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IN THE FIELD OF

EDUCATIONAL SCIENCES

EDITORS

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gece kitaplığı

CONTENTS

CHAPTER 1

LULLABIES IN TURKISH CULTURE

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1. INTRODUCTION

Culture generally refers to the sum total of human knowledge, beliefs and behaviors and all kinds of material and immaterial creations that constitute the components of this sum total. Among the elements that contribute to the shaping of social and individual life are various material and immaterial products such as language, traditions, ideas, symbols, laws, rules, morals, theories, tools, techniques, machines, science, philosophy and works of art. In this context, culture can be defined as a set of institutions and values that all members of a society collectively form and adopt. Therefore, culture is "the way of life of a people." (Turan 1994: 36; Akt. Çüçen, 2005)

Culture consists of two elements, material and immaterial. The transmission of these elements from generation to generation is ensured by these two elements. Building constructions, clothes worn and various tools and equipment are among the elements of material culture. Basic beliefs, norms, rules, customs and traditions, folk songs and lullabies are elements of immaterial culture. What is important here is that today's society must preserve these material and immaterial cultural elements and pass them on to other generations. Because culture is based on human beings in terms of its origin and purpose. As a result of this foundation, the establishment and spread of culture gains different dimensions (Uygur, 2003).

The most important element that ensures the existence and coexistence of a society is undoubtedly its unique cultural identity. Protecting this cultural heritage and passing it on to future generations is one of the primary responsibilities of all societies. Societies that remain connected to their roots aim to live in a strong social integrity both today and in the future. As the proverb "grass grows on the root" expresses, societies take root in the soil thanks to their cultural structures and develop with the strength they derive from their past. Societies that break away from their roots either collapse, disintegrate or disappear from the stage of history. (Büyükyıldız, 2009; Akt. Karagöz & İşcan 2016).

While culture forms the bonds that hold society together, it also shapes the identities of individuals. Because it is the individuals living in that society that make up the society. All the characteristics of these individuals such as language, religion, belief, customs, traditions, art and architecture form the identity of the society. People living together need national unity and solidarity in order to survive as a nation. Nations transfer their culture to future generations in order to preserve this unity and solidarity. Culture transfer is indispensable for the continuity of nations (Güfta ve Kan 2011).

As one of the cornerstones of a society's cultural memory, lullabies are a valuable heritage engraved in the minds of children in their early years.

These melodies, sung with the loving voices of mothers, help children learn the values, traditions and way of life of the society. Through lullabies, children are introduced to music while forming their cultural identity. In this way, both their mental and emotional development is supported. (Ungan, 2009) In this context, the use of lullabies as cultural transmission is very important for Turkish culture.

Lullabies are special compositions in which mothers convey their feelings and thoughts to their children in the simplest form and share their inner world with them. Lullabies, which each mother has her own unique style and melody, give children their first experience of language and music, while at the same time shaping their value judgments. Mothers not only put their children to sleep with lullabies, but also take them on a journey to the spiritual world. By whispering national and spiritual values, historical events and beliefs to their children, they contribute to both their physical and spiritual development. (Farsakoğlu Eroğlu, 2018).

Lullabies are much more than simple melodies used to lull babies to sleep. In the Turkish lullaby tradition, there are many examples in which the moments of awakening, joy and activity of babies are also depicted. This shows that lullabies are not only used to lull babies to sleep, but also to entertain them, to establish emotional bonds with them and to begin their education. When lullaby texts are analyzed, it is seen that education in Turkish society begins in the cradle, that lullabies are sung in a simple and understandable language and that they contribute greatly to the child's language development (Demir and Demir, 2010:17).

Although lullabies may seem simple at first glance, they actually have a very important role in the development of children. Just as every nation has its own lullabies, the Turkish nation also has a rich lullaby culture. The national, spiritual and cultural values in these lullabies shape the language, emotions and thoughts of children. Lullabies sung with the loving voices of mothers strengthen children's sense of trust and give them an unforgettable experience in the first years of life (Farsakoğlu Eroğlu, 2018).

