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Assessing changes to adolescent health-promoting behaviors following the onset of the COVID-19 pandemic: A multi-methods exploration of the role of within-person combinations of trait perfectionism[☆]

Melissa Blackburn^{a,*}, Tabitha Methot-Jones^a, Danielle S. Molnar^a, Dawn Zinga^a,
Natalie Spadafora^b, Natalie Tacuri^a

^a Department of Child and Youth Studies, Brock University, 1812 Sir Isaac Brock Way, St. Catharines, ON L2S 3A1, Canada

^b Offord Centre for Child Studies, Department of Psychiatry and Behavioural Neurosciences, McMaster University, Suite 201A, 175 Longwood Rd. S., Hamilton, ON L8P 0A1, Canada

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ABSTRACT

The current work provides a multi-methods exploration of how within-person subtypes of self-oriented perfectionism (SOP) and socially prescribed perfectionism (SPP) were related to shifts in health-promoting behaviors among adolescents following the onset of the COVID-19 pandemic. Study One tested the 2 × 2 and tripartite models of perfectionism through a quantitative test of how such subtypes predicted changes in health behaviors pre-pandemic to intra-pandemic among 202 adolescents ($M = 17.86$, $SD = 1.421$). Results indicated that the combination of high SOP/high SPP was linked to the most maladaptive changes to health-promoting behaviors, supporting the tripartite model. Study Two aimed to contextualize these findings by analyzing semi-structured interviews with 31 adolescent self-identified perfectionists ($M = 15.97$, $SD = 1.991$) during the initial lockdown mandate. Results indicated that participants experienced a welcome break and found more time to engage in health-promoting behaviors. However, those high in SOP – regardless of their level of SPP – had more difficulty relaxing due to a resistance to relenting their perfectionistic standards. Altogether, these findings support the exacerbating role of SOP when combined with SPP posited by the tripartite model of perfectionism with respect to adolescents' health-promoting behaviors during the COVID-19 pandemic.

1. Introduction

The COVID-19 pandemic has represented a drastic shift in the lives of Canadians. There have been over 1.5 million confirmed cases of COVID-19 in Canada and over 300,000 of those cases were individuals 19 years or younger (Government of Canada, 2021). Though not all adolescents have faced the physical consequences of the virus, the impact of the pandemic has been felt by all youth through the changing landscape of their social environments (e.g., school closures, stay-at-home orders). These dramatic changes to daily life, especially in the early stages of the pandemic, may have had far-reaching implications, particularly for health-promoting behaviors (i.e., behaviors that help to prevent the onset of illness and improve health, including healthy eating, relaxation, sleep, and exercise; Sirois, 2001; 2019; Vickers et al., 1990). Indeed, it

appears the way adolescents are engaging in health-promoting behaviors have shifted throughout the pandemic (e.g., Branquinho et al., 2020; López-Bueno et al., 2020; Moore et al., 2020; Pietrobello et al., 2020; Xiang et al., 2020). It is particularly important to investigate how health-promoting behaviors were impacted during the pandemic as they promote well-being both directly by supporting physical wellness and infection prevention (e.g., Cummings et al., 2022) and indirectly via their robust associations with better mental health (e.g., Shanahan et al., 2020).

One individual difference that may increase vulnerability for poorer pandemic-related outcomes is perfectionism (Flett, Hewitt, 2020b). Perfectionism is a multidimensional personality construct characterized by the setting of excessively high goals, frequent thoughts regarding the achievement of those goals, and overly harsh self-criticism (Frost et al.,

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* Corresponding author at: Department of Child and Youth Studies, Brock University, St. Catharines, ON L2S 3A1, Canada.

E-mail address: mblackburn@brocku.ca (M. Blackburn).

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1990; Hewitt & Flett, 1991). Research generally supports that there are two overarching dimensions of perfectionism (e.g., Dunkley et al., 2012; Stoeber & Otto, 2006): perfectionistic strivings and perfectionistic concerns. Broadly, perfectionistic strivings are characterized by the setting of unrealistically high standards and the tendency to demand perfection of the self (Sirois & Molnar, 2016). Perfectionistic concerns involve a preoccupation with the expectations and evaluations of others, leading to harsh self-criticism and self-evaluations of one's own behavior (Sirois & Molnar, 2016).

Further, research suggests that these two facets of perfectionism interact to create meaningful within-person combinations (Gaudreau & Thompson, 2010; Stoeber & Otto, 2006). There are two influential models that posit within-person combinations of perfectionistic strivings and concerns: the 2×2 model of perfectionism (Gaudreau, 2013; Gaudreau & Thompson, 2010) and the tripartite model of perfectionism (Rice & Ashby, 2007; Stoeber, 2012; Stoeber & Otto, 2006). Notably, these models differ with respect to the number of combinations posited and the adaptive versus maladaptive nature of perfectionistic strivings when combined with high levels of perfectionistic concerns. These models are not only applicable to these higher-order dimensions of perfectionism but may also be applied to investigate the outcomes associated with within-person combinations of narrower facets of perfectionism that are often used as indicators of perfectionistic strivings and concerns (e.g., Gaudreau, 2013). For instance, self-oriented perfectionism (SOP; i.e., an intrapersonal dimension of perfectionism characterized by the tendency to demand perfection of the self, accompanied by punitive self-criticism; Hewitt & Flett, 1991) has been established as a valid proxy for perfectionistic strivings (e.g., Frost et al., 1993). In contrast, socially prescribed perfectionism (SPP; i.e., an interpersonal dimension of perfectionism whereby the individual believes that others expect perfection from them and that they will be met with harsh criticism and punishment from others if these expectations are not met; Hewitt & Flett, 1991) has been established as a relevant indicator of perfectionistic concerns (e.g., Frost et al., 1993).

Consequently, the current multi-method study sought to understand how within-person combinations of SOP and SPP among adolescents contribute to potential changes in health-promoting behaviors from pre-pandemic to intra-pandemic (i.e., during the pandemic). The current work provides the first test of the 2×2 and tripartite models of perfectionism with respect to healthy eating, sleep, physical activity, and relaxation among adolescents within the context of the pandemic, using both qualitative and quantitative methods.

1.1. Within-person combinations of perfectionism traits

1.1.1. The 2×2 model of perfectionism

The 2×2 model of perfectionism examines how four different within-person combinations of perfectionistic strivings and concerns are related to various outcomes (Gaudreau & Thompson, 2010). This model classifies individuals who are low on both perfectionistic strivings and concerns as non-perfectionists. Individuals who are high on both perfectionistic strivings and concerns are considered mixed perfectionists. Finally, pure perfectionistic strivings perfectionists are high on perfectionistic strivings and low on perfectionistic concerns whereas pure perfectionistic concerns perfectionists are low on perfectionistic strivings and high on perfectionistic concerns. According to Stoeber (2012), the key tenet of the 2×2 model is that mixed perfectionism is linked to more positive outcomes compared to pure perfectionistic concerns perfectionism, suggesting that perfectionistic strivings serve as a buffer against the consequences typically associated with perfectionistic concerns.

1.1.2. The tripartite model of perfectionism

The tripartite model of perfectionism also examines how different within-person combinations of perfectionism are associated with outcomes, but it is composed of three, rather than four, combinations (Rice

& Ashby, 2007; Stoeber & Otto, 2006). The tripartite model refers to individuals low on perfectionistic strivings as non-perfectionists, individuals high on perfectionistic strivings and low on perfectionistic concerns as healthy perfectionists, and individuals high on both perfectionistic strivings and concerns as unhealthy perfectionists. Unlike the 2×2 model, the tripartite model does not differentiate between individuals who are high on perfectionistic concerns and low on perfectionistic strivings from those who are low on both facets, as non-perfectionists only need to be low on perfectionistic strivings in this model. Further, the tripartite model of perfectionism posits that unhealthy perfectionism will be characterized by the unhealthiest outcomes of all the combinations, suggesting that perfectionistic strivings exacerbate the effects of perfectionistic concerns.

1.2. Perfectionism and health behaviors

Although individuals higher in perfectionism may strive to be healthy, perfectionism itself may act as a barrier to engaging in adaptive, health-promoting behaviors (Sirois, 2016). More specifically, the zero-tolerance attitude towards failure that tends to accompany perfectionism may lead to the abandonment of health-promoting behaviors following a single lapse. With respect to perfectionistic strivings and concerns, the self-regulation resource model (SRRM) suggests that perfectionistic concerns, including SPP, may be associated with fewer health-promoting behaviors due to poorer self-regulation resources and, thus, a greater tendency to abandon health goals (Sirois, 2016). According to the SRRM, the two key self-regulation resources that link perfectionism to health behaviors are affect and future orientation. This model theorizes that perfectionistic concerns are linked with less engagement in health-promoting behaviors due to lower levels of positive affect, higher levels of negative affect, and a more short-term future orientation (e.g., focusing more on immediate concerns and desires, rather than focusing on long-term health goals; Sirois, 2016). Conversely, perfectionistic strivings, including SOP, tend to be related to higher levels of positive affect, to demonstrate a mixed relationship with negative affect, and are thought to be linked with a more long-term future orientation (Sirois, 2016). As a result, perfectionistic strivings are posited to be related to more successful self-regulation efforts with respect to health-promoting behaviors.

