Skyscrapers or Silos? How Environment Impacts Child Cognitive Development

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Abstract

There has always been the debate between nature versus nurture when looking at the development of human, especially in youth. This report examines multiple pieces of literature that discuss the impacts of living in urban and rural environments and how those environments impact child cognitive development. While investigating these different cultures, research has shown multiple benefits and costs to each environment, including strong language and social skills, and numerous resources in an urban environment and a rural environment offers strong helping behaviors, musical and kinetic strengths and one-on-one opportunities.
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In Psychology, all scholars have different opinions towards the argument of “nature versus nurture”. This argument discerns between how people obtain their traits, personality and behavior. Along with the genetic aspect of development, the environment in which a person is raised impacts their outcome as an adult. Recent studies show that humans’ brains are not fully developed until 25 years of age; this results in the brain absorbing all of the environment around the person for the first 25 years of life (Wallis, 2013). Within 25 years, the brain will experience a plethora of physical, mental and intellectual growth (Wallis, 2013). From school, to work, to every human interaction, a human brain takes that stimuli and applies it to the person’s personality, behavior and lifestyle. 50-70% of cognition is defined by genetics but environmental factors have large effects on development over time (Tucker-Drob, Briley, & Harden, 2013).

While biological factors play a large role in human development, the environment in which our brains develop has the capability to shape who we are. Discussed in this review will examine benefits to urban environments, rural environments and how these cultures impact the cognitive development of children. Wrapping up the review, the conclusion will include overall all results to the research question and recommendations based off of the previous literature.

Urban environments can simply be defined as “An inhabited place of greater size, population, or importance than a town or village” (Merriam-Webster, 2018) but not all cities are the same and there are subcultures within this urban environment. According to Harold Globe (2014), about 54% (3.9 billion people) of the world’s population resides in urban environments and this number is estimated to increase to 66% by 2050. In many of the studies discussed in this paper, their definition of urban and rural vary. Urban communities can also be used in larger
towns where homes are closer together and transportation is more within walking and/or biking
distance. Suburban areas are often overlooked when researching urban life and being accounted
for when comparing urban and rural environments. These suburban areas are a mix between the
outside of the city and it’s own separate community. Throughout the research, urban communities are spread upon a wide range of definitions but always are in contrast to rural environments.

Rural environments can be defined as “Relating to the country, country people or life, or agriculture”(Merriam-Webster, 2018). Agricultural areas and forests are also included in rural environments. According to the United States Census Bureau (2016), about 13.4 million children (under 18 years) live in rural communities and that 97% of the United States is covered in rural life but only 19.3% of the population. Within this population, adults were more likely to stay in the state where they were raised and have lower levels of poverty (11.7%) compared to urban (14%) but rural communities struggle more with higher rates of uninsured children, less adults getting a bachelor's degree or higher and may have a lower median household income (American Community Survey: 2011-2015. 2016). Keeping these definitions of urban and rural cultures in mind, an individual would be able to better understand the impact on cognitive development in youth.

Cognitive Development is an area of psychology in which a child’s development includes information gathering, language development, kinetic skills and how they engage in the world around them. Cognitive (or intellectual) development cannot be discussed without briefly going over Jean Piaget’s four stages of cognitive development. These stages consist of changes in a child’s life between birth and around 20 years of age. The first stage is sensorimotor (birth-24
mos or language develops) (Tuckman, 2010). This stage includes the infant understanding the environment around them and how they play a separate part from it. Object permanence is used in this stage to show the difference between self and the object to the baby. The next stage is the pre-operational stage (age 2- about 7) when the child is able to recognize and use symbols in order to play or obtain something. This stage is also when children are known to frequently ask questions in order to verbally gather information on their surrounding environment (Santrock, 2004). The third stage, known as concrete operational, is displayed in children during their pre-adolescent years. Children in this stage are finally able to view things from other perspectives and use reasoning behind their actions and words. Abstract thinking does not occur until the final stage, formal operational, where the child’s brain is fully developing to allow them to think abstract thoughts and metacognition which is, “thinking about thinking” (Arnett, 2013). Having these stages as the base information on cognitive development allows research to apply this knowledge and see the unique impacts environment plays on this intellectual development. With a specific focus on urban environments, previous literature to follow will discuss the effects of specific factors in these cultures such as parental involvement, crime and transportation.

