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Rewriting the script: How COVID-19 affected the relation between intrinsic aspirations and depressive symptoms

James Avery^{*}, Julie Leboeuf, Anne Holding, Amanda Moore, Shelby Levine, Richard Koestner

Department of Psychology, McGill University, Canada

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ABSTRACT

Self-determination theory proposes that intrinsic aspirations protect against negative mental health outcomes by satisfying people's basic psychological needs of autonomy, relatedness, and competence. The present study investigated this relationship using two four-wave prospective longitudinal studies which followed undergraduate students across the Canadian academic calendar (September to May). The first was conducted across 2018–19 and the second across 2019–20. By comparing these two samples, we examined whether baseline levels of intrinsic aspirations moderated the impact of the COVID-19 pandemic on the development of depressive symptoms. Three main findings emerged, the first being that students reported higher levels of depressive symptoms in Spring 2020 than in Spring 2019. Second, students with more intrinsic aspirations in the pre-pandemic sample (2018–19) experienced fewer depressive symptoms from December to May while students with more intrinsic aspirations in the pandemic sample (2019–20) experienced more depressive symptoms during this period. Lastly, the latter relationship was mediated by need frustration, whereby students with higher levels of intrinsic aspirations experienced greater need frustration during the pandemic year. Together, these findings suggest that although intrinsic aspirations typically protect against negative psychological outcomes, the unique need frustrating context of the pandemic made them a risk factor for depression.

1. Introduction

The COVID-19 pandemic has had worldwide impacts on the physical and mental health of individuals. The US Centers for Disease Control and Prevention reported that COVID-19 has resulted in a substantial increase in psychological distress, with young adults being disproportionately affected (Czeisler et al., 2020). In Canada, 2761 adults were surveyed in December 2020 with results indicating that, compared to before the pandemic, twice as many Canadians were reporting high levels of depression (Mental Health Research Canada, 2020). However, little is known about the psychological mechanisms underlying this heightened vulnerability to depression. One personality factor that has repeatedly been demonstrated to affect people's mental health is their life goals, otherwise known as aspirations. Depending on their content, aspirations can benefit or harm people's well-being (Kasser & Ryan, 1996; Ryan & Deci, 2017). However, the relation between aspirations and mental health has received little attention in a context as challenging and widespread as the pandemic. The present research thus sought to evaluate how aspirations influenced the development of depressive

symptoms during the pandemic.

1.1. Self-determination theory

Self-determination theory (SDT) is an empirically based theory of human motivation and personality (Deci & Ryan, 2000; Ryan & Deci, 2017). SDT posits that there are three universal basic psychological needs that people must satisfy in order to thrive: the needs for autonomy, relatedness, and competence (Ryan & Deci, 2017). Autonomy denotes the need to act volitionally, relatedness entails feeling connected to and cared about by others, and competence refers to the need to feel skillful in everyday life (Ryan & Deci, 2017). SDT proposes that individuals have a propensity toward personal growth and should thus be proactive in satisfying their basic psychological needs (Ryan et al., 2021). Consequently, researchers have investigated the factors and conditions that lead to human flourishing (Ryan & Deci, 2017).

Directly related to the three psychological needs are intrinsic and extrinsic aspirations. Intrinsic aspirations are goals that satisfy people's basic psychological needs and are rewarding in and of themselves (e.g.,

^{*} Corresponding author at: 2001 McGill College, 1456, Montreal, QC H3A 1G1, Canada.
E-mail address: james.avery@mail.mcgill.ca (J. Avery).

community involvement, relationships, and personal growth; (Kasser & Ryan, 1996; Koestner & Hope, 2014; Ryan et al., 2021)). In contrast, extrinsic aspirations are instrumental to achieving separable outcomes and generally do not satisfy people's basic needs (e.g., wealth, fame, and beauty; Hope et al., 2019; Ryan & Deci, 2017). Ultimately, only the pursuit of intrinsic aspirations will result in the satisfaction of people's basic psychological needs and, therefore, greater well-being (Ryan et al., 1996).

As the benefits of prioritizing intrinsic aspirations received more attention, researchers began focusing on the mechanisms underlying the relationship between intrinsic aspirations and mental health. Research has established that the association between aspirations and well-being results from the extent to which people's three basic psychological needs are satisfied (Ryan & Deci, 2017). For example, Hope et al. (2019) reported that relative levels of intrinsic aspirations at baseline predicted greater need satisfaction two months later, which in turn predicted increased well-being four months later. Similar results have been obtained by other researchers (Niemic et al., 2009; Ryan & Deci, 2017).

