Family relationship quality during the COVID-19 pandemic: The value of adolescent perceptions of change

Alexa Martin-Storey [a,*], Melanie Dirks [b], Brett Holfeld [c], Nicole S.J. Dryburgh [b], Wendy Craig [d]

[a] Group de Recherche et d'intervention sur les adaptations sociales de l'enfance, département de psychoéducation, Université de Sherbrooke, 150 Place Charles Lemoyne, Longueuil, Quebec, Canada
[b] Department of Psychology, McGill University, 2001 Avenue McGill College, Montréal, QC H3A 1G1, Montréal, QC, Canada
[c] Psychology Program, Grenfell Campus, Memorial University of Newfoundland, 20 University Drive, Corner Brook, NL, A2H 5G4, Canada
[d] Department of Psychology, Queen's University, Kingston, ON, K7L 3N6, Canada

ARTICLE INFO

ABSTRACT

Introduction: Adolescents typically spend decreasing amounts of time with family members, but the COVID-19 pandemic changed this pattern for many youth. The objective of the current study was to better understand adolescents' perceived change in family relationship quality, and how these perceptions were related to psychosocial functioning during the COVID-19 pandemic, accounting for more traditional measures of family relationship quality. Understanding how adolescents perceived change in relationship quality with family members during the pandemic offers novel insight into adolescents' relationships with their families and psychosocial functioning during this period.
Method: A sample of Canadian adolescents ($N = 605$, ages 14 to 18, 53% girls), was employed to examine patterns of adolescents' perceived change in relationship quality with parents and siblings since the start of the pandemic, accounting for relationship quality, pandemic-related characteristics, and demographic variables.
Results: Four latent profiles were identified: youth who perceived (1) low change, (2) improvement only, (3) moderate instability and (4) high instability in relationship quality. Higher perceived instability was associated with poorer functioning, with youth who reported only improvement reporting the highest overall level of functioning.
Conclusions: Adolescent perceptions of change in relationship quality were heterogeneous, and contribute to psychosocial functioning over and above their general evaluations of relationship quality. In particular, youth who perceive considerable change in their relationships with siblings and parents may require additional support in response to the COVID-19 pandemic.

1. Introduction

Restrictions designed to curb the spread of COVID-19 frequently required adolescents to spend more time at home. Research on adolescents during the early parts of the pandemic illustrated that for the majority of adolescents, this meant spending more time with

---

their families (Bülow et al., 2020; Rogers et al., 2021). Given the important buffering role that relationship quality with family members has for COVID-19 related stress (Campione-Barr et al., 2021), identifying broader patterns of perceived change in relationship quality may have important implications for understanding adolescent wellbeing during the pandemic. Using a sample of Canadian adolescents, a person-centered approach was employed to identify latent profiles of adolescent-perceived change in relationship quality with a parent (i.e., the primary caregiver within whom the child spends the most time) and a sibling during the COVID-19 pandemic. The demographic, COVID-19, and relationship quality factors associated with perceived change were also explored, and the links between adolescent perceptions of change and adolescents' internalizing/somatic symptoms and substance use were examined. Focusing on how adolescents perceived change in relationship quality provides new insights into both family relationships and how youth experience the impact of the COVID-19 pandemic.

1.1. Adolescent assessments of family relationship quality

Relationship quality, or the extent to which relationships fulfill an individual's needs, captures dimensions of interpersonal relationships that promote (i.e., affection, support, warmth) or prevent (i.e., conflict, criticism, antagonism) positive psychosocial functioning (Furman & Buhrmester, 2009). While positive aspects of relationship quality (i.e., support) are generally inversely associated with negative dimensions of relationship quality (i.e., conflict) with parents (Hale et al., 2020) or siblings (Buist et al., 2014), they reflect discrete dimensions. Relationships can be simultaneously high in positive and negative qualities, or low in positive and negative qualities, and these qualities are differentially associated with adolescent outcomes including internalizing symptoms (Branje et al., 2010) and substance use (Yap et al., 2017).

When examined longitudinally, decreases in positive relationship quality (i.e., support, warmth) and increases in negative quality (i.e., conflict, control) are observed from early to mid-adolescence between individuals and their parents and siblings (Ebbert et al., 2018; Whiteman et al., 2015). Subsequently, relationship quality with parents either stabilizes or improves from mid to late adolescence (De Goede et al., 2009), although similar patterns have not been observed with siblings. Higher negative relationship quality and lower positive relationship quality with parents and siblings is associated with poorer psychosocial outcomes for adolescents (Ebbert et al., 2018; Whiteman et al., 2015). This literature generally assesses change in relationship quality with parents and siblings with questionnaires completed across multiple time-points. While this approach provides useful information, how adolescents themselves perceive this change has been overlooked, and may be particularly important for understanding wellbeing in periods characterized by significant uncertainty.

1.2. COVID-19 and relationship quality with family

Research is increasingly documenting the ways in which the COVID-19 pandemic is associated with change in the lives of adolescents, and more specifically the challenges adolescents are experiencing as a result of these changes. Some research suggests that the pandemic, and restrictions related to the pandemic, are associated with poorer psychosocial functioning, such as greater loneliness (Janssens et al., 2021; Rogers et al., 2021), mental distress (Pierce et al., 2020), and depressive symptoms (Barendse et al., 2021). Other research, however, suggests either little change in adjustment, as is the case for anxiety (Barendse et al., 2021), or even improvement in areas such as irritability (Janssens et al., 2021) and bullying involvement (Vaillancourt et al., 2021). Understanding relationship quality during the pandemic is important, due to an emerging body of research suggesting that relationship quality is associated with observed variability in adolescent psychosocial functioning (Campione-Barr et al., 2021; Janssens et al., 2021).

As would be anticipated based on the requirements of many of the lockdowns that characterized the initial phases of the pandemic, adolescents reported spending more time with their parents and less time with their friends (Bülow et al., 2020; Rogers et al., 2021). Recent literature paints a complex picture of how these changes are linked with relationship quality. In terms of longitudinal change in relationship quality, one study that documented change in parent-adolescent relationship quality pre and post the initial lockdowns for COVID-19 found insufficient variance in almost all of relationship quality dimensions to warrant further analyses, suggesting little change in how adolescents evaluated the quality of their relationships with parents before and during the pandemic (Bülow et al., 2020).

There is limited literature that suggests minimal longitudinal change in how adolescents rate relationship quality with one family member (i.e., parents) during the pandemic. Understanding adolescents' perceptions of change may offer some insight into how major societal changes may be associated may be associated with individual well-being. Practically, asking adolescents about relationship quality change during the pandemic provides a discrete and highly salient period for youth to evaluate. Compared to asking about change over a specified period (i.e., the past five years), time since the start of the pandemic is bracketed by events salient to the majority of youth (i.e., school closures, implementation of public health guidelines). One study asking youth about their perceptions of relationship quality change suggests that adolescents in general reported higher levels of support, and slightly lower levels of conflict than prior to the pandemic (Rogers et al., 2021). While still preliminary, these findings suggest that adolescent experience of relationship quality change during the pandemic differs from commonly assumed narratives about worsening relationship quality, underscoring the importance of looking at variation in how youth understand their relationships with their family members as changing during the COVID-19 pandemic.