Indeed, evidence in adult samples, albeit limited, consistently suggests that people higher in perfectionistic concerns tend to engage in fewer health-promoting behaviors (e.g., Andrews et al., 2014; Chang et al., 2008; Molnar et al., 2012; Williams & Cropley, 2014). Conversely, the relationship between perfectionistic strivings and health-promoting behaviors are more ambiguous. For instance, Williams and Cropley (2014) found that perfectionistic strivings were positively related to health-promoting behaviors among a sample of postsecondary students. Similarly, Andrews et al. (2014) found that "positive perfectionism", which is most closely related to perfectionistic strivings, was linked to physical exercise behaviors among an undergraduate sample. However, Chang et al. (2008) and Molnar et al. (2012) found that perfectionistic strivings, as measured by SOP, were unrelated to health-promoting behaviors in adults.

Among adolescents, there is literature that suggests that both perfectionistic strivings and concerns are linked to maladaptive health behaviors among adolescents. For example, research examining physical activity in youth finds that SOP and SPP positively predict compulsive exercise behavior for boys, and SOP positively predicts compulsive exercise behavior for girls (Goodwin et al., 2011). On the other hand, some studies demonstrate that perfectionistic concerns are uniquely linked to maladaptive health behaviors whereas perfectionistic strivings are unrelated. For example, perfectionistic concerns, but not perfectionistic strivings, have been associated with poorer sleep quality among adolescents (Lin et al., 2019). Finally, a review by Vacca et al. (2020) found that, although there is evidence that both perfectionistic strivings (including SOP) and concerns (including SPP) are related to disordered

eating behaviors, the associations with perfectionistic concerns are more consistent than those with perfectionistic strivings.

To date, there is a dearth of literature on the 2×2 and the tripartite models of perfectionism in relation to health-promoting behaviors, both in adolescent and adult samples. However, there is evidence to support the notion that high levels of both perfectionistic strivings and concerns may be the most maladaptive within-person combination of perfectionism with respect to health-related outcomes. For instance, this combination tends to predict the most severe eating disorder symptoms compared to the other three potential combinations (e.g., [Esposito et al., 2019](#)). Further, recent findings suggest that the combination of high perfectionistic strivings and high perfectionistic concerns is the most maladaptive within-person combination of perfectionism among individuals experiencing chronic illness, predicting the highest levels of stress, mental health difficulties, and physical health problems compared to all other subtypes ([Molnar et al., 2020](#); [Sirois et al., 2019](#); [Sirois et al., 2021](#)). Altogether, these findings support the predictions of the tripartite model of perfectionism, which suggest that perfectionistic strivings have an exacerbating, rather than buffering, effect when combined with perfectionistic concerns with respect to health-related outcomes.

1.3. Health-promoting behaviors during COVID-19

Research suggests that health-promoting behaviors have been shifting among adolescents during the pandemic. For example, it appears that young people engaged in less physical activity, more sedentary behaviors, and more unhealthy eating patterns early in the pandemic compared to before the pandemic began, according to retrospective parent-reported comparisons ([López-Bueno et al., 2020](#); [Moore et al., 2020](#)) and examining differences in pre-pandemic to intra-pandemic survey and interview data ([Pietrobelli et al., 2020](#); [Xiang et al., 2020](#)). Conversely, research using both qualitative and quantitative methods also suggest that youth were experiencing more sleep and relaxation ([Branquinho et al., 2020](#); [Moore et al., 2020](#)). Interestingly, [Branquinho et al. \(2020\)](#) noted that youth appear to frame their increase in sleep during pandemic-related lockdown restrictions as negatively impacting their well-being. One potential underlying mechanism propelling these shifts are individual differences in self-regulation resources. Indeed, there is preliminary evidence to suggest that pandemic-related confinement restrictions may deplete the capacity for self-regulation and that adults lower in the capacity for self-regulation tended to engage in fewer health-promoting behaviors during the early stages of the pandemic ([Sousa et al., 2021](#)). Given the theoretical associations between perfectionism and self-regulation resources posited by the SRRM, discussed above, these preliminary findings indicate a critical need to further explore what role, if any, individual differences in perfectionism have played in shifts to health-promoting behaviors among adolescents following the onset of the pandemic.

1.4. The current work

The overarching goals of the present work were to assess changes in health-promoting behaviors pre-pandemic to intra-pandemic and to examine how individual differences in perfectionism contribute to intra-pandemic health-promoting behaviors among adolescents. Individual differences in trait perfectionism were the focus of this work given the theoretical links between perfectionism and health-promoting behaviors outlined by the SRRM as well as empirical evidence demonstrating that trait perfectionism predicts health-promoting behaviors (e.g., [Andrews et al., 2014](#); [Chang et al., 2008](#); [Molnar et al., 2012](#); [Sirois, 2016](#); [Williams & Cropley, 2014](#)). Further, theory postulates that perfectionism is an important consideration for health and well-being during the pandemic ([Flett & Hewitt, 2020b](#)). [Flett and Hewitt \(2020b\)](#) contend that individuals higher in perfectionism may be at an increased risk for maladaptive well-being outcomes during the pandemic due to their need

for control at a time characterized by uncertainty and uncontrollability. Indeed, early research examining links between perfectionism and well-being during the pandemic has indicated that frequent thoughts about needing to be perfect pre-pandemic predicted greater anxiety symptoms during the pandemic ([Molnar et al., 2021](#)). We chose to focus on adolescence given that this is a critical period for establishing health behaviors that set the foundation for lifelong health trajectories ([Patton et al., 2016](#)). Further, it is important to test the role of perfectionism in relation to adolescent intra-pandemic health behaviors in light of trends indicating increasing levels of perfectionism among younger generations ([Curran & Hill, 2019](#)).

As such, we conducted two studies using both quantitative and qualitative methods. The goal of Study One was to test the 2×2 and tripartite models of perfectionism through a rigorous investigation of how within-person combinations of trait perfectionism predict changes in health-promoting behaviors pre-pandemic to intra-pandemic among adolescents. Specifically, we were interested in whether SOP served as a buffer against the effects of SPP or exacerbated such effects. Support would be found for the tripartite model if high SOP/high SPP was linked with the most maladaptive pattern of changes in health-promoting behaviors. Alternatively, the 2×2 model would be supported if low SOP/high SPP was associated with the most maladaptive changes to health-promoting behaviors. Given that evidence, albeit limited, tends to support the tripartite model of perfectionism with respect to health-related outcomes (e.g., [Molnar et al., 2020](#); [Sirois et al., 2019](#); [Sirois et al., 2021](#)), we expected that the combination of high SOP and high SPP would be associated with the most maladaptive changes to health-promoting behaviors relative to the other combinations.

The effects of neuroticism and conscientiousness were accounted for in these analyses to assess the unique predictive utility of perfectionism, consistent with previous work investigating the unique role of perfectionism ([Smith et al., 2017](#)) and evidence demonstrating that neuroticism and conscientiousness are linked to trait perfectionism (e.g., [Stricker, 2019](#)) and health-promoting behaviors (e.g., [Sirois & Hirsch, 2015](#)). Indeed, among adolescent samples, [Stoeber et al. \(2009\)](#) found that, at the bivariate level, SOP was positively related to conscientiousness and unrelated to neuroticism whereas SPP was positively related to neuroticism and unrelated to conscientiousness. Research examining links between conscientiousness, neuroticism, and health-promoting behaviors among adolescents tend to have mixed findings. For instance, [Wheeler et al. \(2012\)](#) found that conscientiousness was positively linked to adherence to management regimens among adolescents with Type 1 diabetes, including healthy diet and exercise, whereas neuroticism was negatively related to adherence. However, in a similar study examining adherence behaviors among hypertensive adolescents, [Zugelj et al. \(2010\)](#) found that conscientiousness was positively related to adherence whereas neuroticism was unrelated. Finally, some work suggests that there are no significant associations among conscientiousness, neuroticism, and health-related behaviors, including physical activity and fruit and vegetable intake ([De Bruijn et al., 2005](#)).

Study Two adopted a qualitatively driven mixed-methods approach ([Morse et al., 2018](#)) that focused on adolescent self-identified perfectionists, a selection method utilized with success in previous research (e.g., [Hill et al., 2015](#); [Slaney & Ashby, 1996](#)). Employing qualitative methods in the current work offered several advantages. First, qualitative methods provide a more nuanced consideration of context compared to the relatively reductive quantitative approaches typically used in perfectionism research ([Flett, Hewitt, 2020a](#); [Hill et al., 2015](#)), which is particularly advantageous given the unprecedented nature of the COVID-19 pandemic. Further, it is critical to create space for adolescent voices in research that concerns them to uncover the complexities of their experiences (e.g., [Leviton, 2019](#)). Thus, the use of qualitative research methods in Study Two afforded a more intricate account of how adolescent self-identified perfectionists are engaging in health-promoting behaviors during the COVID-19 pandemic. All procedures for both studies received ethical clearance from the university

ethics board and, consistent with that clearance, consent was given by participants 18 years and older whereas parental consent and child assent were obtained for younger participants.