A recent shift has focused on the unique role of need frustration on well-being (Vansteenkiste et al., 2020). Frustration of the basic psychological needs is thought to arise from punitive, controlling, or rejecting social environments and tends to result in ill-being (Vansteenkiste et al., 2020). For example, Chen et al. (2015) conducted a study with young adults from Belgium, China, USA, and Peru, finding that the frustration of each of the three needs contributed uniquely to the prediction of depressive symptoms. Importantly, need frustration produced the same effects in people from all four countries and were not moderated by individual differences in the desire for need satisfaction.

As a result of the various restrictions imposed by COVID-19 (e.g., lockdowns, social distancing), people's needs may have been increasingly frustrated, negatively affecting their mental health. In fact, the effect of need satisfaction and need frustration on well-being during the COVID-19 pandemic has received some attention. Behzadnia and FatahModares (2020) tested whether they could increase people's well-being during the pandemic through daily activities targeting people's psychological needs. For ten consecutive days, participants in the experimental condition received activities designed to enhance their need satisfaction. At the end of the intervention, participants in the experimental condition reported greater need satisfaction, lower levels of stress, and importantly, a decrease in need frustration. Other research has shown that need frustration contributes to ill-being and depression during the COVID-19 pandemic (Cantarero et al., 2020; Levine et al., 2021; Vermote et al., 2021).

Together, the evidence reviewed suggests that prioritizing intrinsic over extrinsic aspirations might protect against the negative mental health consequences associated with the pandemic. However, most of the current research on the benefits of intrinsic aspirations was conducted in "normal" conditions. It remains unclear whether intrinsic aspirations would protect people's mental health during the COVID-19 pandemic.

2. Present study

In this study, we compared data collected from two separate four-wave longitudinal studies which followed university students across consecutive academic years (pre-pandemic: 2019–19, pandemic: 2019–20). In each study, we examined the relations between intrinsic aspirations in September and the change in depressive symptoms over the school year. This study design allowed us to compare students' life aspirations, basic psychological needs frustration, and depressive symptoms before and during the pandemic. We focused on the change between December, which is typically when depressive symptoms peak in university students (Moore et al., 2021), and May, at the end of the academic calendar. We chose these time points because the pandemic impacted Canada in March of 2020, allowing us to measure its effects on need frustration and depressive symptoms relative to a pre-pandemic

control sample. First, we hypothesized that students would experience higher levels of depressive symptoms during the Spring of the pandemic year than during the pre-pandemic year. Second, we expected that having relatively more intrinsic than extrinsic aspirations would protect against depressive symptoms during the pandemic, and that this relation would be mediated by participants' need frustration. Specifically, we expected that students who prioritized intrinsic over extrinsic aspirations during the pandemic would have lower levels of need frustration resulting in lower levels of depressive symptoms. Results in line with our hypotheses would support intrinsic aspirations' protective influence on mental health during challenging times.

3. Method

3.1. Overview

The data used came from two separate studies conducted over consecutive academic years (2018–19, 2019–20). The variables used for the present paper represent a subset of a wider range of variables that were assessed in both studies. Participants in both studies were recruited through ads and posters around an Eastern Canadian University campus to participate in a study on goals. Participants completed online Qualtrics surveys at four waves (T1: September, T2: December, T3: March, T4: May) to capture the trajectory of the academic calendar. We also performed supplemental analyses at a nine-month follow up for the pandemic sample (T5: February 2021). Our analyses included three main variables: aspirations, need frustration, and depressive symptoms.

3.2. Participants

We determined our sample sizes based on previous studies that examined the relationship between aspirations and mental health (e.g., Hope et al., 2019). No participants were excluded.

3.2.1. Pre-pandemic sample (2018–19)

The pre-pandemic sample included 379 participants. Of these, roughly 84 % were women, and 16 % were men. The mean age was 20.38 years ($SD = 3.14$). Participants predominantly identified as White/European Canadian (51 %) or Asian/Pacific Islander (32 %). Overall attrition from September 2018 to May 2019 was approximately 20 % (T1 = 379, T4 = 304).

3.2.2. Pandemic sample (2019–20)

The pandemic sample included 295 students. The gender distribution (women: 83 %, male: 17 %) and the mean age ($M = 20.82$, $SD = 3.40$) were nearly identical to the previous year. Participants predominantly identified as White/European Canadian (44 %) or Asian/Pacific Islander (36 %). From September 2019 to May 2020, attrition was 17 % (T1 = 293, T4 = 244). At the nine-month follow up in February 2021, 52 % of the participants in the pandemic sample remained.