1.3. Understanding variation in perceived relationship quality change

Individual experiences of the COVID-19 pandemic vary in ways that may shape how youth see their relationships with their family

members as changing. Examining how regional and temporal COVID-19 factors are associated with perceived change in perceived relationship quality is important, as is accounting for an adolescents' own COVID-19 exposure and guideline adherence. Demographic variables may also shape perceived changes in relationship quality during the COVID-19 pandemic. Family affluence influences many factors including the ability of youth or other family members to choose to remain in jobs with high levels of COVID-19 exposure, the stress associated with loss of income, and the number of screens in the home that condition adolescents' pandemic experiences (Calvano et al., 2021). Racialized status may also shape adolescents' perceptions of change in relationship quality since the start of the COVID-19 pandemic, as systems of oppression disproportionately rendered racialized youth and their families more vulnerable to COVID-19 (Jenkins et al., 2021; Yaya et al., 2020). Sexual and gender minority youth reported poorer relationship quality with family members compared to heterosexual (Fish et al., 2020) and/or cisgender youth (Eisenberg et al., 2017), which may be exacerbated by the contexts resulting from the pandemic. Age and gender may also be important given their association with adolescent evaluations of relationship quality (Laursen & Collins, 2009) and the impact of COVID-19 on psychosocial functioning (Magson et al., 2021).

1.4. The current study

The current study used a person-centered approach to examine how adolescents ages 14 to 18 perceived change in relationship quality with siblings and guardians since the start of the COVID-19 lockdown. The first objective was to identify how adolescents perceived their relationships with their parent and siblings as improving, worsening, or staying the same since the start of COVID-19 lockdowns. Four groups were expected: youth who reported (1) no change; (2) improvement and not worsening; (3) worsening and not improvement; and (4) both improvement and worsening. The second objective was to assess how latent profile membership was associated with: demographic factors (age, family affluence, sexual and gender identity, race/ethnicity), COVID-19 related factors (COVID-19 prevalence, COVID-19 status, adolescents' engagement in COVID-19 prevention measures, time since the start of the pandemic), and family characteristics (adolescent assessments of relationship quality, parent and sibling gender, relative sibling birth order). Youth with more COVID-19 exposure, gender and sexual minority youth, racialized youth, youth with lower levels of family affluence, and youth who reported higher negative relationship quality and less support from their parent and sibling were expected to be in groups characterized by worsening relationship quality and less likely to be in groups characterized by improving or unchanging relationship quality. The third objective was to link patterns of perceived change in relationship quality with internalizing/somatic symptoms and substance use, accounting for demographic factors, COVID-19 factors and family factors (i.e., parent and sibling demographic factors and assessments of relationship quality). Individuals who saw their relationship quality as worsening were expected to report higher internalizing/somatic symptoms and substance use compared to those who did not.

Table 1
Descriptive statistics (N = 605).

	Mean	Standard deviation	Minimum	Maximum
Perceived improvement (parents)	5.07	3.52	0.00	10.00
Perceived improvement (siblings)	4.82	3.37	0.00	10.00
Perceived worsening (parents)	1.37	2.40	0.00	10.00
Perceived worsening (siblings)	1.61	2.58	0.00	10.00
NRI Support (parent)	3.42	.69	1.38	5.00
NRI Support (sibling)	2.90	.75	1.00	4.86
NRI Negative (parent)	2.20	.91	1.00	5.00
NRI Negative (sibling)	2.62	1.05	1.00	5.00
Parent gender (% woman)	24.3			
Sibling gender (% girls)	49.6			
Sibling older or not (%)	39.3			
Psychosocial functioning				
Internalizing/somatic symptoms	1.56	.60	1.00	4.22
Alcohol use	1.42	.86	1.00	6.00
Marijuana use	1.23	.76	1.00	6.00
Demographic variables				
Age	15.83	1.24	14.00	18.00
Sexual minority status (%)	9.4			
Gender minority status (%)	2.8			
Current gender girls (%)	53.1			
Racialized youth (%)	34.9			
Family affluence	5.36	1.55	1.00	9.00
COVID-19 variables				
Cases per province (per 100,000 people)	439.45	259.88	37.00	1035.00
Covid-19 exposure (%)	4.8			
Day of study completion	18.67	13.09	1.00	65.00
COVID-19 behaviors	3.24	.57	1.00	4.00

2. Method

2.1. Participants & procedure

The study was approved by the ethics review board of the relevant institutions, and conforms to the ethical standards of the American Psychological Association. A total of 887 adolescents aged 14–18 years of age ($M = 15.83$, $SD = 1.24$) were recruited between August and October of 2020 by the research firm *Environics*. As has been the case for many countries around the world, Canada has experienced significant COVID-19 morbidity and mortality. The data collection period employed in the current study occurred as Canada was entering a second wave of the pandemic, where increasing COVID-19 cases were observed in all but a small number of eastern provinces (Governement of Canada, 2021). Provinces differed considerably in their response to the second wave, depending on both political considerations and pandemic severity indicators (Fortier, 2020; Gallagher-Mackay et al., 2021). Some provinces offered staggered school openings, others closed all non-school related services but allowed schools to remain open, and provinces with low COVID-19 rates opened schools as they would normally have been opened, but with certain restrictions in place (i.e., masking, distancing measures). It can generally be understood that as the study progressed, the COVID-19 situation worsened. During this period the firm had contacted a total of 1334 families (response rate of 67%). Prior to enrolling participants in the survey, parents and youth provided consent through social media (Facebook, Instagram, LinkedIn, etc.) and via telephone (for individuals 18 years or older). Following the consenting procedure, youth completed the survey online. Participants were retained for the analytic sample if they lived with a parent and a sibling. Participants were asked if they had one or more *siblings living at home*, with 609 individuals (69% of adolescents) reporting living with both guardians and siblings. Individuals who reported that their sibling was their guardian were excluded (0.4%, $n = 4$), leaving an analytic sample of 605 (descriptive statistics in Table 1).

2.2. Measures

Perceived relationship quality change. Youth were asked to specify the parent with whom they spent the most time, with options being mother (72.4%, $n = 441$), father (23.3%, $n = 141$), stepmother (0.2%, $n = 1$), stepfather (0.2%, $n = 1$), grandmother (0.7%, $n = 4$) and grandfather (0.2%, $n = 1$), or other (fill in the blank). All participants who chose the fill in the blank option (2.6%, $n = 16$) reported spending equal amounts of time with two parents. Participants subsequently answered two questions "To what extent has the quality of your relationship with your parent improved since COVID?" and "To what extent has the quality of your relationship with your parent gotten worse since COVID?" using scale ranging from 0 (*no change*) to 10 (*quality of relationship extremely improved/worsened*).

Participants were then asked about their sibling closest to them in age living at home, choosing from the following options: biological brother (47.6%, $n = 288$), biological sister (46.1%, $n = 279$), adopted brother (0.5%, $n = 3$), adopted sister (0.7%, $n = 4$), half-brother (0.7%, $n = 4$), half-sister 1.5% ($n = 9$), stepbrother (1.7%, n = 10), and stepsister (1.3%, $n = 8$). Participants then completed the same two questions listed above about their sibling, with the same response options.