2. Study one

2.1. Study one methods

2.1.1. Study one participants

The data for this study was collected as part of an ongoing longitudinal project focusing on how personality and interpersonal factors contribute to adolescent well-being over time. The current sample included 202 participants between the ages of 13 and 19 years at the first time point included in this study ($M = 17.86$, $SD = 1.421$; 39 male, 161 female, 1 other, 1 prefer not to say). Participants were included if they had completed at least one survey before the first lockdown in Ontario (i.e., March 12th, 2020 or earlier; surveys ranging from February 14th, 2018 to March 12th, 2020) and one survey after the beginning of the first lockdown in Ontario (i.e., March 13th, 2020 or later; surveys ranging from March 18th, 2020 to April 15th, 2021). If participants had more than one survey either before or after the beginning of lockdown, the closest time point to the cutoff date of March 13th, 2020 was selected. Self-reported ethnicities included White/Caucasian (76.2%), Other (9.4%), Asian Canadian (6.9%), Latin Canadian (2.5%), Indigenous Peoples in Canada (2%), and Black/African Canadian (1.5%). Three participants indicated prefer not to say.

2.1.2. Study one measures

2.1.2.1. Demographics. Participants reported their age, sex, and ethnicity.

2.1.2.2. Perfectionism. The Child and Adolescent Perfectionism Scale (CAPS; Flett et al., 2016) was employed to assess perfectionism. The CAPS has 22 items measuring SOP (e.g., “I feel that I have to do my best all the time”) and SPP (e.g., “There are people in my life who expect me to be perfect”). Participants responded how true each item was to them on a 5-point Likert scale where 1 = *False-not at all true of me* and 5 = *Very true of me*. The CAPS is a reliable and well-validated measure of perfectionism in adolescent samples (Flett et al., 2016).

2.1.2.3. Health-promoting behaviors. The Wellness Behaviors Inventory (WBI; Sirois, 2001; 2019) was used to assess how frequently participants engaged in health-promoting behaviors. Behaviors such as “I eat fresh fruits and/or vegetables” and “I take time to relax” were responded to on a 5-point Likert scale where 1 = *less than once a week or never* and 5 = *every day of the week*. Previous research has established the WBI as a valid and reliable measure of health-promoting behaviors (e.g., Sirois et al., 2015).

2.1.2.4. Conscientiousness and Neuroticism. The Ten-Item Personality Measure (TIPI; Gosling et al., 2003) was employed to assess conscientiousness and neuroticism. This measure presents participants with ten pairs of characteristics. Each pair represents one personality trait (e.g., reserved, quiet). Participants were asked to rate the extent to which they agree that each pair applies to them on a 7-point Likert scale where 1 = *disagree strongly* and 7 = *agree strongly*.

2.1.2.5. Lag. Lag was determined by calculating the difference (in days) between when participants completed their pre-pandemic survey (i.e., T1; March 12th, 2020, and earlier) and when they completed their intra-pandemic survey (i.e., T2; March 13th, 2020, and later).

2.1.3. Study one procedure

Community participants aged 13 to 19 years were recruited through

a variety of methods, including in-person presentations and social media advertisements. Participants completed a survey approximately every 4 months with a maximum of 4 time points. Anonymous links to each survey were sent via email. Surveys were completed on participants' personal devices using Qualtrics XM online survey software (Qualtrics, Provo, UT, USA). As compensation for participation at each time point, participants were sent a gift card and entered in a draw for an iPad.

2.1.4. Analytic strategy

A gain score (whereby pre-pandemic WBI scores were subtracted from intra-pandemic WBI scores) was used to measure changes in health-promoting behaviors. A gain score was chosen as the preferred approach to assess change given research suggesting that employing a time 1 variable as a covariate and the same variable at time 2 as a dependent variable can lead to spurious effects and impact type 1 error rates (Farmus et al., 2019).¹

A simultaneous Ordinary Least Squares Regression was conducted using Andrew Hayes' PROCESS macro (model 1) in SPSS version 26 to examine whether within-person combinations of SOP and SPP predicted changes in health-promoting behaviors. Specifically, we sought to test our hypothesis that SOP would have an exacerbating effect when combined with SPP such that high SOP/high SPP would be related to the most maladaptive outcomes. SOP, SPP and their interaction as well as relevant covariates (i.e., lag, age, sex, conscientiousness, neuroticism) were entered simultaneously into a regression. A second regression was conducted without covariates to address concerns regarding the introduction of bias when covariates are included in a model (Simmons et al., 2011). Post hoc simple slopes analyses were conducted to determine whether the association between SPP and changes in health-promoting behaviors varied as a function of the level of SOP (Aiken & West, 1991). Specifically, we examined whether the slopes of the association between SPP and changes in health-promoting behaviors were significantly different than zero at high (+1SD), and low (-1SD) levels of SOP.

However, an examination of the residuals from the regression indicated that the assumption of homoscedasticity was violated. To address this issue, the HC3 (Hayes & Cai, 2007) heteroscedasticity-consistent standard error estimator and bootstrapping with 5000 bootstrap samples were employed to generate all estimates.

2.2. Study one results

2.2.1. Descriptive statistics, bivariate correlations, and paired sample t-tests

See Table 1 for descriptive statistics, bivariate correlations, and internal consistency reliability values. At the bivariate level, neither SOP nor SPP were associated with change in health-promoting behaviors. SOP was significantly and positively associated with conscientiousness and neuroticism. SPP was negatively associated with conscientiousness and positively associated with neuroticism. WBI at both time points was positively associated with conscientiousness and sex (i.e., females tended to engage in fewer health-promoting behaviors than males), and negatively with neuroticism. WBI gain scores were positively associated with age (i.e., older participants tended to engage in more health behaviors following the onset of the pandemic) and negatively associated with lag (i.e., participants with a greater time lag between their pre-pandemic and intra-pandemic data points tended to experience a decrease in health behaviors). Consequently, conscientiousness, neuroticism, lag, age, and sex were included in our regression model as covariates.

Paired sample *t*-tests were used to assess change across time and indicated that only health-promoting behaviors shifted over time (see

¹ A model was conducted employing WBI at pre-pandemic as a covariate and WBI intra-pandemic as a dependent variable. No meaningful differences were found between that model and model using the gains score as a dependent variable.

Table 1
Descriptive statistics and bivariate correlations for all model variables.

	1	2	3	4	5	6	7	8	9	10
1. SOP	–									
2. SPP	.330***	–								
3. WBI Time 1	.069	–.191**	–							
4. Lag	.011	.007	.179*	–						
5. Age	–.043	.030	–.309***	–.517***	–					
6. Sex	–.046	.116	.189**	–.013	–.163*	–				
7. Conscientiousness	.245***	–.143*	.328***	–.086	.022	–.129	–			
8. Neuroticism	.192**	.143*	–.368***	–.049	.093	–.292***	–.232**	–		
9. WBI Time 2	–.037	–.213**	.632***	–.057	–.044	.161*	.288***	–.344***	–	
10. WBI Change	–.102	–.021	–.444***	–.254***	.296***	–.031	–.050	.017	.411***	–
Mean	41.443	28.575	34.255	267.168	17.859	.195	10.755	7.985	35.268	.997
SD	8.164	8.162	6.235	262.794	1.422	.397	2.458	2.928	6.153	5.238
α	.882	.897	.731	N/A	N/A	N/A	.430***	.498***	.689	N/A

Note. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism WBI = Wellness Behavior Inventory; Lag = days elapsed between time 1 and time 2. All measured variables are from time 1 except for WBI Time 2. Internal consistencies with respect to conscientiousness and neuroticism were assessed via Spearman-Brown correlations rather than Cronbach’s alpha given that they consisted of only 2 items. *n* = 199–202. N/A = Not applicable.

*** *p* < .001.

** *p* < .01.

* *p* < .05.

Table 2
Paired samples *t*-tests comparing Time 1 and Time 2 means for main model variables.

	<i>M</i>	<i>SD</i>	<i>SE</i> Mean	Paired sample <i>t</i> -test			
				<i>t</i> value	<i>df</i>	<i>p</i> value	Cohen’s <i>D</i>
SOP Time 1	41.443	8.164	.574	.367	201	.714	.026
SOP Time 2	41.262	8.260	.581				
SPP Time 1	28.575	8.162	.576	–1.284	200	.201	–.091
SPP Time 2	29.197	8.249	.582				
WBI Time 1	34.321	6.179	.437	–2.586	199	.010	–.183
WBI Time 2	35.289	6.161	.436				

Note. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism; WBI = Wellness Behavior Inventory.

Specifically, health-promoting behaviors pre-pandemic were significantly less than they were intra-pandemic. Follow-up paired sample *t*-tests were conducted to determine which health-promoting behaviors increased over time (see Table 3). Results indicated that participants were getting a good night’s sleep, participating in daily exercise, taking time to relax, eating fresh fruits and vegetables, and eating well-balanced meals significantly more often intra-pandemic compared to pre-pandemic.

