The Effect of Social Isolation on Adolescents During COVID-19

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Abstract

My initial hypothesis was that adolescents may carry into adulthood the potential residual effects of social isolation on behavioral changes. To draw a holistic picture of the situation at hand, I went on a quest through different disciplines to test my hypothesis's credibility. First, I examined historical events by following adolescents who lived in similar circumstances. I was looking for helpful trajectories that can be implemented in the current situation to detect any common behavioral patterns. Unable to find a satisfying answer, I have come, through this research, to realize that the question I was asking is complicated and not readily open to historical comparison. By visiting the neurodevelopmental literature, I learned that social isolation could cause a hormonal and neurological imbalance that may shift from a goal-oriented to a habit-like behavior. Equipped with this knowledge, I ventured next into the world of psychology. I aimed to learn from human development theories and to draw a trajectory of the potential long-term damage on the cohort in question. With the abundance of information, I worked on testing and adapting my initial hypothesis. This took me also, inevitably, into issues related to the context where adolescents would normally reside for much of their day: school. I also realized that my interdisciplinary quest was missing a significant factor: social media. I started my research on social media expecting to confirm the negative effect of long hours of exposure to social media, only to be pulled into a complicated, potentially helpful, and useful virtual world that I barely knew. I realized that I could not apply my knowledge as an adult to the age group in question because, practically, many of them are living through the pandemic in a different world: the virtual world.
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Introduction

The pandemic has forced our human race to change their social behavior to curb the intensity of Covid-19. As of March 2021, the total number of deaths in the world has reached 2,772,033 lives. The United States has lost 548,800 fellow Americans.¹ A gloomy atmosphere crawled into every household: social isolation, death of relatives, and income loss became the norm worldwide. The elderly, who are at high risk of being infected by the deadly virus, are deprived of human interaction and confined within their homes. School-aged children have been forced to attend virtual learning while many adults have been restricted to a work-from-home environment. Also, parents have been cornered into home-schooling their children, in some cases, with minimal experience in virtual learning. With the hope of a promising new vaccine on the horizon, many people are patiently awaiting the silver lining and willing to move on to a brighter future while leaving this crisis to be taught to future generations as a dark memory in human history.

Resilience, as a human trait, will aid our society to move on. However, it will be naïve to assume that this pandemic will not have a long-term effect on individuals who witnessed this ordeal. Social isolation will have future repercussions in every age group. Due to their young age, children will soon forget about the pandemic, as well as the terminology associated with it, such as isolation and social distancing. They will engage in social activities once this age group is given the green light by their adult caregivers, whom they look up to for information and security. As for adults, the pre-COVID days’ memory is sufficient to put this group into its pre-

pandemic habits. They may need to accept their loss, but eventually, adults will most likely rebuild their lives based on existing experiences. The group that will be primarily affected in the long term, in my opinion, is the adolescents’ generation. This is due to the existing set of challenges that adolescents are already dealing with based on age-related developmental milestones. The effect of social isolation on adolescents has to be evaluated as an interdisciplinary subject. Although adolescence is well represented in many disciplines, such as medical, social and psychological ones, each field delivers a different perspective associated with that field’s expertise. Therefore, the final product is missing the holistic perspective. I aim at collecting data from different study fields in an effort to join the interdisciplinary pieces of puzzle into one final mosaic project.

My initial thought was to compare current adolescents to previous generations who witnessed similar historical events, specifically the Spanish Flu, hoping to find a common path that adolescents followed to overcome such an event. Later, I realized that this task might not be possible because the science of adolescent development was limited at the time of the 1918 pandemic; therefore, scholars knew little about the influence of historic disasters on this age group in the past. Fortunately, with the turn of the twentieth century, scholars took a particular interest in adolescents. They directed their attention toward this cohort as a critical age group, characterized by crucial physical and psychological changes. With the growing numbers of this age group and an estimated 1.2 billion adolescents worldwide, those studies gained momentum (Dahl et al., 2018). The literature on adolescence has overflowed academia, which I will rely on for my research. The task in hand requires an interdisciplinary approach that aims to shape a holistic picture of the current situation. Therefore, I will draw upon sources from different
scientific, social, and psychological scholars to form my own most pressing questions and help shape my future study suggestions.

I chose adolescents as my focus group for their vital role in shaping society since they represent future adults whom the community will rely on to develop a healthy and productive unit to prosper socially and economically. When adolescents experience significant psychological and social changes due to a traumatic event, such as the current pandemic, the results may cause severe damage to the mental health of this group. This damage may alter the cohort’s behavior and ultimately affect the future working adults of a nation. My initial perception was that social isolation would cause severe yet inevitable damage to adolescents. I based my assumption on collective neurodevelopmental data that describe the critical milestones that adolescents experience throughout their journey towards adulthood. The research took a surprising turn by redirecting my quest towards the fascinating realm of the virtual world. This sudden turn forced me to doubt my original assumption. It showed me a world where current adolescents, the digital natives, process knowledge using different tools whose functions previous generations are unfamiliar with. This discovery led me to question the criteria used to study this age group.

This paper will investigate the social and psychological effects of social isolation on adolescents and the challenges and concerns that this age group faces. It is not my aim to find clear answers regarding the outcome of social isolation. First, it is premature to collect data since we are still struggling to contain COVID-19. Second, it takes years of observation and data collection to frame such a study. This project is a base that I will build upon in the future. Even though social isolation has apparent consequences for adolescents, such as stress and depression, I am more interested in the effects of this phenomenon on shaping their personalities and any
change in attitude that could affect their decision-making into adulthood. I am confident that in the next few years, researchers will collect data to frame the extent of this crisis, but for now, I will draw on The Spanish Flu briefly to consider how previous scholars have asked these questions. Even though it is helpful to study previous crises that forced humanity into social isolation, the current pandemic is unique in that young people are exposed to social interaction through social media. Although exposure to social media has some adverse effects, one cannot ignore its essential role in shaping this generation.

My research is in the convergence of extensive interdisciplinary studies, which aim to consider this topic from different perspectives. During the initial stages of my research, I was bombarded with overwhelmingly pessimistic opinions by an abundance of concerned individuals, including friends and coworkers. They assumed a disastrous effect of social isolation on adolescents. Later, however, I realized that there are always two sides to a story. Although this research will be an ongoing discussion in academia, I am hopeful that, with social support, adolescents will show resilience and overcome this phase.
Definition of adolescence

My quest is to focus on adolescents as an age group. Little did I know as I began this project that the group in question does not have a clear-cut frame. A part of my project then became understanding different cultural definitions of adolescence. Some of the references I read discuss adolescents, others talk about young adults. Later, to confuse me even more, I stumbled upon the term “Generation Z” in my newly acquired virtual skills essential for this project. These three age groups intertwine, which makes differentiating between them confusing. The term “adolescent” is usually used in social science, while “young adult” and “generation Z” mainly refer to financial and marketing trajectories.

The World Health Organization defines adolescents as individuals between the ages of 10 and 19 years, while young adults represent those between the ages of 15 and 24 (WHO, 5). In other words, adolescence is defined as the age of physical, social, and psychological development. Simultaneously, the term “young adults” is associated with a later development stage, characterized by economic independence and career establishment. As for Generation Z, it is the group that was born between 1997 and 2012. Generation Z describes a specific generation according to historical events during this particular phase. It represents a generation born into the digital world that is politically progressive and financially-minded (The Annie Casey Foundation, 2021). To put this term into perspective, my mother is a Baby Boomer, I am a Gen X, and my daughter is Gen Z. Each generation witnessed historical events that affected their perception. For example, I lived my adolescent years in Lebanon during the civil war. My daughter did not experience similar trauma; therefore, her perception of war is limited to my narratives. For this research, the term “Gen Z” will refer to a generation born into an era where
smartphones and social media are the highlights of their time. It is the generation that will “google” how to use a rotary dial phone. I include the term “Gen Z” because defining a generation simplifies understanding each generation's behavior during adolescence (Dimock, 2019). Therefore, I believe that the terms adolescent, young adults, and Gen Z have to be integrated to frame a holistic perception of the topic at hand. I will be using the three terms according to their relevance.

Adolescence refers to the phase of development during which a person is wired with social and cognitive skills that will launch them into the debut of adulthood. It is the stage where individuals venture towards social and economic independence. It is also the age group that is exposed to social media and the virtual world. Experts in cognitive neuroscience and developmental psychiatry such as Crone and Dahl define adolescence as the transitional phase between childhood and adulthood. It is a learning phase as well as an adjustment period of personal aspirations and future goals. In simple words, adolescence is a phase where young people endure physical, cognitive, and emotional changes while trying to figure out their spot in their social environment. It is a turbulent stage where identity is in question, and physical changes are an embarrassment.

Biologically speaking, adolescence begins with puberty between the age of 9 and 12 years old. During this period, adolescents experience hormonal changes as well as social, behavioral, and emotional changes. The end part of this phase is characterized by the development of decision-making concerning career, identity, friends, romantic partners, and religious and philosophical beliefs. Neurodevelopmental changes also describe this phase: it is the stage where the brain develops the neurological system that controls behavioral development.
During this phase, adolescents tend to develop healthy social values, such as inspired goals, and unhealthy ones, such as drug and alcohol use and thrill-seeking (Crone and Konijin, 2018).

**Historical Background**

The study of adolescence is relatively new, and it has its share of evolutionary thoughts. In the nineteenth century, scholars were interested in exploring this new identity and its effect on society's coherence. I came across a book from the mid-nineteenth century that seems to note this particular aspect: adolescents' personality formation. In 1832, pastor Joel Hawes discussed in his publication, *Lectures to Young Men*, the changes that adolescents experience and how these experiences may negatively affect the community if these changes are not controlled and directed towards the greater good of the society. Pastor Hawes describes this phase as “*this time that the character assumes its permanent shape and color, and the young man is wont to take his course for life and for eternity*” (Hawes, 19).