**Urban Environment**

Urban environments usually get a negative rap for their stigma of high crime rates, broken family dynamics, educational failure and mental health practices. Rutter (1981) comprised multiple studies that examine the impact of a city on a child and ways to possibly improve these negative assumptions. All of Rutter’s literature consist of studies done in large cities in England but as they define a city by the population, it is similar to a city population in the United States. A large majority of impacts on children in the city are the people they are in
contact with on a day-to-day basis. This includes everyone from the mailman, to the people on the subway to their parents. Once the child enters school, these schools will also play a large impact on the child’s behavior and attitudes. Every urban school is unique and will affect the child differently depending on the discipline, the location and the socioeconomic status in where the school resides (Rutter, 1981). While there are numerous influences on the child in the urban environment, parental involvement, crime rates and the effects of transportation all affect the child’s cognitive development.

**Parental Involvement.** While parental involvement plays a role in the child’s development no matter where the child is raised, urban family dynamics look different compared to rural families. Apart of family involvement is the amount of time spent in the home before school age and how child care plays a role in the characteristics of a child. No matter what the child care is, it supports child development, especially children in low-income families (De Marco, & Vernon-Feagans, 2015). Aside from the outside urban setting, home-based involvement and better quality programs allow the child to develop to its fullest potential. A majority of research on child care and development at an early age is focused more in urban setting and less in rural settings due to the lack of resources and lower quality of the programs (De Marco, & Vernon-Feagans, 2015). One example of a study done on parental involvement in an urban environment was done by Fatuzzo and colleagues (2004) on 144 Head Start children. They assigned a parental report of family involvement in the child and their education. Using an assessment measuring conduct issues, vocabulary of the child and the parents approach to education. This assessment revealed that family involvement in the greatest predictor of the child’s outcome. Strong family involvement in urban settings results in a longer
attention span, improved vocabulary skills, motivation to learn and lower conduct problems (Fantuzzo, McWayne, Perry, & Childs, 2004). In urban settings, when parents are actively involved in the child’s development, conduct and crime decreases in youth. From these results, there are clear indication that parental involvement plays a vital role in an increase in positive behavior in the children.

**Crime.** Another characteristic that is negatively portrayed in urban culture is the high rates of crime compared to rural environments. Newberger and Cook (1983) took a unique approach to looking at specific child abuse and parental awareness of crime in urban and rural environments. Their original study was completed by 51 urban parents by giving them multiple scenarios and dilemmas and assessing the parents on how they would react. These consisted of abuse, trust and family dynamic (single mother/new baby) dilemmas. These assessments were measured by levels of self orientation, norms orientation, child orientation and systems (family) orientation. Later on, the researchers chose a smaller population to examine rural parents and how they would react to similar studies. Through this research, results shown that every parent had different concepts of what crime was in their communities and how they attempted to steer their child away from crime (Newberger, & Cook, 1983). In the research Newberger and Cook examined, results shown that more parental involvement resulted in more awareness of the child and of crimes in the area. This was prevalent for both environments but parents in rural environments shown more neglect in their own homes and were less aware of issues outside their prominent hometown. In urban settings, children who were reported as abused or neglected struggled more with developmental delays while children in rural setting struggled with gaining support and resources for these less evident delays (Newberger, & Cook, 1983). Keeping these
results in mind, parents and the community are able to improve awareness of crime in their surrounding area and for their families.