2.2.2. Hypothesized model testing

The overall model, including covariates, was statistically significant ($F(8, 184) = 5.111, p < .001$) and accounted for 18.99% of the variability in change in health-promoting behaviors.² All results are presented in Table 4. Of interest, the interaction between SOP and SPP was statistically significant in predicting changes in health-promoting behaviors following the onset of the pandemic. As such, simple slopes analyses were conducted to investigate the nature of this interaction (see Table 5; Fig. 1). Results indicated that a significant association between

² This model was also conducted without covariates. In this model, the main effect of SOP was no longer significant (see Table 4). Diagnostic analyses revealed that accounting for baseline age, sex, conscientiousness, and neuroticism resulted in the significant main effect of SOP (see Table 6).

SPP and change in health-promoting behaviors was present at both low and high levels of SOP. Specifically, at low levels of SOP, the association between SPP and change in health-promoting behaviors was positive, indicating that the combination of low SOP/high SPP was associated with greater engagement with intra-pandemic health-promoting behaviors compared to pre-pandemic levels. At high levels of SOP, the association between SPP and change in health-promoting behaviors was negative, such that the combination of high levels of SOP and SPP was linked with less engagement with intra-pandemic health-promoting behaviors compared to pre-pandemic levels.

2.3. Study one discussion

In line with the tripartite model, these results supported the assertion that SOP has an exacerbating, rather than buffering, effect when combined with SPP, particularly with respect to health-related behaviors. Specifically, high SOP/high SPP was the only within-person combination of perfectionism that was linked with a decrease in health-promoting behaviors following the onset of the COVID-19 pandemic among our adolescent sample. In contrast, the other three combinations were linked with an increase in health-promoting behaviors. Interestingly, the combination of low SOP/high SPP was linked with the greatest positive change in health-promoting behaviors following the onset of the pandemic, suggesting that within the context of the COVID-19 pandemic, this combination is the least maladaptive subtype with respect to health-promoting behaviors. This result was not hypothesized given that it was in direct opposition to both the 2 × 2 and tripartite models, which suggest that this combination should be linked with the most maladaptive outcomes (Gaudreau, 2013; Gaudreau & Thompson, 2010; Rice & Ashby, 2007; Stoeber & Otto, 2006). Study Two employed a mixed-methods design focusing on thematic analysis of semi-structured interviews with adolescent self-identified perfectionists during the first COVID-19-related lockdown in Ontario, Canada to gain a more nuanced understanding of how within-person combinations of perfectionism were associated with intra-pandemic health-promoting behaviors.

3. Study two

3.1. Study 2 methods

The data for Study Two came from a mixed-methods project composed of a core qualitative component and a supplemental quantitative component (Morse et al., 2018). The primary purpose of this

Table 3
Paired samples *t*-tests comparing Time 1 and Time 2 means on items assessing health-promoting behaviors.

	<i>M</i>	<i>SD</i>	<i>SE Mean</i>	Paired Sample <i>t</i> -test			Cohen's <i>D</i>
				<i>t</i> value	<i>df</i>	<i>p</i> value	
I eat breakfast.	3.58 (3.64)	1.350 (1.326)	.095 (.094)	-.652	199	.515	-.046
I get a good night's sleep, for example, uninterrupted, restful sleep.	3.43 (3.58)	1.049 (1.096)	.074 (.077)	-2.038	199	.043	-.144
I drink 2 or more caffeinated beverages, such as coffee, tea or colas (reverse coded item)	2.53 (2.48)	1.466 (1.500)	.104 (.106)	.535	198	.593	.038
I exercise for 20 continuous minutes or more, to the point of perspiration.	2.74 (2.97)	1.276 (1.357)	.090 (.096)	-2.451	198	.015	-.174
I eat at least 3 meals a day.	3.63 (3.60)	1.226 (1.315)	.087 (.093)	.302	199	.763	.021
I take time to relax.	3.66 (3.90)	1.145 (1.166)	.081 (.083)	-2.942	197	.004	-.209
I eat fresh fruits and/or vegetables.	3.71 (3.95)	1.102 (1.021)	.078 (.072)	-3.448	199	.001	-.244
I walk as much as possible. For example: I take the stairs not the elevator, etc.	3.83 (3.73)	1.159 (1.183)	.082 (.084)	.953	198	.342	.068
I eat junk foods (such as chips, candy/candy bars, French fries, etc.)	3.31 (3.40)	.921 (1.017)	.065 (.072)	-1.219	199	.224	-.086
I eat healthy, well-balanced meals.	3.54 (3.78)	1.000 (.991)	.071 (.070)	-3.284	200	.001	-.232

Note. Values outside of parentheses represent Time 1 values. Values in parentheses represent Time 2 values. All items are from the Wellness-Behavior Inventory.

Table 4
Summary of overall regression of change in health-promoting behaviors on SOP and SPP with and without covariates.

With Covariates					
Variable	<i>B</i>	<i>SE</i>	95% CI		<i>p</i> -Value
			LL	UL	
SPP	0.0274	0.0421	-0.0556	0.1104	.5160
SOP	-0.1070	0.0459	-0.1974	-0.0165	.0207
SPP × SOP	-0.0213	0.0049	-0.0310	-0.0117	.0000
Lag	-0.0031	0.0017	-0.0064	0.0002	.6114
Age	0.8396	0.2703	0.3064	1.3729	.0022
Sex	-0.0038	0.9908	-1.9586	1.9511	.9970
Conscientiousness	0.0942	0.1855	-0.2717	0.4602	.6122
Neuroticism	-0.0330	0.1421	-0.3134	0.2474	.8168
Without covariates					
SPP	0.0165	0.0407	-0.0639	0.0968	.6863
SOP	-0.0801	0.0431	-0.1650	0.0049	.0646
SPP × SOP	-0.0172	0.0050	-0.0270	-0.0074	.0007

Note. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism; SPP × SOP = interaction between SPP and SOP; Lag = days elapsed between time 1 and time 2. All measured variables are from time 1. *n* = 193 for the regression with covariates and *n* = 199 for the regression without covariates.

Table 5
Results of simple slopes analyses on the association between SPP and changes in health-promoting behaviors at low, moderate, and high levels of SOP after accounting for covariates.

Level of SOP	<i>B</i>	<i>SE</i>	<i>t</i>	95% CI		<i>p</i> -Value
				LL	UL	
Low	0.2003	0.0627	3.1923	0.0765	0.3241	.0017
Moderate	0.0274	0.0421	0.6508	-0.0556	0.1104	.5160
High	-0.1455	0.0525	-2.7743	-0.2490	-0.0420	.0061

Note. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism.

project was to explore the lived experiences of young self-identified perfectionists via two-part semi-structured interviews. The current work focuses exclusively on the second part of the interview which examined the experiences of young perfectionists during the COVID-19 pandemic. The quantitative component provided demographics as well

as a measure to support the participants' self-identification as perfectionists (i.e., CAPS; refer to Section 2.1.2.2. for a full description of this scale). All interviews and surveys were completed during the first lockdown in Ontario (i.e., between March 13th, 2020 and July 23rd, 2020).

3.1.1. Participants

Participants comprised 58 self-identified perfectionists between the ages of 13 and 24 (*M* = 17.41, *SD* = 2.816; 53 female, 5 male). Given the current work focused on adolescence, the sample was restricted to participants between the ages of 13 and 19 years. Further, participants were included in the analyses if their CAPS subscale profile met the criteria for one of the following four within-person combinations of SOP and SPP: high SOP/low SPP (5 participants), high SOP/high SPP (8 participants), low SOP/high SPP (5 participants), low SOP/low SPP (13 participants). To capture a range of perspectives and achieve saturation of our sample, the 60th and 40th percentiles were used to define high and low scores on each CAPS subscale (Gotwals & Spencer-Cavaliere, 2014). See Table 7 for descriptive statistics. This resulted in a final sample of 31 adolescents (*M* = 15.97, *SD* = 1.991; 30 female, 1 male). Self-reported ethnicities included: White/Caucasian (77.4%), Other (9.7%), Asian Canadian (6.5%), and Latin Canadian (3.2%). One participant indicated prefer not to say.

3.1.2. Procedure

Participants were recruited online via social media advertisements and via the university newspaper. Semi-structured, one-hour interviews were conducted with participants via an online video conferencing platform and were electronically recorded. Interviews were conducted by all authors (except the third author) as well as one graduate research assistant. All interviewers were trained by the fourth author who has extensive experience conducting qualitative research. Following the interview, participants were sent a code and link to an online survey where they completed demographic measures and measures capturing perfectionism and experiences of the COVID-19 pandemic. Participants received a \$40 gift card for completing both components. The COVID-19 section of the semi-structured interviews involved questions concerning experiences with the COVID-19 pandemic, including questions pertaining to lockdown protocols, school experiences during COVID-19, and general experiences of the COVID-19 pandemic (see Supplemental Material for a full list of questions). Participants were prompted by the interviewer to clarify and/or elaborate when necessary and appropriate.

Table 6
Summary of individual regressions conducted to assess each covariate.