Family level factors. In the multivariate analyses, *parent gender* was operationalized as either woman (i.e., a mother, stepmother, or grandmother) or a man (i.e., father, stepfather, or grandfather). For those participants who had stated that they spent equal amounts of time with both parents, parent gender was coded as missing. *Sibling gender* was coded as a girl (i.e., sister, adopted sister, half-sister, step sister) or boy (i.e., brother, adopted brother, half-brother, step brother). *Sibling age* was calculated by subtracting the siblings' age from the participants' age, and was operationalized as older than the participant or not. *Relationship quality.* Participants completed the 30 items of the Network of Relationships Inventory Social Provisions Version (NRI; Furman & Buhrmester, 2009) regarding the same parent and sibling for whom they had completed the perceived relationship change questions. This scale shows good stability over a one-year period as well as strong convergent and divergent validity. The overall scores for Support (21 items, Cronbach's alpha in the current sample = .91 for parents/guardians and 0.92 for siblings) and Negative Interactions (six items, Cronbach's alpha in the current sample = .92 for parents and .93 for siblings) showed good internal consistency. For each question, response options varied from little to none (1) to the most (5). Responses were averaged, with higher values indicating more support or higher levels of negative interactions, respectively.

Demographics. Participants were asked two questions about their *gender identity*. First, they were asked about their gender identity – girl, boy, non-binary. They were subsequently asked a yes or no question as to whether they were transgender, gender fluid, or uncertain of their gender identity. Two different gender variables were subsequently constructed. First, youth were classified as being gender minorities or not based on (1) identifying as non-binary or (2) reporting being transgender, gender fluid or uncertain of their gender identity. Youth were also classified as girls or not, based on their current gender identity.

Sexual identity was assessed using a question in which participants were asked about the term that best described their sexual identity. Their options were (1) heterosexual, (2) gay/lesbian, (3) bisexual, (4) queer, pansexual or polysexual, (5) Two-Spirit, (6) questioning or (7) other. As no sexual minority identity group contained more than 22 individuals, these categories were collapsed as sexual minority or not for the multivariate analyses.

Race/ethnicity. Youth were asked to identify their race/ethnic background from the following options: African/Caribbean, East Asian, First Nations, Inuit, Latin American, Métis, Middle Eastern/West Asian, South Asian, Southeast Asian, or White/European. Youth could pick multiple options and were classified as racialized or not depending on having reported an exclusively White/European background or not due to limitations regarding cell size for each group. Subsequent sensitivity analyses were conducted to test for differences across any group with more than 30 participants (African/Caribbean, East Asian, and South Asian: reflecting 24% of the sample), with an ANOVA indicating no significant differences in terms of perceived improving or worsening relationships with parents or siblings among these three groups.

Age. Adolescents were asked their birth year and month, and age was calculated by subtracting this value from the date at which they completed the study.

Family affluence. Family affluence was assessed using a modified version of the Family Affluence III scale, which has been previously linked to other indicators of SES (Hartley et al., 2016). Adolescents responded to six questions with either yes or no answers, or numeric answers (i.e., 0, 1, more than 1) regarding their home, their activities, and the things they owned, with higher scores indicating higher levels of affluence (ordinal alpha of .64).

COVID-19 variables. *COVID-19 cases* per 100,000 of the population, per province, were used to account for overall COVID-19 prevalence from the government of Canada website on October 14th (i.e., the day following the last day of data collection), and was included as a continuous variable, with higher scores indicating higher numbers of COVID-19 cases.

As participants completed the questionnaires between the 7th of August and the 13th of October 2020, *day of study completion* (i.e., the day the participant completed the survey minus the day the study started) was included, with higher values indicating later survey completion.

Nine questions, based on the Ways of Coping questionnaire and previous work on changes in protective behavior in response to the COVID-19 pandemic, were asked about health specific *COVID-19 guideline adherence behaviors* which have been linked to individual assessments of risk associated with COVID-19 (Parker et al., 1993; Wise et al., 2020). These included questions such as "During COVID-19 outbreak, to avoid being infected, I have avoided crowds." Response ranged from not at all (1) to a lot (4), and the mean score of these nine items was used in the current study (Cronbach's alpha = .85), with higher scores indicating greater increases in COVID-19 compliance behaviors. Finally, participants were asked questions about their own *COVID-19 status*. We used an item asking if participants had experienced symptoms that they felt might have been COVID-19, where the responses were: (a) no (83% of the sample); (b) Yes, but I was certain it was not COVID-19 (12.4% of the sample); and (c) Yes, but I feel it could have been COVID-19 (5% of the sample). Participant responses were coded as yes it could have been COVID-19 or no for the multivariate analyses.

Psychosocial functioning. *Internalizing/somatic symptoms* were assessed using a modified version of the Health Behavior in School-Aged Children Scale, which shows strong convergent validity with other measures of emotional problems (Gariepy et al., 2016). The scale used included nine items such as "in the past two weeks how often have you felt low (depressed)?" and "in the past two weeks how often have you had a stomachache?" with response options ranging from 1 (rarely) to 5 (many times per day). This measure had an alpha of .87 in the current study, with higher scores indicating higher level of internalizing/somatic symptoms. *Alcohol use* was assessed by asking participants "In the past two weeks how many times have you had an alcoholic beverage?" with the options ranging from (1) Not at all to (6) multiple times (Boyle et al., 2019). Responses were coded continuously, with higher scores indicating higher alcohol use. Participants were also asked about *marijuana use* with the question "In the past two weeks how many times have you used marijuana?" This question had the same response items as the alcohol question, with higher scores indicating higher marijuana use, and both items have been previously employed in large-scale data collections with Canadian adolescents and relate to other mental health indicators (Boyle et al., 2019).

2.3. Analytic sample

The analytic sample consisted of adolescents ages 14 to 18 ($M = 15.84$, $SD = 1.24$) from across all ten Canadian provinces, with 60.7% being from Quebec and Ontario, 7.6% being from the Atlantic Provinces, and 31.7% being from the western provinces. The sample consisted of slightly more girls than boys (53.1% girls, 45.8%, 1.2% non-binary youth), with 2.5% of the sample reporting being transgender. The majority of the sample was heterosexual (88.1%), with 2.0% reporting a gay or lesbian identity, 3.6% reporting a bisexual identity, 0.8% reporting a queer, pansexual or polysexual identity, 0.2% reporting a Two-Spirit identity, 2.2% reporting questioning their sexual identity and 3.2% reporting another sexual identity. While the majority of the sample identified as white (66.9%), racialized youth in the sample were fairly heterogeneous, and included African/Caribbean (5.8%), East Asian (11.2%), First Nations (2.0%), Latin American (1.8%), Métis (2.1%), Middle Eastern/West Asian (3.0%), South Asian (7.4%), and Southeast Asian (3.5%) youth.

2.4. Planned analyses

To address the first two objectives, a 3-step latent profile analyses was conducted. In line with the first objective, latent profile analysis was used to determine patterns of perceived change in relationship quality. To identify appropriate number of latent profiles, multiple criteria were considered. First, Akaike Information Critierion (AIC) and Bayesian Information Criterion (BIC) were employed, with smaller values indicating better fit. Second, the Vuong Lo-Mendell-Rubin likelihood ratio (VLMR) and the Lo-Mendell Rubin Adjusted LRT Test (LMR), which indicate whether a solution with k-profiles provides a better model fit than a solution with k-1 profiles, were employed. Finally, entropy (indicative of the separation between profiles) and profile size (solutions with profiles containing less than 10% of the sample were rejected) were considered.