**Transportation Noise.** When living in a city for a duration of development, transportation may become an every day mean to survive and may be overlooked when observing the impact. Everything from aircrafts to traffic noise to subways, these noises and stimuli to a child developing has the ability to affect the child’s cognitive development. Researchers, Clark and Stansfield (2007), examined the effect of transportation noise in urban areas on cognitive development in school-age children. Through assessment, the professionals were able to test how families (children and adults) on the amounts of exposure they have to transportation noise over a specific amount of time. For adults, an increase in transportation noise (and other variables such as lifestyle choices) increases their chances to have coronary heart disease and higher stress hormones. On the contrary, two recent large studies done in London show no negative stress hormones displayed in children (Clark, & Stansfeld, 2007). In addition, sleep disturbances due to transportation are shown more in adults recently moved to an urban environment but decreasing over time. Multiple studies discussed by Clark and Stansfeld (2007) state that families that have resided in an urban environment for a long period of time are less likely to be disturbed by outside transportation noise and more likely noises inside the house. During schooling, transportation noise was shown to have a negative impact on the learning environment and delays in reading comprehension, attention and memory. As discussed in the article, Clark and Stansfeld (2007) report on children having the natural ability to filter unwanted noise out of their attention when residing in the urban environment for longer periods of time. The potential impact of this article displays that if the family is raised in this environment, that they less
impacted in educational settings and in their sleep habits compared to those who are not raised in around this noise.

**Rural Environment**

Compared to urban environments, rural setting show drastic differences in the area where people reside. Factors such as the physical distance between destinations and the different dynamics of the community and family distinguish the two opposing areas. Unlike urban research, rural research is far and few between which limits the information given to society. Much of the given research consists of certain mental and physical disabilities in rural areas which briefly covers a wide variety of participants. Due to the lack of participants, researchers struggle with collecting and analyzing data when the means are not available to them.

**Social Aspects of Rural Life.** One common assumption of urban life is that new residents never get to know their neighbors; that is not the case in small towns in rural environments. This is shown through a helping behavior study done by Steblay that tested the hypothesis that “country people are more helpful than city people” (Steblay, 1987). Through 65 assessments, the results supported Steblay’s original hypothesis. With the effect size of .29, participants who resided in rural areas were more likely to have a helping response to someone in need (Steblay, 1987). The discussion in this article discusses how positive relationships in rural communities are due more to the size of the population and less on the individual themselves. An example of this would be a small town where people have a higher chance on knowing another person. If a person in need is surrounded by others who know them, they are more likely to help. Another factor in play would be the stereotype of not helping those in need. There is a weakness
in knowledge and understanding of social behavior in communities which limits researchers' ability to hypothesize theories like this.

**Dynamics in Rural Communities.** Similarly to children in urban environments, rural children need the same types of engagement and involvement in order to cognitively develop successfully. As stated previously, parental involvement is the largest predictor of a child’s outcome at a young age. While rural settings allow the child to have less human interaction on a day-to-day basis compared to their urban counterparts, children in rural homes may strengthen bonds with fewer adults such as surrounding family and others closely involved with the family.

There are about 13.3% of people in rural communities that live below the poverty line compared to the 16% in urban settings (American Community Survey: 2011-2015. 2016). With this, the average household income in rural setting is lower due to the lower expense of living in rural communities. Families living in poverty are at a higher risk for poorer health, decrease in resources and higher stress levels for children and adults. Multiple factors such as family income-to-need, a maternal behavior, social advantage and a child’s attention, mental development and temperament were all assessed in Blair and researchers (2008) study conducted on low-income families. The children in this study were assessed as infants and later as toddlers by measuring cortisol levels through their saliva. Results shown that mothers who were engaged at infancy had a higher chance of having a toddler with lower cortisol levels, higher attention span, greater brain development and a slower temperament. This was for all rural families, disregarding the socioeconomic status. When the family was undergoing pressures from the community because of the lack of income, the mother and infant became negatively affected (Blair, Granger, Kivlighan, Mills-Koonce, Willoughby, Greenberg, & Fortunato, 2008). Engaged
and close community dynamics in rural settings allow the child to grow closer with the people around them and to strengthen connections with others compared to urban children. This connection in these communities is what fuels the stereotype that crime is less prevalent in rural communities.

