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The COVID-19 Pandemic's Effects on Sex, Dating, and Self-Concepts Among American College Students

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Abstract

This study compares self-reported levels of sex- and romantic relationship-related distress, along with self-concept scores and perceived effects of the COVID-19 pandemic, in American college students before (Time 1) and after (Time 2) the onset of COVID-19 restrictions in the United States. It was hypothesized that participants would experience higher levels of distress and more negative self-concepts during Time 2 than during Time 1. Participants included 146 college students aged 18 to 23 years old from various schools, mainly the University of Vermont. Participants were given an online questionnaire asking questions about their current romantic and sexual beliefs and behaviors and self-concept, as well as asking them retrospective (memory-based) questions about these beliefs and behaviors prior to March of 2020. Paired-samples *t* tests were used to compare distress scores from Time 1 and Time 2. Romantic relationship-related distress was found to differ significantly between Time 1 and Time 2, while no significant differences were found for sexual beliefs and behaviors or for self-concept. However, contrary to the hypothesis, romantic relationship-related distress actually *decreased* from Time 1 to Time 2, suggesting that participants' confidence in their romantic relationships was higher during the pandemic than pre-pandemic. These results may indicate that trauma-related solidarity and/or maturity increased romantic confidence between Time 1 and Time 2. Additionally, relationship status acted as a buffer for romantic relationship confidence, as being in a romantic relationship at the time of the study correlated with lower romantic distress scores.

The COVID-19 Pandemic's Effects on Sex, Dating, and Self-Concepts Among American College Students

Pandemics are not a new phenomenon in human history, but the COVID-19 pandemic, the most destructive and widespread in the twenty-first century, has created unprecedented challenges and changes to humankind.

While contracting COVID-19 has clear physical health ramifications, the stress, fear, and isolation experienced during this pandemic can also cause or exacerbate serious mental health challenges (Baumeister & Leary, 1995). Despite the novelty of this reality, several researchers have been able to begin to study social, sexual, and romantic changes during the COVID-19 pandemic including Starks and colleagues, who studied drug use and risky sexual behavior among queer men in the United States in 2020. These researchers were interested in sexual minority men (especially those who use drugs) because their risk of HIV transmission is higher, potentially making their risk of COVID-19 infection higher as well. In this study, 455 adult queer men completed an online survey asking about their drug use in the past 90 days and their sexual behavior in the past 30 days, including their number of partners and how often they had condomless sex. Relating to sexual encounters, results indicated an association between illicit drug use and number of casual sexual partners. Notably, the association between sexual risk behavior and illegal drug use was significantly higher after the onset of the pandemic for all drugs in the survey (cocaine, meth, MDMA, GHB, and ketamine) except for marijuana (Starks et al., 2020). In other words, the participants' number of casual sexual partners increased among illegal drug users during the pandemic, although condom use did not decrease, indicating that this change in sexual behavior was not necessarily reflective of an overall increase in general health risk-taking. The increase in casual sex among those who use illicit drugs is understandably

concerning, as frequent sexual encounters during this pandemic not only increase the risk of contracting sexually transmitted infections, but also the risk of contracting and spreading COVID-19, which could have higher lethality rates among those who already have health problems associated with drug use. These findings indicate that the COVID-19 pandemic influenced people's sexual behaviors; specifically, that queer men may have used in-person sexual encounters to counter their feelings of loneliness and depression, despite the health risks. This is important to note because increased sexual behavior could be attributed to increased feelings of loneliness and depression, which Rosenberg and colleagues explore in the next study.

To study the mental health effects of the COVID-19 pandemic, Rosenberg and colleagues studied depression and loneliness in the United States and their association with social and sexual behavior. Using an online survey of adults aged 18 to 94, these researchers measured participants' self-reported loneliness and depression ratings between April 10th and April 20th of 2020, along with assessing the frequency of self-reported social and sexual encounters within the last month. Their findings indicate that depression and loneliness increased overall during the early days of the pandemic, but that in-person (not remote) social and sexual connections were associated with lower loneliness and depression measurements (Rosenberg et al., 2021). This means that those individuals who were closely following COVID-19 protocol (specifically, social distancing and isolating) had lower risk of physical health complications, but were putting their mental health at risk. While precautions and restrictions are being lifted around the United States, the lasting effects of depression and loneliness in the adult population cannot be ignored, and going "back to normal" in terms of socializing and dating will be difficult for many individuals.

In addition to mental health risks brought on by feelings of isolation from platonic and romantic interactions, relationship conflicts as a result of pandemic-related stressors are another area of potential concern. Drawing on the same sample used in the aforementioned (Rosenberg et al., 2021) research, Luetke and colleagues investigated conflict in romantic relationships during the pandemic, along with changes in sexual behavior among American adults, during the early days of pandemic-related restrictions in the United States. This online survey was conducted between April 10th and April 20th in 2020, and asked the same 1,010 adults about relationship conflict, changes in the frequency of their sexual and intimate behaviors, and event-level experiences (orgasm and emotional closeness). The researchers found that 34% of respondents reported some degree of conflict between themselves and their romantic partners due to the pandemic and its restrictions. Interestingly, the researchers also found that participants living with their romantic partners were having significantly less sex than before the onset of the pandemic; conversely, single individuals and individuals who did not live with their partners were not having significantly less sex (Luetke et al., 2020). This means that people living with their romantic partners saw a decrease in sexual behavior, even though it does not decrease transmission risks to abstain from sex if one is already living with their partner. The researchers speculated that the increased conflict in relationships and overall increased life stress due to the pandemic may have been the reason people were less sexually active with their partners. This finding is important, as it implies the virus and its related stressors had negative effects on relationships, even for individuals who do not experience as severe isolation because they live with their partners.

Relationship stressors brought on by the circumstances of the COVID-19 pandemic are not a problem exclusive to one region, group, or relationship dynamic, as found in an online

cross-national study of 1,559 adults in 2020. Participants in various countries (including the United States, Canada, the United Kingdom, and Australia) were asked between March 21st and April 14th of 2020 about their sexual behaviors during the COVID-19 pandemic, including both partnered and solo (masturbation) sexual behavior. Most participants reported decreased partnered sexual behavior during the pandemic, and reported decreased solo sexual behavior (masturbation) as well. This was a bit surprising to researchers; despite increased time spent at home and increased privacy, adults in this study reported a reduction, rather than an increase, in sexual behaviors. A substantial minority of participants did endorse an increase in sexual behavior, including new additions to their sex lives (like trying new positions or toys), but the majority of respondents said their sex lives declined during the pandemic (Lehmiller et al., 2021). In the media and in conversations with friends, many people have probably heard jokes about "pandemic babies" (babies conceived during quarantine due to their parents' boredom and subsequent increased sexual activity), but these surveys are actually finding that adults' sex lives are experiencing a decline in response to the pandemic, possibly due to stress or increased household conflict. Data supports the notion that people who are not isolated from others (for instance, those who live with their partners) are not necessarily more likely to have sexual contact because pandemic-related difficulties can affect their relationships.