3.3. Measures

3.3.1. Aspiration index

We used the aspiration index (Kasser & Ryan, 1996) to assess participants' aspirations, a widely used measure in SDT research. Participants rated the importance of twelve aspirations, each on a seven-point Likert scale, from *not at all* to *very important*. Extrinsic items related to wealth, fame, or physical beauty, while intrinsic items related to personal growth, community contributions, and relationships. For example, two items for intrinsic aspirations were "to have committed, intimate relationships" and "to grow and learn new things", while two items for extrinsic aspirations were "to have enough money to buy everything you want" and "to be admired by lots of different people". An index of participants' relative valuation of intrinsic and extrinsic aspirations was derived at T1 by subtracting the mean extrinsic item rating from the

mean intrinsic item rating (Kasser & Ryan, 1996). At T1, Cronbach's alpha was 0.73 in the pre-pandemic sample and 0.78 in the pandemic sample.

3.3.2. Depressive symptoms

The Center for Epidemiologic Studies Depression Scale-Revised (CESD-R 10) is a widely used and validated 10-item questionnaire that focuses on the affective side of depression (Björngvinsson et al., 2013). It was administered at T2 and T4 to assess students' levels of depressive symptoms. Participants rated each item on a four-point Likert scale based on frequency, from rarely or none of the time (< 1 day) to most or all of the time (5–7 days). The scale included items such as “I felt that everything I did was an effort” and “I was bothered by things that usually don't bother me”. Participants could score between zero and 30 based on the sum of their ratings. Cronbach's alpha ranged from 0.85 (T2) to 0.86 (T4) in both samples.

3.3.3. Need frustration

The need frustration subscale of the Balanced Measure of Psychological Needs scale (BMPN; Sheldon & Hilpert, 2012) was used to measure frustration of the needs for autonomy, competence, and relatedness, and was administered at T1 and T3. Participants were asked to rate their agreement with nine statements on a seven-point scale ranging from 1 “not at all true” to 7 “very true”. There were three items that assessed each need. Items included “I had a lot of pressure I could do without” (autonomy frustration), “I felt lonely some of the time” (relatedness frustration), and “I experienced some kind of failure” (competence frustration). Cronbach's alpha across the need frustration items ranged from 0.79 to 0.83 across the two studies.

4. Results

4.1. Preliminary analyses

The correlations between all variables are presented in Table 1. In the pre-pandemic sample, aspirations at T1 were negatively and significantly correlated with T3 need frustration and T2 and T4 depression, whereas none of these correlations were significant in the pandemic sample. The strongest correlation in the pre-pandemic sample was between T2 depression and T4 depression. In the pandemic sample, the strongest correlation was between T3 need frustration and T4 depression. Both relations were positive. Means and standard deviations are presented in Table 2.

To examine differences between years we conducted *t*-tests on all variables. Recall that the pandemic arrived in Canada in March of 2020. We therefore expected differences in need frustration and depressive symptoms to show at the May assessment. Our results in Table 2 showed that the pandemic sample indeed exhibited significantly higher levels of depressive symptoms than the pre-pandemic sample in May. There was no difference in depressive symptoms in December between the two years. Need frustration was also higher during the pandemic.

Table 1
Descriptive statistics and correlations.

| Variable | 1 | 2 | 3 | 4 | 5 |
|-------------------|---------|---------|---------|---------|---------|
| 1. T1 Aspirations | – | –0.115 | 0.059 | –0.120 | 0.097 |
| 2. T1 Frustration | –0.036 | – | 0.386** | 0.440** | 0.293** |
| 3. T3 Frustration | –0.117* | 0.357** | – | 0.331** | 0.538** |
| 4. T2 Depression | –0.085* | 0.087 | 0.127* | – | 0.496** |
| 5. T4 Depression | –0.150* | –0.044 | 0.229** | 0.445** | – |

Note. T1: September, T2: December, T3: March, T4: May. Correlations below diagonal correspond to 2018–2019. Correlations above the diagonal correspond to 2019–2020.

* *p* < .05.