Historians such as John and Virginia Demos believe that the term “adolescence” emerged in nineteenth-century America. They explain that adolescence, as a stage, became noticeable as the United States shifted from a rural to an urban society. In rural families, all members collaborate to achieve their goal as a farming family, regardless of age groups. Adolescents, in this setting, grow up to be farmers. But in urban environments, the authors explain, the gap between children and adults grew wider. Parents could not assign goals, which forced adolescents to create their own identity (Demos and Demos, 1969).

A few years later, the Darwinian evolutionary theory was introduced to the academic community. Many scholars integrated the view into their disciplines to interpret unexplained behaviors. Stanley Hall, one of the principal founders of American psychology, was influenced
by evolutionary theory, which is evident in his writings on adolescents' role in society. Hall ventured into the field of adolescence by forming study groups to learn about adolescent developmental changes. In this study, Hall asked mothers to report their adolescent children's behavior (Demos and Demos, 1969). Hall concluded that “Adolescence is characterized by lack of coordination, difficulty in adjusting to the environment, the risk of mental and physical relapse. Therefore, providing the most favorable environment and eliminating every possible cause of arrest is key in protecting this age group” (Hall, 1916).

Although Hall’s publications at the end of the nineteenth century and early twentieth century looked promising in the study of adolescents, research was primarily descriptive. With new developmental theories in the horizon and the increase of information on adolescent anatomy, the field took a turn towards a new phase in which science is applied to the real world. Adolescent behavior was changing, and society was faced with new social issues, such as drug use, non-marital pregnancy, and depression. Thus, the study of adolescence evolved into scientific-based research, where adaptation to new circumstances was studied (Steinberg and Lerner, 2004). The goal was to draw adolescents' trajectories based on available information, thus containing unwanted behavior before it escalates into a bigger problem.

The shift from describing the developmental milestones of adolescents to the interaction of this cohort with its environment was the subject of new theoretical models, such as the human ecology model by Bronfenbrenner and the life course theory by Elder. I will expand later on these theories. By using these models, researchers follow a multidisciplinary perspective to explain physical and mental changes that adolescents experience in relation to their social environment. This environment includes family, school and peers as well as the community at large. In order to form a holistic model, researchers argue that the adolescent population is
diverse in terms of race and social class. Therefore, this group cannot be perceived as one size fits all. For example, Latino minorities may suffer from some health conditions, such as obesity due to illiteracy and poverty, while others, such as Asian immigrants tend to excel in education due to parental high expectations (Crosnoe et al. 2011).

At the beginning of the twenty first century, the study of adolescence entered another phase, where scientists used the multi-disciplinary studies to promote positive development. Scholars realized that the available studies can help shape the future generation into healthy individuals, qualified to be leaders among their family as well as their community. By promoting positive behavior, adolescence may well build the civil society needed to lead the society into a healthy future (Steinberg and Lerner, 2004). In addition to the wealth of knowledge that researchers collected throughout the past two centuries, this futuristic method adds biomarkers to identify genetic traits. The development of genetic science enabled scientists to read the individual genetic map to predict behavioral changes within a social context. For example, GABRA2, a gene-regulating neurotransmitter, is associated with conduct disorder in adolescents (Crosnoe et al. 2011). By identifying this gene, scientists can direct this individual away from risk taking situations. The development of the genetic theory enables researchers in identifying some unhealthy behavior in its early phases, such as depression. Other genetic traits can be encouraged if it benefits the society in general.
Definition of Social Isolation

I have established to my reader the reason why I chose this cohort to be the focus of my research. Since adolescence is known for physical and mental changes, I am curious to investigate the effects of a dramatic change, such of social isolation during the pandemic, on this cohort’s behavior. Social isolation is usually defined as the lack of social interaction with family, friends, and neighbors; it is the absence of societal interaction at large (NCBI, 1992). Social isolation, specifically during the current pandemic, refers to school closure, social distancing, and deprivation of face-to-face interaction with relatives and friends outside of the household. In addition to loneliness, social isolation has long-term adverse effects on humanity, such as depression and stress. The importance of factoring social isolation into the general impact on adolescence is based on the evolutionary argument that humans are social species that function as a group to survive. Humans learned that cooperation is essential in hunting, protection, and reproduction (The Cooperative Human, 2018). Our ancestors developed the ability to draw, and later talk, to communicate with each other. By sharing, the older generation could channel their experiences to the younger one, thus surviving the harsh environment and developing cultures.

Since social isolation goes against human instinct, it is interesting to study its effect on our species. However, one should be careful when generalizing because humans are diverse; while some prosper in a societal environment, others are content with seclusion. Besides, the term “social isolation” may be tricky when discussing adolescents, especially with social interaction available through the virtual world. In addition, adolescence is an age group that mostly lives with caregivers. Adolescents need societal interaction to develop behavioral skills that will enable them to navigate their place in the human hierarchy. With isolation, I wonder if
the community is in the process of witnessing a new set of skills where face-to-face interaction is not essential for the adolescents’ behavioral development, but rather virtual interaction is setting new rules.
Since data on social isolation during the current pandemic is still being researched, I will look into similar historical events that led American society to isolate. I hope to find any evidence that shows how adolescents survived social isolation in a similar historical event and the long-term effects of that event on their behavior.

“I had a little bird. Its name was Enza. I opened the window, and in flew Enza”.

The pandemic that seemed, in my opinion, closest to COVID-19 was the Spanish Flu. Like the current pandemic, the 1918 influenza, which killed millions worldwide, had spread within two months to every country on Earth. For almost two years, individuals worldwide fought a ghostly enemy that would strike and kill without giving its opponent the power to fight back. Unlike a natural disaster with an identified source and sometimes a predicted trajectory, the Spanish Flu was an enemy that scientists lacked the knowledge needed to deal with.

The Spanish Flu mainly collected the lives of people aged 20-40 years. Although scientists attempted to explain this phenomenon, it is still a mystery. Some researchers argue that this age group was exposed to a previous influenza outbreak (Russian Flu, 1889-90) as infants and young children. This exposure caused an alteration in their metabolism and permanent damage to their lungs, making this age group vulnerable to any new influenza type (Gagnon et al., 2013). Another theory argues that this age group was affected due to other environmental exposures such as smoking and aspirin (Morens and Fauci, 2007).

Francis Russell, who wrote his memoirs on the Spanish Flu, describes the general atmosphere of fear of the pandemic and the resistance of some who refused to wear a mask due

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2 Old Nursery Rhyme
to their claims of personal freedom. Russell narrates the general precautions that the population was advised to follow, such as spraying nose and throat with dichloride, taking plenty of rest, refraining from handshaking, eating healthy diet, and keeping windows wide open. In the third grade in Boston, the author was happy with school closures (Russell, 1957). Even though his *Journal of the Plague* provides little details on how this age group was dealing with the pandemic, it draws a gloomy picture of the death toll that surrounded the author at that time. Russell also talks about his adventures with his friends, in which they used to meet and watch the everyday burial events. His outdoor adventures give the impression that adolescents were not confined at home. Although it is worth noting that, at that time, outdoor activities were the norm, since they were the primary source of entertainment and socialization for this age group.

Other survivors narrated similar stories of the Spanish Flu. Edna Boone, who was ten years old at that time, confirms the same atmosphere where people were falling sick for two weeks because of the “Asian Flu.” She also mentioned school and church closures. Edna describes the overall community interaction, where a healthy household would prepare food for the infected ones. (“1918 Pandemic Influenza Survivors Share their Stories”, 2017).

The literature preserved from the Spanish Flu era did not fulfill my initial inquiry. Although there is plenty of historical narration on the Spanish Flu, I could not find a helpful connection that ties adolescents who survived the Spanish Flu to the current ones. Perhaps I am asking the wrong questions. For one, the science of human development was still in the making at the beginning of the last century; therefore, scholars did not yet pinpoint adolescents as an age group critical for societal development. In addition, I realized that I am comparing things that are polar opposites when it comes to generational differences. The Greatest Generation, the one

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\(^3\)Aboutgeneration.com
that survived the Spanish Flu, has different experiences than Generation Z. Although both
generations experienced school closures, the former enjoyed the outdoors and the company of
their peers, while the latter were confined at home, navigating the virtual world.
Since records on the Spanish Flu do not provide this project with much useful information, I will direct my inquiries on the effect of social isolation to the science of neurodevelopment. I am curious to investigate the physical and hormonal effects on an adolescent’s behavior. Neuroscience explains in detail the chemical reactions in an adolescent’s brain and the results that shape their behavior and interaction with their environment. In contrast, if a change in the adolescent’s environment, such as social isolation, affects their behavior, I wonder about brain chemistry changes. I am interested to learn if social isolation will cause any damage to the hormonal and chemical balance of an adolescent. And if so, I wonder if the damage is reversible or permanent. I believe that the answer to this question will help predict how society will maintain its healthy existence in the future.

Scientists stress the importance of adolescence as a developmental phase due to physical and psychological changes that carry on into adulthood. Changes in brain activity, especially in the cortical region, have long-lasting effects on emotional stability and establish an identity within a societal context. Accordingly, researchers need to study the impact of social deprivation on adolescents since it may have a long-term effect that will linger into adulthood. Besides, by drawing a timeline for the developing human brain, scientists will pinpoint the right time for intervention (Dahl et al., 2018). This section will explore the effect of social isolation on behavioral changes in two areas: habit-like behavior and stress. The environmentally-induced changes I hope to investigate start as neurological reactions and end with a set of behavioral changes. While stress is short-lived, and symptoms usually stop once the source is resolved,
habit-like behavior is permanent, and its effects may cause damage not only to the person but to society.

