

Mentally Contagious

An Investigation of Parent and Child Anxiety During the COVID-19 Pandemic

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Honors Thesis

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The COVID-19 pandemic has engendered anxiety in millions of people around the world, especially in parents and their children. These feelings of anxiety are even more prevalent in vulnerable groups such as nurses, doctors, young adults, racial and ethnic minorities, and unpaid caregivers for older adults. The goal of this study is to understand the relations between household income, economic pressure, parent perceptions of COVID-19, parent threat transmission to children, parent anxiety, and child anxiety during the ongoing pandemic. I hypothesized that household income, economic pressure, and perceived threat of the virus would all contribute to a rise in parental anxiety, which would increase child anxiety. To test these hypotheses, an online survey was administered using Amazon Mechanical Turk (MTurk) to parents living in the state of Hawai'i with at least one child between the ages of 1–16 (n = 108). All participants were invited to report their levels of anxiety, their child's anxiety, household income, economic pressure, perception of COVID-19, and parent threat transmission. Using structural equation modeling, a measured variable path model was fit to the data, demonstrating excellent fit. The final structural model revealed that household income predicted parent anxiety, and economic pressure, which then predicted parent anxiety above and beyond income. In turn, parent anxiety strongly predicted child anxiety.

In this unprecedented COVID-19 pandemic, anxiety is elevated around the world as countries rush to stop the spread of this deadly disease. Confirmed cases of COVID-19 have reached 244 million worldwide, and close to five million deaths have resulted (WHO Coronavirus Disease COVID-19 Dashboard, 2021). In an attempt to reduce infections, the use of face masks were mandated, social distancing was required in public places, and sanitation

and disinfection were consistently emphasized until spring 2022. As a result of the necessity to implement public health measures to contain the novel COVID-19 virus and variants, especially when no treatment protocols or vaccinations were available, many countries and states have struggled with the social and economic impacts of business closures, school closures, the wearing of face masks, and the mental health effects of social distancing.



My name is Migdalia Pensado Alvarenga and I am a recent graduate of the University of Hawai'i at Mānoa. I completed my Honors thesis, titled "Mentally Contagious: An Investigation of Parent and Child Anxiety During the COVID-19 Pandemic" in an attempt to study how different factors like income and threat transmission affect how anxious local parents and children. I plan to pursue my doctorate in counseling psychology in the future.

While mask-wearing and sanitization efforts do not necessarily increase anxiety amongst the population, the disruption of schooling worldwide, the loss of income, and job loss can cause major disruption in the lives of people around the world. In addition, many people were unable to see family or friends for fear of spreading the COVID-19 virus to them. Loneliness and social isolation have been linked to a multitude of health problems such as elevated heart issues, depression, change in sleep habits, unhealthy behaviors such as smoking and drinking, an increased chance of developing dementia, and an increase in suicide attempts (Hwang et al., 2020). These behaviors and diseases can in turn create more anxiety in a vicious cycle. Socialization can mitigate and prevent a lot of issues from developing into larger issues. Fears of getting sick and dying, experiences of loved ones growing sick and dying in isolation, as well as the impact of social isolation are contributing to an undermining of support systems that help maintain mental health for adults and children alike.

Parent Anxiety during the Pandemic

Not surprisingly, the one major issue facing parents during this pandemic is anxiety. Anxiety is defined as disproportionate, excessive, and constant worry about events and activities in life (Mayo Clinic, 2018). With the recent economic losses, closures of schools and workplaces, and overburdened medical facilities (Pfefferbaum & North, 2020), anxiety has likely increased. These problems are becoming more urgent as many families face potential hunger and homelessness, causing a great deal of anxiety, especially for parents and their children.

Additionally, parent anxiety is associated with household income. With many businesses being closed, furloughs, and corners being cut to stay afloat, many parents are experiencing a partial or complete loss of income (Parker et al., 2020). As a result, parents are struggling to find the financial resources needed to meet expenses, potentially raising anxiety due to increasing economic pressure. In this way, economic pressure and financial strain can increase parent anxiety.

Another factor is the threat of the virus and ongoing pandemic. There are some parents whose lived experiences could have the pandemic trigger different levels of anxiety than other parents (Hansen, 1994). For instance, if the parent is considered an “essential worker” during the pandemic, then they would have to leave the house and have more potential contact with carriers of the virus. This creates a different perception of a threat than a parent who works from home or believes that COVID-19 is not as dangerous as the common cold or flu, despite the Center for Disease Control stating otherwise.

