Sunday = 247, Monday = 266, Tuesday = 266, Wednesday = 261, Thursday = 263, Friday = 253, and Saturday = 240. The reason for unequal numbers is due to participants starting on different start-dates for the study; moreover, the differences in frequencies for days of the week was found to not be statistically significant, $\chi^2(6) = 2.41, p = .879$.

Table 3

Descriptive Statistics and Correlations for Trait-Level PERMA (N = 76)

Variable	M	SD	1	2	3	4	5
1. Positive Emotions	6.33	1.64	—				
2. Engagement	7.03	1.48	.64***	—			
3. Relationships	7.04	1.96	.67***	.49***	—		
4. Meaning	6.70	1.86	.80***	.59***	.73***	—	
5. Accomplishment	6.73	1.66	.50***	.41***	.52***	.70***	—

Note. *** $p < .001$. All variables were measured on a 1–10 Likert scale.

Multilevel Modeling Results

Associations Between Usage of ER Skills with mPERMA

The first research question pertains to whether the usage of ER skills would be predictive of momentary well-being (mPERMA) above and beyond trait well-being (PERMA). Analyses including demographic covariates—age, gender, living situation, number of people in current household—yielded non-significant effects ($ps > .05$) and did not drastically alter the pattern of results for the main variables of interest. For parsimony and ease of interpretation, the final results presented exclude demographic covariates. The final results of the multilevel modeling analyses that test the association between ER skills and momentary PERMA (controlling for trait PERMA) can be found in Table 4.

For the final model predicting momentary Positive emotions (mP) while controlling for dispositional Positive emotions (trait P), significant and positively correlated momentary emotion regulation predictors were accumulating positives (short and long term), building mastery, avoiding excess mood-altering substances, eating a balanced diet, and getting balanced sleep since the past signal (past day for sleep only). On the other hand, avoiding substances had a negative relationship with mP, $t = -3.43, p < .001$. These within-person (momentary) variables still significantly predicted mP even though trait Positive emotions was a significant between-person (trait) variable, $t = 8.12, p < .001$.

For predicting momentary Engagement (mE) while controlling for dispositional Engagement (trait E), significant momentary emotion regulation predictors were accumulating positives (short and long term), building mastery, avoiding excess mood-altering substances, and eating a balanced diet. Similar to mP, avoid substances (Avoid) had a negative relationship with mP, $t = -3.43, p < .001$. In contrast to mP, having exercised (Exer) since the previous signal had

positively and significantly predicted mE, $t = 3.01, p < .01$. Notably, trait Engagement did not significantly predict momentary Engagement ($t = 1.91, p = .060$) and was the only well-being element to have this pattern.

The pattern of MLM results for momentary Relationships (mR) was similar to mP, except getting a balanced amount of sleep in the past day was not found to significantly predict mR in the final model, $t = 0.36, p = .721$. As for momentary Meaning, the only significant Level 1 predictors were: accumulate positives (short and long), building mastery, avoiding excess mood-altering substances, and getting sufficient sleep. Lastly for momentary Accomplishment (mA), treating physical illnesses and attending to physical health needs (e.g., taking prescribed medications, addressing any physical pains) was found to be a significant within-person predictor in the final model, $t = 2.08, p = .038$. Similar to most other multilevel models for the momentary well-being elements, mA was significantly predicted by accumulating positives (short and long term) and building mastery (since the previous signaled moment), in addition to trait-level Accomplishment.

Table 4*Results for Multilevel Models Predicting mPERMA from DBT Skills, Controlling for Trait-Level PERMA*