Control variable	Variable	B	SE	95% CI		p-Value
				LL	UL	
Lag	SPP	0.0131	0.0404	-0.0666	0.0927	.7463
	SOP	-0.0798	0.0408	-0.1602	0.0007	.0520
	SPP × SOP	-0.0192	0.0048	-0.0286	-0.0099	.0001
Age	Lag	-0.0057	0.0015	-0.0087	-0.0027	.0002
	SPP	0.0077	0.0403	-0.0718	0.0972	.8483
	SOP	-0.0804	0.0405	-0.1604	-0.0005	.0487*
Sex	SPP × SOP	-0.0197	0.0047	-0.0291	-0.0103	.0001
	Age	1.1425	0.2382	0.6727	1.6122	.0000
	SPP	0.0304	0.0403	-0.0490	0.1098	.4513
Conscientiousness	SOP	-0.0967	0.0435	-0.1825	-0.0109	.0273*
	SPP × SOP	-0.0172	0.0051	-0.0273	-0.0071	.0010
	Sex	-0.5695	1.0315	-2.6040	1.4650	.5815
Neuroticism	SPP	0.0245	0.0436	-0.0615	0.1105	.5746
	SOP	-0.1032	0.0467	-0.1952	-0.0111	.0282*
	SPP × SOP	-0.0191	0.0049	-0.0288	-0.0095	.0001
Conscientiousness	Conscientiousness	0.0994	0.1806	-0.2568	0.4556	.5826
	SPP	0.0154	0.0413	-0.0660	0.0969	.7091
	SOP	-0.0927	0.0434	-0.1784	-0.0071	.0339*
	SPP × SOP	-0.0181	0.0050	-0.0279	-0.0082	.0004
Neuroticism	Neuroticism	0.0484	0.1447	-0.2371	0.3339	.7384

Note. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism; SPP × SOP = interaction between SPP and SOP; Lag = days elapsed between time 1 and time 2. * denotes instances where SOP becomes significant.

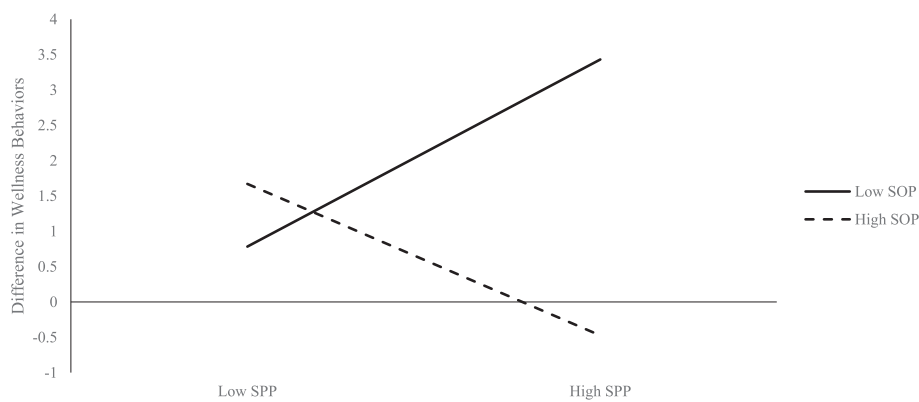


Fig. 1. The Interaction of SPP and SOP on Change in Health-Promoting Behaviors.

Table 7
Descriptive statistics for perfectionism subscale scores, by group.

Group	SOP			SPP		
	M	SD	Range	M	SD	Range
High SOP/low SPP	55.60	2.19	54–58	21.60	3.58	18–27
High SOP/high SPP	55.63	1.92	54–60	38.00	4.38	35–47
Low SOP/high SPP	42.95	3.21	39–48	37.40	4.04	33–42
Low SOP/low SPP	42.54	4.45	36–49	18.15	4.79	11–26

Note. SPP = socially prescribed perfectionism; SOP = self-oriented perfectionism.

3.1.3. Data analysis

All interviews were transcribed, anonymized, and entered in NVivo by trained research assistants (QSR International Pty Ltd, 2020). Consensus coding (Zinga et al., 2013) and inductive thematic analysis (Braun & Clarke, 2006) were used to analyze the dataset. During consensus coding, each team member reviewed several transcripts and came to group brainstorming meetings having identified initial emergent codes, which included codes relating to health-promoting behaviors (i.e., physical activity, sleep, relaxation). Once consensus was reached on the codes, a coding guide was developed, and team members received coding assignments. The coding procedure allowed for

emergent codes to develop and team meetings were held regularly to review the coding and any new emergent themes. Two team members cross-checked all transcripts and reviewed all the coding. The scope of the current paper was limited to themes related to health-promoting behaviors (described in more detail below).

3.2. Study two results

The interviews did not explicitly ask participants about health behaviors. However, physical activity, sleep, and relaxation emerged as themes from the data. Notably, themes relating to healthy eating did not emerge. As reported below, participants from the four identified subtypes of perfectionism demonstrated some heterogeneity, which appeared to be associated with their relative levels of SOP and SPP.

3.2.1. Physical activity

Physical activity was the most consistently referenced theme. Twenty-five participants (80.64%) made sixty-six references to physical activity at some point during their interviews. In all perfectionism groups, physical activities such as walking, biking, playing, and working out, appeared to represent a method of coping with the lockdown, particularly by offering a way to connect with friends and family and to stay busy.

“Just keeping busy, staying with school, working out, trying to build some sort of routine for myself instead of letting all my days pass by doing nothing” (High SOP/high SPP, age 18)

“I’ve been trying to keep active... And my soccer coach, he sent – he was really nice – he sent over a ball for everybody and some cones. And he – he makes a training video every week.” (High SOP/low SPP, age 13)

“My nephew lives here. So we – me and him go outside and play with water guns or like that kind of thing.” (Low SOP/high SPP, age 16)

“It’s mostly, um, exercising or sometimes we go out in the backyard and we’ll play whatever sports we can, me and my siblings.”

(Low SOP/low SPP, age 15)

Further, all groups, except for high SOP/low SPP, emphasized the role that physical activity and exercise played in shaping their daily schedules.

“I feel like I’d just be, my whole day would just be at school. But then now since I have like my evenings kind of to myself, I’ll be like working out in the evenings now. So I kind of just dedicated that time like working out now.” (High SOP/high SPP, age 18)

“I either do my schoolwork or if I don’t feel like doing it, I just like watch Netflix or Tik Tok and then I get ready for dance. And then I dance. And then I go to bed. And then I do it all the next day.” (Low SOP/high SPP, age 16)

“Then I make breakfast and then exercise.” (Low SOP/low SPP, age 18)

Uniquely, only the low SOP/low SPP group appeared to refer to a positive health-focused approach to engaging in physical activity during the pandemic-related lockdown.

“But then I was like “okay, let’s look at the brighter side of things and see what I can do and how I can be healthy and active.” (Low SOP/low SPP, age 15)

“And I’m finding new ways to keep myself active [...] I’m kind of finding ways to keep myself moving and busy, which is now coming more naturally to me than it was at the beginning of quarantine.” (Low SOP/low SPP, age 18)

3.2.2. Sleep

The second most referenced theme related to health-promoting behaviors was sleep. Twenty-six (83.38%) made fifty-four references to sleep at some point during their interview. With respect to sleep patterns, participants in all groups reported experiencing disruptions to their regular patterns. Specifically, participants referenced later bedtimes and wake-up times. Interestingly, the low SOP/low SPP group tended to indicate that this was a welcome change whereas the other groups expressed dissatisfaction with the changes to their sleep habits. More specifically, the high SOP/high SPP and high SOP/low SPP groups indicated that these changes were having a negative impact on their day-to-day lives whereas the low SOP/high SPP group alluded to the idea that their changing sleep patterns were due to feelings of amotivation and apathy.

“I’ve been waking up very, very late. And I feel like my whole day is thrown off cause then I don’t feel motivated to work at all.” (High SOP/high SPP, age 16)

“Pretty much my sleep schedule is complete garbage right now. It’s all over – like even staying up until like 2 or 3 am sometimes” (High SOP/low SPP, age 13)

“But I mean, some days I just sleep like all day because I’m just like, I have nothing else to do.” (Low SOP/high SPP, age 18)

“I procrastinate a lot, I wasn’t getting a lot of sleep [referring to before lockdown]. So just being able to like recharge.” (Low SOP/low SPP, age 15)

However, a few participants in the high SOP/high SPP group reported maintaining, or attempting to maintain, their pre-lockdown sleep schedules.

“Like I, I still get up early and go to bed early.” (High SOP/high SPP, age 17)

“But usually what I would do is I would wake up pretty early and – kind of like I would for school.”

(High SOP/high SPP, age 16)

Although all groups referenced sleeping in later, the motivation for doing so appeared to differ among groups. For instance, the low SOP/high SPP group emphasized sleeping in due to not having anything better to do whereas the other groups discussed getting a break from pre-pandemic obligations and enjoying the extra sleep. The latter was particularly prominent in the low SOP/low SPP group.