According to one study, parents who relayed higher threats of transmission and shared more threatening information about COVID-19 with their child reported feeling higher levels of anxiety than parents who reported a lower level (Hansen, 1994).

Child Anxiety during the Pandemic

In terms of child anxiety, parent threat transmission plays a role in whether parent anxiety will affect child anxiety. The more anxious the parents are, the more anxiety the child will experience. In one study, anxious mothers unknowingly increased their children’s anxiety, making them more susceptible to anxiety disorders (McClure, 2001). Anxiety in the mothers could be due to the threat transmission felt by the parent, and then, inadvertently, transferred to the child. This was also demonstrated in a study investigating the relationship between information given to the parent about the 2009 swine flu epidemic and the amount of medical fear their child had. Compared to children whose parents reported not warning them about the swine flu, children whose parents reported warning them had comparatively more fear (Remmerswaal & Murius, 2011). In times of great uncertainty and stress, it can be assumed that the link for anxiety is even greater. Thus, parent threat transmission is important to consider while measuring child anxiety during the COVID-19 pandemic.

As with parent anxiety, child anxiety is influenced by household income and economic pressure. Another study showed that children of lower socioeconomic status demonstrated higher levels of anxiety than children in higher statuses (Ziv, 1973). In sum, child anxiety is dependent on a number of factors, including the level of anxiety of the parents, parent threat transmission, and the socioeconomic background of the family.

Hypotheses

Several hypotheses were investigated. First, it was predicted that parent anxiety will be associated with child anxiety. Sec-

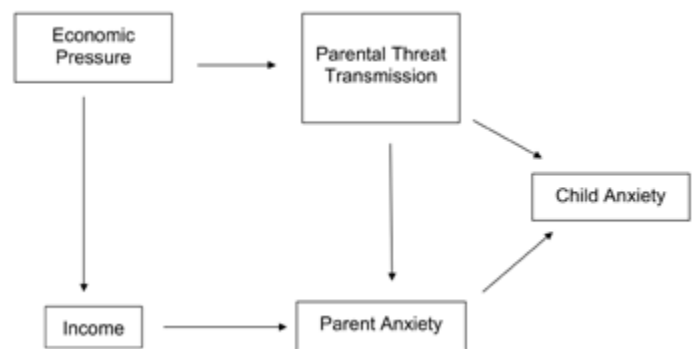


Figure 1. Model of Hypothesized Relationships Between Variables. Conceptual and analytic model. Economic pressure directly affects parental threat transmission due to the need to work and what kind of work the parent needs to perform. This can then directly affect child anxiety as a result. Additionally, economic pressure can change income for the parent, creating parental anxiety that then affects the child.

ond, it was predicted that threat transmission will be associated with parent and child anxiety. Third, family economic pressure and parental perception of COVID-19 was predicted to be associated with parent anxiety. Lastly, economic level will affect threat transmission, possibly due to the need to secure an income.

Method

PARTICIPANTS

Participants were 108 parents living in the state of Hawai'i on the island of O'ahu, were fluent in English, and had at least one child aged 1–16. Participants ranged from 25–64-years old. Participants were 42% female and 57% male with less than 1% identifying as nonbinary. On the whole, participants came from relatively educated backgrounds, with 1% without

a high school diploma, 8% with a high school diploma, 15% completed some college, 32% completed a two-year college degree, 23% completed a four-year degree, and 21% completed a postgraduate or professional degree. This is demonstrated in Figure 2. The parents surveyed identified as 9% Asian, 16% Native Hawaiian or Pacific Islander, 66% White, 13% as a mixed racial identity, and 4% other races. In terms of ethnicity, approximately 6% identified as Hispanic or Latinx, which is demonstrated in Figure 3.

Participants were asked to report two separate annual household incomes: pre-COVID annual household income and post-COVID annual household income. A majority of the participants made \$60,000 and above before the pandemic. However, after the pandemic hit, the income distribution changed. The income distribution shifted downward, resulting in most participants making less than \$60,000. Participant incomes are demonstrated in Table 1.