	mPositive		mEngage		mRelations		mMeaning		mAchieve	
	Est. (SE)	<i>t</i>	Est. (SE)	<i>t</i>	Est. (SE)	<i>t</i>	Est. (SE)	<i>t</i>	Est. (SE)	<i>t</i>
Fixed Effects										
Intercept	-0.17 (.02)	-7.79***	-0.13 (.02)	-4.36***	-0.09 (.02)	-5.05***	-0.11 (0.02)	-6.02***	-0.20 (.02)	-9.07***
Accumulate positives (s)	0.15 (.01)	14.76***	0.15 (.01)	10.47***	0.08 (.01)	10.22***	0.07 (0.01)	8.71***	0.04 (.01)	3.74***
Accumulate positives (l)	0.04 (.01)	2.77**	0.04 (.01)	2.53*	0.04 (.01)	5.01***	0.04 (0.01)	4.68***	0.09 (.01)	9.06***
Build mastery	0.03 (.01)	3.39***	0.03 (.01)	2.37*	0.02 (.01)	2.31*	0.03 (0.01)	4.16***	0.08 (.01)	8.90***
Coping ahead	-0.02 (.01)	-1.84	-0.02 (.01)	-1.38	0.00 (.01)	0.63	0.01 (0.01)	0.75	0.01 (.01)	0.59
PL (Physical illness)	0.01 (.01)	-0.01	0.01 (.02)	0.47	0.01 (.01)	1.12	0.01 (0.01)	0.97	0.03 (.01)	2.08*
Eat (balanced diet)	0.03 (.01)	2.53*	0.01 (.01)	0.95	0.02 (.01)	2.46*	0.01 (0.01)	0.80	0.01 (.01)	0.65
Avoid substances	-0.08 (.02)	-3.43***	-0.08 (.02)	-3.43***	-0.04 (.02)	-3.41***	-0.02 (0.02)	-1.83	-0.01 (.02)	-0.32
Sleep balance	0.02 (.01)	2.44*	0.01 (.01)	0.86	0.00 (.01)	0.36	0.02 (0.01)	2.64**	0.04 (.01)	3.77***
Exercise balance	0.01 (.01)	0.86	0.04 (.02)	3.01**	-0.00 (.01)	-0.48	0.00 (0.01)	0.19	-0.01 (.01)	-1.58
Trait PERMA	0.02 (.01)	8.12***	0.02 (.01)	1.91	0.05 (.01)	8.30***	0.05 (0.01)	8.41***	0.04 (.01)	5.46***
Random Effects										
Residual variance (SD)	.02 (.15)		.04 (.19)		.01 (.10)		.01 (.10)		.02 (.14)	
Intercept variance (SD)	.006 (.08)		.01 (.10)		.008 (.09)		.008 (.09)		.008 (.09)	

Model Fit Indices

Pseudo-R ² (Fixed)	0.35	0.14	0.39	0.40	0.34
Pseudo-R ² (Total)	0.49	0.33	0.66	0.67	0.54
AIC, BIC	-1582, -1510	-545, -474	-2770, -2698	-2681, -2610.	-1755, -1684

Note. $N = 76$, with 1796 momentary observations. All predictors were sample-mean centered. Random intercepts-only model

presented (fixed slopes). Momentary PERMA (mPERMA) is specified as outcome variables derived from a continuous scale from

0.00–1.00. Emotion regulatory skills (ABC PLEASE) measured where 0 = no behavior, 1 = presence of behavior since the previous

signal (for sleep, since the previous day). Trait PERMA measured on 1–10 scale. Satterthwaite's method is used to calculate t -values

and p -values. AIC = Akaike's Information Criteria; BIC = Bayesian Information Criteria.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Associations Between Lifestyle Factors and Likelihood of Using ER Skills in Daily Life

The second research question pertains to whether lifestyle factors (day of the week, human interaction) would increase the likelihood that first-year students would employ emotion regulatory skills throughout the day. Similar to the first research question, there were no significant effects of any of the demographic covariates (age, gender, living situation, household size; $ps > .05$) on the pattern of results, thus these variables were dropped from the final models presented. The final generalized linear mixed models that tested the association between lifestyle factors and usage of ABC and PLEASE skills are found in Table 5.

A consistent pattern across nearly all the final binomial mixed models was that having interacted with another person since the previous EMA signal—whether it be in-person or through phone or video call—significantly predicted an increased likelihood of engaging in an ER skill (nine out of ten models) when controlling for day of the week. Significant positive coefficient values (in logit units) for Interact with Person ranged from 0.87 (Build mastery) to 6.66 (Exercise). In terms of probability, these values range from .705 (i.e., 70% likely to report true for Build mastery in that moment) to .999 (i.e., 99% likely for Exercise). The only exception was the model for predicting avoiding mood-altering substances, $\text{logit} = 0.48$, $p = .188$. Students were only marginally more likely to report that they had avoided substances in the time interval between signals—given they had also interacted with someone.

There were several patterns found for the day of the week. First, all days were associated with a decreased likelihood of getting exercise. This ER skill had the largest logit and z -score (-2.06 and -6.66, respectively) for Sunday; in terms of probability, on a typical moment on Sunday, a student had only an 11% chance to report having exercised in the time period since the previous signal (while controlling for interaction with another person). Yet, if a student had

interacted with another person, they would then have a 40% chance to have reported getting exercise in that same time period. Otherwise, most days of the week were associated with a greater likelihood (as indicated by positive logit scores) of using ER skills throughout the day. In the final models that predicted attenuation of physical illnesses (PL), eating a balanced diet (Eat), and getting sufficient exercise, there was no significant variation in likelihood of engaging in that particular activity in the moment across the entire week. In other words, whether it was Sunday or not, respondents had no significant difference in likelihood to employ these three emotion regulation strategies throughout moments in a day.