** *p* < .001.

Table 2
Between year differences in key variables.

| Variable | Year | N | M | SD | <i>t</i> | <i>p</i> |
|----------------|--------------|-----|-------|------|----------|----------|
| T1 aspirations | Pre-pandemic | 379 | 2.17 | 1.26 | 0.71 | 0.481 |
| | Pandemic | 289 | 2.10 | 1.38 | | |
| T1 frustration | Pre-pandemic | 379 | 3.95 | 0.83 | 1.25 | 0.212 |
| | Pandemic | 286 | 3.85 | 1.15 | | |
| T3 frustration | Pre-pandemic | 304 | 3.82 | 0.77 | –1.68 | 0.094 |
| | Pandemic | 231 | 3.96 | 1.20 | | |
| T2 depression | Pre-pandemic | 333 | 12.95 | 6.11 | –1.13 | 0.259 |
| | Pandemic | 256 | 13.51 | 6.12 | | |
| T4 depression | Pre-pandemic | 304 | 10.38 | 5.90 | 4.93 | 0.000 |
| | Pandemic | 244 | 12.92 | 6.14 | | |

Note. T1: September, T2: December, T3: March, T4: May.

4.2. Primary analyses

Our primary goal was to examine whether the association between intrinsic aspirations, need frustration, and depressive symptoms was moderated by the pandemic. First, we standardized all variables and created an aspiration index X pandemic status interaction term as the product of the two variables. We then conducted two separate hierarchical multiple regression analyses in which Need Frustration in March and Depressive Symptoms in May were regressed first on their baseline scores, then on year of the study (pre-pandemic/pandemic), then on the aspiration index score at baseline, and finally, on the interaction term for aspirations index X pandemic status.

The regression for need frustration yielded a significant *R*-square of 0.217, $F(5,524) = 8.95, p < .001$. There was a main effect for year, indicating that need frustration was higher in the pandemic year, $\beta = 0.16, t = 2.58, p < .001$. There was no main effect for baseline aspirations, $\beta = 0.01, t = 0.30, ns$. There was, however, a significant aspirations x pandemic interaction effect, $\beta = 0.11, t = 2.58, p = .01$.

To interpret the interaction terms, we conducted a subgroup analysis in which we conducted regression analyses for T3 Need Frustration and T3 Depression Levels separately for participants in the pre-pandemic and pandemic school year. These analyses showed that intrinsic aspirations were associated with significantly lower need frustration pre-pandemic ($\beta = -0.11, p = .05$) but with higher need frustration during the pandemic ($\beta = 0.11, p = .05$).

The regression for depressive symptoms yielded a significant *R*-square of 0.271, $F(5,524) = 24.31, p < .001$. There was a main effect for year, indicating that depressive symptoms were higher during the pandemic year, $\beta = 0.21, t = 4.93, p < .001$. There was no main effect for aspirations, $\beta = 0.02, t = 0.47, p = .443$. There was, however, a significant aspirations x pandemic year interaction effect, $\beta = 0.14, t = 3.16, p = .002$. Conditional analyses showed that intrinsic aspirations were marginally associated with lower depressive symptoms pre-pandemic ($\beta = -0.11, p = .06$) but were associated with significantly higher depressive symptoms during the pandemic ($\beta = 0.17, p = .01$). Thus, during the pandemic, intrinsic aspirations were associated with increased need frustration from September to March and increased depressive symptoms from December to May. This pattern is opposite to what was predicted.

These analyses were rerun separately for men and women. The interaction effect for year and aspirations on change in need frustration from September to March and for change in depressive symptoms from December to May was nearly identical for the two genders. For need frustration, the standardized regression coefficient for Year X Aspirations was 0.125 for men and 0.129 for women. For depressive symptoms, the standardized regression coefficients were 0.122 for men and 0.145 for women.

4.3. Mediation analyses

We performed a mediation analysis using the Hayes PROCESS macro

(Hayes, 2022) in SPSS with the data from the 2019–2020 pandemic sample to assess whether change in need frustration from September to March mediated the relation between participants' aspirations in September and change in depressive symptoms from December to May. A 95 % confidence interval of the indirect effect using bootstrap resampling ($k = 5000$) procedure was estimated. Results in Fig. 1 demonstrate that change in need frustration fully mediated the relationship between participants' aspiration index scores in September and change in depressive symptoms from December to May. Therefore, aspiration index scores had a significant indirect effect and a non-significant direct effect on change in depressive symptoms from December to May.