The inability to create a laboratory-induced experiment where humans are exposed to a stressful environment, such as social deprivation, makes our data very limited on that subject. However, I believe that, with this current pandemic, researchers will have plenty of data to rely on in the next few years. Online questionnaires are conducted worldwide, with encouraging feedback. Since human exposure to social isolation may be considered unethical in a laboratory setting, scientists have to depend on the abundance of animal research. Most of the research conducted used rodents due to the similarity that rodents have with humans regarding the developmental process and social behavior. Adolescent rodents show similar peer interaction to humans. Studies show that social isolation in rodents triggers anxiety, hyperactivity, and the tendency to seek food and drugs. Even though some of those effects, such as anxiety, disappear once the rodent is placed back within its social environment, other results have long-term consequences, such as an increase in ethanol intake. Also, researchers noticed that social isolation in the adolescent phase in rodents had adverse cognitive effects such as difficulty in learning and attention deficit (Orben et al., 2020).

**Habit-like vs. goal-oriented:**

I remember watching a documentary a while ago on mental self-care. What stuck with me from that day was the danger and ease of forming habit-like behavior. The example used to explain that phenomenon was something I am guilty of doing: driving to work every day using the same route. The reason for calling this a bad habit, according to the documentary, is that the individual will create an automatic routine, which allows part of the brain to shut down. The
solution, according to that show, was to change the route to keep the brain interacting. Even though this route routine is relatively harmless, other habit-like behaviors cause more significant damage, such as drug and alcohol use. With proper self-discipline, an individual may overcome habit-like behavior. Still, it will be challenging when the environment, such as social isolation, forces this shift towards a comfortable and familiar setting. I am worried that habit-like behavior might damage adolescents in a way that harms future society's sustainability. A civilization advances with its goal-oriented members. If the members are not equipped for that task, I fear that the outcome may cripple our nation.

Based on the research available on rodents, there is enough information to confirm that social isolation triggers habit-like behavior. By relying on experiments conducted on mice, scientists concluded that adolescence is a critical phase during which social circumstances influence the ability to create and follow goals in adulthood. Scientists tested this hypothesis by conducting an experiment where mice are isolated from others during their adolescent phase and later re-integrated in adulthood. The results showed that this forced isolation created a behavior that was habit-like rather than goal-oriented, even after social integration in adulthood is enforced. The study concludes that adolescent mice exposed to social interaction can learn new skills while isolated ones adopted old habits.

With this conclusion, I will take the reader next to the unique neurological system that controls human reactions to external factors. The noticeable behavior change is the outcome of a set of chemical changes in the neurological sphere. These changes occur in the dendritic spine (nerve endings), which, if disrupted, may cause the species to refer to habit-based rather than goal-oriented behavior. Dendritic spines\(^4\) and synapses (connectors) are responsible for

\(^4\) Dendritic spines serve as a storage site for synaptic strength and help transmit electrical signals to the neuron's cell body (Wikipedia).
developing response strategies that an organism requires in decision making. A disruption to this sensitive procedure may eliminate the ability to make decisions, and the organism will rely on previous experience, therefore confirming habit-based behaviors. As a disruptive agent to this process, social isolation may cause negative habit-oriented behaviors, such as addiction and obesity in adults (Hinton et al., 2019).

Reinforcing the danger of habit-oriented behavior, a study was conducted to measure alcohol consumption in the population during the pandemic. The study showed that the percentage of adolescents consuming alcohol did not change, but the frequency increased. This increase may be related to its availability in the household. In addition, vaping decreased from 16.6% to 11.5%, while cannabis use decreased for girls from 16.4% to 13.4%, but the frequency increased (Dumas et al., 2020). Due to school closure and lack of activity, adolescents have more time on their hands.

The increase in alcohol and substance use during the pandemic confirms that social isolation may trigger habit-like behavior. Adolescents, in the above study, discuss different factors for substance use. Some argue that substance and alcohol use is a coping strategy that
helps this age group overcome long confinement days. The study highlights a new phenomenon, in which adolescents’ substance use mainly occurs in a solitary setting. The latter is very concerning because it predicts future mental health issues (Dumas et al., 2020).

When human adolescents are deprived of their daily routine of going to school, face-to-face interaction with peers, and sports involvement, is it possible that the age group will develop habit-like behaviors? If this is the case, what will the future society look like? Can the “digital natives” substitute online exposure for in-person peer interaction? Unlike the enforced social isolation that rodents endured, adolescents tend to prefer isolation from their families by choice. By recognizing this tendency, a socially-enforced culture plays a role in adjusting adolescents’ behavior within accepted norms. Caregivers should be aware of the potential damage caused by social isolation, get involved in guiding adolescents through this phase, and work with them on shaping goal-oriented skills.

**Stress:**

Working in a health care setting, I witness discussions between patient and provider. Usually, the patient comes with symptoms like headaches, reflux, or insomnia, hoping that the physician will treat their condition. After running a few tests, the provider usually will discuss the positive results and conclude the discussion by saying: “it is probably stress.” In addition to habit-like behavior, social isolation triggers another neurological challenge. One critical yet reversible change is the increase in stress and anxiety in adolescence. My aim in discussing this behavior is to highlight the serious health risks associated with stress. It is a common complaint among adolescents that stress and anxiety are side effects of the pandemic. According to Mayo Clinic, stress is guilty of causing many symptoms, such as chest pain, headache, fatigue, upset
stomach, anger, and sleep deficit (Mayo Clinic, 2019). These symptoms may result in serious illness if left untreated. Even though the current environment is the leading cause of stress and anxiety, little can be done to solve it. Fortunately, the pharmaceutical field offers many drugs that curb the severity of stress and anxiety.

I find it fascinating to learn how scientists translate complex chemical reactions in the brain into descriptive, human behavior. They blame glucocorticoid insufficiency in adolescence for the increase in stress levels. By using rodents, scientists were able to study the short-term effect of social isolation on stress levels. Luckily, the experiment proved that, by re-housing mice into its social network, glucocorticoid leveled up, and consequently, stressful behavior was resolved (Hinton et al., 2019).

The following experiment explains the effect of hormonal imbalance on human behavior. It highlights the association of stress levels with oxytocin levels, a hormone essential in building social connections. An interesting study on prairie voles confirms that increasing oxytocin levels helps with social isolation symptoms and aging. The study conducted on female prairie voles indicates that oxytocin may regulate the stress levels in humans. The research placed the study group in isolation to trigger stress and injected a group with oxytocin (Stevenson et al., 2019).

Oxytocin, a neurotransmitter hormone, is responsible for bonding and attachment. Its level increases in social interaction, but with social isolation, stress levels in the body decrease. In contrast, stress triggers the release of the hormone corticoid, which is associated with low energy and suppresses the immune system. This is due to this hormone's ability to direct the body's energy and nutrition from the usual tasks to cope with the stressors. Oxytocin levels play a role

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5 Glucocorticoids are a class of corticosteroids, which are a class of steroid hormones. Glucocorticoids are corticosteroids that bind to the glucocorticoid receptor that is present in almost every vertebrate animal cell (Wikipedia).
in regulating this process: a higher oxytocin level can reduce the stress response's activation and release the body's corticoid (Stevenson et al., 2019). Other hormones are similarly affected by social deprivation. A decrease in dopamine and serotonin affects brain development, which induces behavioral changes such as lack of motivation and increased anxiety (Orben et al., 2020). This research will help analyze the impact of social isolation on adolescents while providing tools to revoke some of its harmful effects by substituting hormonal unbalance with human-made alternatives.

Although medications can play a role in treating side effects, one should not ignore a significant stabilizer: caregivers' influence on adolescents. Their impact can be direct by helping this cohort navigate this challenging phase or indirectly by their behavior towards the pandemic. A caregiver who provides a safe environment helps ease the effects of social isolation. In contrast, a stressed and anxious caregiver will mirror these feelings towards the household's young ones. When speaking of the role that society plays in containing a behavior, it is essential to factor in the increased testosterone levels in girls and boys during this phase. In addition to its importance in puberty, this hormone is associated with establishing social status. So, when a society intervenes to curb a hormonal adolescent's behavior, it is essential to include them in the intervention process since adolescents are not passive learners. They are trying to establish their presence in society. Also, the sudden rise of a hormonal level triggers another behavior, which is risk-taking. Again, the community may channel this energy towards pro-social opportunities, such as sports, volunteering, and social justice (Dahl et al., 2018).

The abundance of information on adolescents’ brains should be used to direct this energy away from habit-like behavior like drugs and obesity and aim to work with this age group to
channel newly acquired energy towards positive goals. Stress should not be underestimated, but it is instead treated as a condition requiring immediate attention and treatment.

Neurology partially answered my inquiry. With scientific evidence, I know that it is possible for the environment to trigger a neurological chain of reactions that may lead to a negative change in behavior. The severity of the reaction depends on the individual as well as their support group.
Human Development Theories

While neuroscientists explain the internal changes, behavioral scientists and psychiatrists pave the way for society to deal with these changes. This enables the formation of practices that society may implement to curb any side effects caused by the sudden change to an adolescent’s environment. Scholars have invested in the study of human development for its beneficial information in tracing the human body's development from birth to death. Those studies project age-related behaviors as well as physical changes to establish physical and psychological milestones. Comprehensive research has to include physical changes to the body and behavioral aspects to develop a well-rounded outcome.