To address the second objective of how demographic, family-level, and COVID-19 variables were associated with profile membership, latent variable multinomial logistic regressions, within a three-step approach, were employed. This approach accounts for latent profile probabilities when examining how auxiliary variables differ in their association with profile membership. For missingness, while only 6% of the data was missing overall, listwise deletion would have resulted in the loss of 20% of the sample. While Little's Missing Completely at Random (MCAR) test was non-significant (χ^2 (303) = 344.56, $p = .05$), imputation using the MPlus impute command was employed due to concerns over loss of power. Differences on missingness were observed on both deaths by province (F (1, 603) = 4.67, $p < .05$) and wealth by province (F (1, 603 = 4.75, $p < .05$), both of which, along with other relevant

demographic variables available on the full sample (age, day of study completion, province of residence, provincial COVID-19 cases) were used to impute missing data. Ten datasets were produced using MPlus, and the analyses for the second and third objectives were conducted with these imputed data.

Finally, to test the third objective (i.e., the association between perceived change profiles and internalizing/somatic symptoms, marijuana use and alcohol use, accounting for demographic, COVID-19, and relationship quality factors) regressions were used in which most likely class membership was exported and used as a predictor variable. This approach allows for an assessment of the link between perceived change in relationship quality and internalizing/somatic symptoms and substance use over and above the impact of demographic, COVID-19, and traditional relationship quality measures.

3. Results

Prior to conducting the principal analyses, correlations between the primary study variables were explored (see Table 2). Perceived worsening and improvement in relationship quality with parents were positively correlated ($r = .11$, $p < .01$), while perceived worsening and improved relationship quality with siblings were not linked ($r = 0.04$, *n.s.*). Parent and sibling worsening ($r = 0.71$, $p < .01$) as well as parent and sibling improvement ($r = 0.78$, $p < .01$) in relationship quality were both strongly positively correlated, while parent improvement and sibling worsening, and sibling worsening and parent improvement were both positively correlated (correlations between $r = .15$ and $r = 0.17$, $p < .01$). Perceiving relationships as improving with both parents ($r = 0.17$, $p < .01$) and siblings ($r = 0.18$ $p < .01$) was associated with higher levels adherence to COVID-19 guidelines, while higher provincial numbers of COVID-19 cases were associated with worsening relationships with parents ($r = 0.08$, $p < .05$), but with no other perceived relationship quality change variable. Higher support from parents and siblings as assessed using the NRI were generally positively associated with perceived improvement in both relationships (correlations between $r = .11$ and $r = 0.36$, $p < .01$), and negatively associated with perceived worsening in both relationships (correlations between $r = 0.07$ *n.s.*, and $r = -0.25$, $p < .01$). Negative relationship quality with both the parent and siblings as measured by the NRI, however, were generally positively correlated with both perceived worsening (correlations between $r = .12$ and $r = 0.32$, $p < .01$) and improving (correlations between $r = -0.03$, *n.s.*, and -0.13, $p < .01$), although the correlations with worsening were larger.

3.1. Identifying patterns of perceived change in relationship quality

The four latent profile solution had the best fit indices, along with high entropy (see Table 3), and are presented in Fig. 1. Profile one, the *low change profile* ($n = 196$) consisted of youth who reported little worsening or improving in either their relationships with their parents or their siblings since the start of the pandemic. Profile two, the *improvement profile* contained the most participants ($n = 285$) and consisted of youth who saw improvement in their relationships with parents and siblings, but not worsening. Youth in profile three ($n = 76$), the *moderate instability profile*, reported moderate improvement and worsening in their relationships with parents and siblings. Participants in profile 4, the *high instability profile* ($n = 48$) reported high levels of improvement and worsening in their relationships with both parents and siblings.

In line with the second objective, categorical latent variable multinomial logistic regressions were conducted to examine how demographic, COVID-19, and family relationship quality variables were associated with profile membership (see Table 4). Starting with model 1.1, few differences were observed between the *low change profile* (profile one) and the *improvement profile* (profile two), with youth in the *improvement only profile* engaging in more COVID-19 related health behaviors, and reporting higher levels of sibling support. In model 1.2, compared to the *low change profile* (profile one), youth in the *moderate instability profile* (profile 3) were more likely to have described an older sibling, were in provinces with higher numbers of COVID-19 cases, reported lower levels of parental support and more negative relationships with parents and siblings. Finally, in model 1.3, compared to the *low change profile* (profile one), youth in the *high instability profile* (profile four) were less likely to have a sexual minority identity, reported lower levels of parental support and higher levels of sibling support, and reported more negative relationship quality with parents.

As is presented in Model 2.1 of Table 4, compared to individuals in the *improvement only profile* (profile two) individuals in the

Table 2
Correlations between covariates.

|	1	2	3	4	5	6	7	8	9	10	11	12
1. Parent improving	1.00	.11**	.78**	.15**	.17**	.04	-.01	-.04	.15**	.16**	.09*	.13**
2. Parent worsening		1.00	.17**	.71**	-.03	.02	.08[a]	.04	-.25**	.07	.38**	.12**
3. Sibling improving			1.00	.04	.18**	-.01	-.02	-.03	.11*	36**	.12**	-.03
4. Sibling worsening				1.00	-.04	.03	.08	.01	-.18**	-.20**	.25**	.32**
5. COVID-19 guideline adherence					1.00	.00	.01	.01	.21**	.20**	-.02	.04
6. COVID-19 exposure						1.00	-.01	-.04	-.01	-.06	.04	.05
7. COVID-19 cases							1.00	.02	-.06	.03	-.12**	-.07
8. Day of study completion								1.00	.01	-.05	.03	.08*
9. NRI support parent									1.00	.58**	-.08	.15**
10. NRI support sibling										1.00	.01	-.13**
11. NRI negative parent											1.00	.51**
12. NRI negative sibling												1.00

[a] $= p < .05$; ** $= p < .01$.

Table 3
Model Fit for Latent Profiles for Improving and Worsening Relationships with Parents, Siblings and Friends (n = 605).

	AIC	BIC	Adj BIC	Profile counts	Entropy	Average latent profile probabilities	VLMR	LMR
1 Profile	12079.26	12114.51	12089.11					
2 Profiles	11291.92	11349.19	11307.92	494, 111	0.97	.97–1.00	40.83[a]	773.20[a]
3 Profiles	10710.67	10789.96	10732.82	295, 207, 103	0.94	.97–.98	123.44*	573.35*
4 Profiles	10466.72	10568.04	10485.02	196, 48, 285, 76	0.94	.96–.97	−53.2	246.26*
5 Profiles	10222.24	10345.58	10256.69	28, 185, 74, 29, 289	0.95	.94–.98	40.21	246.78