These findings are important because both established relationships and novel relationships may need help recovering from the stressors associated with COVID-19, and adults may struggle to adapt to dating and navigating established relationships as restrictions are becoming more lenient. This could have widespread psychological implications, as well as implications regarding domestic violence (Kourti et al., 2021) and the declining birth rate (De Rose et al., 2021).

Although there has been minimal research to date on the pandemic's effects on romantic relationships due to the newness of the pandemic, there has been a fair amount of research regarding social alienation and self-concept which are relevant to this question (Harris & Orth, 2020). Self-concept is defined as individuals' beliefs about themselves, including their self-worth, self-esteem, social skills, talents, characteristics, et cetera (Mercer, 2012). In 2008, Tarquin and Cook-Cottone explored the association between self-concept and student alienation, an experience where students do not feel a sense of belonging. They gave several questionnaires to 351 undergraduate students at an American university, 95% of which were between 18 and 25 years old, and measured the students' self-concepts and number of alienation incidents since elementary school. The researchers found a negative correlation between self-concept and student alienation – that is, positive self-concepts (indicated by higher scores) were associated with lower reports of alienation (Tarquin & Cook-Cottone, 2008). These findings indicate that participants in the present study who score higher on self-concept measures may be less susceptible to negative effects of isolation, and will potentially demonstrate fewer changes in self-concept and distress scores from Time 1 to Time 2. Feelings of social isolation brought on by the COVID-19 pandemic may also change individuals' confidence in themselves and their dating habits, leading to lowered self-concept scores and higher distress from Time 1 to Time 2. Based on this research, it was hypothesized that self-concept scores would be negatively correlated with romantic distress in the current study.

The present study explores such possibilities by gathering self-reported data from college students who have come into young adulthood during the onset of the COVID-19 pandemic. This sample of participants, aged 18 to 23, can help shed light on the challenges young adults are facing as they navigate their newfound maturity in the age of COVID-19. Using established

measures of romantic confidence, sexual confidence, and self-concept, this study expands on previous knowledge by asking participants retrospective questions about their beliefs and behavior prior to the COVID-19 pandemic, and then comparing those answers to the same participants' answers about themselves currently (during the COVID-19 pandemic). This study uses quantitative data, utilizing Likert scales to score participants' answers, allowing statistical tests to be used to compare scores. Based on prior research on social isolation and self-concept (Tarquin & Cook-Cottone, 2008), it is hypothesized that self-concept scores will show a statistically significant decrease between Time 1 (before March 2020) and Time 2 (now). Based on research suggesting negative impacts of the pandemic on romantic and sexual well-being (Luetke et al., 2020; Lehmiller et al., 2021), it is further hypothesized that romantic confidence and sexual confidence will demonstrate a statistically significant decrease between Time 1 and Time 2. Results may be useful for therapists, counselors, parents, professors, psychiatrists, physicians, and other support providers who are tasked with helping young adults in an emotional, mental, or psychological capacity.

Methods

Participants

Participants were recruited from a volunteer (or self-selected) sample of college students ranging from ages 18 to 23, located at a variety of colleges, including Oberlin College, the University of Colorado Boulder, and Wheaton College (see **Table 5** for frequencies and **Appendix B** for a full list). Only college students were allowed to participate. Eighty-two participants (56%) were recruited at the University of Vermont through Sona, a study recruitment forum that allows anonymous users to participate in various studies for class credit.

Other University of Vermont students, along with all other participants, were classmates and friends recruited via email. The total sample size was 146, although not all participants answered all questions. See **Tables 1, 2, 3,** and **4** for demographics data of participants.

Materials

This study utilized online questionnaires about self-concept, along with sexual and dating habits, asking participants to answer retrospective questions about their beliefs and behavior before the pandemic (i.e., prior to March 2020), and questions about their beliefs and behavior during the pandemic (meaning, their beliefs and behavior at the time of taking the survey). Some questions were developed by the principal investigator (including questions about demographics), but most were borrowed from questionnaires with established validity and reliability. Borrowed questionnaires included the Social Isolation Scale (Cotten, 2013), the State Adult Attachment Measure (Gillath, 2009), the Inventory of Romantic Relationship Confidence (Faber et al., 2019), and the Multidimensional Scale of Sexual Self-Concept (Ferrer-Ubina et al., 2019).

Frequency, agreement, and likelihood questions were asked regarding dating, sex, and self-concept using Likert scales, for instance, "how often did you use dating apps before March of 2020?" with answers ranging from 0 (never) to 5 (very often). These ratings provided a scale variable to use when comparing the means of the first "sample" (Time 1) and the second "sample" (Time 2). See **Appendix A** for the full list of questions.

Procedure

Data were collected between December of 2021 and March of 2022. Participants were emailed a link to the survey, which was entirely online, and provided with an informed consent briefing at the beginning of the survey, where they were told the benefits (for University of

Vermont undergraduates, possible extra credit in some), risks (psychological distress), and cost to them (their time). They were also informed that their data would remain anonymous and confidential, with no way to connect their responses to any identifying information. Those who chose to continue were presented with an online survey on the website Qualtrics, which usually took them between 15 and 30 minutes to complete. Questions were presented in sections, starting with a demographics section, and participants were able to take a break from the survey and come back to it later (although they could only take the survey once). For specific questions and the order in which they were distributed, see **Appendix A.**

Analyses

Scores were broken down into three categories: SEX, DATING, and SELF_CONCEPTS, and each category was further split into two subgroups: _PRIOR and _CURRENT, which _PRIOR including scores from questions asked about pre-pandemic beliefs and behavior, and _CURRENT including scores from questions asked about during-pandemic beliefs and behavior. Participants were also asked to rate how much they perceived the pandemic to affect their own beliefs and behavior. Those scores were divided into two categories: EFFECT_SEX (how much the participant perceived the pandemic to have affected their sexual beliefs and behaviors) and EFFECT_DATING (how much the participant perceived the pandemic to have affected their romantic or dating beliefs and behaviors).