In the previous section, I highlighted the neurological changes that may be responsible for behavioral changes. In this section, I am interested in investigating how psychology contributes to finding answers to human behavior and how this behavior affects a society. Even though chemical reactions provide valuable explanation of behavioral changes, personality variation may be misread if restricted into one frame. The wealth of theories on human behavior and development in psychology is overwhelming. My concern is to connect the information acquired through neuroscience to the current situation. After navigating behavioral schools of thought, I decided to explore two theories that relate the individual to society: The Bioecological model of human development and the Life-course development theory.

Bioecological model

One of the prominent advocates for a holistic theory in psychology is Urie Bronfenbrenner. He rejected the results created in the laboratories by arguing that an individual
does not exist in a bubble but rather in a society with culture and rules. Consequently, Bronfenbrenner developed the Bioecological model that studies the interchangeable influence between an individual and its societal elements, such as family, peers, and school, on its biological and psychological development, within the context of time. The theory analyzes the life course of a person throughout generation and time. By building a behavioral approach, the bioecological researcher can predict future outcomes or even alter reactions to a changing environment.

The Bioecological theory has four components: the proximal process, personal characteristics, context, and the dimension of time. The proximal process, which represents an individual's interaction with the environment, does not function without the other three components. What is valuable in this theory are the personal characteristics that pave the road to either difficulty or readiness to engage in the proximal process. The second component's reaction, the person, is influenced by personal traits, resources (family, experiences, or knowledge), and the overall societal culture. Bronfenbrenner explains that a disruptive character who has difficulty controlling emotions and behavior, such as impulsiveness, explosiveness, apathy, and lack of interest, will result in an individual who cannot show resilience and accept the changes in the environment. By contrast, a generative individual who has curiosity, tendency to initiate and engage can have long-term goals (Bronfenbrenner and Pamela, 2007). In other words, a traumatic event may have a different outcome based on personal character as well as the environment and social interaction. Resilience, the ability of a person to recover from a traumatic event, varies according to the type of personality and the social support available at that time. An adolescent with a supportive network at home might react to the pandemic by showing signs of
resilience, while an adolescent whose parents lost their income source might show a higher level of stress.

The Bioecological theory places the adolescent as the center of attention in a complicated network of societal support. The microsystem, where the youth is placed is surrounded by the mesosystem that includes family, peers and neighbors. Schools and community services, the exosystem, come as a third layer of support. Finally, economy and welfare services shape the final support layer, which is the macrosystem. During the pandemic, each of these layers are disrupted. Adolescents suffer when their families suffer due to mortality, unemployment and racial inequality (Cheng et al., 2020). By using this framework, scholars can analyze and predict the traumatic effects on an individual and society. Taking the educational system as an example, the bioecological theory can be used to analyze how a society deals with a traumatic event such COVID-19. An individual (microsystem) cannot face the traumatic consequences of the lockdown without the support of their school (mesosystem), whose role is to deal with the immediate effects of social isolation and to get them back on track towards the academic pathway. In addition, mental health services (macrosystem) and long-term coaching should be capable of supporting the individual throughout the trauma (Muccahy, 2020). Resilience is a joint effort where an individual is supported by the community and has access to essential services (Boon et al., 2011). By assessing an individual’s characteristics, such as optimism and adaptation in a social context, starting with caregivers and ending with governmental financial support and regulations, researchers may develop tangible effects of trauma and predict the future outcome. The diagram below helps simplify the intertwined Bioecological theory (Boon et al., 2011).
Conceptual scheme of Bronfenbrenner’s systems and their interactions (Diagram constructed by authors to illustrate Bronfenbrenner’s theory)

The diagram explains how society shapes an individual’s personality, starting with caregivers and peers (Microsystem) and ending with governmental policy-making (Macrosystem). By defining the roles that culture plays in shaping an individual’s behavior, Bronfenbrenner’s theory stresses each player's responsibility in molding healthy behavior. The effect of social isolation on adolescence should not be studied in a bubble but as part of a bigger picture. It enables awareness of the problem on a societal level and encourages an individual’s micro, meso, and macrosystems to play an active role in dealing with this phenomenon. With social isolation, adolescents suffer from mental health issues that may alter their behavior and decision making in the future. Caregivers can see the early signs of trauma since they are the first layer of support. Once those signs are identified, mental health services may get involved. Since adolescents’ reaction to trauma varies based on racial and economic variables, it is the society’s role to identify those variables and to channel adolescents’ needs towards the proper service channels.

While the Bioecological theory is useful in involving the different support systems, it is too complicated in my opinion. Since Bronfenbrenner believes that every adolescent is unique
and should be perceived as such, it is challenging to apply one rule that obviously does not fit all. It is one of the examples that evaluating an individual’s needs depend on that person’s characteristic, the nature of its social support systems as well as the inclusion challenges that this person may experience. In contrast, Elder’s life course theory includes longitudinal research on cases that offers answers to traumatic events. Instead of building a theory that may or may not work, Elder presents a final product that carries answers.

**The life course theory**

The life course theory follows the effect of traumatic events from adolescence to adulthood, to learn about the possible trajectories that individuals adopt. The studies that adopt this theory include socioeconomic differences among individuals and observe the level of resilience. Influenced by longitudinal studies at the University of California in the 1920s and 1930s on child development, a research professor in sociology and psychology, Glen Elder, came up with the Life-course theory. Similar to the bioecological approach, Elder confirms that an individual is affected by their environment and that development is shaped by the social trajectories of family, education, and work. Using research conducted on children and adolescents during the Great Depression and the second world war, scholars followed their study groups well into adulthood. This longitudinal study shows that historical events would affect the social trajectory and consequently cause a change in an individual’s development.

The study followed adolescents who lived during the Great Depression well into adulthood. Researchers were interested in the effect of a traumatic event on this specific cohort and to measure their resilience. The results showed different outcomes: Some were successful in overcoming the socioeconomic crisis by joining the military service or by having a nurturing
family, while others were less fortunate due to race and lack of education. The research showed that adolescents who joined the military service scored higher in mental health and life achievements as adults. By contrast, some black adolescents were less privileged and were not successful on the long term. In addition, adolescents who ventured into early marriage resulted in loss of education and consequently lower socioeconomic standard. The study included the difference in gender reaction to traumatic events. Girls were more susceptible to depression when they endure trauma, especially with the absence of parental support. Elder’s research shows that any historical change affects the individual development and results in trajectory shift on the long run. The severity of the shift depends on personal choices as well as societal support (Elder, 1998).

I believe that this theory can be applied to the current pandemic, since the psychological effects on this group may be high due to the significant disturbance to their daily routine. They may project changes in development in the future. Loss of loved ones, loss of household income, and educational shift to virtual learning, in addition to social isolation and restrictive physical activities, are all contributors. Unpredicted socio-historical events may cause permanent damage, shock the development and alter the trajectory.

The life course theory is explained through the following diagram. It highlights adolescence's importance as a stage since it predicts future trajectories in human development into adulthood.
Scientists agree that the adolescent phase is crucial in human development since behavioral and mental changes occur in that phase. They also agree that any abnormal change to their environment may alter the trajectory of cognitive and social behavior. Therefore, any critical event that an adolescent witness will most likely leave a long-term effect on his or her attitude in the future (Shcuman and Corning, 2011).
Collective memory in Adolescence

Growing up, I used to hear my grandfather murmuring these words: “Peace and prosperity do not last.” Although his words did not make sense to me as a child, I realized later that experiencing traumatic events is part of being a human. I learned that every generation has to inevitably endure one or more traumatic events. These events can be in a form of a pandemic, war, economic crisis or death of a parent. Every generation experiences historical events, but the effect of these events varies according to the age group of the individual when they experience the trauma. I mentioned earlier that the current pandemic will scar this generation, but the ones that will be affected the most are the adolescents. In this chapter, I will discuss the logic behind this assumption. In the chapter on neurological development, I discussed theories about the chemical and neurological transformation caused by changes in the individual’s environment and its effects on behavior. Later, in the chapter on human development theories, I explained the intertwined relation of an individual with their social community. This chapter will apply theories to practice by discussing real-life cases.

COVID-19 will likely leave a permanent mark on adolescents, but this assumption cannot be tested at the moment. However, relying on data from previous historical events, scholars may predict possible outcomes for the current pandemic. “Collective memory” is the term that researchers use to explain how a cohort reacts to a historical event. They believe that once a cohort experiences trauma, it will be retained in memory as they age. This is specifically critical to adolescents since this memory will have a generational effect. To test this theory, researchers attempted to investigate the traumatic effects of 9/11 on adolescents who witnessed it. Amy Corning and Howard Schuman, researchers at the university of Michigan, invested years in the
study of the effects of 9/11 on adolescents. They believe that a dramatic national or world event can have a long-term impact on young cohorts that leads to a lasting collective memory. They explain that such an event is probably the first major one experienced by this cohort, therefore it is the baseline that adolescents use to compare future events. They showed that individuals between the age of 11 and 30 years carry a vivid memory of the 9/11 events (Schuman and Corning, 2016). Although the study suggests the potential general effects of a traumatic event on adolescents, it does not clearly pinpoint the specific physical and psychiatric changes that are related to such a trauma.