VLMR = Vuong Lo-Mendell-Rubin likelihood ratio test LMR = Lo-Mendell Rubin Adjusted Test.
[a] = $p < .01$; * = $p < .05$.
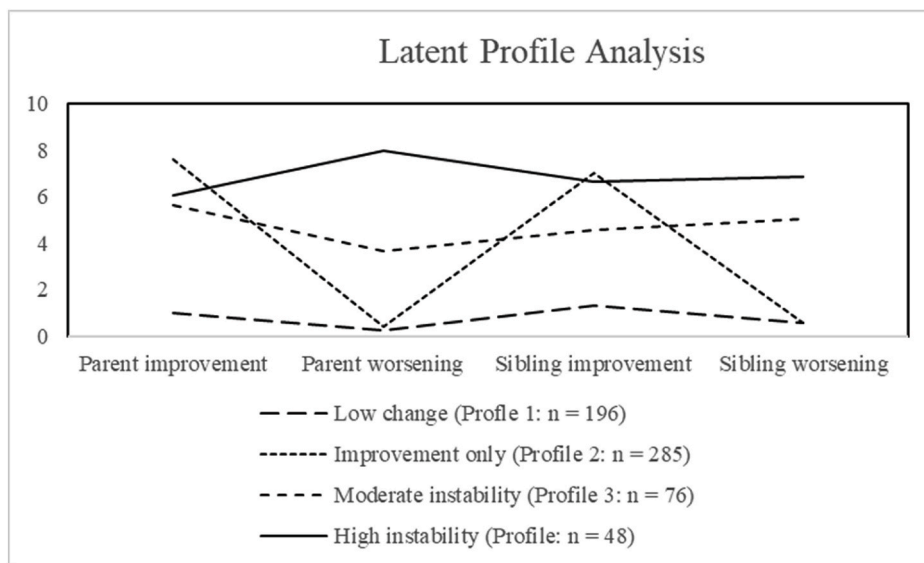
Fig. 1. Latent profile analysis.

moderate instability profile (profile three) were more likely to report a sexual minority identity, reported higher levels of family affluence, and were in provinces with higher numbers of COVID-19 cases. They also reported lower levels of parental support and more negative relationship quality with siblings. In Model 2.2, compared to individuals in the *improvement only profile* (profile two) individuals in the *high instability profile* (profile four) were less likely to report a sexual minority identity, lived in provinces with higher numbers of COVID-19 cases, reported lower levels of parental support and more negative relationship quality with parents. Finally, as is presented in model 3.1 of Table 4, compared to individuals in the *moderately unstable profile* (profile three), adolescents in the *high instability profile* (profile four) were significantly less likely to report a sexual minority identity, reported higher levels of sibling support, and higher levels of negative relationship quality with a parent.

3.2. Psychosocial functioning across latent profiles

The final objective was to assess if the perceived change in relationship quality latent profiles were associated with psychosocial functioning, over and above demographic, COVID-19 and family-level factors (including relationship quality with a parent and sibling). Given the high entropy for the four-profile solution, the most probable profile membership was exported, and linear regressions, using the MLR estimator to account for non-normality in the data, were conducted. Dummy variables were constructed indicating latent profile membership. Starting with internalizing/somatic symptoms (see Model 1, Table 5), youth in the *high instability profile* (profile four) and *moderate instability profile* (profile 3) generally reported higher levels of internalizing symptoms, compared to individuals in the *low change profile* and *improvement only profile*. Individuals in the *low change* (profile 1) and *improvement only* (profile 2) profiles, however, did not differ from one another. With regards to alcohol use, the only link between latent profile membership and alcohol use was that individuals in the *high instability profile* (profile four) reported significantly higher levels of alcohol use than individuals in the *improvement only profile* (profile two). Finally, with regards to marijuana use, again individuals in the *high instability profile* (profile four) reported higher levels of use than individuals in the *improvement only profile* (profile two), while individuals in the *low change profile* (profile one) reported higher levels of use than youth in the *improvement only profile* (profile two).

Table 4
Latent variable multinomial regressions using the three-step procedure (n = 605).

	Model 1 Low change referent (group 1)			Model 2 Improvement referent (group 2)		Model 3 Moderately unstable referent (group 3)
	Model 1.1. Improvement (group 2)	Model 1.2 Moderate instability (group 3)	Model 1.3 High instability (group 4)	Model 2.1 Moderate instability (group 3)	Model 2.2 High instability (group 4)	Model 3.1 High instability (group 4)
Demographic variables						
Sexual minority identity	−0.47	0.66	−1.94*	1.12*	−1.47*	−2.60**
Gender minority identity	−0.52	−0.57	0.92	−0.06	1.44	1.49
Gender identity (girls)	0.16	−0.02	0.07	−0.17	−0.09	0.08
Race	−0.33	−0.40	−0.73	−0.07	−0.40	−0.33
Age	−0.02	−0.22	−0.12	−0.19	−0.10	0.10
Family affluence	0.02	0.27	0.27	0.25**	0.25	0.00
Older sibling or not	0.12	0.53**	0.02	0.40	−0.11	−0.51
Sibling gender (girl referent)	0.18	0.02	−0.22	−0.16	−0.40	−0.24
Parent gender (woman referent)	0.02	0.29	−0.82	0.27	−0.84	−1.11
COVID-19 variables						
Provincial case rate	−0.44	1.32*	1.50	1.75**	1.94*	0.19
Individual-level COVID-19 exposure	0.33	0.00	0.08	−0.33	−0.25	0.07
COVID-19 guideline adherence	0.42*	−0.01	0.17	−0.42	−0.25	0.18
Family relationship quality						
Day of study completion	−0.01	−0.01	0.00	0.00	0.01	0.01
NRI Parental support	−0.23	−1.45**	−1.94**	−1.22**	−1.71**	−0.49
NRI Sibling support	0.64**	0.10	1.19**	−0.54	0.56	1.10**
NRI Parental negative	0.32	0.63*	1.45**	0.31	1.13**	0.82**
NRI Sibling negative	0.11	0.66**	0.12	0.55*	0.01	−0.54

Unstd Coeff = unstandardized coefficient; sig. = significance. * = $p < .05$; ** = $p < .01$.

4. Discussion

Following from the restrictions designed to curb the spread of COVID-19, many adolescents are spending more time at home with their families, during a developmental period where they would typically be spending less time in this context. Existing research has longitudinally examined fluctuation in relationship quality with parents (De Goede et al., 2009) and siblings (Defoe et al., 2013), and during the pandemic in particular (Bülow et al., 2020). Focusing on adolescents' perceptions of change in relationship quality with family members during the COVID-19 pandemic, however, provides insight into how adolescents are reflecting on an important dimension of their lives during the pandemic. Four latent profiles of perceived change in relationship quality with parents/guardians and siblings were identified: a pattern characterized by *low change*, a pattern characterized by *improvement only*, and two patterns characterized by instability (*one moderate and one high*) characterized by perceptions of both improvement and worsening. These latent profiles differed in terms of their correlates and in their association with adolescent psychosocial functioning, even after accounting for more traditional evaluations of relationship quality. Together, these findings provide initial support for considering adolescents' assessments of perceived change in the quality of their family relationships during the COVID-19 pandemic.

Findings were mixed in terms of support for the proposed hypotheses. While we anticipated the identification of low change, improvement only, and instability profiles, two instability latent profiles, and not worsening only profiles were identified. Reflecting a literature linking relationship quality with parents to relationship quality with siblings both prior to (Brody, 1998) and during the COVID-19 pandemic (Campione-Barr et al., 2021), the findings did not support the existence of a group of youth who reported improvement in relationship quality with siblings but worsening with parents, or vise versa. The one exception to this finding was the higher level of sibling support among youth in the high instability profile compared to youth in the moderate instability profile. This

Table 5
Standardized coefficients from latent variable multinomial regressions (n = 605).