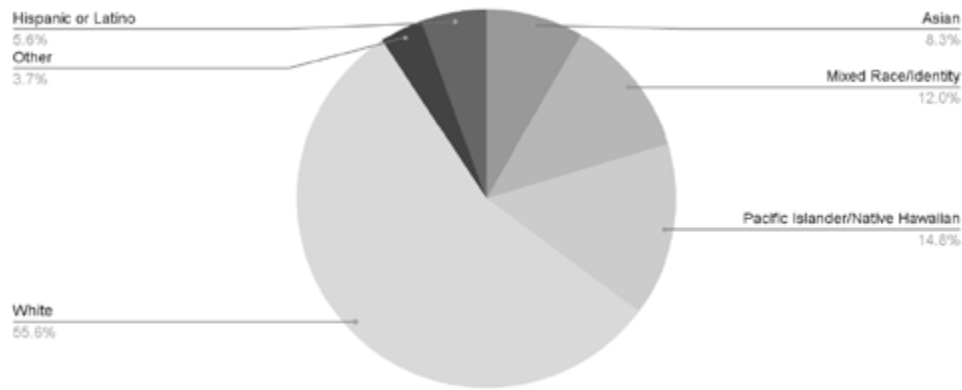


Figure 2. Participant Ethnicity.

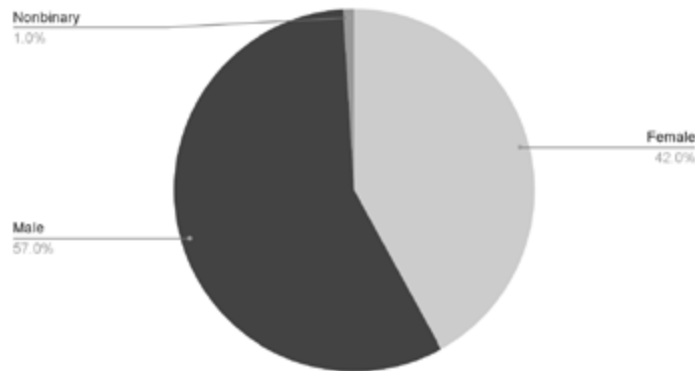


Figure 3. Participant Genders.

Table 1. Household Income Pre- and Post- Pandemic Bracket Percentages

INCOME BRACKET	PRE-COVID ANNUAL HOUSEHOLD INCOME (%)	POST-COVID ANNUAL HOUSEHOLD INCOME (%)
Less than \$15,000	4	8
\$15,000–30,000	5	8
\$31,000–45,000	4	14
\$46,000–59,000	9	24
\$60,000–75,000	34	20
\$76,000–100,000	25	14
\$101,000–150,000	14	11
\$150,000 or more	5	1

PARTICIPANT RECRUITMENT

The study was approved by the University of Hawai'i IRB. Participants were recruited via Amazon's Mechanical Turk (MTurk). Amazon's MTurk is an online marketplace for work, where "Requesters" (e.g., researchers) post Human Intelligence Tasks (HITs; e.g., surveys) for Workers (i.e., respondents or participants) to complete for compensation. This online platform is ideal because it is widely used and allows researchers to set system qualifications for location and respondent approval rating. For the proposed study, participants were required to live in the United States and have an approval rate of 90% or higher. Additional inclusion criteria dictate that participants must be Hawai'i residents, and they must be parents, primary caregivers, or legal guardians (aged 18–60) for at least one child.

Screener Survey

After viewing an informed consent page and consenting to participate, respondents were directed to a 5-item screener, which evaluated whether survey-takers meet the study's inclusion criteria. The brief screener included the following questions: (1) "In which state do you currently reside?" with "Hawaii" as the desired response; (2) "What is your age (in years)?" with "18–60" as the desired response range; (3) "What is your gender?" with no desired response; (4) "Are you a parent, primary caregiver, or legal guardian of a child between the ages of 0–16?" with the desired response yes. In addition, screener questions that qualified respondents for the full parent survey were somewhat disguised to minimize participant deception by including additional questions that have no bearing on participant qualification for the full study (Chandler & Paolacci, 2017). If respondents did not meet study inclusion criteria, they received \$0.10 compensation and their participation was terminated. If respondents met the inclusion criteria, they were invited via MTurk to complete the main parent survey for this study (a separate, private HIT open only to those who qualified). The main survey took approximately 15–20 minutes to complete. This two-step survey process was chosen because it is effective in minimizing rates of identity deception on MTurk (Sharpe Wessling et al., 2017).