Lawrance Amsel, a clinical psychiatrist in New York, collected data from adolescents who lived close to the World Trade Center at the time of 9/11. His study included a sample of ethnically diverse groups, equal numbers of males and females. It also included different socioeconomic status. His research shows that the group that was directly exposed to the traumatic event suffered from separation anxiety. Consequently, this group is less likely to live independently or with a partner. Furthermore, the study shows that the affected group will probably suffer from multiple physical and psychiatric problems, such as high blood pressure, obesity and smoking. What is alarming in this study is the realization that all potential physical and psychiatric problems evolved from untreated Post-Traumatic Stress disorder. Dr. Amsel concludes that early psychiatric intervention can decrease the effects. In addition, the diverse platform of the study group shows that individuals with no insurance or family support did not have access to early intervention, unlike the ones that had medical and social support (Anderson, 2019). The results that Dr. Amsel shares concur with the neurological changes associated with a sudden traumatic event and its effect on an individual’s behavior, especially in building a habit-like vs. goal-oriented behavior in adolescence.
The collective memory of the current pandemic will become part of social heritage. Adolescents will use this memory as a base to evaluate and analyze future experiences. Jonny Hawton, an advertising and marketing agent, highlights the potential trajectory of the long-term effects of the pandemic on Generation Z. Hawton explains that, with COVID-19, the cohort faces school closures, a global shutdown of many businesses, and unemployment. Based on the current challenges, the author draws a trajectory of this current cohort through adulthood. According to him, adolescents will prefer living in rural areas, spacious homes, and less crowded cities. Due to the ability to work from a home culture that has been successfully integrated within society, this trajectory may be applicable. Remote jobs will attract talents from all over the world, which were not able to relocate. Hawton also describes Generation Z as a “do it yourself”; they will rely on reusing material instead of buying brand new products. They will seek education but through untraditional channels since acquiring higher education will be less appealing. In summary, future adults will favor stability over wealth, personal development over higher education, and hobbies over traditional careers (Hawton, 2020). Whether this trajectory is realistic is yet to be seen.
Cross-Cultural Review

So far, my study is based on conversations in academia. I imagine the setting as a group of politicians discussing significant policies behind closed doors without sensing the public’s opinion. Or a group of physicians doing their morning rounds on patients without asking that patient how they feel. Therefore, in this section, I will look into interviews with adolescents or narratives written by them. To understand the extent of damage caused to adolescents during the pandemic, one must listen to their muffled voices. My sample will include adolescents from different parts of the world, because I am interested to learn if the pandemic has universally affected this cohort. I am curious to study how adolescents experienced COVID-19 within racial, economic and ethnic differences.

Scientists may define current symptoms associated with social isolation and predict a trajectory to probable consequences on the cohort in question. But I am interested to know how adolescents feel. Gathering from the limited data collected so far, I was able to find examples of adolescents’ reactions towards social isolation from literature published in developed and developing countries. During the current pandemic, Christopher Null, a journalist, conducted interviews with adolescents in the United States to understand social isolation’s immediate effect. He concluded that the devastation that they endure is real. For one, many milestone achievements take place at this stage in life, such as prom, graduation, and sports events. Being forced into social isolation stole those precious and memorable moments. Zoe, a subject in his research, narrates her frustration by describing this pandemic as “it feels like the last four years of hard work have been for nothing.” As for online learning, she adds, “it is just a waste of time.” For adults, this frustration is laughable since death and loss of jobs are at stake. Nevertheless,
one should not ignore the adolescents’ feeling of loss. For them, they “did not get the chance to say goodbye.” Null highlights the importance that caregivers play; they need to show compassion, validate their sadness, and be present for them (Null, 2020).

To back those feelings up with data, a group of researchers measured the stress and anxiety symptoms among U.S. college students in the time of COVID-19. The longitudinal qualitative study includes adolescents from diverse background and represents different gender, sexual orientation, race and household income. In general, the study group expressed an increase in stress due to lack of technology access and a quiet place to study. The research shows that women were more affected mentally than men. In their own words, several women express the challenges associated with returning home due to college closure. An Asian woman from a higher-income household complains of “being assigned home duties and taking care of siblings”. Another white woman from a low-income household adds that these chores are required to earn a spot in the household, regardless of being a full-time student. As for the LGBT community, going back to homophobic household and losing access to therapy force them to hide their sexual identity (Hoyt et al., 2020).

Those feelings of fear, loneliness, and depression are not limited to American adolescents. Chinese adolescents expressed the same concerns. In China, 220 million children and adolescents were asked to stay home and continue education through TV programs during the COVID-19 lockdown. According to research conducted in China, adolescents spend around five hours daily online, leading to mental and behavioral problems. Even though the Chinese adolescents showed similar symptoms to their American peers, the Chinese developed fear due to the universal bias against them as the source of the pandemic’s eruption (Duan et al., 2020).
As for adolescents in less developed countries, such as Bangladesh, the situation is quite similar. The research conducted on this age group showed that school closure led them to spend more time online and less activity time. In addition, adolescents experienced sleep deprivation. Adolescents were encouraged to complete an online questionnaire to study the severity of mental health disturbance caused by the lockdown. Out of the number who responded to the questionnaire, 43% suffered from mild depression, while 7.2% of the sample suffered severe health issues. The results depend on the caregivers’ education, living area, and exposure to the virus. Children who lived with educated caregivers showed higher symptoms of mental health problems. Besides, urban dwellers experience depression and anxiety more than rural dwellers who are not forced into social isolation. Of course, adolescents who witnessed sickness and death are at a higher risk for depression and anxiety (Yeasmin et al., 2020).

As for adolescents in Europe, where COVID-19 hit the most, results were quite similar. In a study conducted on adolescents in Italy and Spain, the Spanish respondents were more psychologically affected than their Italian peers. The Spanish adolescents expressed behavioral problems, anxiety, sleep deprivation more than Italians. The study explains that adolescents who had no access to outdoor activities suffered more than the ones who were allowed some outdoor time. Unlike the Spanish government, the Italian one understood the positive effects of outdoor time on the adolescents’ mood and allowed caregivers to take those under 18 years old out for a short walk. Also, more Italian homes have gardens for the young to exercise (Morales et al., 2020).

The most detailed study that gathered the essence of how adolescents feel about lockdown was conducted in Italy. This study was introduced as a pop-up window through a student website to help adolescents with homework. After consenting, participants were encouraged to write about
the negative and positive experiences of living in isolation due to COVID-19. The most representative theme in that study was the sense of loss. I will quote the participants since their heartfelt words paint a better picture than any other literature. A 17-year-old male expresses the loss of an intimate relationship by describing his visit to his grandmother’s house. He says, “I went to hug her, but she pushed me away as if I stank. It was so ugly, I felt like a stranger”. Another adolescent describes the fear of losing their parents when the latter had to go back to the workforce. The loss of relatives to death was also narrated in this study. A 16-year-old female describes the tragedy of not only losing her beloved grandfather but being unable to bid him farewell. Other participants complained about the lack of privacy at home, while others were forced to endure to listen to their parents arguing. Some participants felt that their lives are going in vain, as if they were in prison for an offense they did not commit (Fioretti et al., 2020).

The study also highlighted the positive side of being in lockdown. The main autobiographical narratives mentioned discovering the pleasures of spending time with themselves while dedicating time to develop new hobbies. Other adolescents narrate their journey of re-discovering the importance of family by saying, “I’m spending time with my grandparents, and they are teaching me things that I did not know, such as board games that we often play them together” (Fioretti et al., 2020).

Those last positive notes are essential in our fight against COVID-19. Research tends to highlight the negative aspects of a crisis, which creates a gloomy environment within a society. During my research for this paper, I found myself guilty of looking into the adverse side effects of social isolation without paying much attention to the bright examples of adolescents who create a positive experience during the pandemic. Therefore, I will highlight the story of Macaire.
Every day, fourteen-year-old Macaire Everell, an Instagram sensation, uses her artistic talents to create a unique drawing on their sidewalk using colorful chalk. Her story is an example of a positive perception of making the best out of social isolation. Besides, it shows the positive influence of her caregivers. Every night, her family will give insights into her next day's project. Dad prepares the sidewalk by power washing the area while mom makes sure that Macaire has plenty of chalk for her project. Her nine-year-old brother Camden usually poses for the picture after the project is done. Her projects include scenery from all over the world. Her artwork is published on her Instagram account, macairesmuse, which has almost 22 thousand followers (Howes, 2020). It is always important to highlight the positive sides of a crisis because, during such times, resilience is crucial to a sustainable society. This is what the Life-course theory advocates for, a social network capable of supporting adolescence to go through this traumatic phase with minimum loss and maximum achievement. The following picture is my favorite. The simplicity of the project, combined with the cheerfulness of Camden, brings optimism and hope.
Role of Caregivers

Developmental theories stress the importance of caregivers and their crucial role on the adolescent’s behavior. In the previous section, I shared the frustrations that adolescents are experiencing during this turbulent time. In this section, I will highlight the reactions of parents and their role in supporting their adolescents.

Living the experience through one of my close friends, I watched the slow transformation from a cheerful and smiley friend into a depressed and exhausted person. “My son is driving me crazy; I don’t know how to keep him busy,” she replied when I asked her about her mood changes. One day, she stormed into the office, her body angrily shaking. She was furious at her son’s pediatrician, who, concerned with his noticeable weight gain, blamed my friend for letting her son spend long hours playing online games. I sympathized with her frustration by offering some words of support. She expressed her frustration in dealing with her adolescent child and her fear for her son’s future in response to the challenging virtual educational system. As for the pediatrician’s allegation, my friend shyly nodded her head in agreement but also questioned the alternatives she had. As a working mother, she wondered how to fill an adolescent’s day with valuable tasks. Another colleague voiced his concern for the lack of social skills crucial for future development. I sympathized with their fear of a gloomy future, where adolescents may miss essential skills as future adults.