However, there were some exceptions. For example (all compared to Sunday), on Mondays students reported a greater likelihood to Build mastery and Cope ahead, Tuesdays had a similar pattern but also a greater likelihood to Accumulate positives in the long-term, and Thursdays were similar to Tuesdays except with an increased likelihood to Accumulate positives in the short-term. Moreover, students were less likely to cope ahead on Sundays (Wednesday, Friday, and Saturday were not significantly different). Notably, the only instance in which a *specific day* of the week had a significantly *lower* likelihood of engaging in an ER skill was Saturday, where there was a reduction in logit (Sunday logit = 1.25, probability = 77%; Saturday logit = 0.41, probability = 60%) for predicting the skill for getting balanced Sleep. In other words, for the prototypical moment on Saturday (when controlling for human interaction), respondents were less likely to get an appropriate amount of sleep (neither too much nor too little). This pattern was unique only for this day of the week and this emotion regulatory behavior.

Table 5*Results for Generalized Linear Mixed Models Predicting Momentary DBT Skills from Lifestyle Factors*

	Accumulate short		Accumulate long		Build mastery		Coping ahead		Physical illness	
Fixed Effects	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>
Intercept	1.09 (.29)	3.78***	0.24 (.30)	0.79	-0.05(.27)	-0.19	-0.82 (.32)	-2.53*	2.30 (.45)	5.15***
Human interaction	0.89 (.20)	4.42***	0.98 (.20)	4.96***	0.87 (.19)	4.63***	1.21 (.22)	5.56***	1.05 (.25)	4.23***
Monday	0.12 (.25)	0.46	0.24 (.23)	1.07	0.43 (.21)	2.02*	0.65 (.23)	2.87**	0.13 (.35)	0.38
Tuesday	0.08 (.25)	0.33	0.71 (.24)	3.03**	0.68 (.21)	3.13**	0.88 (.23)	3.83***	-0.07 (.34)	-0.22
Wednesday	-0.19 (.24)	-0.76	0.25 (.23)	1.11	-0.12 (.21)	-0.56	0.43 (.23)	1.89	-0.43 (.33)	-1.31
Thursday	0.55 (.26)	2.09*	0.74 (.24)	3.11**	0.34 (.21)	1.58	0.57 (.23)	2.48*	0.01 (.34)	0.03
Friday	0.01 (.25)	0.03	0.31 (.23)	1.35	0.01 (.21)	0.02	0.05 (.23)	0.22	-0.43 (.33)	-1.32
Saturday	0.30 (.26)	1.15	0.60 (.24)	2.51*	-0.20 (.21)	-0.97	-0.15 (.23)	-0.63	-0.22 (.34)	-0.63
Random Effects										
Variance (SD)	1.71 (1.31)		2.76 (1.67)		1.73 (1.31)		3.35 (1.83)		5.07 (2.25)	
Model Fit Indices										
Pseudo-R ² (Fixed)	0.03		0.03		0.04		0.05		0.02	
Pseudo-R ² (Total)	0.36		0.47		0.37		0.53		0.61	

AIC, BIC	1498, 1548		1690, 1740		1982, 2032		1815, 1865		1022, 1071
	Eat		Avoid subs[†]		Sleep		Exercise		
Fixed Effects	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>	Logit (SE)	<i>z</i>	
Intercept	0.76 (.32)	2.36*	4.48 (.79)	5.69***	1.25 (.47)	2.64**	-2.06 (.34)	-6.03***	
Human interaction	1.18 (.21)	5.66***	0.48 (.37)	1.32	0.55 (.23)	2.37*	1.66 (.25)	6.66***	
Monday	-0.12 (.25)	-0.50	0.88 (.46)	1.90	-0.46 (.27)	-1.66	-0.09 (.23)	-0.41	
Tuesday	0.38 (.26)	1.45	1.57 (.55)	2.86**	-0.28 (.28)	-1.02	0.22 (.22)	0.99	
Wednesday	0.05 (.25)	0.21	-0.03 (.41)	-0.79	-0.30 (.28)	-1.08	-0.01 (.23)	-0.03	
Thursday	0.34 (.26)	1.31	-0.12 (.42)	-0.30	-0.26 (.28)	-0.93	-0.06 (.23)	-0.26	
Friday	0.01 (.25)	0.03	-0.27 (.40)	-0.68	-0.42 (.27)	-1.54	0.36 (.22)	1.60	
Saturday	-0.10 (.25)	-0.38	0.02 (.42)	0.04	-0.84 (.28)	-3.00**	-0.11 (.23)	-0.48	
Random Effects									
Variance (SD)	2.92 (1.71)		8.00 (2.83)		10.38 (3.22)		2.97 (1.73)		
Model Fit Indices									
Pseudo-R ² (Fixed)	0.03		0.04		0.01		0.05		
Pseudo-R ² (Total)	0.48		0.72		0.76		0.50		
AIC, BIC	1494, 1543		632, 681		1332, 1381		1863, 1912		