Main Parent Survey

Respondents that qualified for the full study viewed another, separate informed consent page pertaining to the main parent survey. Throughout the main survey, participants with more than one child were prompted to respond to each item with the one particular child in mind. The main parent survey included questions about demographics, family economic pressure, parent efficacy, parent anxiety, child anxiety, parent perception of COVID-19, parent threat transmission, parenting style, parent support of child academic learning, child learning, helpful supports during the outbreak, as well as attention-checking

questions. There were no questions posed as to whether participants knew anyone who had died from COVID-19 because in July 2020 at the time the data were collected, exactly 26 Hawai'i residents were officially reported to have died from COVID-19, though it is worth noting that losing a loved one would certainly affect anxiety. Deaths were not anticipated to be significantly relevant to the data being investigated.

MEASURES

Attention-Checking Items

When administering surveys on MTurk, researchers commonly use attention checks and response times to screen respondents who are not sufficiently diligent (Peer, Vosgerau, & Acquisti, 2014). To ensure quality control of participant responses, five such attention-check questions were spread throughout the survey. For example, "From the following list of options below, please select answer D." The data from participants who failed to correctly respond to each of the three attention-checking items were removed from the final dataset prior to analyses.

Family Economic Pressure

Family economic pressure was measured using a Likert scale in order to measure how much economic pressure families have been experiencing (Conger et al., 1992). For example, parents will be asked to respond to items, including "I can't make ends meet" and "I have trouble paying bills" (responses on a 5-point Likert scale with 1 = *no difficulty at all* and 5 = *great deal of difficulty*). Participants responded on a 5-point Likert scale (1 = *no difficulty at all* to 5 = *great deal of difficulty*) with a maximum score of 40, indicating extreme family economic pressure. The dependent variable was participants' total scores on the family economic pressure scale.

Parent Anxiety

Parent anxiety in relation to COVID-19 will be measured using the short form of the state scale of the Spielberger state-trait anxiety inventory (Marteanu & Becker, 1992). This anxiety scale was adapted to ask respondents to answer with respect to how they have been feeling over the past week in relation to COVID-19. Parents rated each of six prompts on a 1 (*not at all*) to 4 (*very much so*) scale. For example, one of the items participants responded to was "I feel worried," and the participants gave a response according to how worried they felt. Participants responded on a four-point Likert scale (0 = *not at all* to 3 = *very much so*) for a maximum score of 20, indicating extreme anxiety levels.

Child Anxiety

Child anxiety was the anxiety measured by the parent participant and recorded in the survey. The short form of the state scale of the Spielberger state-trait anxiety inventory (Marteanu

& Becker, 1992) was adapted to reflect parents' perceptions of their children's anxiety about the COVID-19 pandemic. Parents answered questions such as "My child feels worried" to the best of their ability according to their observations of the child that they have in mind while answering. Participants responded on a four-point Likert scale (0 = *not at all* to 3 = *very much so*) for a maximum score of 20 indicating extreme anxiety levels.

Parent Threat Transmission

Parent threat transmission refers to the threat participants felt by the COVID-19 pandemic. A survey of parent threat transmission adapted from the *Sources of Information about the Swine Flu Scale* (Remmerswaal & Muris, 2011) to reflect the current COVID-19 pandemic. This survey consisted of 4 items that measured parents' transmission of negative information about the disease (e.g., "I warn my child about COVID-19"). Additionally, parents were asked what percentage of time they spend discussing COVID-19 with their child or as a family. Participants responded on a four-point Likert scale (0 = *not at all* to 3 = *a lot*) for a maximum score of 20 indicating an extremely large threat felt by the pandemic.

PARTICIPANT COMPENSATION

All participants were compensated \$3.00 for completing the main parent survey. This rate was determined by calculating approximately 1.25 times the US federal minimum wage (\$7.25/hour) for the amount of time the HIT was estimated to require (15–20 min).