The Bioecological and life course theories suggest that adolescents need a societal network to function. Even though peer groups play a significant role in building this cohort’s personality, society must have an active role in supporting this sensitive age. Throughout this research, the studies I mentioned insist on caregivers’ critical role in supporting adolescents’
decision-making and in providing a set of acceptable rules. However, caregivers who, suddenly, were forced to be the breadwinners, as well as the educators, are cracking under pressure. Adding the stress of job loss, scholars predict that some caregivers will collapse under pressure and direct their anger and frustration towards their children. So far, limited research shows that adolescents who have maternal support during the pandemic are less likely to suffer from anxiety and depression symptoms (Benner and Mistry, 2020). On the other hand, it is established that adolescence is a transitional phase from childhood towards building autonomy in adulthood. This process entails fewer family ties and more peer connection to create a set of goals and significant relationships.
In-class or online education

One of the significant impacts of COVID-19 is on the educational system. School is a major player in forming this newly acquired bond by providing a healthy environment for peers to meet through academics and sports events. With school closure, I wonder how adolescents maintained this bond and, if not, what are the effects, positive and negative, of such closure. When school buildings closed their doors to in-person education, confused students (and their caregivers) were faced with a significant shift to online learning. This shift drew the objection and the frustration of a group, while others were relieved that one infection source has been neutralized. Online education has triggered a controversy on an individual as well as a state level. In this section, I will navigate the history of education in the United States, to understand the logic behind school closures and to form my own opinion.

In general, the main complaints of concerned individuals are school closures and the mental health issues of social isolation. Schools play a role in education as well as personality development. The burden of school closures on students and their caregivers is overwhelming and exhausting. Robert Sanchez is one of the journalists who ventured into this frustrating world of remote learning from the parent’s perspective. Sanchez listened to desperate mothers who watched their adolescent’s academic skills decline into sometimes failing their classes. A frustrating mother echoed her concern by saying that “I feel like I’m the one who’s failing.” Once this ordeal is over, the educational body will be overwhelmed with a whole generation who desperately needs support and intervention to fix the academic level decline (Sanchez et al., 2021). Remote learning is challenging, and caregivers’ frustration is real. However, I must say,
in the short term, online education can substitute in-class traditional learning if this is an essential aspect of our fight against COVID-19.

The educational system has transitioned and evolved quite a bit since the last century. Is it possible that this new online learning trend is just another evolutionary phase that needs time for people to get used to? If so, how will adolescents transition without having traditional social tools? Historically, every society faces a set of challenges that is only relatable to that time frame. Consequently, individuals work to overcome those obstacles by creating solutions that operate within their timely framework. Education is an example of societal adaptation to new challenges.

The evolution of education

Education evolved from basement classrooms to healthy schools since the beginning of the twentieth century, where a curriculum became tailored to every cohort. Like the current objectors to online learning, Hall believed that an outdoor environment is the best fit for this age group. To put it into a historical perspective, Hall’s theory was developed when schools in the United States went through reform, and the importance of classroom education was highlighted. With the recognition of the importance of education for the nation’s development and prosperity, the US government invested in the school environment by building proper schools and well-lit classrooms. Hall developed his evolutionary theory to undermine and criticize the effort by arguing that this confinement ruins adolescents’ spirits. For Hall, neither in-school education nor job-seeking benefits adolescent development; outdoor activities and gymnastics is the best-fitted roles for them. Hall compares this outside activity to our ancestors’ athletic skills in hunting.
prey. Therefore, it is a basic instinct for adolescents to be active outdoors rather than confined indoors in classrooms where their primary instincts are suppressed (Hall, 1916).

Nonetheless, the United States invested in schools since education is a significant pillar in building a strong nation. Around the 1918 pandemic, the public-school system was blooming due to the mandatory school attendance law that passed that year. The educational system switched from a multi-aged one-room classroom to a curriculum with an age-appropriate grading system, where the health of schools and students were prioritized. Before this revolution in education, classrooms were usually in the basement with poor lighting, inadequate ventilation, and plumbing, which had changed when improving health conditions became a public concern. At the turn of the century, classrooms were arranged to accommodate pupils in a healthy environment where medical, dental, and vision services were provided.

With this progressive attitude that resulted in a decrease in contagious illnesses, students were better off in schools. By the time the pandemic struck the United States, each school had a full-time nurse capable of recognizing symptoms and can quarantine the sick ones. In addition to the medical supervision, schools took the responsibility to educate students and their families about personal hygiene and methods to prevent diseases. Although many schools closed their doors during the 1918 pandemic, few cities resisted closure. In New York City, the school system catered one million students, where 75% of those lived in crowded households. Copeland, the New York governor, decided to keep schools open due to schools' health supervision that lacked in homes. Those cities that chose to keep their schools open could control the infection rate (Stern et al., 1974).

Coming back to the present day, I doubt that such a model can be implemented. Unfortunately, our public schools now lack the infrastructure as well as the personnel. The
budget cuts affected nursing programs, and schools do not have the skills or tools to protect students from COVID-19. Since these health services cannot be provided, it is logical to send students home, especially that this generation has access to online learning. It is true that statistically, children and adolescents are not prone to infection, but they can carry this virus to their family members who may have underlying conditions. One should not also forget the exposure of the educational body in the face to face learning. I believe that virtual learning will be perfected with time, and gaps will be filled in. For now, I will highlight the challenges that adolescents face in school closures and the shift towards online learning.
Challenges caused by school closures

The Centers for Disease Control and Prevention studied current challenges facing adolescents as well as caregivers. To create awareness and educate the public on current challenges, the CDC published a COVID-19 parental resource kit with suggestive tools to overcome some challenges. The main challenges discussed were the break in the continuity of education and health care. In addition to online learning challenges, access to online learning was not equally provided, and internet connectivity was challenging for some households. Some also complained of zoom fatigue due to long hours of screen exposure (CDC, 2020). Not to underestimate the previous challenges, but the community will overcome these obstacles with discipline and planning.

One of the significant setbacks in online learning is the lack of essential developmental services, such as occupational, behavioral, and speech therapy. Many students used some of these services to manage behavioral and psychological issues, while others depended on occupational and speech therapy to succeed. Students with existing health issues are not adequately supported by their learning and mental needs (CDC, 2020). As a medical interpreter, I witness the frustration that caregivers face due to the lack of services for their adolescents who desperately need support, such as occupational and speech therapy. Even though some services may be provided through a telehealth visit, others, such as occupational therapy, have to be conducted in person.
A study conducted by Young Minds, a charitable organization that advocates for children and adolescents’ mental health, confirms the lack of mental health services provided in schools. The researchers argue that 26% of young people who rely on that support say that they cannot access those services. Some of the support is provided virtually, but due to lack of internet connection or lack of privacy, those sessions are unattainable. To prevent any further deterioration, the article urges the government to provide resources for early intervention (Young Mind, 2020).

Zoom fatigue, yet another challenge, has been identified by many individuals. Zoom fatigue is caused by the extra attention required to focus on the conversation since no one is around to fill in space when one zones out. Also, staring at (constant gaze) the screen makes us uncomfortable and tired. In normal circumstances, one can look to a window or any other distraction without losing focus. But on the screen, one has to stare constantly to prove focus (Fosslien and Duffy, 2020). Adding the sensitive behavior of adolescents towards their physical appearance, being on camera may be highly uncomfortable.

With the information available, scholars suggest that a change in an adolescent’s routine may cause psychological damage, especially if this change targets one or more of this cohort's fundamental pillars needed for its developmental process. Depression is a significant side effect of social isolation and has the following symptoms; depressed mood, loss of interest in activities, loss of energy, and worthlessness. A study on Turkish students showed a deterioration in mental health, such as depression, anxiety, and stress. Researchers noticed a 40% increase in stress levels in Turkish students. The reasons for this increase are financial burdens, infections among family and friends, or even death (Aslan et al., 2020). In contradiction to the former study, other studies show that stress levels decrease with social isolation. In a Dutch longitudinal survey that
aimed at analyzing adolescent’s mood and prosocial behavior, researchers used the previously collected data to compare the effect of social isolation on the cohort in question. The Dutch study results confirm that adolescents showed a decrease in stress levels, which researchers relate to the possible reduction in school exposure and other obligations. This study suggests that sometimes, a crisis may help in mental health by breaking a stressful routine. The same research highlights a drawback in adolescent’s prosocial skills. This group showed a decrease in empathy towards others and a tendency to be emotionally self-focused. The study blames social isolation for this disruptive change since adolescents do not have many chances to volunteer in the community with a lockdown in effect (Van De Groep et al., 2020).

Equipped with clues on adolescent’s development, one may conclude that this decrease in prosocial behavior will negatively impact the future. Since social skills are developed in this age group, lack of interaction may have severe repercussions on future communities.
Peer influence

Schools do not only deliver educational services to adolescents; they also provide a climate for this age group to develop social skills, which usually happens when an adolescent is surrounded by its most influencing group: peer groups. Acceptance by peers at this stage shapes personality. As scientists explain, adolescence is defined as a phase where parental influence decreases while peers play a more prominent role. In an experiment that aimed at studying the impact of peer interaction on neurological development, functional Magnetic Resonance Imaging (fMRI) was used. In the adolescents’ brain anatomy, scientists discovered the increase in white matter connections, which translates into better communication between different brain areas. This neurological change is essential in developing behavioral control that characterizes this cohort.