“I also enjoy not having to wake up at like 8, 7 AM because I can sleep in a little bit as long as I get my work done by the end of the week” (High SOP/high SPP, age 14)

“I like to sleep in. So I’ll get up around 10:00” (High SOP/low SPP, age 16)

“On the weekend, I just don’t do school and that part of my day gets taken up by either sleeping or Netflix binging.” (Low SOP/high SPP, age 14)

“So it’s kind of it’s kind of nice to know, I get to wake up a little later, which is nice.” (Low SOP/low SPP, age 16)

3.2.3. Relaxation

Of the participants included in the current analyses, eighteen participants (58%) made twenty-seven references to relaxation. Across groups, participants tended to discuss relaxation as part of their scheduled routines, often reserved for later in the day or in the evening.

“And then taking a break for lunch, you know, relaxing a little bit, getting back into schoolwork, finishing up over around, I’d say like 4:00-5:00, just relax for a little bit, watch show, something like that.” (High SOP/high SPP, age 18)

“...when I finish with school I normally practice my piano and my voice. And then I do a little bit of exercise and I normally have that done by 3:00. Oh, and chores. And then I do that. I have that done by 3:00-3:30 and then I have some relaxing time.” (Low SOP/high SPP, age 14)

“I would get up, I would eat, I would work out for about an hour, take a break, shower, do homework, dinner, and then I would relax at the nighttime.” (Low SOP/low SPP, age 15)

Only the high SOP/high SPP and high SOP/low SPP groups had participants who referred to making active attempts to relax. This difficulty with scaling back personal standards and productivity expectations was particularly interesting, given that both groups were high in SOP. There was also a lot of talk about completing new tasks and there seemed to be a conflation of relaxation with productivity.

“So I’ve been trying to, I’ve been trying to be more easy on myself. Even with all the work I’m getting, I kind of want to take more breaks and just take this as an opportunity to work when I can.” (High SOP/high SPP, age 13)

“I kind of like go to my room and like watch something or play some video games or just like read a book. But more of a relaxed book though” (High SOP/low SPP, page 13)

All groups except low SOP/high SPP spoke of lockdown-related changes as providing more time for relaxation. Low SOP/low SPP was unique with respect to this subtheme as participants engaged in more self-reflection of their pre-pandemic schedules and seemed more aware of how driven they had been pre-pandemic compared to the other two groups.

“I feel actually more relaxed.”

(High SOP/high SPP, age 15)

“I think I’ve just got in a lot of free time so I’ve been able to sort of relax more and it’s really helped my mental health.” (High SOP/low SPP, age 14)

“I like grinding through and getting it over with and then feeling accomplished at the end [referring to sports schedule]. But it was also part of me that’s relieved that I didn’t have to go through that, obviously, because it’s exhausting, but that is a good part of it. But the best part is definitely enjoying outside while being able to do my homework. I could do my homework from my in my hammock in my backyard, and it’s just relaxing.” (Low SOP/low SPP, age 17)

3.3. Study two discussion

The qualitative analysis revealed greater insight into the nature of pandemic-related changes in health-promoting behaviors among adolescent self-identified perfectionists. Our results indicate that these youth used physical activity as a method of coping with the pandemic, experienced shifts to their sleep schedules, and felt that they had more time to relax during the first lockdown. Overall, it appears that the first pandemic-related lockdown afforded adolescent perfectionists a break from their typical schedules, allowing them to spend more time engaging in health-promoting behaviors.

Notably, the low SOP/low SPP group appeared to have the most adaptive attitudes towards these changes. Specifically, they exhibited a health-focused approach to incorporating physical activity into their schedules, reported enjoying the extra sleep they were able to get during the lockdown, and appeared to be the most self-aware with respect to the opportunities for relaxation offered by the pandemic restrictions. In contrast, the other three groups expressed more resistance towards these changes. For instance, these groups expressed concerns about shifts in their sleep schedules, rather than appreciation. Further, the low SOP/high SPP group often reported sleeping more because they had nothing better to do. With respect to relaxation, the high SOP/low SPP and high SOP/high SPP groups appeared to struggle with allowing themselves to relax and felt a pressure to maintain a certain degree of productivity.

4. General discussion

The aim of the current work was to provide an in-depth, multi-methods exploration of how health-promoting behaviors shifted among adolescents following the onset of the COVID-19 pandemic, with a focus on how these shifts were related to within-person subtypes of SOP and SPP. In line with the tripartite model of perfectionism (Rice & Ashby, 2007; Stoeber & Otto, 2006), the results of Study One indicated that combined high levels of SOP and SPP was the most maladaptive subtype of perfectionism with respect to changes in health-promoting behaviors

following the onset of the COVID-19 pandemic. Namely, high SOP/high SPP was linked with a decrease in health-promoting behaviors during the first few months of the COVID-19 pandemic, whereas all other subtypes were linked to increases in such behaviors. This finding supports a growing body of literature suggesting that SOP exacerbates the negative effects of SPP on health-related outcomes (e.g., Esposito et al., 2019; Molnar et al., 2020; Sirois et al., 2019; Sirois et al., 2021). Interestingly, despite theory linking SPP with poorer health-related outcomes (e.g., Sirois, 2016) and the low SOP/high SPP subtype with the most maladaptive outcomes relative to other subtypes (e.g., Gaudreau, 2013; Gaudreau & Thompson, 2010), the within-person combination of low SOP and high SPP was linked to the greatest positive change in health behaviors in our sample.

The qualitative methods used in Study Two offered a greater consideration of the unique context of the COVID-19 pandemic, helping to explain the findings from Study One. For instance, the results of Study Two suggest the pandemic offered young people with perfectionistic tendencies a break from their typical schedules and obligations, allowing them to spend more time engaging in health-promoting behaviors. This mirrors the pattern seen among three of the four subtypes in Study One. However, participants who were high in SOP reported more difficulty taking full advantage of this break. Specifically, they cited having to actively remind themselves to relax and appeared to put pressure on themselves to maintain a sense of productivity, even within the context of their relaxation efforts. This supports the notion that, in the context of the pandemic, SOP serves as a barrier to engaging in health-promoting behaviors among adolescents. This aligns with theory postulating that perfectionists tend to uphold their stringent standards, even when the context suggests that it may be time to lower these standards and be gentler with oneself (e.g., Flett & Hewitt, 2020b; Hewitt & Flett, 2002). Our results suggest that perfectionists characterized by the self-driven need to be perfect are particularly susceptible to this unrelenting need to uphold their self-imposed standards. Conversely, as individuals with tendencies towards SPP are primarily concerned with external pressure and evaluation, it follows that the low SOP/high SPP group may have been better able to take advantage of a break during a time when external standards for productivity and success were no longer meaningful, helping to explain the increase in health-promoting behaviors for this group in Study One. These findings support the notion that the COVID-19 pandemic (at least the early stages) may have served as a “catalyst for positive change” for those perfectionists who are able to free themselves from the pressure to be perfect (Flett & Hewitt, 2020b, p.15).

Altogether, these results indicate that most adolescents experienced a reprise from the pressures of their normal schedules at the beginning of the COVID-19 pandemic that allowed them to engage in more health-promoting behaviors, in line with other research emerging from the pandemic (e.g., Branquinho et al., 2020; Moore et al., 2020). However, these benefits did not extend to all teenagers – those high in both SOP and SPP appeared to be the most vulnerable to poorer health-related outcomes during the pandemic, supporting the exacerbating role of SOP when combined with SPP.

4.1. Limitations and strengths

Some limitations of the current work need to be considered. First, Study One used a half-longitudinal design to assess change in health-promoting behaviors across the onset of the pandemic. Given the rapidly changing landscape of the COVID-19 pandemic, future work should use multiple post-pandemic time points to explore changes in health-promoting behaviors. Similarly, the interviews analyzed for Study Two took place early in the pandemic, highlighting a need for more research to see how youth, particularly those with perfectionistic tendencies, are faring as time goes on with respect to health-promoting behaviors. Further, both studies relied on the self-reported accounts of adolescents. Future work could include the perspectives of significant

others, including parents, to offer a well-rounded account of youths' intra-pandemic experiences. Finally, both samples used in the current work were predominantly female, limiting the generalizability of the current findings.

Despite these limitations, the current work also has several strengths. First, the multi-method nature of this work allowed for a nuanced account of *how* and *why* health-promoting behaviors are shifting during the pandemic among adolescents (Lund, 2012). Specifically, the quantitative nature of Study One allowed for a broader view of trends in changes to health-promoting behaviors during the pandemic whereas the qualitative nature of Study Two offered important insights into the nature of such changes and revealed potential contributing factors to the group differences seen in Study One. Further, Study One used pre- and intra-pandemic data to observe actual changes in health-related behaviors, compared to other work examining pandemic-related changes to health behaviors which are limited by cross-sectional designs using retrospective accounts of pre-pandemic health behaviors (e.g., Lopez-Bruno, 2020; Moore et al., 2020). Finally, although it was primarily female, the sample used for Study One was comprised of community participants, offering greater generalizability compared to other work testing within-person combinations of perfectionism in relation to health outcomes, which has largely focused on individuals experiencing chronic illness (Molnar et al., 2020; Sirois et al., 2019; Sirois et al., 2021) and eating disorders (Esposito et al., 2019).