Results

PRELIMINARY ANALYSES

Economic pressure was negatively correlated with pre-COVID Annual Household Income ($r = -.35, p < .001$), indicating that the lower participants' pre-COVID annual household income, the more economic pressure respondents reported. The same pattern held true for the relation between economic pressure and post-COVID annual household income ($r = -.54, p < .001$), indicating that as income decreased, economic pressure increased. Relatedly, economic pressure was positively correlated with parent anxiety ($r = 0.25, p < .01$), such that the more economic pressure parents reported, the more anxiety reported. There was also a positive correlation between economic pressure and child anxiety ($r = .30, p < .01$). Loss in income also had a strong positive correlation with economic pressure ($r = .38, p < .001$). Economic pressure was not statistically significantly related to parent threat transmission, indicating that despite the socioeconomic status of the parents, children did not experience significantly different levels of anxiety as a result of economic pressure. Unsurprisingly, annual household income pre-COVID was associated strongly and positively with annual

household income post-COVID ($r = .83, p < .001$). Similarly, there was a weak positive correlation with annual household income and loss in income ($r = .20, p < .05$). There was also an extremely weak negative and statistically insignificant correlation between annual household income pre-COVID and parental threat transmission suggesting that the more money a household had before the pandemic, the threat transmission that the parents experienced would slightly decrease.

Annual Household Income post-COVID had a moderately negative relation with loss in income ($r = -.37, p < .001$), suggesting that the lower the income post-COVID, the higher the loss experienced. Annual Household Income also had a negative relation with parental threat transmission at a much smaller rate ($r = -.06$), possibly demonstrating that the higher the income for a household during the pandemic, the lower the parent threat transmission.

Loss in income was positively correlated to child anxiety ($r = .18, p < .10$), which was higher than loss in income correlated with parent anxiety ($r = -.11$). This could demonstrate that children potentially felt more anxious about household finances than what was previously suspected. Parent anxiety has had a strong positive relation to child anxiety ($r = .50, p < .001$). This suggests that the more anxious a parent feels, the higher rates of anxiety felt by the child. Conversely, if the parent experiences less anxiety, they would likely report their child also feeling less anxiety.

PRIMARY ANALYSES

Using *Mplus* Version 8.4 (Muthén & Muthén, 2017), and the structural equation modeling framework,¹ The model assessed the relations between family economic pressure, income, parent anxiety, parent threat transmission, child anxiety (Figure 1).

Multiple indicators of model fit, which describes how the data fit the hypothesis that was investigated, were used to assess the fit of the hypothesized model. Several goodness-of-fit indices are recommended for assessing model fit, including the standardized root square mean residual (SRMR, Steiger, 1990), the root mean square error of approximation (RMSEA, Steiger, 1990), and the comparative fit index (CFI, Bentler, 1990). The SRMR is an absolute index of model fit, evaluating the overall discrepancy between the observed and the model-implied covariances. Acceptable model fit is indicated by values less than .08 (Hu & Bentler, 1999). The RMSEA is a parsimonious index of model fit, which evaluates the explanatory power of the model relative to the simplicity (parsimony) of the model. Acceptable fit is indicated by values of .06 or less (Hu & Bentler, 1999). Lastly, the CFI is an incremental fit index, which compares the fit of the model to the fit of a null model. CFI values of .95 or above indicate adequate model fit (Hu & Bentler, 1999). These three fit indices were used to

1 A measured variable path model (MVPM) was fit to the data.

evaluate the level of measurement invariance in the measurement model.

EXPLORATORY ANALYSES

When the hypothesized conceptual and statistical model was fit to the data, the model fit was very poor. Therefore, in place of the original model, a new exploratory model was constructed (Figure 4). Based on descriptive data, I reformulated my hypothesis to fit the correlations observed between the different variables investigated. Using *Mplus* Version 8.4 (Muthén & Muthén, 2017) and the structural equation modeling framework, a measured variable path model (MVPM) was fit to the data. The model assessed the relations between family economic pressure, income, parent anxiety, and child anxiety. See Figure 1 for a visual representation of the path model.

ASSESSMENT OF MODEL FIT

As before, model fit of the exploratory measured variable path model was assessed using the standardized root square mean residual (SRMR), the root mean square error of approximation (RMSEA), and the comparative fit index (CFI). Overall fit of the exploratory model was excellent, $\chi^2 = 1.058$, $p = .30$. All model fit indices indicated excellent fit (SRMR = .02; RMSEA = .023; CFI = .999), suggesting that the relations in the revised path model describe the data extremely well.