Researchers observed a study group playing with a ball to study the negative peer influence on brain activity. This ball was tossed among the group while excluding a few members. Later, imaging showed that the excluded group's brain presented higher activity in the orbi-frontal cortex, a crucial part of the brain where emotions and memory are shaped. Researchers conclude that being excluded from a peer group, adolescents will develop low self-esteem, lack of belonging to a group, and loss of control. In contrast, in a study conducted on adolescents’ interaction on social media, researchers noticed that the study group experienced activity in the Ventral Striatum part of the brain, responsible for subjective pleasures and rewards. Since an adolescent’s brain is still developing, any exposure, positive or negative, will affect the sensitive phase of development (Crone and Konijn, 2018).
Albert Bandura, a social cognitive psychologist, argues that even though an adolescent is expected to abide by researchers’ developmental milestones, self-efficacy plays a role in fitting into a specific social group. Self-efficacy is the belief in an individual’s capabilities in controlling events and level of functioning. It affects how individuals think, feel and motivate themselves to achieve goals. In general, when a person believes in their cognitive abilities, they are more likely to set higher goals. On the one hand, a person who judges one’s ability to surpass others tends to enhance performance. On the other hand, individuals who believe that they cannot control their environment tend to suffer anxiety and depression. Based on their beliefs in their capabilities, individuals will position themselves into social categories they feel they fit in. In general, adolescents with a high level of efficacy tend to perform better socially than those who do not do well academically. Adolescents with low self-efficacy may carry the adverse effects into adulthood in shyness in choosing complex and successful tasks. This group suffers stress and depression in adulthood (Bandura, 1993).

An interesting power shift has been observed during the current pandemic. Usually, the most popular in school is the sociable and academically achiever, while the computer wizards are less popular and lack self-efficacy. Shifting towards e-learning, adolescents who have computer skills excelled while the popular ones did not find the environment that nurtures their popularity. In other words, students who believed in their capabilities were successful in e-learning, while others suffered the loss of their popularity and skills (Pellas, 2014).

In their extensive research on adolescents' psychology, Steinberg and Lerner describe changes in adolescent’s development, namely a sense of authenticity, intimate sharing of personal experiences, and trust. Adolescents, in this phase, struggle to find their place in a social environment since inclusion and exclusion of peers in social circles is essential in personality
building. The beginning of this phase is known to cause confusion and conflict due to a lack of self-description. With time, moral values and personal beliefs are developed and hence results in a higher-order construction. During this phase, adolescents try to expand their autonomy by negotiating boundaries inflicted by parental authority. The authors of this research argue that even though adolescence is characterized by developmental maturity, one should not ignore the concept of egocentrism, which distorts social reasoning. By egocentrism, the authors refer to two concepts: imaginary audiences and personal fable. While imaginary audiences refer to the belief that others are constantly paying attention to the individual’s behavior, personal fable defines their idea that they are unique and invulnerable. Those two concepts lead to error in judgment (Steinberg and Lerner, 2009).

With the adolescent’s vulnerable stage in development, peers may positively influence character building, but it may also encourage unwanted behavior. Unlike adults, adolescents tend to take risks in the presence of peers, such as reckless driving and experimenting with drugs, smoking, and alcohol. Also, adding sexual content online may be desirable by some adolescents who seek inclusion in certain social groups. By imposing social isolation, authorities echoed their concern that adolescents' risk-taking behavior may cause defying to stay at home orders. To curb the intensity of this behavior, researchers suggest using positive peer influence in balancing their behavior. Surrounded by positive influencers, adolescents may be engaged in prosocial behavior, such as volunteering (Andrews et al., 2020).

One mechanism used in peer influence is bullying the other to be forcefully integrated into a social group. Bullying has been recognized as a significant problem in middle and high schools. Its effect may linger well beyond the adolescent years and into adulthood. With school
closure, face-to-face bullying decreased, but other forms emerged.

**Bullying**

Many adolescents may experience some sort of bullying throughout their school years. Bullying can take many forms: physical violence, psychological violence (mocking and gossip), victimization, adapted behavior, and risky behavior (Substance abuse, risky sexual behavior). A study on bullies' and victims' personality traits shows that bullies are usually characterized by low school achievement and negative attitudes towards others. In contrast, victims typically show signs of internalized problems. The last cluster is generally rejected by peers and is socially isolated. It is worth noting that around 14% of adolescents are bullied, while 19% are defined as bullies (Kodzopeljic et al., 2014).

Researchers noticed the loss of power of some groups with school closures, while others emerged to dominate the scene. On the one hand, bullies who need a social group to feed their negative behavior lost this support. On the other hand, online learning is a new skill that all students are acquiring. Therefore, there is no social hierarchy similar to the one that exists on school campuses. Tech-savvy, who were once perceived as socially isolated, are shining with their skills. Lack of comparison in the virtual world helped many kids to excel and raise their grades (Wong, 2020). With this change, some adolescents, as well as caregivers, expressed relief from this pressure. However, being exposed to e-learning and social media, adolescents are facing a new threat, cyberbullying.

Cyberbullying is defined as an aggressive intentional act that uses electronic forms to inflict harm and discomfort on others. This act results in depression, social isolation, low self-esteem, academic difficulties, and even suicidal thoughts. Cyberbullying can take many forms:
- Happy Slapping: Degrading video that is forwarded to others.
- Sexting: Sending sexual content to others.
- Flaming: Online fighting, using offensive language.
- Impersonalizations: Creating fake accounts.
- Cyberstalking: Following victims online, including threats of physical harm.
- Exclusion: Intentionally leaving someone out of a group chat (Hutson, 2016).

Sarah Needleman, a journalist with the Wall Street Journal, puts the above-mentioned terminology into perspective. According to her published article on online threats, two million online child exploitation reports have been submitted to the National Center for missing and exploited children. Also, the dark web witnessed a 23% increase in child predators’ accounts since the rise of online exposure gave those predators easy access to a bigger group to produce sexually explicit material. The author also mentions a report published by Light, an online company that follows adolescent cyberbullying. The report confirms an increase of 70% in hate speeches among adolescents (Needleman, 2020).

In addition to the dangerous effects of cyberbullying, caregivers have learned of adolescents’ involvement in the dark web. Dr. Marseille, a psychiatrist, was introduced to the dark web’s underworld through his adolescent clientele. He soon learned that this cohort could easily access the dark web by following simple instructions that direct users to tor, The Onion Router. Then, adolescents can create an account that enables them to purchase drugs or venture into illegal activities (Marseille, 2018). Whether cyberbullying or the dark web, this age group is an easy target. Regardless of the source of danger, parents need to be proactive. While Online companies are using filtering alerts to police toxic language and ideas, caregivers and teachers have to monitor online content and create awareness of this hidden danger.
The Virtual world

When the highly contagious virus forced the educational system to shift in-person classes to online learning, many concerned groups questioned the effect of enforced social isolation on adolescents. With this lack of physical interaction, it was assumed that the generation would be scarred for life. Initially, I also believed that this generation would suffer tremendously due to a lack of exposure to others, especially that, at this stage, critical developmental milestones are achieved. Later, I realized that the picture might not be as gloomy as I thought. Online interaction has been widely typical among adolescence way before the pandemic due to social media exposure.

Research conducted in 2018 shows that teens are more likely to spend time with friends online than in person, which is due to their other responsibilities that make it challenging to find time to hang out in person. Also, transportation for 32% of teens interviewed was an inconvenience. 33% of teens agreed that interacting with peers online is more accessible. 81% of interviewed teens believe that social media keeps them connected with their peers. Some even highlighted that it is easier to find like-minded peers through online groups (Anderson and Jiang, 2018). In other words, many benefits of face-to-face peer encounters, such as peer support, interaction, social recognition, and confiding in peers, are all present in online communication (Orben et al., 2020). Global Web Index, an agency that provides audience feedback to marketing companies, published a report on social media's role, specifically adolescents. The report suggests that 65% of Generation Z feel that social media helped them overcome social isolation and stay connected with their friends during the pandemic (Williams, 2020).
Adolescents, as I mentioned earlier, are a transitional group where identity and goals are formed. By applying this statement to social media exposure, adolescents may find an outlet to identify themselves in a virtual platform where they can be whoever they decide to be. On the one hand, this identity statement may help an adolescent to create a healthy identity but, on the other hand, it might confine them into a fictional personality that they made online (Pescott, 2020).

The virtual presence is far from ideal since social media is a double-edged tool; it entitles active and passive use, which can have a different effect on adolescents’ well-being. Active use, which is the direct interaction, includes bridging and bonding. The former implies the active learning of new information that a person can use, while the latter is the connection and support offered by peers. The active kind of use is associated with the adolescent's positive overall well-being; on the other hand, the passive one is related to a decrease in the person’s mental well-being. This is because monitoring other people’s lives may create envy and dissatisfaction with their own lives (Verduyn et al., 2017). Since adolescents tend to seek their peers' approval as part of the identity formation, social media platforms feed this need by peers' ability to “like” a post. This “like” button is a critical tool because it has a tremendous effect on adolescents' self-esteem (Pescott, 2020).

Active virtual socialization for Gen Z is spreading through different virtual tools such as Facebook, Instagram, Youtube, TIKTOK, and K-Pop fans. I believe that this virtual world offers an enormous source of information suitable for another research paper, but scratching the surface is vital for the topic at hand. According to statistics, adolescents’ use of social sites varies. The following table highlights the percentage of adolescent usage to different social media sites (Barnhart, 2020) & (Tankovska, 2021):
<table>
<thead>
<tr>
<th>Social Media</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>FaceBook</td>
<td>51%</td>
</tr>
<tr>
<td>Instagram</td>
<td>72%</td>
</tr>
<tr>
<td>Twitter</td>
<td>32%</td>
</tr>
<tr>
<td>LinkedIn</td>
<td>28%</td>
</tr>
<tr>
<td>Snapchat</td>
<td>69%</td>
</tr>
<tr>
<td>Youtube</td>
<td>85%</td>
</tr>
<tr>
<td>Pinterest</td>
<td>34%</td>
</tr>
<tr>
<td>TikTok</td>
<td>32%</td>
</tr>
</tbody>
</table>

My virtual knowledge was limited to Facebook until years later, when my teenage daughter, a digital native, introduced me to Instagram. My curiosity lured me into spending more time on Instagram to study the dynamics and creative ideas that the app comes up with. Although many ideas are useless and practically waste valuable time, other ideas are quite creative and valuable. After many months of navigating Instagram, I learned useful tricks to help in meal preparation, beauty ideas, and home decors. Thanks to a video I watched on Instagram, I developed a new respect for fish tacos. With the lifestyle that we all share, those short videos can be easily integrated into a busy schedule. My newly acquired curiosity soon turned into an addiction. I realized how easy it is to waste a few hours a week by scrolling down those short videos. Although I found the “do it yourself” videos beneficial and entertaining, the ones that struck my interest the most are the ones that teach tricks to generation Z on how to make easy and quick money. Investing in Bitcoins and stocks has an impressive share on Instagram as well.
as real estate tips. Another interesting section is presented by an influencer who interviews people that own fancy cars. His only question to those individuals is what they do for a living. Interestingly, most of them are investors in the stock market with a high school degree. The term “influencer” defines an individual who spends time on Instagram. Once they collect enough followers, they start marketing either their products or get paid to market businesses. Going back to the fourteen-year-old Macaire, after building a portfolio of cheerful, artistic drawings, she published her first book of designs in December 2020.