Crime. According to the stereotype, rural areas are known for lower crime rates, when that might not always be the case. TIME magazine (2013) published an article debating this stereotype. Their point of view states that the reason society thinks rural life if safer, is because that information is not as published as it is in the city. Naturally social media is prone to exclaim the negative events in urban areas before rural ones because less people are less likely to be living there. A large majority of crime that occurs in rural settings is behind closed doors such as rape, abuse and homicide while crimes in urban settings are more widespread but less likely to occur (Walsh, 2013). People in rural communities are also more likely to have the means of harm compared to urban communities (Walsh, 2013). For example, many rural homes own firearms and personal weapons that can lead to harm to the family or others. With this being said, the likelihood of an individual being harmed in a small town in the open in less likely to occur due to the lack of people surrounding them, unlike largely populated areas (Walsh, 2013). These different types of crime can impact cognition through the feeling of safety or lack of in their communities (Walsh, 2013). Examining previous research done in urban and rural areas, the factors that are apart of child cognitive development such as language development, educational performance and involvement of the family in this development all determine the success of the child later in life.
Cognitive Development

Cognitive development in children is an inevitable change in human growth. This fragile stage of growth can be altered and impacted through the stimuli that surrounds the individual. Cognitive development can be assessed through language development, educational performance and how the family interacts with the developing child.

**Language Development.** Even before birth, children are capable of hearing and gathering information through language. Language can consist of verbal abilities, non-verbal skills or written skills. Lloyd and Hertzman (2010) examined all three of these subsections of language in kindergartners and later in fourth grade to compare the development of children living and learning in rural and urban environments. This study completed in Canada was composed of 635 rural children and 4,825 urban children. All of the children were first assessed in kindergarten and later in fourth grade using the Early Development Instrument (EDI) and then the Foundation Skills Assessment (FSA) (Lloyd, & Hertzman, 2010). According to the research, no significant data was found due to the inability to control all of the other factors in the child’s development. The one result found was that in order to cognitively develop language, the child must be engaged in language outside of school (Lloyd, & Hertzman, 2010). So, children who are neglected social support and active stimuli outside of their education, will not fully develop language compared to their counterparts. Anastasiow and Hanes (1974) discussed how three subgroups in an environment are able to acquire language differently depending on the culture they are raised in. These three subcultures included black inner-city, white middle class inner-city and white rural children between kindergarten and 2nd grade. After completing a sentence repetition task, a numeration take and other small language assessment, results were
made that there were significant differences in word omission scores and task orientation scores. In all areas, the black inner city and white inner-city were the same while white rural children had lower scores in language skills (Anastasiow, & Hanes, 1974). These results show that both ethnicities in an urban environment are developing similar language structures compared rural children at the same age. Language has been shown to be a strength in urban youth in Shepard’s (1942) study as well. Out of the 104 pairs of rural and urban children, the results indicated that urban children were superior in verbal language skills while rural children showed strength in musical abilities and hands-on abilities. Through these assessments, Shepard (1942) was able to observe that the urban children were quicker to complete assignments that were timed. These results indicated that children in different environments had unique strengths including language, kinetics and music.