Due to the use of Likert scales, responses were coded as displaying higher levels of sexual- or relationship – related distress if they exhibited lower scores, and lower levels of distress if they exhibited higher scores. In other words, there is an inverse relationship between score and level of distress. Questions Q42, Q43, and Q62-71 were reverse-coded to fit this

model. The calculations of the categories (SEX, DATING, SELF_CONCEPT, and EFFECT) and their subgroups are outlined in **Appendices C, D, E,** and **F**, respectively**.**

Using paired-samples *t* tests, the retrospective pre-pandemic (Time 1) mean beliefs and behavior scores were compared to the current (Time 2) mean beliefs and behavior scores, with March 2020 being the marker of the beginning of the pandemic in the United States, because widespread pandemic restrictions began in March (Bowman, 2020). This was a within-groups design, meaning all participants were part of both samples/conditions, as they answered questions about themselves from before and during the pandemic.

Results

Descriptive statistics for each measure are provided in **Table 7.** Each "_PRIOR" variable represents participants' reported state of mind prior to March 2020 (hereafter referred to as "Time 1"), whereas each "_CURRENT" variable represents participants' current state of mind (hereafter referred to as "Time 2"). EFFECT_SEX and EFFECT_DATING represent participants' current attitudes regarding the overall effects of the pandemic on their sexual and romantic behaviors and beliefs, respectively.

The paired-samples *t* tests used to compare the Time 1 (PRIOR) and Time 2 (CURRENT) scores found varying results, with no statistically significant differences found for gender, race, ethnicity, sexual orientation, or age. As a within-subjects design, this study treats Time 1 and Time 2 as conditions experienced by all participants, and treats their beliefs and behavior during each time period as dependent variables. All analyses were run while assuming a 90% confidence interval.

Possible scores for SEX_PRIOR (sexual distress in Time 1) and SEX_CURRENT (sexual distress in Time 2) ranged from 0 (high distress) to 25 (no distress). Possible scores for

DATING_PRIOR (romantic distress in Time 1) and DATING_CURRENT (romantic distress in Time 2) ranged from 0 (high distress) to 44 (no distress). Possible scores for SELF_CONCEPT_PRIOR (self-concept distress in Time 1) and SELF_CONCEPT_CURRENT (self-concept distress in Time 2) ranged from 0 (high distress) to 45 (no distress). Possible scores for EFFECT_SEX ranged from 0 (high distress) to 12 (no distress), and EFFECT_SEX possible scores ranged from 0 (high distress) to 16 (low distress).

Sexual distress. Scores collected regarding distress related to sexual beliefs and behavior during Time 1 were coded as SEX_PRIOR during statistical analyses. Scores collected regarding distress related to sexual beliefs and behavior during Time 2 were coded as SEX_CURRENT. SEX_PRIOR and SEX_CURRENT each had possible minimum scores of 0, and possible maximum scores of 25, with a score of 0 indicating the highest level of distress and a score of 25 indicating the lowest level of distress. For SEX_PRIOR and SEX_CURRENT, there was not a statistically significant difference between Time 1 (mean score = 13.40) and Time 2 (mean score = 13.81) (paired $t(85) = -.872$, $p = .386$). In other words, sexual distress during Time 1 and sexual distress during Time 2 were not significantly different. It is important to note, however, that only a little more than half ($n = 86$) of participants answered all relevant sex questions. Sixty-two participants out of 139 (44.6%) reported that they were not in a sexual relationship at the time they took the survey and 71 participants out of 138 (51.4%) reported that they were not in a sexual or romantic relationship in March of 2020, meaning about half of participants were not sexually active in Time 1 and about half were not sexually active in Time 2. This lack of sexual activity and/or experience may have contributed to the smaller sample size, possibly along with discomfort answering questions.

Romantic distress. For DATING_PRIOR and DATING_CURRENT, there was a statistically significant difference between Time 1 and Time 2 (paired $t(124) = -4.26$, $p < .000$)**.** These data were collected from a larger group of participants ($n = 125$) than the SEX data, increasing generalizability. DATING_CURRENT (distress related to romantic beliefs and behavior during Time 2) reported a higher mean score ($M_{T2}=26.45$) than DATING_PRIOR, distress during Time 1 ($M_{T1}=23.18$), indicating an association between the COVID-19 pandemic and *decreased* romantic distress. Reasons behind this unexpected directionality are explored in the Discussion section.

Self-concept. Self-concept scores did not differ significantly from Time 1 to Time 2 (paired $t(53) = -1.206$, $p = .233$). These data included only 54 participants' results, meaning there were only 54 participants that answered all SELF_CONCEPT_PRIOR questions and SELF_CONCEPT_CURRENT questions. This is a notably smaller number than any other sample size, making results less generalizable. Reasons behind this much smaller number are explored in the Discussion section. SELF_CONCEPT_PRIOR (self-concept in Time 1) scores did not predict significant differences in DATING_PRIOR (romantic distress in Time 1) scores ($p = .312$), but did significantly predict SEX_PRIOR scores (sexual distress in Time 1). Higher SELF_CONCEPT_PRIOR scores (meaning, lower self-concept distress) were found to predict a weak *decrease* in SEX_PRIOR scores (meaning, higher sexual distress) ($r = -.291$, $p = .031$), an unexpected direction. SELF_CONCEPT_CURRENT scores (self-concept in Time 2) did not predict significant differences in DATING_CURRENT scores (romantic distress in Time 2) ($p = .129$), but did also significantly predict SEX_CURRENT scores (sexual distress in Time 2) with a moderate negative correlation ($r = -.430$, $p = .001$). This indicates that a higher SELF_CONCEPT_CURRENT score (meaning, lower self-concept distress) predicted a *lower*

SEX_CURRENT score (meaning, higher sexual distress), another unexpected direction. These results will also be discussed more in the Discussion section. There was also a moderate positive correlation between SELF_CONCEPT_PRIOR and SELF_CONCEPT_CURRENT when running a linear regression analysis ($r = .494$, $p < .000$), implying that having a more negative view of oneself in Time 1 (and therefore, a high score) predicted a more negative view of oneself in Time 2, and vice-versa.