	Model 1: Internalizing/somatic symptoms			Model 2: Alcohol Use			Model 3: Marijuana Use		
	Group 1 (ref)	Group 2 (ref)	Group 3 (ref)	Group 1 (ref)	Group 2 (ref)	Group 3 (ref)	Group 1 (ref)	Group 2 (ref)	Group 3 (ref)
Group membership									
Group 1 (low change)	——————	0.07	−0.09	——————	0.07	−0.06	——————	0.10**	−0.01
Group 2 (improvement only)	−0.06	——————	−0.14*	−0.07	——————	−0.12	−0.10**	——————	−0.11
Group 3 (moderate instability)	0.06	0.10*	——————	0.04	0.09	——————	0.01	0.08	——————
Group 4 (high instability)	0.19**	0.22**	0.14*	0.10	0.14**	0.07	0.10	0.16**	0.09
Demographic variables									
Sexual minority identity	0.12**	0.12**	0.12**	0.13*	0.13*	0.13*	0.14*	0.14*	0.14*
Gender minority identity	0.12	0.12	0.12	−0.05	−0.05	−0.05	−0.06	−0.06	−0.06
Gender identity (girls)	0.02	0.02	0.02	−0.06	−0.06	−0.06	−0.07	−0.07	−0.07
Race	0.08*	0.08*	0.08*	0.10*	0.10*	0.10*	0.08*	0.08*	0.08*
Age	0.13**	0.13**	0.13**	0.22**	0.22**	0.22**	0.12**	0.12**	0.12**
Family affluence	0.07	0.07	0.07	0.06	0.06	0.06	0.01	0.01	0.01
Older sibling or not	0.00	0.00	0.00	0.02	0.02	0.02	−0.02	−0.02	−0.02
Sibling gender (girl referent)	0.04	0.04	0.04	0.02	0.02	0.02	0.07	0.07	0.07
Parent gender (woman referent)	−0.01	−0.01	−0.01	0.01	0.01	0.01	0.00	0.00	0.00
COVID-19 variables									
Provincial case rate	−0.02	−0.02	−0.02	−0.01	−0.01	−0.01	−0.07	−0.07	−0.07
Individual-level COVID-19 exposure	−0.09	−0.09	−0.09	0.02	0.02	0.02	0.01	0.01	0.01
COVID-19 guideline adherence	0.04	0.04	0.04	−0.07	−0.07	−0.07	−0.05	−0.05	−0.05
Family relationship quality									
Day of study completion	0.05	0.05	0.05	0.00	0.00	0.00	0.01	0.01	0.01
NRI Parental support	−0.12*	−0.12*	−0.12*	0.03	0.03	0.03	0.10	0.10	0.10
NRI Sibling support	−0.03	−0.03	−0.03	−0.04	−0.04	−0.04	−0.07	−0.07	−0.07
NRI Parental negative	0.08	0.08	0.08	−0.06	−0.06	−0.06	0.02	0.02	0.02
NRI Sibling negative	0.15**	0.15**	0.15**	0.09	0.09	0.09	0.03	0.03	0.03
R^2	.23**			.09**			.08**		

Unstd Coeff = unstandardized coefficient; sig. = significance. * = $p < .05$; ** = $p < .01$.

finding suggests the compensatory role for sibling relationships in light of poor quality parental relationships (Milevsky, 2005), which was only observed in the current study, however, among the two groups of youth with the most compromised functioning.

That no *worsening only* profile was identified was somewhat surprising given the negative impact that the pandemic has had on many adolescents and their families (Janssens et al., 2021; Magson et al., 2021; Pierce et al., 2020). The findings do, however, align with an emerging literature on both perceptions of change in and prospective evaluations of relationship quality with family members during the pandemic, which suggest little change in relationship quality when examined longitudinally (i.e., Bülow et al., 2020) or perceived increases in positive relationship features and declines in negative relationship features when perceptions of change are assessed (i.e., Rogers et al., 2021). Our findings correspond with an existing literature that suggests that while the pandemic is characterized by significant changes in many aspects of adolescent life, the majority of youth see either little change or improvement only in the quality of their relationships with their family members. These findings point to the resilience of many adolescents, even in the face of extenuating hardship.

The ways in which the identified latent profiles were associated with psychosocial outcomes suggests the unique added value of understanding perceived change in relationship quality. Individuals in the two unstable profile, and in particular those in the *high instability profile,* reported higher levels of internalizing/somatic symptoms than youth in all other profiles, and higher levels of alcohol and marijuana use compared to youth in the *improvement only profile,* while youth in the *moderate instability profile* reported higher levels of internalizing than youth in the *improvement only profile*. Some of this vulnerability may have reflected the fact that youth in both of the instability groups were more likely to live in provinces with higher numbers of COVID-19 cases (and thus potentially more COVID-19 related stress), although the differences in functioning were observed accounting for COVID-19 related variables. Conversely, adolescents in the *improvement only profile* had the best overall functioning, as in addition to their better functioning than the instability profiles, they also reported less marijuana use than the *low change profile*. Thus, there may be benefits in perceiving relationship improvement, but not worsening relationship quality during a time in which youth spend more time with their families (Bülow et al., 2020; Rogers et al., 2021). These findings may also reflect a large body of work suggesting that relationships high in positive characteristics and low in negative characteristics are associated with better psychosocial functioning in general (Dirks et al., 2015; Ebbert et al., 2018). They also extend previous work highlighting the buffering role of positive relationships with parents during the pandemic to include the importance of positive relationships with siblings (Campione-Barr et al., 2021).

Perceived relationship quality improvement and worsening was positively associated for both parents and siblings, respectively. The contradictory-seeming nature of these findings underscores how positive and negative relationship characteristics are not necessarily inverse constructs, and are differentially associated with adolescent outcomes (Branje et al., 2010; Yap et al., 2017). Additional insight into the finding may be garnered from considering how adolescents spent increased amount of time with family members during the COVID-19 pandemic. In qualitative work where adolescents discuss the impact of the pandemic, many youth reported increased time with family as being a benefit of the pandemic, while at the same time reporting on how too much time with family was a potential stressor (Fioretti et al., 2020; Rogers et al., 2021). Ultimately, these findings suggest that understanding perceptions of improving are not the same as perceptions of worsening, and suggest the relevance of examining how time spent with family members shapes the associations between both of these constructs.

The few demographic, COVID-19, and family-level factors that differentiated between profiles provide insight into perceived relationship quality change. Starting with sexual minority status, individuals in the *high instability profile* were significantly less likely to report sexual minority identities, while individuals in the *moderate instability profile* were the most likely to report sexual minority identities, particularly compared with the individuals in the *improvement only profile*. That individuals in the *moderate instability profile* were the most likely to report a sexual minority identity may reflect the particular challenges of being a sexual minority youth during the pandemic (Salerno et al., 2020). Still, this findings need to be replicated in a larger sample, especially given that the *high instability profile* were the least likely to report a sexual minority identity. This somewhat contradictory finding may reflect the small overall number of adolescents in the *high instability profile*. Sexual minority status was, however, associated with higher levels of internalizing/somatic symptoms (Marshal et al., 2011), and substance use (Fish et al., 2017). Youth in the *moderate instability profile* also reported higher levels of family affluence than youth in the *improvement only profile*. This finding was surprising given how socio-economic inequality can heighten stressors associated with the COVID-19 pandemic for families (Calvano et al., 2021). In terms of perceived change, however, higher SES youth may have experienced more change such as the cancellation of expensive leisure or extracurricular activities. Families of lower SES adolescents may experience more barriers in complying with pandemic guidelines (e. g., reliance on jobs that are public facing, inability to avoid public transit or use of other public services, greater reliance on family members in daily life). These barriers may have resulted in less change in the daily lives of these youth. Racialized youth, partially as a function of the broader socioeconomic disparities experienced by racialized families in Canada (Lightman & Good Gingrich, 2018), were also anticipated to perceive worsening relationships, which were not observed. The diversity within the current sample prompted the decision to collapse across racialized groups, which may have concealed differences. Future work is needed to focus on subgroups of racialized youth who may experience unique challenges in terms of racism associated with COVID-19, such as Asian youth (Nguyen et al., 2020), or disproportionate surveillance, such as Black or Indigenous youth (Evans & Francis, 2020; Ineese-Nash, 2020). Finally, latent profile membership did not vary according to gender minority status. For youth under age 18, participation was limited to youth for whom parental consent could be obtained, and youth with the poorest quality family relationships may have been excluded from the study.