Specifically, in the revised model, annual household income significantly predicted economic pressure ($b = -1.67$, $p < .001$) and parent anxiety ($b = 0.52$, $p = .04$). In turn, economic pressure significantly predicted parent anxiety ($b = .28$,

$p = .001$) and to a lesser extent, child anxiety ($b = .14$, $p < .03$). Last, parent anxiety significantly predicted child anxiety ($b = .48$, $p < .001$).

Discussion

The aim of the study was to determine the extent to which income, economic pressure, parental threat transmission, and parent anxiety influenced child anxiety.

The increase in anxiety in children from the parent can be due to a number of behaviors such as outwardly worrying around the house, or the parent can simply perceive their child as more anxious through projection. Parental threat transmission not being an influential variable could be the result of children not understanding the severity of the pandemic or being protected from stressful information by their parents. Despite this, parents with jobs that could lead to higher exposure rates could consider the pandemic to be a greater threat than parents that do not. Information, and unfortunately, disinformation being readily available also affects anxiety as well. Parent threat transmission still plays a part in how anxious parents can feel; too low would mean taking less precautions such as vaccinations and social distancing, while too high could create a myriad of anxiety problems such as panic disorder or agoraphobia.

Factors such as a child's understanding of the household finances, parental health, and economic pressure affect parent anxiety, however, must be taken in separate consideration since they can affect anxiety in different ways.

Income and economic pressure had more of an impact on child anxiety than any of the other factors investigated in the study. Even if no one else is affected in the child's family due to the pandemic outside of income and economic pressure, these affect children more personally than any of the other variables measured in the survey.

LIMITATIONS AND FUTURE DIRECTIONS

As previously mentioned, the survey was distributed in July 2020, when the pandemic was only four months in. Attitudes towards the pandemic have changed over time, and with a variable that can be difficult to quantify, the low impact that parental threat transmission had on anxiety has many explanations, making this study a snapshot of an earlier era of the pandemic.

Conclusion

With income and economic pressure the most influential factors on parent anxiety, and therefore child anxiety, this survey suggests that any policy changes that plan to ease anxiety and mental health as an extension need to aid families economically. Policies such as a higher minimum wage, consistent

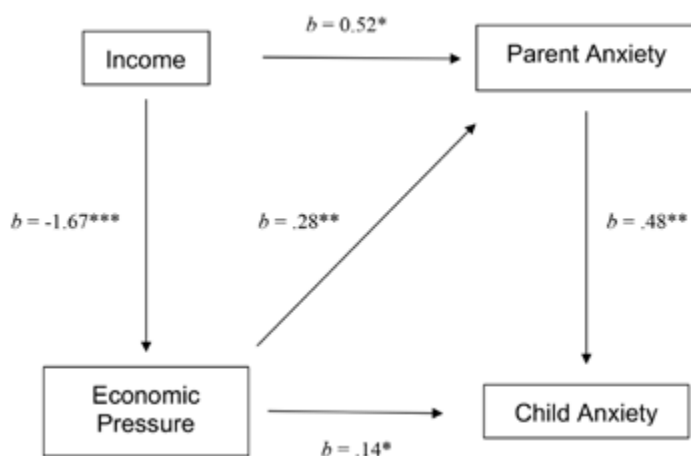


Figure 4. Revised Model of Relations Between Variables.

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. More variables impacted child anxiety than previously hypothesized. Economic pressure and income directly impacted child anxiety, while child anxiety also affected parent anxiety. Parent threat transmission was removed from the revised model entirely as the hypothesized effect that it would have on any of the other variables was minor.

stimulus checks, and hazard pay would boost income, and therefore, ease economic pressure placed on households by the pandemic. Parents, and by extension, their children, will not have to worry about cutting expenses, missing bill payments for housing or healthcare, or dramatic changes in their lives. With the COVID-19 disrupting the lives of millions of people in Hawai'i, levels of anxiety have changed along with the reality in which parents and children now live. The virus has impacted the functioning of entire systems such as the economy, the educational system, healthcare, and the employment of millions of people. These changes and disruptions have changed the levels of stress and anxiety that individuals of all ages experience in their everyday lives. This survey seeks to investigate the levels of anxiety in the lives of parents and their children as they adapt and change to the ongoing pandemic.

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