Participants' perception of pandemic's effects. For EFFECT_SEX and EFFECT_DATING, which measured participants' perceptions of the pandemic's effects on their sexual and romantic beliefs and behavior, EFFECT_DATING ($M_{EFFECT\_DATING} = 6.127$) had significantly higher scores than EFFECT_SEX ($M_{EFFECT\_SEX} = 4.304$) (paired $t(131) = -9.383$, $p < .000$), indicating that participants perceived *higher* rates of distress caused by the pandemic in their romantic beliefs and behavior rather than their sexual beliefs and behavior, which did not align with actual DATING and SEX scores. These data included the largest group of participants, with 132 participants answering all questions included in both categories. Data exhibited a strong positive correlation ($r = .735$, $p < .000$) indicating that participants who reported less sexual distress due to the COVID-19 pandemic were less likely to report more romantic distress.

Romantic distress and relationship status. DATING_PRIOR (romantic distress during Time 1) and DATING_CURRENT (romantic distress during Time 2) scores were then tested for association with Q16_R, a recoded version of Q16 ("Are you currently in a romantic relationship?") that included only data from respondents who answered YES (1). While DATING_PRIOR scores did not differ significantly based on relationship status, DATING_CURRENT scores did differ significantly ($p < .000$). Students who reported that they

were currently in a romantic relationship (at the time of taking the questionnaire) scored higher on DATING_CURRENT, meaning they reported lower levels of distress, with the mean DATING_CURRENT score for single students being 23.94 (indicating higher distress), and the mean DATING_CURRENT score for non-single students being 30.58 (indicating lower distress).

Current sexual distress and romantic distress. Sexual distress scores for Time 2 and romantic distress scores for Time 2 were analyzed and were found to have a moderate positive correlation ($r = 0.522$, $p < .000$). These results indicate that participants who reported high levels of current sexual distress also reported high levels of current romantic distress, and participants who reported low levels of current sexual distress also reported low levels of current romantic distress.

Discussion

Dating scores

As mentioned in the Results section, there were significantly different scores between DATING_PRIOR (romantic beliefs and behavior during Time 1) and DATING_CURRENT (romantic beliefs and behavior during Time 2). Interestingly, participants reported higher levels of romantic distress *prior* the COVID-19 pandemic than *during* the COVID-19 pandemic, given the difference between the means of each set of scores ($M_{T2}=26.45$, $M_{T1}=23.18$, $t = -4.26$, $p < .000$). There are several possible explanations for this difference in scores.

Solidarity. The COVID-19 pandemic undoubtedly caused personal distress for a majority of people, but this traumatic experience may have also brought people together, decreasing interpersonal distress (Prainsack & Buyx, 2011). By experiencing solidarity with other young adults navigating the trauma of the COVID-19 pandemic, college students may actually be having an easier time dating and making romantic connections than they did previous

to the onset of pandemic restrictions. Now, regardless of personal differences, young adults all share a commonality: experiencing the COVID-19 pandemic.

Age. Participants in this study ranged from 18 to 23 years old, meaning they were potentially as young as 16 before the onset of the COVID-19 pandemic. 100% of UVM first- and second-year undergraduates currently live on-campus, and 62.49% of undergraduates come from out-of-state (College Factual, 2022; University of Vermont, 2022). This numbers indicate that the majority of undergraduates have moved to a new location for college and have met many new people in college who are within their age range. With increased maturity, a "clean slate" at a new school, and access to an increased number of peers (potential romantic partners), participants may feel it is easier to date now than it was in and before 2020. Considering this theory, it was surprising that age did not correlate with statistically significant differences in any combined measures (sexual distress, romantic distress, or self-concept distress).

Dating scores also differed between participants in romantic relationships and participants not in romantic relationships; specifically, romantic distress in Time 2 was significantly lower for non-single respondents than for single respondents. This is an important finding, as it indicates that being in a relationship may act as a cushion against some of the negative effects relating to the COVID-19 pandemic. These data may be reflective of young adults' experiences, specifically college students, but may not be indicative of the experiences of adolescents, middle-aged adults, and the elderly in relationships. These populations would benefit from further research.

Self-concept was predicted to have a similar effect, in that a positive view of oneself would correlate with lower romantic distress, but this was not supported by the data, as romantic distress scores were not significantly different depending on self-concept scores. However, self-

concept scores did show a significant difference for sexual distress scores in both Time 1 and Time 2, in an unexpected direction. In both Time 1 and Time 2, lower self-concept scores (meaning high self-concept distress) correlated with *lower* sexual distress scores, implying that a negative view of oneself can predict a higher belief in one's sexual competency. The correlation for Time 1 was weak, however, and the correlation for Time 2 was moderate. The lack of valid responses collected for self-concept measures must also be taken into account when interpreting these results. Had more participants answered both sexual distress related questions and self-concept related questions, results would be more generalizable.

Self-Concept and Sex

Results indicated that participants with more positive self-concepts in both Time 1 and Time 2 experienced more sexual distress in both Time 1 and Time 2, a surprising finding. These data may reflect findings by Starks and colleagues, who reported that queer men who use illegal drugs had, overall, more casual sexual partners after the onset of pandemic restrictions in the United States (2020). Since negative self-concept was measured in the current study using statements like "I will be alone forever" and "I am willing to engage in risky behaviors to prevent loneliness," participants with lower self-concepts may have sought out more sexual encounters as a coping mechanism in both Time 1 and Time 2, while their counterparts with higher self-concepts may have sought out the same or lower number of sexual encounters. It is reasonable to assume that increased sexual experiences in the negative-self-concepts group could have led to higher sexual confidence, and therefore lower sexual distress.