Social media drew teens’ attention in the past few years. For example, TikTok announced an increase in downloads at the beginning of the pandemic. The company published its first-quarter report in 2020 with an estimate of 315 million downloads for that period. TikTok has created a safe environment where adolescents are entertained with short videos and have helpful information on COVID-19 (Hillier, 2020). TikTok prides itself on launching a learning platform where instructors can offer educational material to adolescents. In a Youtube tutorial video, Edward Lindemen, TikTok media manager, explains how TikTok is used to educate adolescents on challenging subjects, such as chemistry, by integrating an idea into an entertaining video. For example, the tutorial explains how the peel of an orange can dissolve plastic waste due to its potent elements. The tutorial explains that those short videos aim at teaching adolescents about sustainable development, either by recycling or by learning new benefits of available items. Sustainable development, an essential tool to preserve the planet for future generations. The tutorial concludes by proudly announcing that, according to statistics, 96.5% of TikTok followers agreed that they benefited from the chemistry videos. Inspired, those followers recreated experiments, and they agree that chemistry is crucial in daily life (Times Higher Education, 2020).
While these two virtual trends, TikTok and K-POP, involve mostly music and short videos, one cannot overlook TikTokers and K-Pop fans' role in June of 2020 to sabotage President Donald Trump’s campaign rally in Tulsa. The rally organizers, who bragged about selling one million tickets, were bewildered to find out that only 6200 people attended the event. It soon became clear that Tiktokers and K-Pop fans had bought tickets intending never to attend (Jenning, 2020). This political pragmatism shows that Gen Z is not a generation that only spends their time watching funny cats and dogs' videos.

K-Pop, short for Korean pop music, is gaining popularity among adolescents. Their music should be seen as well as heard since each song includes a calligraphy dance. The K-Pop trend is also spreading to other social and political issues in the United States, such as the “Black Lives Matter” movement. When the Dallas police department asked citizens to post pictures of protesters in the Black Lives Matter movement, activists flooded the website with k-pop idols, which caused the website to crash (Haskins, 2020).

I included these platforms in this paper to suggest that adolescents have been living in this virtual world for many years before the pandemic. Since being part of the app world requires social isolation, it is safe to assume that adolescents may not be affected by the lack of face-to-face interaction with peers. Even though this statement is alarming to the traditional social structure that we are used to, one has to accept that our social face-to-face interaction is not the only possible way. My generation is comfortable with this traditional social environment and might be disapproving of other norms but being afraid of the unknown is usually a normal human reaction to any new trend. Adolescents may not be as deeply affected by social isolation because they have other existing channels that may even involve a more extensive social network than other generations have ever encountered. The alarmed caregivers and educators must have
an active role in not only accepting the social media penetration into the adolescents’ daily life but helping and teaching them how to protect themselves from the negative aspects of these platforms. Studies show that by equipping this age group with emotional resilience and coping techniques, they will be able to recognize the dangerous aspects of social media, such as cyberbullying, and will be able to deal with it through the proper emotional channels (Pescott, 2020). By now, I am convinced that generation Z will pave its digital way through this pandemic. Those who cannot go with the flow will fall victim to mental issues. Others will show resilience and will lead the way towards a healthy society. But I wonder how generation Z will substitute for the lack of physical touch. With social distancing and lack of physical touch, how will adolescents make up for this touch deprivation?
Touch Starvation

The virtual world may substitute in-person peer interaction and deliver sources that adolescents need to feed their self-esteem. But I wonder how adolescents will substitute human touch. A few months into the pandemic, I felt the heaviness of working in the health system. I was desperately looking for a familiar setting where I can relax and let my guard down. So, I decided to visit my mother, which meant traveling by plane. The fear of catching the virus during that journey or the risk that I might have retracted through my work in a hospital forced me to be very cautious around her. Consequently, when I saw her after many months of isolation, I was deprived of hugging her. A hug that usually nourishes my soul with comfort and security. I felt empty and disappointed.

Although we are lucky to live in an era when modern technology, such as Zoom and Facetime, provides social interaction solutions, touch deprivation is still a challenge. Human touch conveys reassurance, comfort, and support, while touch starvation increases stress and disrupts resilience. This is especially important in a traumatic setting, where physical proximity is essential to trigger a coping mode (Banerjee et al., 2021). However, many families worldwide missed bidding farewell to their loved ones and were also deprived of expressing their grief due to social isolation and touch deprivation.

Following the holistic approach that I adopted throughout this paper, I will discuss the biopsychosocial effect of touch deprivation in general before applying this knowledge to the age group in question. Carissa Cascio, assistant professor of Psychiatry and Behavioral Sciences, explains how the body processes positive feelings associated with a touch. The C-touch, a set of
nerve fibers located under the skin, is activated by another human's gentle touch. The body muscles respond in the form of a smile or any other appropriate reaction. The C-touch communicates with the central nervous system, which, in response, triggers the release of Oxytocin, a hormone that enhances social bonding. In other words, C-touch plays a role in bridging the gap between the self and the environment (Cascio, 2019). The outcome of this chemical sequence is a set of feelings that are essential for comfort and bonding. Therefore, the absence of this process may increase depression, anxiety, boredom, anger, insomnia, and even mental disorder (Banerjee et al., 2021).

Along the same lines of thoughts, there is evidence that adolescents are severely affected by lack of touch. In a research study, Tiffany Field, a pediatric psychiatrist, shares her concerns about adolescents' aggressiveness due to touch deprivation. She concludes that a lack of physical intimacy with parents and peers results in an aggressive attitude and triggers risk-taking behavior. Unlike the ones who enjoy parental and peer intimacy. Those show interest in school, higher self-esteem, and lower risk-taking scores (Field, 2002). Since the cohort in question is most likely living with caregivers, touch deprivation is minimized. Besides, I believe that owning a pet may substitute a human touch. I aim to educate caregivers that even though adolescents tend to exclude their parents from their inner circle, the latter should insist on caring and providing support for the former, especially in crisis times. The upcoming years will deliver hundreds of studies on the effect of social isolation on adolescents. For now, American society should work with the information available from previous historical events and the abundance of studies on adolescent development to shield this generation from potentially irreversible harm. In addition, our role as a society is to accept generational differences, build resilience and support each other.
Conclusion

I started this project during the summer of 2020 when we were hit with the pandemic, surrounded by confusion and doubt. At that time, scientists were struggling to implement safety measures, and researchers were frantically looking for a vaccine. A year after the lockdown, I feel that we reached important milestones in combating COVID-19. With vaccines in the market and the slow re-opening of the economy, scholars can look around and evaluate the damage caused by the pandemic on social interactions.

My research was not an easy task due to the limited resources on the long-term effects of social isolation on adolescents during COVID-19. I believe that I have achieved my quest to understand the potential harm and benefit that adolescents will experience. I realized that adolescents might suffer behavioral changes in a controlled environment due to neurological and hormonal factors. Behavioral scientists confirm the vital role of society in controlling behavior by shifting the undesired traits towards the good of the community. My grandmother used to repeat an Arabic proverb every time she saw me tired when my daughter was growing up. “A generation will not grow until the previous generation is exhausted,” she would say. This is some wise talk from a wise woman who lived to see her great-grandkids. Parents and caregivers can learn a lot by believing in such wisdom, which helps them weather their ship before the next storm and smoothly sail into the ocean of the present time with their continuously evolving offspring.

I believe that every generation is capable of creating a comfortable atmosphere that works for them. There is no doubt that generation Z will have the same opportunity as previous ones. Our role as a community is to support their decisions, accept change with an open mind
and try to be part of it. Society has to assume that there are different ways of achieving a coherent community. Adolescence is an exciting time, where personalities are shaped, and goals are set. But these significant milestones do not come easily; adolescents endure waves of confusion and frustration until they settle down into balanced adults. Perhaps the current generation of adolescents will have different visions than ours in shaping future society. Change is not always bad. It needs adjustments of older generations to new ideas.

The turning point in my research was my exposure to the virtual world. Any scholar interested in understanding the virtual world's dynamics and its association with digital natives must explore this field. These are my questions moving forward for research I hope to pursue in the future. In the virtual world, adolescents are using a set of skills needed to communicate. These skills may lack physical interaction. I wonder if the digital natives will lose their social skills and, if so, how severe will the hormonal and neurological shift affect their behavioral development? Going back to school will be the perfect evaluative opportunity to study those changes. I hope to explore the adolescents’ experiences after one year of social isolation and their reaction once they are placed back into their peer groups.
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