Note. $N = 76$, with 1,796 momentary observations. All predictors were sample-mean centered. Day of the week was a categorical variable with Sunday as the reference day (intercept). Random intercepts-only model presented (fixed slopes). Emotion regulatory skills (ABC PLEASE) specified as binary outcome variable where 0 = no behavior, 1 = presence of behavior since the previous signal (since the previous day, for sleep). Human interaction measured as 0 = no interaction, 1 = had interaction with someone else (even through text, chat, or phone call) since the previous signal. Laplace's approximation method used to calculate z values and p values. AIC = Akaike's Information Criteria; BIC = Bayesian Information Criteria.

†glmer(generalized linear mixed effects) control optimizer was set to "bobyqa" (bound optimization by quadratic approximation) for model convergence.

*** $p < .001$, ** $p < .01$, * $p < .05$.

Discussion

Young people naturally find ways to flourish on a daily basis even while navigating through the beginnings of adulthood, the first year of college, and the repercussions of a pandemic. Using an ecological momentary assessment approach, I conducted this research to explore how everyday emotion regulatory skills relate to first-year students' well-being and to examine what lifestyle conditions were opportune for usage of more regulatory skills and improved well-being. This study provides insight into whether specific emotion regulation skills (naturally occurring rather than explicitly taught or trained) can benefit well-being in the moment, and how other aspects of life (the day of the week, social interaction) can influence the likelihood of those regulatory skills—all the while during a pandemic lockdown context. Consistent with my hypotheses, results from the current study suggest: (a) first-year college students who used certain clinically backed emotion regulatory skills (i.e., ABC PLEASE) in a given moment were more likely to report increased well-being (PERMA) in that moment; and (b) certain lifestyle aspects (day of the week and interaction with other people) were associated with a greater likelihood of a first-year student to use ABC PLEASE skills in those circumstances. In the following, I will elaborate on the specifics of these findings.

Emotion Regulation Skills Benefit Elements of Well-Being

A main finding of this study was that two emotion regulation skills—Accumulating positives and Building mastery—were significantly associated with all elements of PERMA well-being in first-year students' daily life. The benefit of accumulated positive emotions has been linked to an upward spiral towards improved emotional well-being, as well as extended cognitive and psychological resources that link them to eudaimonic aspects of well-being (Fredrickson, 2001; Fredrickson & Joiner, 2002). Similarly, building mastery has been

associated with fulfilling an innate psychological need of *competency* according to models of motivation and eudaimonic well-being (e.g., self-determination theory; Ryan & Deci, 2000) and the Accomplishment aspect of PERMA (Seligman, 2011). Based on this study, feeling good *emotionally* and feeling good *at something* are key ingredients for living a good life for this population.

On the other hand, out of all ER skills examined, only one skill—Coping ahead, or strategically planning ahead to solve problems with a future situation (Linehan, 2014; Neacsiu et al., 2014)—was not significantly related to any elements of first-year students' PERMA well-being. Results from this study's American emerging adults contrast with a Romanian emerging adult population during COVID-19, for whom problem-focused coping (which includes planning) was positively associated with life satisfaction (Stefenel et al., 2022). These patterns of results could explain how coping may be related to life satisfaction (a component of subjective well-being, i.e., hedonic well-being), but not to elements of PERMA (a model of hedonic and eudaimonic well-being). In other words, when well-being was measured through multiple dimensions in this study, the relationship with coping was not as apparent. Moreover, the momentary single-item question (“planning ahead to cope with a difficult situation) was more cognitive in nature and did not specify a type of coping strategy or a future difficult situation. Thus, future research could investigate coping as an emotion regulatory skill on a more granular level in addition to its relationship to multidimensional well-being.

The other ER skills related to physiological factors (PLEASE) had differential effects on specific elements of well-being. For instance, emerging adults that reported that they were treating physical illnesses (PL)—treating physical ailments, taking necessary medications—also reported higher levels of momentary Accomplishment. This finding seems intuitive since taking

prescribed medications on a regular basis or attenuating pain would elicit a sense of achievement in completing a required task to maintain or improve their physical health. Also, first-year students who reported Eating a balanced diet also reported higher levels of Positive emotions and positive Relationships. The connection between balanced eating and positive emotions is clear from a physiological standpoint, since food can impact mood and be used to modify an emotional experience (Gross, 2014; Neacsiu et al., 2014). The link between balanced eating and nutrition with relationships is less direct, but there has been research connecting food consumption to well-being in general (Holder, 2019). Particularly for eudaimonic well-being (which includes aspects of relationships), it was found in a daily diary study of young adults that consumption of fruits and vegetables (but not chips or sweets) were associated with higher reports of daily eudaimonic well-being (Conner et al., 2015). Although it cannot be fully determined from the present correlation study if having a nutritional diet leads to feeling connected to others (even virtually during the pandemic), future studies should look at the causal relationship between healthy relationships and healthy diet.