Effect

The difference in scores between the pandemic's perceived effect on sexual behavior and beliefs and the effect on romantic behavior and beliefs was statistically significant with a strong

positive correlation ($r = .735$, $p < .000$), indicating that a higher report of perceived sexual distress was associated with a higher report of perceived romantic distress. These perceptions mirrored the data on actual distress, which showed a statistically significant and moderate positive correlation ($r = .522$, $p < .000$) between levels of sexual distress in Time 2 and levels of romantic distress in Time 2. Statistical significance also indicated a difference in mean scores, with EFFECT_DATING having a higher mean score ($M = 6.127$) than EFFECT_SEX ($M = 4.304$). This indicates participants were right about their own experiences and beliefs, as their romantic beliefs and behaviors were in fact significantly different before versus during the pandemic ($p < .000$), while their sexual beliefs and behavior were not ($p < .386$). However, participants predicted this effect in the *opposite* direction than the results indicated. It appears that participants theorized that the pandemic increased their romantic distress, but responses from the DATING_PRIOR and DATING_CURRENT questions showed significantly *less* romantic distress in Time 2 (during the pandemic) than in Time 1 (before the pandemic). However, this may have occurred because the wording of the questions did not specifically ask if the pandemic negatively impacted participants; for example, questions asked, "How much has the pandemic affected your dating habits?" rather than "How much has the pandemic *negatively* affected your dating habits?" Therefore, participants may have been reporting that the pandemic had a significant positive impact on their romantic beliefs and behavior, as indicated by the data. Participants may have also been answering the EFFECT questions with slight bias due to demand characteristics, a common cause of systematic error in sociological and psychological studies. Demand characteristics are indicators to participants in a study or experiment that they should answer questions or behave in a certain way, either to help the researchers support their hypotheses, or to disprove those hypotheses (Nichols & Maner, 2008). In this case, two demand

characteristics can be identified. First, the presence of questions asking about negative beliefs (e.g., "I will be alone forever") and second, the fact that participants were asked to report on their behaviors and beliefs from two time frames, may have swayed them to assume that there was, in fact, a negative impact on their lives because of the pandemic. Even if participants did not really believe that they experience a significant negative impact, they may have answered effect questions to indicate that they had because they thought that would be beneficial to the researcher.

Limitations

Response discrepancy. The largest discrepancy in this study was the difference in the number of participants who responded to all SEX (n = 86) and DATING (n = 125) questions and the number of participants who responded to all SELF-CONCEPT (n = 54) questions. Specifically, 77 participants answered the SELF_CONCEPT_PRIOR questions, and 81 participants answered the SELF_CONCEPT_CURRENT questions, with an "overlap" of 54 participants who answered both PRIOR and CURRENT questions. Fifty-four is about 37% of the original number of participants (N =146) and was much lower than the predicted number of responses. The smaller number of respondents to the sex-related questions was predictable because participants may have felt uncomfortable answering questions about sex, they may have little to no experience with sex, or they may have little to no sexual desire as a baseline. This makes it unusual for respondents to have a higher number of responses to sex-related questions than to self-concept-related questions. There are two potential theories behind this discrepancy.

1. Reluctance**.** One theory is that the emotional intensity of the questions made participants reluctant to answer them. Self-concept questions included "I will be alone forever"

and "I am willing to engage in risky behaviors to prevent loneliness." The act of answering these questions could have been triggering to some participants, causing them to skip some or all.

2. Uncertainty. Another theory is that participants simply did not know how to answer these questions, especially the SELF_CONCEPT_PRIOR questions, as those questions asked about beliefs prior to the COVID-19 pandemic. These data were collected between December 2021 and March 2022, meaning participants were asked to recall thoughts and feelings from between 17 and 24 months ago. Possibly, it was difficult for participants to remember how they felt up to two years prior to taking the survey, which could have caused them to skip some questions (Gardner, 2001).

Lack of qualitative data. This study only employed quantitative measures, forcing participants to rate their feelings, thoughts, and behaviors on scales. While this kept study participation brief and allowed for statistical analyses, this detracted from results because participants were unable to articulate their experiences in their own words. Without qualitative data, there is a narrowed and limited understanding of participants' individual realities.

Retrospectivity. Because this study was conducted between December of 2021 and March of 2022, participants had to rely on memory to report their beliefs and behavior during Time 1. The human memory is powerful but unreliable, and inaccurate memories may have biased results, especially in a study regarding psychological and social research (Gardner, 2001). Elizabeth Loftus's experiment, "Leading Questions and the Eyewitness Report," supports this notion. Loftus found that, after showing participants a video of a car crash, she was able to influence their answers about the video by asking leading questions: "How fast was Car A going when it ran the stop sign?" versus "How fast was Car A going when it turned right?" Fifty-three percent of participants who were asked about the stop sign reported seeing a stop sign in the

video, while only 35% of participants who were asked about the car turning right reported seeing a stop sign (1975). This research indicates that even recent memories can be influenced by the wording of questions. In the present study, participants could have conjured false or distorted memories based on the nature of the questions, many of which implied that life was very different before the COVID-19 pandemic (e.g., "How often did you use dating apps before March of 2020?"). Some participants were answering questions about their beliefs and behavior from more than two years ago, so the combination of leading questions and retrospective unreliability could have influenced results to appear significant (and in support of the hypotheses).

Lack of diversity. As this study was conducted at the University of Vermont, it was expected that the majority of participants would be white and female, with 82% of current undergraduates identifying as white, and 60% of current undergraduates identifying as female (College Factual, 2022). As participants were in fact majority white (86.3%) and female (77.9%), these data could be considered generalizable to the student body at the University of Vermont, but the data's generalizability to other groups and demographics is limited. The lack of diversity in age was enforced, along with current student status, as only 18- to 23-year-old college students were permitted to take the present study's survey, but it is important to note that this age and status limit also narrows the generalizability of data.

Specificity of self-concept measures. Self-concept is defined as individuals' beliefs about themselves, including their self-worth, self-esteem, social skills, talents, characteristics, et cetera (Mercer, 2012). The present study constricted its measures of self-concept to mainly examine participants' views of their own social skills, social desirability, and social talents (see

Appendix E) to reflect the purpose of the study. While this was beneficial for these analyses, this could have also limited the generalizability of results.

Ethnic labeling. In Question 3, participants were asked, "Do you identify as Hispanic and/or Latinx?" The use of the term Latinx was intended to be inclusive of respondents who identified outside the gender binary, as the term Latino implies masculinity and the term Latina implies femininity. However, further research conducted after data collection revealed that Latinx is a controversial term that did not necessarily originate in the Latina and Latino community, and is not the only queer-inclusive term available for people of Central American and South American descent (Salinas & Lozano, 2017). It is possible that some potential participants felt offended or excluded by the wording of Question 3, since their identities may have not aligned with either Hispanic or Latinx, and opted out of the rest of the survey. Regardless of whether the wording affected sample size, terminology should have been more carefully studied and crafted prior to data collection. Future research may consider using the term Latin*, a proposed "placeholder" for people with Central American and South American ancestry, until an appropriate term (or collection of terms) emerges from the community (Salinas, 2020).