4.2. Conclusions and implications

The present work is the first to provide evidence supporting perfectionism's role in predicting changes in health-promoting behaviors pre-pandemic to intra-pandemic, using a community sample of adolescents within a multi-method framework. Results indicate that early in the pandemic, youth experienced a welcome break from their typical schedules that generally allowed for greater engagement in health-promoting behaviors, including physical activity, sleep, and relaxation. However, it appeared that some youth, particularly those who were high in both SOP and SPP, did not fare as well and had more difficulty affording themselves the opportunities to engage in such behaviors. Further, it appears that the inability to let go of self-imposed standards for productivity associated with SOP was a key contributing factor to this barrier. The present findings are particularly important given that the habits established in adolescence often set the stage for health-related habits as an adult and, as such, the extent to which adolescents are engaging in health-promoting behaviors can have life-long impacts on their health and well-being (Patton et al., 2016). Future research should continue to examine the long-term impacts of perfectionism on health-promoting behaviors throughout the pandemic and explore ways to boost adolescents' health-promoting behaviors within pandemic restrictions. With respect to the pandemic specifically, policy makers are encouraged to consider the role of perfectionism in how adolescents are responding to COVID-19 pandemic conditions, particularly for extreme perfectionists who are high in both SOP and SPP, to best invest in resources that will effectively mitigate the anticipated adverse effects on the health and well-being on this group of young people.

Declaration of competing interest

None.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications Inc.
- Andrews, D., Burns, L. R., & Duelling, J. K. (2014). Positive perfectionism: Seeking the healthy "should" or should we? *Open Journal of Social Sciences*, 2, 27–34. <https://doi.org/10.4236/jss.2014.28005>

- Branquinho, C., Kelly, C., Arevalo, L., Santos, A., & Gaspar de Matos, M. (2020). "Hey, we also have something to say": A qualitative study of portuguese adolescents' and young people's experiences under COVID-19. *Journal of Community Psychology*, 48(8), 2740–2752. <https://doi.org/10.1002/jcop.22453>
- Braun, V., & Clarke, V. (2006). Using thematic analyses in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp0630a>
- Chang, E., Ivezaj, V., Downey, C., Kashima, Y., & Morady, A. (2008). Complexities of measuring perfectionism: Three popular perfectionism measures and their relations with eating disturbances and health behaviors in a female college student sample. *Eating Behaviors: An International Journal*, 9(1), 102–110. <https://doi.org/10.1016/j.eatbeh.2007.06.003>
- Cummings, J. R., Wolfson, J. A., & Gearhardt, A. N. (2022). Health-promoting behaviors in the United States during the early stages of the COVID-19 pandemic. *Appetite*, 168, Article 105659. <https://doi.org/10.1016/j.appet.2021.105659>
- Curran, T., & Hill, A. (2019). Perfectionism is increasing over time: A meta-analysis of birth cohort differences from 1989 to 2016. *Psychological Bulletin*, 145(4), 410–429. <https://doi.org/10.1037/bul0000138>
- De Bruijn, G., Kremers, S. P. J., Van Mechelen, W., & Brug, J. (2005). Is personality related to fruit and vegetable intake and physical activity in adolescents? *Health Education Research*, 20(6), 635–644. <https://doi.org/10.1093/her/cyh025>
- Dunkley, D., Blankstein, K., & Berg, J. (2012). Perfectionism dimensions and the five-factor model of personality. *European Journal of Personality*, 26(3), 233–244. <https://doi.org/10.1002/per.829>
- Esposito, R. M., Stoerber, J., Damian, L. E., Alessandri, G., & Lombardo, C. (2019). Eating disorder symptoms and the 2 x 2 model of perfectionism: Mixed perfectionism is the most maladaptive combination. Eating and weight disorders – Studies on anorexia. *Bulimia and Obesity*, 24, 749–755. <https://doi.org/10.1007/s40519-017-0438-1>
- Farmus, L., Arpin-Cribbie, C. A., & Cribbie, R. A. (2019). Continuous predictors of pretest-posttest change: Highlighting the impact of the regression artifact. *Frontiers in Applied Mathematics and Statistics*, 4. <https://doi.org/10.3389/fams.2018.00064>
- Flett, G. L., & Hewitt, P. L. (2020a). Reflections on three decades of research on multidimensional perfectionism: An introduction to the special issues on further advances in the assessment of perfectionism. *Journal of Psychoeducational Assessment*, 38(1), 3–14. <https://doi.org/10.1177/0734282919881928>
- Flett, G. L., & Hewitt, P. L. (2020b). The perfectionism pandemic meets COVID-19: Understanding the stress, distress, and problems in living for perfectionists during the global health crisis. *Journal of Concurrent Disorders*, 2(1), 80–105.
- Flett, G. L., Hewitt, P. L., Besser, A., Su, C., Vaillancourt, T., Boucher, D., Munro, Y., Davidson, L. A., & Gale, O. (2016). The child-adolescent perfectionism scale: Development, psychometric properties, and associations with stress, distress, and psychiatric symptoms. *Journal of Psychoeducational Assessment*, 34, 634–652. <https://doi.org/10.1177/0734282916651381>
- Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences*, 14(1), 119–126. [https://doi.org/10.1016/0191-8869\(93\)90181-2](https://doi.org/10.1016/0191-8869(93)90181-2)
- Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, 14, 449–468. <https://doi.org/10.1007/BF01172967>
- Gaudreau, P. (2013). The 2 x 2 model of perfectionism: Commenting the critical comments and suggestions of Stoerber (2012). *Personality and Individual Differences*, 55, 351–355. <https://doi.org/10.1016/j.paid.2013.03.021>
- Gaudreau, P., & Thompson, A. (2010). Testing a 2 x 2 model of dispositional perfectionism. *Personality and Individual Differences*, 48, 532–537. <https://doi.org/10.1016/j.paid.2009.11.031>
- Goodwin, H., Haycraft, E., Willis, A., & Meyer, C. (2011). Compulsive exercise: The role of personality, psychological morbidity, and disordered eating. *The International Journal of Eating Disorders*, 44(7), 655–660. <https://doi.org/10.1002/eat.20902>
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr. (2003). A very brief measure of the big five personality domains. *Journal of Research in Personality*, 37, 504–528. [https://doi.org/10.1016/S0092-6566\(03\)00046-1](https://doi.org/10.1016/S0092-6566(03)00046-1)
- Gotwals, J., & Spencer-Cavaliere, N. (2014). Intercollegiate perfectionistic athletes' perspectives on achievement: Contributions to the understanding and assessment of perfectionism in sport. *International Journal of Sport Psychology*, 45, 271–297. <https://doi.org/10.7352/IJSP.2014.45.271>
- Government of Canada. (2021). COVID-19 daily epidemiology update. September 10 <https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html>
- Hayes, A. F., & Cai, L. (2007). Using heteroskedasticity-consistent standard error estimators in OLS regression: An introduction and software implementation. *Behavior Research Methods*, 39, 709–722. <https://doi.org/10.3758/BF03192961>
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, 60, 456–470. <https://doi.org/10.1037/0022-3514.60.3.456>
- Hewitt, P. L., & Flett, G. L. (2002). Perfectionism and stress processes in psychopathology. In G. L. Flett, & P. L. Hewitt (Eds.), *Perfectionism: Theory, research, and treatment* (pp. 255–284). Washington, DC: American Psychological Association.
- Hill, A. P., Witcher, C. S. G., Gotwals, J. K., & Leyland, A. F. (2015). A qualitative study of perfectionism among self-identified perfectionists in sport and the performing arts. *Sport, Exercise, and Performance Psychology*, 4(4), 237–253. <https://doi.org/10.1037/spy0000041>
- Leviton, J. (2019). The role of reflexivity in performing collaborative student voice research. In I. R. Berson, M. J. Berson, & C. Gray (Eds.), *Participatory methodologies to elevate children's voice and agency* (pp. 73–92). Information Age.