4.4. Supplemental analyses

As outlined above, intrinsic aspirations predicted greater depressive symptoms via higher levels of need frustration during the 2019–2020 pandemic academic year. Because this relationship contrasted previous research, we tested whether this relationship held in the pandemic sample nine months later (February 2021). Regression analyses showed that aspirations were unrelated to levels of depressive symptoms in February 2021, $\beta = 0.01$, $t(121) = 0.155$, $p = .877$, suggesting that the positive association obtained in May 2020 no longer held true.

5. Discussion

The COVID-19 pandemic drastically changed people's day-to-day lives forcing individuals to find novel ways of pursuing their goals and satisfying their basic psychological needs. This was especially true for university students who were forced to adjust to a completely new learning environment, one devoid of the expected social interactions. We considered life goals from a self-determination theory perspective using Kasser and Ryan's (1996) dichotomy between intrinsic aspirations and extrinsic aspirations. While studies have shown that intrinsic aspirations protect against psychological distress (e.g., Niemiec et al., 2009), this relationship had not been tested in circumstances as challenging and indeterminate as the COVID-19 pandemic. To evaluate the relationship between aspirations and depressive symptoms, we compared two longitudinal studies of university students conducted in 2018–19 and 2019–20, respectively. Both samples were followed throughout the academic calendar and completed online assessments in September, December, March, and May. The pandemic sample completed an additional nine-month follow-up in February 2021. Using this data, we examined between-sample differences in depressive symptoms and the relations between aspirations, need frustration, and depressive symptoms.

First, as hypothesized, participants in the pandemic sample experienced more depressive symptoms than participants in the pre-pandemic, but only after the pandemic began. While there were no between-sample differences in December, the pandemic sample reported significantly higher levels of depressive symptoms in May. Seeing as both samples

reported fewer depressive symptoms in May than in December, it appears as though the pandemic dampened the normally seen pattern of students experiencing fewer depressive symptoms at the end of the academic calendar (Moore et al., 2020). Furthermore, the authors of the CESD-10 suggested that scores above ten indicate the presence of depressive symptoms (Andresen et al., 1994). Research conducted with students attending American universities has also found mean scores on the CESD-10 ranging from 5.29 to 7.88 (Davila et al., 2014). These findings suggest that our sample's increase in depressive symptoms during the pandemic may have been clinically significant. Concerning our primary hypothesis, as expected, intrinsic aspirations acted as a resilience factor as they predicted lower levels of depressive symptoms in the pre-pandemic year. In contrast, intrinsic aspirations significantly predicted higher levels of depressive symptoms during the pandemic year thus acting as a risk factor. Thus, the occurrence of the pandemic moderated the relationship between intrinsic aspirations and the development of depressive symptoms across the academic calendar. This finding was unexpected given the established positive effects of intrinsic aspirations on well-being (Kasser & Ryan, 1996). We also found that change in psychological need frustration from September to March mediated the relationship between participants' September aspirations and their December to May depressive symptoms. In the pre-pandemic sample, participants who valued intrinsic over extrinsic goals reported lower levels of need frustration and lower levels of depressive symptoms. This result aligns with Chen et al.'s (2015) finding that higher need frustration leads to more depressive symptoms. In contrast, prioritizing intrinsic aspirations during the pandemic resulted in higher need frustration in March, and subsequently, more depressive symptoms in May, a finding which contrasts previous research showing a positive relationship between intrinsic aspirations and well-being (Hope et al., 2019). When conducting supplemental analyses, however, we found that the positive relation between intrinsic aspirations and depressive symptoms during the pandemic did not hold nine months later (February 2021) suggesting that the atypical association found in May 2020 was transient.

This is likely explained by the pandemic interfering with people's pursuit of intrinsic aspirations and the satisfaction of their basic needs. As was previously mentioned, pursuing intrinsic aspirations satisfies the three basic needs while pursuing extrinsic aspirations does not (Ryan & Deci, 2017). For example, people who value community and close relationships are more likely to satisfy their need for relatedness. However, given the lockdowns and social distancing measures inflicted by the pandemic, people's ability to interact with others was severely limited. This may have led to greater levels of depressive symptoms. In short, people's intrinsic aspirations may have become a source of frustration because of their inability to pursue them effectively. Indeed, research has shown that people derive well-being from actively pursuing intrinsic aspirations, not simply from valuing them (Sheldon & Krieger, 2014).