Notably, the DBT skill of Avoiding mood-altering substances (such as alcohol or illicit drugs) was negatively associated with momentary Positive emotions, Engagement, and Relationship. In other words, in moments when first-year students reported having recently avoided substances like alcohol, marijuana, or illicit drugs, they also reported lower well-being scores for the aforementioned elements. These results provide support for the salient developmental need for first-year students to feel good and engaged with others by creating social connections in the new university context. Qualitative research by Brown and Murphy (2020) found that alcohol use (as an act of social integration) was beneficial for assisting residential first-year students to form new relationships and decrease transition-to-college

anxiety. Past research has also shown that college students reported a greater likelihood to use alcohol to alleviate negative emotions such as boredom during COVID-19 (Jackson et al., 2021). Without alcohol as a social lubricant for forming social connections (Brown & Murphy, 2020) or to help relieve boring lockdown days (Jackson et al., 2021), avoiding (perhaps unintentionally) substances like alcohol in daily life seems logically related to students' tendency to also *not* feel higher levels of engagement (as an analogous term for flow, or a state of non-boredom; Csikszentmihalyi, 1990). Two notes, however: (1) this study's sample was specifically first-year students all under the legal age to purchase alcohol and cannabis (21 years old in the US), which may reflect a social desirability bias in the results (especially for other illicit substances); and (2) mood-altering substances were presented as more general, so I was not able to determine the disaggregated effects between substance types.

Additionally, emerging adults who reported getting a balanced amount of Sleep reported higher levels of the well-being elements of Positive emotions, Meaning, and Accomplishment. For Positive emotions, results from this study align with research that found daily positive affect was associated with better sleep quality but not with higher averages of daily felt love (Dickens et al., 2021). Specifically in this study, balanced sleep was not associated with the element of positive Relationships (which had a momentary item "I feel loved"), which can be directly compared to "felt love" in Dickens and colleagues' (2021) study. Furthermore, results from this study replicate another study that found overall psychological well-being (which included items on meaning and competence) had a curvilinear relationship with sleep quality (Armand et al., 2021; Okano et al., 2019). Also, previous research has consistently found that college students' improved academic performance (among many other aspects like mood) is positively influenced by sufficient sleep and sleep quality (Hershner & Chervin, 2014). It should be noted that the item

for Sleep in this study (“in the last 24 hours, I have been getting balanced sleep, e.g., not too much/little and keeping a consistent sleep schedule”) should be interpreted as an overall day assessment rather than moment-to-moment. In other words, respondents provided assessments of their perceived sleep levels from the past day when beeped at the momentary intervals.

Nonetheless, the results show that getting an appropriate amount of sleep consistently during a stressful time (even during a pandemic lockdown) can be an effective strategy to bolster multiple aspects of well-being throughout the entire day. Based on the findings of this study and past literature, first-year college students should attempt to have a consistently balanced sleep life (avoiding excessive “all-nighters” or sleeping-in every single morning) in order to live a more optimal waking life.

Another finding from this study was that students who reported having Exercised were more likely to report higher levels of the element of engagement. Intuitively, having gotten some form of exercise in the moment should be linked to the well-being element of engagement since exercising (regardless of a daily walk or a weightlifting session) requires some level of focused attention. This aligns with the body of research that has found a connection between flow (an optimal experiential state with characteristics such as deep concentration) with sports and other physical activities (Csikszentmihalyi, 1990).

Lifestyle Factors and Use of Emotion Regulation Skills

I also examined whether lifestyle factors such as “interacting with others” and “day of the week” were related to first-year college students’ engagement in ER skills. I expected that above all else, social interaction in daily life would increase the likelihood of using ER skills in a day, and that there would be some differences between the days of the week in regard to use of ER skills. A finding from this study was that regardless of day of the week, students were less likely

to engage in physical exercise during COVID-19. This result demonstrates the historical and contextual effect of the pandemic-related disruption of university students' physical activity levels even if they were previously very physically active (Hagedorn et al., 2022; López-Valenciano et al., 2021). However, another finding in this study was that on days where students interacted with others, students reported that they got more physical exercise. These additional results support past research on the effect of others. For instance, a review on social relations and health behaviors research found that interacting with others (a type of social integration) is associated with health-promotive behaviors such as increased physical activity—as opposed to social isolation predicting decreased physical activity (Tay et al., 2013). It may be that simply having more interactions with others was helpful in making students feel the need to do healthy activities such as exercise but further experimentation to test this is needed. Thus, even though a pandemic lockdown greatly reduced students' tendency to exercise, the power of others nonetheless could help get one back into a better exercise regimen.