Conclusions and Further Research

The COVID-19 pandemic has taken an unprecedented and irrevocable toll on humanity, and continues to do so. The physical and medical consequences of COVID-19 are undeniable, and the mental, psychological, and emotional effects are beginning to be studied in earnest as well. The present study compared self-reported levels of distress related to sex, dating, and self-concept among 18- to 23- year-old American undergraduate college students to gain a better understanding of the effects of the pandemic. Results unexpectedly indicated a possible

resiliency among young adults that has maintained sexual confidence and self-confidence, and even increased romantic confidence, especially among students currently in romantic relationships. Despite these positive results, survivors of this pandemic should still be offered psychological support as they navigate reality during and after the traumatic effects of lockdown, isolation, quarantine, and more. Pandemic-related restrictions save lives and should not be antagonized, but it is still important to acknowledge their effects on people's social and emotional lives. Further research should continue examining the long-term psychological effects of the COVID-19 pandemic on various age groups, and should examine the efficacy of various interventions.

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Tables

Table 1

Gender Identity of Participants

Gender identity	Frequency (Percentage)
Male	19 (13.6%)
Female	109 (77.9%)
Non-binary	9 (6.4%)
Other	3 (2.1%)*

Note. "Other" answers included "genderqueer," "nonbinary woman," and "male/nonbinary"

Table 2

Racial Identity of Participants

Race	Frequency (Percentage)
White	120 (86.3%)
Black or African American	2 (1.4%)
Asian	10 (7.2%)
American Indian or Alaskan Native	0
Native Hawaiian or Other Pacific Islander	0
Other	3 (2.2%)
	Hispanic/Latinx: 1 (0.7%)
	Roma: 1 (0.7%)
	No answer: 1 (0.7%)

Note. Both participants who checked "Black or African American" also checked "White." Three participants who checked "Asian" also checked "White."

- Black or African American AND White: 2 (1.4%)
- Asian AND white: 3 (2.2%)

Table 3

Ethnic Identity of Participants

Do you identify as Hispanic and/or Latinx?	Frequency (Percentage)
Yes	9 (6.4%)
No	131 (93.6%)

Table 4

Age of Participants

Age in years	Frequency (percentage)
18	20 (14.8%)
19	32 (23.7%)
20	41 (30.4%)

Age in years	Frequency (percentage)
21	26 (19.3%)
22	15 (11.1%)
23	1 (0.7%)

Note. The total number of participants may seem to be fewer than in Table 1 because some participants selected multiple races, but none selected multiple ages.

Table 5

Colleges Participants Attended

College attended in spring of 2020	Frequency (Percentage)
The University of Vermont	47 (32%)
Oberlin College	12 (8.2%)
Other (see Appendix B)	17 (11.6%)
Not in college yet	60 (40.8%)
Took time off school	3 (2%)
Other (no explanation)	2 (1.4%)

Table 6

Descriptive Statistics for Participants' Romantic Relationship Statuses

Are you currently in a romantic relationship?	Frequency (Percentage)
Yes	51 (34/7%)
No	76 (51.7%)
Unsure / Missing	20 (13.6%)

Table 7

Descriptive Statistics for Variables of Interest

Variable	N	Minimum	Maximum	Mean	Standard Deviation
SEX_PRIOR	92	.00	24.00	13.4023	4.65528
SEX_CURRENT	105	1.00	20.00	13.8095	3.81569
DATING_PRIOR	127	5.00	40.00	23.1811	6.62776
DATING_CURRENT	129	6.00	38.00	26.4496	6.71049
SELF_CONCEPT_PRIOR	77	2.00	45.00	29.1429	8.73847
SELF_CONCEPT_CURRENT	81	.00	45.00	31.5309	9.51326
EFFECT_SEX	135	.00	9.00	4.3037	2.98322
EFFECT_DATING	134	.00	12.00	6.1269	3.39044

Appendix A

Questionnaire and Possible Responses

Demographics

Q1 How old are you? If you are younger than 18 or older than 23, please do not continue with this survey, as your data will be discarded.

Q2 What is your racial identity? (select all that apply)
Black or African American
White
Asian
American Indian or Alaskan Native
Native Hawaiian or Other Pacific Islander
Other: _____

Q3 Do you identify as Hispanic and/or Latinx?
Yes
No

Q4 What is your gender identity?
M
F
NB
Other: _____

Q5 What year are you in college? If you are not currently in college, please do not continue with this survey, as your data will be discarded.
Senior
Junior
Sophomore
Freshman
Other: _____

Q6 What is your family's annual income? (pick the closest amount)
$100k+
$75k
$50k
$25k
Unsure

Q7 What is your sexual orientation?
Straight
Bisexual/pansexual
Gay/lesbian
Unsure

Other

Q8 If you answered Other to the previous question, please write in your sexual orientation:

COVID-19

Q9 Have you ever tested positive for Covid-19?
Yes
No
Unsure

Q10 Has a family member or housemate ever tested positive for Covid-19?
Yes
No
Unsure

Q11 Have you been vaccinated against Covid-19?
Yes
No

Q12 Do you ever wear masks in places they are not required?
Yes
No

Q13 Were you attending college in the spring of 2020?
Yes
No

Q14 If you answered yes to the previous question, what college were you attending in the spring of 2020?

Q15 If you answered no to the previous question, please explain:
I wasn't in college yet
I took time off of school
Other: _____

Relationships

Q16 Are you currently in a romantic relationship?
Yes
No
Unsure

Q17 Are you currently in a sexual relationship?
Yes

No
Unsure

Q18 Were you in a romantic OR sexual relationship in March of 2020?
Yes
No
Unsure

If you are currently in a romantic OR sexual relationship:

Q20 If you are currently in a romantic OR sexual relationship: When did this relationship begin?
Before March of 2020
During March of 2020
After March of 2020

Q21 Is this relationship currently long-distance? (as in, more than an hour driving distance from each other)
Yes
No

Q22 Was this relationship long-distance in March of 2020? (as in, more than an hour driving distance from each other)
Yes
No

Q23 Do you currently live with your partner?
Yes
No

Q24 Have you ever lived with your current partner?
Yes (when?) _____
No

If you are NOT currently in a romantic or sexual relationship:

Q26 Are you actively looking for a romantic partner right now?
Yes
No

Q27 Are you actively looking for a sexual (non-exclusive) partner right now?
Yes
No

Pandemic Restrictions
Possible answers: Very, Somewhat, Barely, Not at all

Q28 Since March of 2020, how strictly have you followed masking guidelines?