4.1. Limitations and future directions

While the current study provides novel insight into how adolescents' perceptions of change in relationship quality are associated

with their psychosocial functioning during the COVID-19 pandemic, findings should be considered in light of several additional limitations not discussed above. First, while the current study drew youth from across Canada, the sample is not representative of all Canadian adolescents. Second, these findings were cross-sectional, and longitudinal research is needed to understand the consequences of perceived relationship quality change over time. Third, the current findings are correlational and cross-sectional, limiting insight into the directionality of the identified associations.

Research has largely overlooked how adolescents themselves perceive change in relationship quality. The current findings address this gap by suggesting that adolescents' perceptions of change in relationship quality with parents and siblings are linked with their psychosocial functioning during the COVID-19 pandemic, over and above their reports of relationship quality. Future research may extend these findings by exploring continuity in these profiles of perceived change in relationship quality over time, and how these profiles are prospectively associated with individual functioning. Ultimately, these findings suggest the importance of including adolescents' own perceptions of change in their environment as a component of their psychosocial functioning.

References

Barendse, M., Flannery, J., Cavanagh, C., Aristizabal, M., Becker, S. P., Berger, E., Breaux, R., Campione-Barr, N., Church, J. A., Crone, E., Dahl, R., Dennis-Tiwary, T. A., Dvorsky, M., Dziura, S., Groep, S. van de, Ho, T., Killoren, S. E., Langberg, J., Larguinho, T., & Pfeifer, J. (2021). Longitudinal change in adolescent depression and anxiety symptoms from before to during the COVID-19 pandemic: A collaborative of 12 samples from 3 countries. *PsyArXiv.* https://doi.org/10.31234/osf.io/hn7us

Boyle, M. H., Georgiades, K., Duncan, L., Comeau, J., & Wang, L. (2019). The 2014 Ontario child health study—methodology. *Canadian Journal of Psychiatry, 64*(4), 237–245. https://doi.org/10.1177/0706743719833675

Branje, S. J. T., Hale, W. W., Frijns, T., & Meeus, W. H. J. (2010). Longitudinal associations between perceived parent-child relationship quality and depressive symptoms in adolescence. *Journal of Abnormal Child Psychology, 38*(6), 751–763. https://doi.org/10.1007/s10802-010-9401-6

Brody, G. H. (1998). Sibling relationship quality: Its causes and consequences. *Annual Review Of Psychology, 49*(1), 1. https://doi.org/10.1146/annurev.psych.49.1.1

Bülow, A., Keijsers, L., Boele, S., Roekel, E. van, & Denissen, J. (2020). Parenting adolescents in times of a pandemic: Changes in relationship quality, autonomy support, and parental control? *PsyArXiv.* https://doi.org/10.31234/osf.io/g8kpf

Calvano, C., Engelke, L., Di Bella, J., Kindermann, J., Renneberg, B., & Winter, S. M. (2021). Families in the COVID-19 pandemic: Parental stress, parent mental health and the occurrence of adverse childhood experiences—results of a representative survey in Germany. *European Child & Adolescent Psychiatry.* https://doi.org/10.1007/s00787-021-01739-0

Campione-Barr, N., Rote, W., Killoren, S. E., & Rose, A. J. (2021). Adolescent adjustment during COVID-19: The role of close relationships and COVID-19-related stress. *Journal of Research on Adolescence, 31*(3), 608–622. https://doi.org/10.1111/jora.12647

De Goede, I. H., Branje, S. J., & Meeus, W. H. (2009). Developmental changes in adolescents' perceptions of relationships with their parents. *Journal of Youth and Adolescence, 38*(1), 75–88.

Defoe, I. N., Keijsers, L., Hawk, S. T., Branje, S., Dubas, J. S., Buist, K., Frijns, T., Aken, M. A. G. van, Koot, H. M., Lier, P. A. C. van, & Meeus, W. (2013). Siblings versus parents and friends: Longitudinal linkages to adolescent externalizing problems. *Journal of Child Psychology and Psychiatry, 54*(8), 881–889. https://doi.org/10.1111/jcpp.12049

Dirks, M. A., Persram, R., Recchia, H. E., & Howe, N. (2015). Sibling relationships as sources of risk and resilience in the development and maintenance of internalizing and externalizing problems during childhood and adolescence. *Clinical Psychology Review, 42*, 145–155.

Ebbert, A., Infurna, F., & Luthar, S. (2018). Mapping developmental changes in perceived parent–adolescent relationship quality throughout middle school and high school. *Development and Psychopathology, 31*, 1–16. https://doi.org/10.1017/S0954579418001219

Eisenberg, M. E., Gower, A. L., McMorris, B. J., Rider, G. N., Shea, G., & Coleman, E. (2017). Risk and protective factors in the lives of transgender/gender nonconforming adolescents. *Journal of Adolescent Health, 61*(4), 521–526. https://doi.org/10.1016/j.jadohealth.2017.04.014

Evans, K., & Francis, L. (2020). Galvanizing solidarity through chaos: Policing, surveillance and the impact of COVID-19 on Black Canadian youth. *Child & Youth Services,* 1–4.

Fioretti, C., Palladino, B. E., Nocentini, A., & Menesini, E. (2020). Positive and negative experiences of living in COVID-19 pandemic: Analysis of Italian adolescents' narratives. *Frontiers in Psychology, 11.* https://doi.org/10.3389/fpsyg.2020.599531

Fish, J. N., Russell, B. S., Watson, R. J., & Russell, S. T. (2020). Parent-child relationships and sexual minority youth: Implications for adult alcohol abuse. *Journal of Youth and Adolescence, 49*(10), 2034–2046. https://doi.org/10.1007/s10964-020-01299-7

Fish, J. N., Watson, R. J., Porta, C. M., Russell, S. T., & Saewyc, E. M. (2017). Are alcohol- related disparities between sexual minority and heterosexual youth decreasing? *Addiction, 112*(11), 1931–1941. https://doi.org/10.1111/add.13896

Fortier, M. (2020). Les écoles restent ouvertes en zone rouge. *Le Devoir.* https://www.ledevoir.com/societe/education/586803/les-ecoles-primaires-et-secondaires-resteront-ouvertes-en-zone-rouge.

Furman, W., & Buhrmester, D. (2009). The Network of relationships inventory: Behavioral systems version. *International Journal of Behavioral Development, 33*(5), 470–478. https://doi.org/10.1177/0165025409342634

Gallagher-Mackay, K., Srivastava, P., Underwood, K., Dhuey, E., McCready, L., Born, K., Maltsev, A., Perkhun, A., Steiner, R., Barrett, K., & Sander, B. (2021). COVID-19 and education disruption in Ontario: Emerging evidence on impacts. *Law and Society Faculty Publications.* https://scholars.wlu.ca/laso_faculty/1.