Another noteworthy finding was that Saturday was the *only* day of the week where students were reportedly less likely to get a balanced amount of sleep. Sleep is vital for regulating emotional well-being through physiological health according to DBT training (Linehan, 2014). Notably, sleep disruptions were associated with stress and anxiety during COVID-19 (Huckins et al., 2020; Kleiman et al., 2020; Son et al., 2020). Generally, the difference between Saturdays and Sundays for the weekend is not as clearly delineated in COVID-19-related literature and thus has been rarely found; in other words, most studies combine the two days to assess a weekend effect (Ramos Socarras et al., 2021) and seldom as separate days (Wright et al., 2020). Generally, the consensus of research has clearly found that the pandemic was related to major sleep quality and pattern disruptions for university students

(Fila-Witecka et al., 2021; Saadeh et al., 2021), with some studies reporting increased sleep duration for students (Giuntella et al., 2021). Moreover, past research has typically found some differences between weekdays and weekends. For instance, Ramos Socarras and colleagues (2021) found that sleep times, wake times, and duration, differed between weekdays and weekends for 18- to 21-year-olds. As for Saturdays specifically, one study found that university students' "time in bed devoted to sleep" (TIB) increased for all days of the week but *not* Saturdays during the stay-at-home period of the pandemic (Wright et al., 2020). Given that first-year students typically get under the recommended seven hours of sleep (Rea et al., 2021), the increase in students' sleep duration during the pandemic (Giuntella et al., 2021; Ramos Socarras et al., 2021) might have been beneficial for this population. Yet, a caveat for this study is that respondents were not able to provide objective details on the sleep item—"getting balanced sleep (not too much/little and keeping a consistent sleep schedule)." Thus, though first-year students had a decreased likelihood to get a balanced amount of sleep on Saturdays, it is undetermined whether they were inconsistent in their sleep or if it was more time in bed for the purpose of sleep (like Wright et al., 2020). Future research should investigate specific details about sleep quality and schedule (e.g., objective measures of hours of sleep, over-or-under slept) to further understand the effect of Saturdays on college students during times of distress.

Furthermore, a consistent finding was that students were unlikely to engage in planning for future difficult situations on every day of the week (even though some days were slightly better or worse compared to Sunday). A decreased likelihood in future planning to cope may also reflect the feeling of time dissociation, where people felt like days blended together during COVID-19 (Mental Health Association, n.d.). Specifically for coping (as a defense mechanism in times of anxiety and stress), this time period in the pandemic was during an unprecedented

stay-at-home order in the U.S. (CDC, 2022). It would have been difficult for students to accurately predict how long the pandemic would last and how to appropriately plan (and cope) for future situations.

Above all else, when first-year students had recently interacted with others (even virtually), they were more likely to engage in ER skills as well. Specifically, in time periods that had human interaction, students were more likely to do activities to feel more positive emotions, build competence, cope ahead for hard times, and take care of their bodies (via attenuating pain, eating well, and staying physically active). First, my research closely corroborates research conducted during COVID-19 at the same time (March through April 2020), which found that for days that college students practiced increased social distancing and disconnection (even if they could have safely connected with others online), they also reported a decrease in healthy behaviors like exercising and healthy eating (Ford, 2020). Also, the results from my study are generally unsurprising given emerging adults' vital need for social interactions during the college transition (Barry et al., 2016; Park et al., 2020). For instance, longitudinal research has found that social interactions and social connections were associated with students' increased use of adaptive (as opposed to maladaptive) emotion regulation across the first two years of college (Park et al., 2020). Even though this study's findings come from a niche population and context, the findings still corroborate past research by Marroquín and Nolen-Hoeksema (2015) on large and nationally representative samples of adults. Specifically, they found that adults' perceived social connectedness was related to higher adaptive ER strategies and lower maladaptive ER strategies, thereby showing that close relationships with others can influence individual emotion regulation (Marroquín & Nolen-Hoeksema, 2015). Considering the COVID-19 context, moments involving interaction with others (even virtually through a screen) would likely create feelings of

social connectedness, thereby potentially motivating one to continue using adaptive (rather than maladaptive) emotion regulatory strategies. Although in this study the relationship type was not specified (e.g., family member, professor, peer) nor the quality of the social connection, future and complementary research could parse out the types of relationships and social interactions that were less beneficial for first-year students' emotion regulatory behaviors and well-being during COVID-19. For instance, Dotson and colleagues (2022) explored qualitative data from college students and the positive and negative changes in their relationships over time (e.g., roommates, classmates, co-workers, family), and Hall and Zygmunt (2021) found that first-year students were more likely to have negative interactions with their parents during quarantine. Though future research can investigate the quality and types of interactions, a robust finding from this study suggests that more human interaction in a day was more beneficial for helping first-year students regulate their emotional well-being than no interactions at all. Overall, the results from this study demonstrate that more moments with other people matter—for young people's everyday behaviors, emotions, and well-being.