Q29 Since March of 2020, how strictly have you followed social distancing guidelines?

Q30 Since March of 2020, how strictly have you followed traveling guidelines?

Beliefs and behavior: effect
Possible answers: A lot, Somewhat, A little, Not at all

Q31 How much has the pandemic affected your work situation?

Q32 How much has the pandemic affected your living situation?

Q33 How much has the pandemic affected your dating habits?

Q34 How much has the pandemic affected your sexual habits?

Q35 How much has the pandemic affected your ability to find a partner?

Q36 How much has the pandemic affected your romantic relationship(s)?

Q37 How much has the pandemic affected your sexual relationship(s)?

Q38 How much has the pandemic affected your romantic confidence?

Q39 How much as the pandemic affected your sexual confidence?

Beliefs and behavior: frequency
Possible answers: Very often, Often, Not often, Never

Q40 How often did you use dating apps before March of 2020?

Q41 How often have you used dating app(s) since March of 2020?

Q42 How often did you go on dates before March of 2020? ("date" is defined in this study as an in-person meeting with someone with romantic intentions)

Q43 How often have you gone on dates after March of 2020? ("date" is defined in this study as an in-person meeting with someone with romantic intentions)

Beliefs and behavior: agreement (pre-pandemic)
Possible answers: Strongly agree, Agree, Disagree, Strongly Disagree

To the best of your ability, respond to the following 6 statements as if you were answering them prior to March of 2020.

Q44 It is hard for me to find a romantic partner.

Q45 It is hard for me to find a sexual partner.

Q46 I am unhappy with my relationship status.

Q47 I am lonely.

Q48 I will be alone forever.

Q49 I am willing to engage in risky behaviors to prevent loneliness.

Beliefs and behavior: agreement (current)
Possible answers: Strongly agree, Agree, Disagree, Strongly disagree

To the best of your ability, respond to the following 6 statements with your current feelings.

Q50 It is hard for me to find a romantic partner.

Q51 It is hard for me to find a sexual partner.

Q52 I am unhappy with my current relationship status.

Q53 I am lonely.

Q54 I will be alone forever.

Q55 I am willing to engage in risky behaviors to prevent loneliness.

Social Isolation Scale (pre-pandemic)
Possible answers: Often, Some of the time, Hardly ever

How often did you experience the following 3 feelings in the years prior to March of 2020?

Q56 How often do you feel you lack companionship?

Q57 How often do you feel left out?

Q58 How often do you feel isolated from others?

Social Isolation Scale (current)
Possible answers: Often, Some of the time, Hardly ever

Q59 How often do you experience the following 3 feelings currently? Feeling 1: How often do you feel you lack companionship?

Q60 Feeling 2: How often do you feel left out?

Q61 Feeling 3: How often do you feel isolated from others?

State Adult Attachment Measure (pre-pandemic)
Possible answers: Strongly disagree, Disagree, Somewhat disagree, Neutral/Mixed, Somewhat agree, Agree, Strongly agree

To the best of your ability, rate much you agreed with the following 5 statements in the years prior to March of 2020.

Q62 I wish someone would tell me they really love me.

Q63 I really need to feel loved right now.

Q64 I want to share my feelings with someone.

Q65 I want to talk with someone who cares for me about things that are worrying me.

Q66 I really need someone's emotional support.

State Adult Attachment Measure (current)
Possible answers: Strongly disagree, Disagree, Somewhat disagree, Neutral/Mixed, Somewhat agree, Agree, Strongly agree

To the best of your ability, rate much you agree with the following 5 statements currently.

Q67 I wish someone would tell me they really love me.

Q68 I really need to feel loved right now.

Q69 I want to share my feelings with someone.

Q70 I want to talk with someone who cares for me about things that are worrying me.

Q71 I really need someone's emotional support.

Inventory of Romantic Relationship Confidence (pre-pandemic)
Possible answers: Almost never, Not very often, Sometimes, Often, Almost always

To the best of your ability, rate how often the following 9 statements were true for you in the years prior to March of 2020.

Q72 I believe I will be able to effectively deal with conflicts that arise in my relationships.

Q73 I feel good about the prospects of making a romantic relationship last.

Q74 I feel I have the skills needed for a lasting stable romantic relationship.
Q75 I am confident I can handle relationship challenges that arise.

Q76 I feel I am able to meet the emotional needs of my significant other.

Q77 I feel I can influence my relationship satisfaction.

Q78 I feel that if I am not happy in a relationship, I can improve the relationship.

Q79 I am confident that I will have a long term happy committed relationship.

Q80 Statement 9: I am very satisfied with my sex life.

Inventory of Romantic Relationship Confidence (current)
Possible answers: Almost never, Not very often, Sometimes, Often, Almost always

To the best of your ability, rate how often the following 9 statements are true for you currently.

Q81 I believe I will be able to effectively deal with conflicts that arise in my relationships.

Q82 I feel good about the prospects of making a romantic relationship last.

Q83 I feel I have the skills needed for a lasting stable romantic relationship.

Q84 I am confident I can handle relationship challenges that arise.

Q85 I feel I am able to meet the emotional needs of my significant other.

Q86 I feel I can influence my relationship satisfaction.

Q87 I feel that if I am not happy in a relationship, I can improve the relationship.

Q88 I am confident that I will have a long term happy committed relationship.

Q89 I am very satisfied with my sex life.

Multidimensional Scale of Sexual Self-Concept (pre-pandemic)
Possible answers: Strongly disagree, Disagree, Agree, Strongly agree, N/A (no partner(s)/no sexual encounters)

To the best of your ability, rate how much you agreed with the following 6 statements prior to March of 2020.

Q90 I am very satisfied with my sex life.

Q91 I'm fine with myself in the sexual domain.

Q92 My sexual encounters are satisfying for me and my partner(s).

Q93 I think I know how to stimulate my partner(s) well.

Q94 I perform well in the sexual realm.

Q95 I believe in my abilities and sexual skills.

Multidimensional Scale of Sexual Self-Concept (current)
Possible answers: Strongly disagree, Disagree, Agree, Strongly agree, N/A (no partner(s)/no sexual encounters)

To the best of your ability, rate how much you agree with the following 6 statements currently.

Q96 I am very satisfied with my sex life.

Q97 I'm fine with myself in the sexual domain.