Additionally, there is a parallel in the motivation literature in which a highly adaptive motivational characteristic was shown to predict

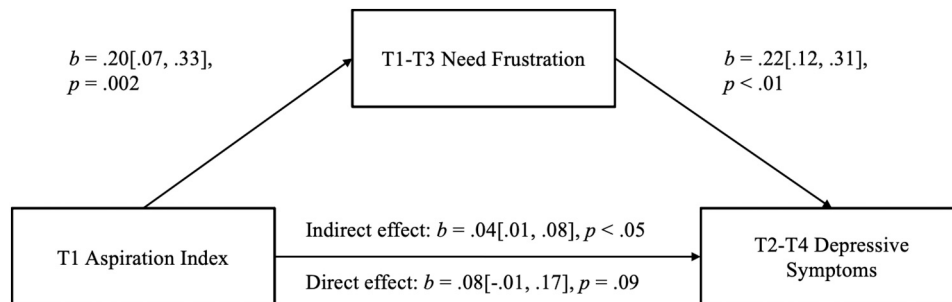


Fig. 1. Direct and indirect effects of aspirations on change in depressive symptoms via change in need frustration. Note. T1: September, T2: December, T3: March, T4: May.

negative affect and dysphoria when the needs related to the motive could not be satisfied. Intimacy motivation is defined as recurrent preference or readiness for experiences of warm, close, and communicative interaction with other persons (McAdams, 1989). High levels of intimacy motivation have been consistently associated with higher levels of psychological well-being (McAdams, 2015). However, there is also evidence that when circumstances limit its expression, high levels of intimacy motivation paradoxically relate to psychological distress (Koestner et al., 1991).

5.1. Limitations and future directions

There were limitations to the present study. First, both samples were relatively homogeneous, consisting solely of students from an Eastern Canadian University, most of whom were women. This university's response to the COVID-19 pandemic included transitioning to online classes and closing residences, changes which may have influenced our results. Furthermore, universities differed in their response to the pandemic meaning different universities' student may have experienced the pandemic differently. Second and related, one systematic review found that university students report substantially higher rates of depression than the general population, with a prevalence of 30.6 % compared to an estimated 9 % for the general population, although this difference may be partially attributable to the diversity of measures and definitions used to assess depression across studies (Ibrahim et al., 2013). Overall, future pandemic-related research on aspirations and depressive symptoms should use more heterogeneous samples including people who are not students. Third, our measures had relatively few items. At both T2 and T4, ten items were administered to participants. We were limited to shorter scales because our study was part of a larger data collection effort; thus, we had to ensure that our survey was not too time-consuming. Lastly, as is mentioned above, the positive association found between intrinsic aspirations and depressive symptoms during the pandemic may have resulted from the pandemic-related restrictions prohibiting participants from actively pursuing their intrinsic aspirations. The fact that this relationship no longer held at the nine-month follow up suggests that this may have been the case, with students adapting to their new context. Future research could, therefore, assess participants' valuation of intrinsic goals as well as the extent to which they are pursuing them. The relations between aspirations, need frustration, and depression could also be assessed in a controlled setting where participants' needs are experimentally thwarted.

Future research could also create resources designed to increase students' need satisfaction. As previously mentioned, one study provided participants with daily activities designed to foster participants' basic psychological needs during the COVID-19 pandemic (Behzadnia & FatahModares, 2020). Results showed that these participants reported greater need satisfaction paired with less stress and need frustration. While students' day-to-day lives are trending back toward what they were like before the pandemic, a similar resource would nonetheless be beneficial in so-called "normal times". Providing such a resource through an online platform would also increase its reach.

6. Conclusion

The present study examined the impact of the pandemic on the association between aspirations, need frustration, and depressive symptoms. Surprisingly, we found that intrinsic aspirations predicted greater levels of depressive symptoms during the pandemic, a finding that could be explained by increased need frustration. Despite the surprising association between intrinsic aspirations and depressive symptoms, this study should not be taken as evidence that intrinsic aspirations will typically or even often impair psychological health. Instead, it should emphasize the widespread impact that the pandemic has had on people's mental health, even for those who are usually highly adaptable.

CRedit authorship contribution statement

James Avery: Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing, Visualization. **Julie Leboeuf:** Conceptualization, Methodology, Formal analysis, Writing – original draft. **Anne Holding:** Methodology, Writing – review & editing. **Amanda Moore:** Methodology, Writing – review & editing. **Shelby Levine:** Methodology, Writing – review & editing. **Richard Koestner:** Conceptualization, Formal analysis, Methodology, Resources, Writing – review & editing, Supervision, Funding acquisition.

Data availability

Data will be made available on request.

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