Strengths and Limitations

A key strength of this study is the use of real-time, ecologically valid momentary assessments of first-year students' well-being and emotion regulation behaviors. The methodology of this study goes above and beyond static, one-time global assessments of well-being and helps reduce recall bias in the results. Another strength is the timeliness; this study captured momentary data during a unique developmental and historical time period (transitioning adults during a pandemic). Lastly, this study adds to the recent literature on measuring PERMA on a daily or momentary basis (see Heshmati et al., 2020 and Heshmati et al., 2021) and adds to

the burgeoning research of brief, scalable DBT interventions for events like COVID-19 (Rizvi et al., 2022).

This study is not without limitations. First, this study narrowly looked at a specific set of emotion regulatory skills from the entire DBT framework. This study investigated the ABC and PLEASE skills set, yet there exist other models of emotional regulation skills within the DBT literature (e.g., “STOP”, “positive self-talk”; Linehan, 2014). Also, items in this study (e.g., Coping ahead, Avoiding mood-altering substances) were not elaborated further through multi-item measures. Due to the brevity needed for EMA-style items in this study (which also included mPERMA items), shorter survey lengths were chosen in favor to increase participants’ response rates (Shiffman et al., 2008). Although I consulted a licensed clinical psychologist with a specialization in DBT to inform the overall research design and the development of the DBT measures used in this study, there is still room for improvement for measuring DBT tools and skills in a non-clinical population. Lastly, this study investigated a non-experimental, one-week snapshot of private college, first-year students’ lives during the initial height of the COVID-19 crisis. Moreover, the participants came from the Claremont Colleges, which are highly selective private colleges with low acceptance rates (e.g., 10% for Claremont McKenna College in 2019¹). The results presented do not show what directly causes students’ well-being or use of emotion regulation skills and may not be generalizable to other educational institutions and geographic regions. Also, these findings can only be interpreted in the context of first-year emerging adult students and may not be generalizable to students at other stages of their education or development.

¹<https://www.cmc.edu/institutional-research/admission#:~:text=Information%20about%20undergraduate%20fall%20first,%25%20and%2050%25%2C%20respectively.>

Future Directions

The results of this study serve as a point of reference for future research on low-cost, scalable interventions for regulating emotions and sustaining well-being during times of major distress for this particular population of emerging adults. It may be advantageous to design studies to specifically target certain elements of well-being or emotion regulatory skills that emerging adult college students may need to improve. Rizvi and colleagues (2022) conducted research on the effects of a two-week DBT-video intervention for college students during COVID-19 and found mixed results (some efficacy in decreasing negative affect but no apparent effect of improving overall outcomes). Also, the present study can be helpful for researchers interested in studying emotion regulatory behaviors in real-time on a daily or momentary basis; emotion regulation skills are used every day and not just in lab settings (Colombo et al., 2020). The transition to adulthood is a natural facet of life. Although an event like going through college is fairly common (NCES, 2020a)—and it is hoped that events like COVID-19 are also uncommon—the act of regulating one’s emotions and optimizing well-being is something that can be done in any situation.

Conclusion

Based on this study, first-year students who use more emotion regulatory skills in daily life also often experience improved facets of well-being. Also, in more cases than not, interacting with others (virtually or in-person) yields higher likelihood of engaging in daily emotion regulation skills. Though the experiences of this sample are embedded in a unique time period—first-year college students during the beginning phases of the COVID-19 pandemic—valuable knowledge about the emotion regulatory skills used by them may be generalizable to emerging adults in other stressful situations. Times of uncertainty and unrest (e.g., active shooters, riots),

disaster (e.g., natural disasters), insufficient resources (e.g., food or housing insecurity), and isolation (e.g., blackouts, campus lockdowns) can still happen even after the major effects of the COVID-19 pandemic have waned. Thus, having a toolkit of effective emotion regulatory strategies and skills would benefit the well-being of first-year college students and others in similar situations—in a transitional period while dealing with distressing circumstances. This study has provided evidence that generally having strategic emotion regulatory strategies (focusing on positive moments, building a sense of mastery, actively maintaining physiological health) can reap benefits for well-being, and that one is more likely to regulate their emotions effectively in the presence of others.