Q98 My sexual encounters are satisfying for me and my partner(s).

Q99 I think I know how to stimulate my partner(s) well.

Q100 I perform well in the sexual realm.

Q101 I believe in my abilities and sexual skills.

Appendix B

Answers to Written Questions

Q8 If you answered Other to the previous question, please write in your sexual orientation:
Frequencies and answers

- 2 Queer
- 1 Asexual
- 1 Panromantic deminsexual *[sic]*
- 1 Bisexual and Demisexual

Q14 If you answered yes to the previous question, what college were you attending in the spring of 2020?
Frequencies and answers

- 47 University of Vermont
- 12 Oberlin
- 17 Other (10 answers):
    - I was abroad at Trinity College Dublin, but studying through Oberlin College
    - Coastal Carolina University
    - Bridgewater State University
    - University of South Carolina
    - Online classes at various institutions, including Mcdaniel *[sic]* College and Oberlin college
    - University of Colorado Boulder
    - Quinnipiac University
    - Wheaton College
    - Newcastle University
    - Bard College at Simon's Rock

Appendix C

Calculations of SEX_PRIOR and SEX_CURRENT (measures of sexual distress)

SEX_PRIOR was calculated by adding scores from pre-pandemic-related (Time 1) questions:

Q45 It is hard for me to find a sexual partner.

Q80 I am very satisfied with my sex life (almost never to almost always)

Q90 I am very satisfied with my sex life. (strongly disagree to agree)

Q91 I'm fine with myself in the sexual domain.

Q92 My sexual encounters are satisfying for me and my partner(s).

Q93 I think I know how to stimulate my partner(s) well.

Q94 I perform well in the sexual realm.

Q95 I believe in my abilities and sexual skills.

SEX_CURRENT was calculated by adding scores from during-pandemic (Time 2) questions:

Q51 It is hard for me to find a sexual partner.

Q89 I am very satisfied with my sex life (*almost never* to *almost always*)

Q96 I am very satisfied with my sex life. (*strongly disagree* to *agree*)

Q97 I'm fine with myself in the sexual domain.

Q98 My sexual encounters are satisfying for me and my partner(s).

Q99 I think I know how to stimulate my partner(s) well.

Q100 I perform well in the sexual realm.

Q101 I believe in my abilities and sexual skills.

Appendix D

Calculations of DATING_PRIOR and DATING_CURRENT (measures of romantic distress)

DATING_PRIOR was calculated by adding scores from pre-pandemic (Time 1) questions:

Q40 How often did you use dating apps before March of 2020?

Q42 How often did you go on dates before March of 2020? ("date" is defined in this study as an in-person meeting with someone with romantic intentions)

Q44 It is hard for me to find a romantic partner.

Q46 I am unhappy with my relationship status.

Q72 I believe I will be able to effectively deal with conflicts that arise in my relationships.

Q73 I feel good about the prospects of making a romantic relationship last.

Q74 I feel I have the skills needed for a lasting stable romantic relationship.

Q75 I am confident I can handle relationship challenges that arise.

Q76 I feel I am able to meet the emotional needs of my significant other.

Q77 I feel I can influence my relationship satisfaction.

Q78 I feel that if I am not happy in a relationship, I can improve the relationship.

Q79 I am confident that I will have a long term happy committed relationship.

DATING_CURRENT was calculated by adding scores from during-pandemic (Time 2) questions:

Q41 How often did you use dating apps after March of 2020?

Q43 How often did you go on dates after March of 2020? ("date" is defined in this study as an in-person meeting with someone with romantic intentions)

Q50 It is hard for me to find a romantic partner.

Q52 I am unhappy with my relationship status.

Q81 I believe I will be able to effectively deal with conflicts that arise in my relationships.

Q82 I feel good about the prospects of making a romantic relationship last.

Q83 I feel I have the skills needed for a lasting stable romantic relationship.

Q84 I am confident I can handle relationship challenges that arise.

Q85 I feel I am able to meet the emotional needs of my significant other.

Q86 I feel I can influence my relationship satisfaction.

Q87 I feel that if I am not happy in a relationship, I can improve the relationship.

Q99 I am confident that I will have a long term happy committed relationship.

Appendix E

Calculations of SELF_CONCEPT_PRIOR and SELF_CONCEPT_CURRENT (measures of self-concept distress)

SELF_CONCEPT_PRIOR was calculated by adding scores from pre-pandemic (Time 1) questions:

Q47 I am lonely.

Q48 I will be alone forever.

Q49 I am willing to engage in risky behaviors to prevent loneliness.

Q56 How often do you feel you lack companionship?

Q57 How often do you feel left out?

Q58 How often do you feel isolated from others?

Q62 I wish someone would tell me they really love me.

Q63 I really need to feel loved right now.

Q64 I want to share my feelings with someone.

Q65 I want to talk with someone who cares for me about things that are worrying me.

Q66 I really need someone's emotional support.

SELF_CONCEPT_CURRENT was calculated by adding scores from during-pandemic (Time 2) questions:

Q53 I am lonely.

Q54 I will be alone forever.

Q55 I am willing to engage in risky behaviors to prevent loneliness.

Q59 How often do you feel you lack companionship?

Q60 How often do you feel left out?

Q61 How often do you feel isolated from others?

Q67 I wish someone would tell me they really love me.

Q68 I really need to feel loved right now.

Q69 I want to share my feelings with someone.

Q70 I want to talk with someone who cares for me about things that are worrying me.

Q71 I really need someone's emotional support.

Appendix F

Calculations of EFFECT_SEX and EFFECT_DATING

Perceived effect of the pandemic was broken down into two categories: EFFECT_SEX and EFFECT_DATING.

EFFECT_SEX measured how much participants perceived the pandemic affected their sexual beliefs and behavior. EFFECT_SEX was calculated by adding scores from questions:

Q34 How much has the pandemic affected your sexual habits?

Q37 How much has the pandemic affected your sexual relationship(s)?

Q39 How much as the pandemic affected your sexual confidence?

EFFECT_DATING measured how much participants perceived the pandemic affected their romantic beliefs and behavior. EFFECT_DATING was calculated by adding scores from questions:

Q33 How much has the pandemic affected your dating habits?

Q35 How much has the pandemic affected your ability to find a partner?

Q36 How much has the pandemic affected your romantic relationship(s)?

Q38 How much has the pandemic affected your romantic confidence?