**Educational Performance.** Language was a factor to developing cognition but in educational systems, there are other tests used to determine cognitive development. In 2010, Lloyd and Hertzman’s research observed children in kindergarten and fourth grade in multiple areas of education. They included the EDI and the FSA. The EDI tested overall health/well being, social awareness, emotional health/maturity, language, and verbal skills. The FSA is an overall foundation skills assessment that tests math, reading and writing. Between the tests given in kindergarten and fourth grade, urban children’s educational performance went down in math but increased in language while rural children’s scores decreased in language. This study examined the differences in mental health and stability within the child and results shown that rural children were more influenced by instability in their community more than urban children and that was more likely to influence their educational performance (Lloyd, & Hertzman, 2010).
**Family Impacts on Cognitive Development.** The immediate family in a child’s life has the largest impact on the child’s cognitive development. As noted through the previous literature, parental involvement in their child’s physical and mental growth and their education is the largest predictor of the child cognitively developing the best possible way. In each environment, rural and urban, parenting styles appear unlike the other. An increase in parent engagement in the child’s life leads to a decrease in problem behaviors and an increase in social skills (Nokali, Bachman, & Votruba-Drzal, 2011). These skills allows the child to develop cognitively in school, social settings and in the future as an adult. While parental involvement may not always be the key to academic success, socially and emotionally children will become more introspective due to the involvement (Nokali, Bachman, & Votruba-Drzal, 2011). The point of this study was to determine the positive effect of family involvement on the development of cognition and how these benefits impact the child’s academics and social interactions.

**A-Typical Developing Children**

A-Typical developing children consist of children with a mental or physical disability. A majority of the studies discussed in the previous section only cover typical developing children. As stated before, urban communities are more likely to offer and provide services to children with disabilities of any type. Due to the lack of resources in rural communities, some children may go without diagnosis or assistance from their communities or educational system. Urban and rural environments were cross examined by Mello and colleagues (2016) by studying the services offered for families with a children diagnosed with autism spectrum disorder and how those families utilized those services. 415 guardians of children with autism spectrum disorder were given an online survey about the services provided, the distance traveled to get there and
the satisfaction of those services. Almost a quarter of those participants were from the rural community while the rest were from urban areas. Surprisingly, results shown that that there were equal number of services offered to each environment but both groups utilized them differently. This research shows that significantly less rural families use behavioral support at home because they lacked resources in the community. Overall there were less supportive/professional assistance from rural communities than urban communities. Another study done by Shepard (1942) briefly examines how rural communities work with students with intellectual disabilities. This study determines that rural communities acknowledge that students have strengths and weaknesses but often struggle in approaching this with the limited resources that are available to them. Many teachers and other faculty in the student’s life will often personalize their education for the child in order for them to succeed. This way of personalizing the child’s education is common in rural communities which allows the child to succeed differently than success in urban education.

**Recommendations**

As this report lists pros and cons to each of the unique environments that children can be raised in, there are multiple alternative perspectives to why these children exhibit these strengths or weaknesses in these environments. Similarly to what is stated before, the family of origins ways of raising the child and personal background would affect the child’s abilities and cognitive development. Another factor in play would be the socioeconomic status of the family. Low, medium and high income families were discussed in some of the previous literature and all considered their status to be a limitation of their research. Families in low socioeconomic status, in either environment, would struggle finding the means to physically, mentally and cognitively
provide for their child. The involvement of their community would also distinguish the
development of the child, as discussed in the literature. If a community is frequently interacting
with the family in a positive way, the child will be able to grow and learn from that which will
enable the child to cognitively grow from the support it is shown. Recommendations for
maintaining a positive development of cognition would include having equal amount of time
spent in each environment. Another way to assist the development, as discussed in multiple
studies in the review, would be to instill strong parental involvement in the area in which a
family is raised. These benefits to each community will be strengthened through this parent-child
interaction.

Limitations

Some more limitations of the literature that was reviewed consisted of the broad
definitions and the lack of research done in the United States. In every article and research study,
the definition for urban and rural environments altered. Some defined it population while some
covered square miles. With that, a large majority of the population was disregarded by not
including suburban communities; or not defining that in the research. A majority of the data in
the research was collected in Europe, Canada, or the area was not defined in the literature.
Implications consisted of the lack of participants in rural communities which causes a margin of
error when comparing results. Recommendations from previous literature mainly consisted of
removing as much as outside variables as possible when collecting data but that would be
difficult for researchers to accomplish.
Conclusion