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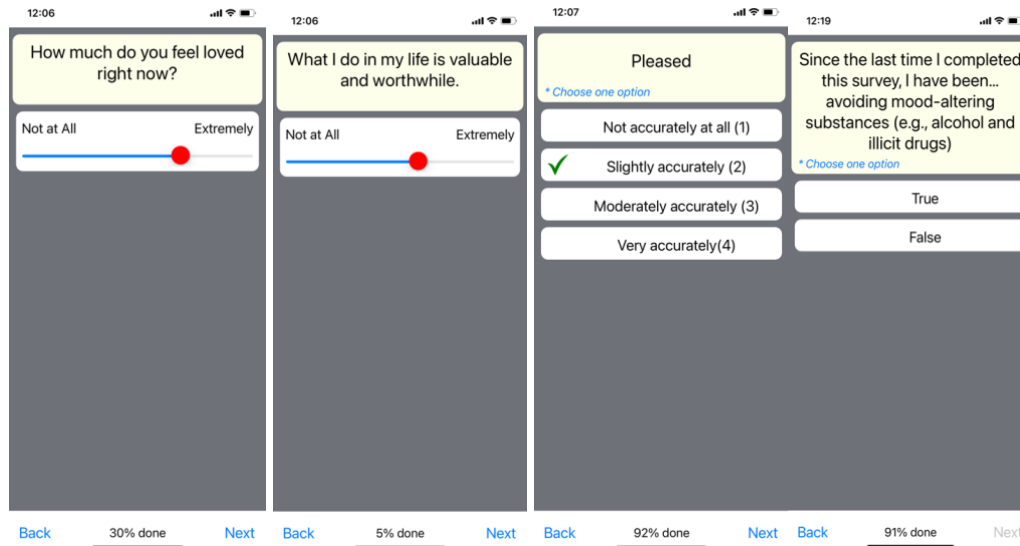
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Appendix A

PIEL Survey User Interface

Figure 1



Note. First panel on the left shows a sample item from the momentary contextual items (momentary felt love). Second panel is a sample item from mPERMA assessing meaning. Third panel is an example of the momentary positive and affect measurement (not used in final analyses). Fourth panel is an example of the momentary DBT ABC PLEASE emotion regulatory measure items.

Appendix B

All EMA Survey Items

Instructions—Starting on the next page, please answer how much the statement currently describes you in this exact moment by moving the red circle on the slider towards either end (Not at All — Extremely)

Lifestyle Contextual Factor (True or False)

Since the last time I completed this survey, I have been...interacting with people (including chat, phone, or video)* (True or False)

mPERMA** (Not at all — Extremely)

I am feeling joyful

I am feeling positive

I am feeling contented

When I noticed this survey, I was absorbed in what I was doing

When I noticed this survey, I felt excited and interested in the things around me

When I noticed this survey, I had lost track of time because of what I was doing

I feel helped and supported by others

I feel loved

I feel satisfied with my personal relationships

I lead a purposeful and meaningful life.

What I do in my life is valuable and worthwhile

I have a sense of direction in my life

I am making progress towards accomplishing my goals

I am achieving the important goals I have set for myself

I am handling my responsibilities

Instructions—Next pages: Please use a 1-4 scale to indicate how accurately each adjective describes how you feel in this moment. 1 = not accurately at all, 2 = slightly accurately, 3 = moderately accurately, 4 = very accurately

Positive and Negative Affect***

Lively, Full-of-energy, energetic, Happy, Pleased, Cheerful, At ease, Calm, Relaxed,

Sad, Depressed, Unhappy, On edge, Nervous, Tense, Hostile, Resentful, Angry

DBT ABC Please Skills (True or False)

Since the last time I completed this survey, I have been...doing things that lead to positive emotions NOW.

Since the last time I completed this survey, I have been...doing things that will lead to positive emotions in the FUTURE.

Since the last time I completed this survey, I have been...doing challenging things that make me feel competent.

Since the last time I completed this survey, I have been...planning ahead to cope with a difficult situation.

Since the last time I completed this survey, I have been...staying physically healthy (e.g., treating illness and taking necessary medications)

Since the last time I completed this survey, I have been...avoiding mood-altering substances (e.g., alcohol and illicit drugs)

Since the last time I completed this survey, I have been...eating a balanced diet (healthy foods, not too much or little)

Since the last time I completed this survey, I have been...getting some exercise.

In the last 24 hours, I have been...getting balanced sleep (not too much/little and keeping a consistent sleep schedule)

*Interaction with people item was presented within the DBT ABC Skills block on the PIEL App, since it had a similar response set (True or False)

**To reduce order effects and satisficing for responding to survey items, mPERMA presentation items were randomized within its block.

***For this paper, momentary Positive and Negative Affect were not used in analyses.