Gariepy, G., McKinnon, B., Sentenac, M., & Elgar, F. J. (2016). Validity and reliability of a brief symptom checklist to measure psychological health in school-aged children. *Child Indicators Research, 9*(2), 471–484. https://doi.org/10.1007/s12187-015-9326-2

Governement of Canada. (2021). *COVID-19 Daily Epidemiology Update.* https://health-infobase.canada.ca/covid-19/epidemiological-summary-covid-19-cases.html. (Accessed 15 August 2021).

Hale, W. W., Nelemans, S. A., Meeus, W. H. J., & Branje, S. J. T. (2020). A 6-year longitudinal study of adolescents and mothers depression symptoms and their perception of support and conflict. *Child Psychiatry and Human Development, 51*(3), 407–415. https://doi.org/10.1007/s10578-019-00952-y

Hartley, J. E. K., Levin, K., & Currie, C. (2016). A new version of the HBSC family affluence scale - FAS III: Scottish qualitative findings from the international FAS development study. *Child Indicators Research, 9*(1), 233–245. https://doi.org/10.1007/s12187-015-9325-3

Ineese-Nash, N. (2020). Finding our power together: Working with indigenous youth and children during COVID-19. *Child & Youth Services, 41*(3), 274–276. https://doi.org/10.1080/0145935X.2020.1835161

Janssens, J. J., Achterhof, R., Lafit, G., Bamps, E., Hagemann, N., Hiekkaranta, A. P., Hermans, K. S. F. M., Lecei, A., Myin-Germeys, I., & Kirtley, O. J. (2021). The impact of COVID-19 on adolescents' daily lives: The role of parent–child relationship quality. *Journal of Research on Adolescence, 31*(3), 623–644. https://doi.org/10.1111/jora.12657

Jenkins, E. K., McAuliffe, C., Hirani, S., Richardson, C., Thomson, K. C., McGuinness, L., Morris, J., Kousoulis, A., & Gadermann, A. (2021). A portrait of the early and differential mental health impacts of the COVID-19 pandemic in Canada: Findings from the first wave of a nationally representative cross-sectional survey. *Preventive Medicine, 145*, Article 106333. https://doi.org/10.1016/j.ypmed.2020.106333

Laursen, B., & Collins, W. A. (2009). Parent-child relationships during adolescence. *Handbook of Adolescent Psychology, Volume 2: Contextual Influences on Adolescent Development, 2*, 1.

Lightman, N., & Good Gingrich, L. (2018). Measuring economic exclusion for racialized minorities, immigrants and women in Canada: Results from 2000 and 2010. *Journal of Poverty, 22*(5), 398–420. https://doi.org/10.1080/10875549.2018.1460736

Magson, N. R., Freeman, J. Y. A., Rapee, R. M., Richardson, C. E., Oar, E. L., & Fardouly, J. (2021). Risk and protective factors for prospective changes in adolescent mental health during the COVID-19 pandemic. *Journal of Youth and Adolescence, 50*(1), 44–57. https://doi.org/10.1007/s10964-020-01332-9

Marshal, M. P., Dietz, L. J., Friedman, M. S., Stall, R., Smith, H. A., McGinley, J., Thoma, B. C., Murray, P. J., D'Augelli, A. R., & Brent, D. A. (2011). Suicidality and depression disparities between sexual minority and heterosexual youth: A meta-analytic review. *Journal of Adolescent Health, 49*(2), 115–123. https://doi.org/10.1016/j.jadohealth.2011.02.005. psyh.

Milevsky, A. (2005). Compensatory patterns of sibling support in emerging adulthood: Variations in loneliness, self-esteem, depression and life satisfaction. *Journal of Social and Personal Relationships, 22*(6), 743–755. https://doi.org/10.1177/0265407505056447

Nguyen, T. T., Criss, S., Dwivedi, P., Huang, D., Keralis, J., Hsu, E., Phan, L., Nguyen, L. H., Yardi, I., Glymour, M. M., Allen, A. M., Chae, D. H., Gee, G. C., & Nguyen, Q. C. (2020). Exploring U.S. Shifts in anti-asian sentiment with the emergence of COVID-19. *International Journal of Environmental Research and Public Health, 17*(19), 7032. https://doi.org/10.3390/ijerph17197032

Parker, J. D., Endler, N. S., & Bagby, R. M. (1993). If it changes, it might be unstable: Examining the factor structure of the Ways of Coping Questionnaire. *Psychological Assessment, 5*(3), 361–368. https://doi.org/10.1037/1040-3590.5.3.361

Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., Kontopantelis, E., Webb, R., Wessely, S., McManus, S., & Abel, K. M. (2020). Mental health before and during the COVID-19 pandemic: A longitudinal probability sample survey of the UK population. *The Lancet Psychiatry, 7*(10), 883–892. https://doi.org/10.1016/S2215-0366(20)30308-4

Rogers, A. A., Ha, T., & Ockey, S. (2021). Adolescents' perceived socio-emotional impact of COVID-19 and implications for mental health: Results from a U.S.-Based mixed- methods study. *Journal of Adolescent Health, 68*(1), 43–52. https://doi.org/10.1016/j.jadohealth.2020.09.039

Salerno, J. P., Devadas, J., Pease, M., Nketia, B., & Fish, J. N. (2020). Sexual and gender minority stress amid the COVID-19 pandemic: Implications for LGBTQ young persons' mental health and well-being. *Public Health Reports, 135*(6), 721–727. https://doi.org/10.1177/0033354920954511

Vaillancourt, T., Brittain, H., Krygsman, A., Farrell, A. H., Landon, S., & Pepler, D. (2021). School bullying before and during COVID-19: Results from a population-based randomized design. *Aggressive Behavior, 47*(5), 557–569. https://doi.org/10.1002/ab.21986

Whiteman, S. D., Solmeyer, A. R., & McHale, S. M. (2015). Sibling relationships and adolescent adjustment: Longitudinal associations in two-parent African American families. *Journal of Youth and Adolescence, 44*(11), 2042–2053. https://doi.org/10.1007/s10964-015-0286-0

Wise, T., Zbozinek, T. D., Michelini, G., Hagan, C. C., & Mobbs, D. (2020). Changes in risk perception and self-reported protective behaviour during the first week of the COVID-19 pandemic in the United States. *Royal Society Open Science, 7*(9), Article 200742. https://doi.org/10.1098/rsos.200742

Yap, M. B. H., Cheong, T. W. K., Zaravinos-Tsakos, F., Lubman, D. I., & Jorm, A. F. (2017). Modifiable parenting factors associated with adolescent alcohol misuse: A systematic review and meta-analysis of longitudinal studies: Parenting and adolescent alcohol misuse. *Addiction, 112*(7), 1142–1162. https://doi.org/10.1111/add.13785

Yaya, S., Yeboah, H., Charles, C. H., Otu, A., & Labonte, R. (2020). Ethnic and racial disparities in COVID-19-related deaths: Counting the trees, hiding the forest. *BMJ Global Health, 5*(6), Article e002913. https://doi.org/10.1136/bmjgh-2020-002913