After reviewing various research, it is apparent that there is no set ideal environment for a child to be raised in to ensure the best cognitive development. Each environment has its own benefits and downfalls. If the parent wants their child to have strong language and social skills, a fast learner and have resources always available to them, then the city may have the best opportunities for their child’s growth. If a parent wants the child to have strong helping behaviors, have musical and kinetic strengths and have one-on-one opportunities, than a rural environment may be the best bet for the child’s success. To ensure the best of both worlds, a parent may have the ability to combine these two lifestyles by living right between the city and the country; or spending the school year in one environment while spending the summers in the opposite. Overall, the decision is in the hands of the parents and their involvement in the child’s life; that will be the greatest predictor of the child’s cognitive success.
References


Skyscrapers vs Silos
How Environment Impacts Child Cognitive Development

Morgan Vallie
Outline

➢ Introduction
  ○ Defining the environments and cognitive development

➢ Urban Environment
  ○ Previous Literature

➢ Rural Environment
  ○ Previous Literature

➢ Cognitive Development
  ○ Previous Literature

➢ Alternative Perspectives

➢ Recommendations
Introduction

➢ Urban Environment
  ▪ “An inhabited place of greater size, population, or importance than a town or village” (Merriam-Webster, 2018)
  ▪ 54% of the world’s population
  ▪ Suburban areas

➢ Rural Environment
  ▪ “Relating to the country, country people or life, or agriculture” (Merriam-Webster, 2018)
  ▪ 97% is rural life- 19.3% of the population

➢ Cognitive Development
  ▪ Birth-age 20
  ▪ Piaget’s Stages of Cognitive Development
Urban Environment

➢ Education in Urban Areas (Rutter, 1981)
  ○ Discipline, location, & SES

➢ Parental Involvement (Fantuzzo, McWayne, Perry, & Childs, 2004)
  ○ Greatest predictor of child outcome in adulthood
    ■ Decrease in conduct problems
    ■ Increase in attention span, vocab skills & motivation
Urban Environment Continued

➢ Crime (Newberger & Cook, 1983)
  ○ Abuse and parental awareness
  ○ Parental involvement—higher awareness

➢ Transportation Noise (Clark & Stansfield, 2007)
  ○ Increase chances of coronary heart disease & higher stress in adults
  ○ Opposite for children
  ○ Sleep Disturbances
  ○ Educational Impacts
Rural Environment

➢ Social Life (Steblay, 1987)
  ○ Smaller communities = stronger helping behaviors

➢ Family Dynamics (Blair et al., 2008)
  ○ 13.3% of population live in poverty
  ○ Mother engagement—lower cortisol levels, greater attention span & slower temperament
  ○ Community involvement positive impact
Rural Environment Continued

➢ Crime (Walsh, 2013)
  ○ TIME Magazine article debate
    ■ City vs Rural Safety
    ■ Different types of crime
Cognitive Development

➢ Language Development (Anastasiow & Hanes, 1974)
  ○ Three Subcultures—kindergarten & 2nd grade
  ○ Inner city children—same results compared to rural youth
  ○ Rural Youth—lower language skills

➢ Language Development cont. (Shepard, 1942)
  ○ Urban strengths—verbal
  ○ Rural strengths—musical & kinesthetic
Cognitive Development Continued

➢ Educational Performance (Lloyd & Hertzman, 2010)
   ○ Stability in the community—influences education

➢ Family Impact on Cognitive Development (Nokali et al., 2011)
   ○ Decrease in Problem Behaviors
   ○ Increase in Social Skills
**A-Typical Developing Children**

- Equal Number of Resources (Mello et al., 2016)
  - Rural
    - Lack of behavioral support
    - Less professional support from lack of local help
    - One-on-One Support
  - Urban
    - More available resources
    - Broad range of help
    - Not as personal
Alternative Perspectives

➢ Family Origins
➢ Socioeconomic Status
➢ Community Involvement
Recommendations

➢ What can a parent do?
  ○ Parental Involvement
  ○ Equal Time in both environments
  ○ Suburban Residence

➢ The Best of Both Worlds
  ○ Urban Benefits
  ○ Rural Benefits
Any questions?