- Lin, R., Xie, S., Yan, Y., Chen, Y., & Yan, W. (2019). Perfectionism and adolescent sleep quality: The mediating role of repetitive negative thinking. *Journal of Health Psychology, 24*(12), 1626–1636. <https://doi.org/10.1177/1359105317693914>
- López-Bueno, R., López-Sánchez, G., Casajús, J., Calatayud, J., Gil-Salmerón, A., Grabovac, I., Tully, M., & Smith, L. (2020). Health-related behaviors among school-aged children and adolescents during the Spanish COVID-19 confinement. *Frontiers in Pediatrics, 8*, 573. <https://doi.org/10.3389/fped.2020.00573>
- Lund, T. (2012). Combining qualitative and quantitative methods: Some arguments for mixed methods research. *Scandinavian Journal of Educational Research, 56*(2), 155–165. <https://doi.org/10.1080/00313831.2011.568674>
- Molnar, D., Sadava, S., Flett, G., & Colautti, J. (2012). Perfectionism and health: A mediational analysis of the roles of stress, social support and health-related behaviors. *Psychology & Health, 27*(7), 846–864. <https://doi.org/10.1080/08870446.2011.630466>
- Molnar, D. S., Methot-Jones, T., Moore, J., O'Leary, D. D., & Wade, T. J. (2021). Perfectionistic cognitions pre-pandemic predict greater anxiety symptoms during the pandemic among emerging adults: A two-wave cross-lagged study. *Journal of Rational-Emotive and Cognitive-Behavior Therapy, 1–19*. <https://doi.org/10.1007/s10942-021-00423-1>
- Molnar, D. S., Sirois, F. M., Flett, G. L., & Sadava, S. (2020). A person-oriented approach to multidimensional perfectionism: Perfectionism profiles in health and well-being. *Journal of Psychoeducational Assessment, 38*(1), 127–142. <https://doi.org/10.1177/0734282919877754>
- Moore, S., Faulkner, G., Rhodes, R., Brussoni, M., Chulak-Bozzer, T., Ferguson, L., Mitra, R., O'Reilly, N., Spence, J., Vanderloo, L., & Tremblay, M. (2020). Impact of the COVID-19 virus outbreak on movement and play behaviors of Canadian children and youth: A national survey. *The International Journal of Behavioral Nutrition and Physical Activity, 17*(1), 85. <https://doi.org/10.1186/s12966-020-00987-8>
- Morse, J. J., Cheek, J., & Clark, L. (2018). Data-related issues in qualitatively driven mixed-methods designs: Sampling, pacing, and reflexivity. In M. Steele (Ed.), *The SAGE Handbook of Qualitative Data Collection* (pp. 564–582). SAGE Publications Inc.
- Patton, G. C., Sawyer, S. M., Santelli, J. S., Ross, D. A., Afifi, R., Allen, N. B., Arora, M., Azzopardi, P., Baldwin, W., Bonell, C., Kakuma, R., Kennedy, E., Mahon, J., McGovern, T., Mokdad, A. H., Patel, V., Petroni, S., Reavley, C., Taiwo, K., Viner, R. M., ... (2016). Our future: A lancet commission on adolescent health and well-being. *The Lancet, 387*(10036). [https://doi.org/10.1016/S0140-6736\(16\)00579-1](https://doi.org/10.1016/S0140-6736(16)00579-1)
- Pietrobelli, A., Pecoraro, L., Ferruzzi, A., Heo, M., Faith, M., Zoller, T., Antoniazzi, F., Piacentini, G., Fearnbach, S., & Heymsfield, S. (2020). Effects of COVID-19 lockdown on lifestyle behaviors in children with obesity living in Verona, Italy: A longitudinal study. *Obesity (Silver spring, Md.), 28*(8), 1382–1385. <https://doi.org/10.1002/oby.22861>
- QSR International Pty Ltd. (2020). NVivo (Version 12) [Computer software]. QSR. <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>.
- Rice, K., & Ashby, J. (2007). An efficient method for classifying perfectionists. *Journal of Counseling Psychology, 54*(1), 72–85. <https://doi.org/10.1037/0022-0167.54.1.72>
- Shanahan, L., Steinhoff, A., Bechtiger, L., Murray, A. L., Nivette, A., Hepp, U., Ribeaud, D., & Eisner, M. (2020). Emotional distress in young adults during the COVID-19 pandemic: Evidence of risk and resilience from a longitudinal cohort study. *Psychological Medicine, 1–32*. <https://doi.org/10.1017/S003329172000241x>
- Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science, 22*, 1359–1366. <https://doi.org/10.1177/0956797611417632>
- Sirois, F., & Hirsch, J. (2015). Big five traits, affect balance and health behaviors: A self-regulation resource perspective. *Personality and Individual Differences, 87*, 59–64. <https://doi.org/10.1016/j.paid.2015.07.031>
- Sirois, F., & Molnar, D. (2016). Conceptualizations of perfectionism, health, and well-being: An introductory overview. In F. M. Sirois, & D. S. Molnar (Eds.), *Perfectionism, Health, and Well-Being* (pp. 1–21). Springer International Publishing. https://doi.org/10.1007/978-3-319-18582-8_1
- Sirois, F. M. (2001; 2019). *The Wellness Behaviors Inventory*. Unpublished manual. Psychology. UK: University of Sheffield.
- Sirois, F. M. (2016). A self-regulation resource model of self-compassion and health behavior intentions in emerging adults. *Preventive Medicine Reports, 2*, 218–222. <https://doi.org/10.1016/j.pmedr.2015.03.006>
- Sirois, F. M., Kitner, R., & Hirsch, J. K. (2015). Self-compassion, affect, and health-promoting behaviors. *Health Psychology, 34*(6), 661–669 (<https://doi.org.proxy.library.brocku.ca/10.1037/hea0000158>).
- Sirois, F. M., Toussaint, L., Hirsch, J. K., Kohls, N., & Offenbacher, M. (2021). A person-centered test of multidimensional perfectionism and health in people with chronic fatigue syndrome versus healthy controls. *Personality and Individual Differences, 181*, Article 111036. <https://doi.org/10.1016/j.paid.2021.111036>
- Sirois, F. M., Toussaint, L., Hirsch, J. K., Kohls, N., Weber, A., & Offenbacher, M. (2019). Trying to be perfect in an imperfect world: A person-centered test of perfectionism and health in fibromyalgia patients versus healthy controls. *Personality and Individual Differences, 137*, 27–32. <https://doi.org/10.1016/j.paid.2018.08.005>
- Slaney, R. B., & Ashby, J. S. (1996). Perfectionists: Study of a criterion group. *Journal of Counseling & Development, 74*, 393–398. <https://doi.org/10.1002/j.1556-6676.1996.tb01885>
- Smith, M. M., Saklofske, D. H., Yan, G., & Sherry, S. B. (2017). Does perfectionism predict depression, anxiety, stress, and life satisfaction after controlling for neuroticism? A study of Canadian and Chinese undergraduates. *Journal of Individual Differences, 38*, 63–70. <https://doi-org.proxy.library.brocku.ca/10.1027/1614-0001/a000223>
- Sousa, S. S., Ferreira, M. M., Cruz, S., Sampaio, A., & Silva-Fernandes, A. (2021). A structural equation model of self-regulation and healthy habits as an individual protective tool in the context of epidemics – evidence from COVID-19. *Frontiers in Psychology, 12*, Article 696813. <https://doi.org/10.3389/fpsyg.2021.696813>
- Stoeber, J. (2012). The 2 x 2 model of perfectionism: A critical comment and some suggestions. *Personality and Individual Differences, 53*(5), 541–545. <https://doi.org/10.1016/j.paid.2012.04.029>
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review, 10*(4), 295–319. https://doi.org/10.1207/s15327957PSR1004_2
- Stoeber, J., Otto, K., & Dalbert, C. (2009). Perfectionism and the big five: Conscientiousness predicts longitudinal increases in self-oriented perfectionism. *Personality and Individual Differences, 47*, 363–368. <https://doi-org.proxy.library.brocku.ca/10.1016/j.paid.2009.04.004>
- Stricker, B. (2019). Multidimensional perfectionism and the big five personality traits: A meta-analysis. *European Journal of Personality, 33*, 176–196. <https://doi.org/10.1002/per.2186>
- Vacca, M., Balleio, A., & Lombardo, C. (2020). The relationship between perfectionism and eating-related symptoms in adolescents: A systematic review. *European Eating Disorders Review, 29*, 32–51. <https://doi.org/10.1002/erv.2793>
- Vickers, R. R., Conway, T. L., & Hervig, L. K. (1990). Demonstration of replicable dimensions of health behaviors. *Preventive Medicine, 19*(4), 377–401. [https://doi.org/10.1016/0091-7435\(90\)90037-k](https://doi.org/10.1016/0091-7435(90)90037-k)
- Wheeler, K., Wagaman, A., & McCord, D. (2012). Personality traits as predictors of adherence in adolescents with type 1 diabetes. *Journal of Child and Adolescent Psychiatric Nursing, 25*, 66–74. <https://doi.org/10.1111/j.1744-6171.2012.00329.x>
- Williams, C., & Cromptley, M. (2014). The relationship between perfectionism and engagement in preventive health-promoting behaviors: The mediating role of self-concealment. *Journal of Health Psychology, 19*(10), 1211–1221. <https://doi.org/10.1177/1359105313488971>
- Xiang, M., Zhang, Z., & Kuwahara, K. (2020). Impact of COVID-19 pandemic on children and adolescents' lifestyle behavior larger than expected. *Progress in Cardiovascular Diseases, 20*, 30096–30097. <https://doi.org/10.1016/j.pcad.2020.04.013>
- Zinga, D., Bennett, S., Bomberry, M., & The Student Success Research Consortium. (2013). Consensus coding: Balancing perspectives in community-first research with an aboriginal community. In *Paper presented at the ninth annual Congress of Qualitative Inquiry, Urbana-Champaign, Illinois*.
- Zugelj, U., Zupancic, M., Komidar, L., Kenda, R., Varda, N. M., & Gregoric, A. (2010). Self-reported adherence behavior in adolescent hypertensive patients: The role of illness representations and personality. *Journal of Pediatric Psychology, 35*(9), 1049–1060. <https://doi.org/10.1093/jpepsy/jsq027>