Although there is no exact information about the origin of the word "lullaby" and when it was introduced into Turkish, it is clear that this oral tradition has a long history. In his work "Divanü Lügat it-Türk" written in the 11th century, linguist Kashgarlı Mahmud uses the expression "balu balu" for "lullaby" and describes this doubling as "Lullaby. This is what women sing in the cradle to lull the child to sleep" shows that the tradition of singing lullabies in Turkish culture started at least before the 11th century. Kashgarli Mahmud's work suggests that the word lullaby entered Turkish after the 11th century or that it took on a different form during this period. However, the existence of the tradition of singing lullabies, albeit

with a different expression such as “balu balu”, reveals that lullaby singing was a common practice in ancient Turkish culture. This shows that Turks have been singing lullabies to their children throughout history in order to put them to sleep, establish emotional bonds and transmit cultural values. (Çıblak Coşkun, 2013)

Lullabies are much more than simple melodies used to lull babies to sleep. These special songs, sung by women and passed down to babies, play an important role in the transmission of social values, traditions and beliefs from generation to generation. Through lullabies, mothers instill in their children the cultural identity of the society they belong to and ensure that future generations adopt this identity. Cultural memory is the mechanism by which a society passes on its past, values and traditions to future generations. Lullabies play an important role in this memory process and ensure the transmission of cultural knowledge from generation to generation. Important life events such as birth, marriage and death, traditional rituals, social norms and values are transmitted to children through lullabies. In this way, children feel that they are part of the society and form their cultural identity. Lullabies are not only a form of verbal expression, but also a means of emotional bonding. Lullabies, sung in the loving voices of mothers, create a sense of security in babies and play an important role in their socialization process. Therefore, lullabies are not only a cultural heritage but also a means of psychological support. In sum, lullabies are an indispensable tool for preserving the cultural identity of a society and passing it on to future generations. These special songs sung by mothers are the first cultural experiences engraved in children’s minds and shape the values they will carry throughout their lives (Kırcı Uğurlu, 2014: 43). In this study, we will talk about the feature of lullabies to transfer cultural memory, the use of lullabies in Turks, which can be called the first step in the transfer of culture to children and the implantation of national and spiritual values in Turks as in other nations, which we think will be beneficial for today’s society.

2.CHARACTERISTICS OF LULLABIES

Lullaby is more than just a sleep song, it is an emotional communication tool that plays an important role in strengthening the bond between mother and baby. While singing lullabies, mothers both express their own emotions and pass on the cultural values of the society to which they belong. In this way, lullabies contribute to the establishment of a secure bond between mother and baby and to the emotional development of the baby. The soft melody and rhythm of lullabies help both mother and baby to relax and reduce stress levels. Listening to lullabies regularly, especially during pregnancy, positively affects the mother’s mood and allows the baby to develop in a more peaceful environment (Baltacı & Başer 2020).

According to Şimşek 2016; Lullabies are sung in a simple language close to the daily spoken language of the people. For this reason, the word structure and pronunciation of lullabies reflect the dialectal characteristics of the region where they are sung. Singers of lullabies are usually women such as mothers, grandmothers and aunts. Today, however, with the increase in the number of working mothers, fathers and caregivers have also started to sing lullabies. Lullabies have fixed stereotyped expressions that are repeated at the beginning and end. As a product of oral literature, lullabies are usually anonymous, meaning that they are folk poems whose singer is unknown. '' Dandini dandini dan iki; Dandini dandini dastana; Dandini dandini danalı bebek; Dandini dandini danayı; Eee.... dedim (yavrum), Hu hu hu Allah, Hu hu hu kuşu, Kızım kızım benim kızım, Ninni dedim (derim) Pattern expressions at the end of lullabies: Eee... eeee..., Hû.... Hû...., Nenni nenni nenni; Ninni ninni ninni, Piş piş piş ...., Uyusun da büyüsün''.

Lullabies are one of the most valuable parts of a nation's cultural heritage. Lullabies, which are reflections of traditional life and values, have an important role in creating the cultural identity of the society and transferring it to future generations. Lullabies are much more than just simple melodies used to put children to sleep. These oral products, with the cultural codes they contain, transmit the values, beliefs and lifestyle of the society to new generations. For this reason, lullabies can also be seen as educational tools. As can be seen in the analysis of literary texts, even texts that are not directly written for educational purposes contain an indirect or direct instruction. In this context, lullabies are an important tool that teaches cultural values to children in a fun and memorable way (Yılmaz, 2016).

Mothers initiate meaningful learning processes by transferring the knowledge they blend with their life experiences and motherly love to their children through lullabies. Thanks to the magical power of words, bridges are built between the past and the present, and the bond between mother and child is strengthened. Lullabies contribute to the emotional, cognitive and linguistic development of children, while at the same time conveying to them the historical and cultural heritage of the society to which they belong. In this way, children establish a link between the past and the future and form their identity. Lullabies are an important tool that helps children understand and explore the world and express themselves (Karagöz, İşcan; 2016).

Lullabies are the first works of music and literature that children encounter. These special songs, which they hear in their mothers' voices, play an important role in children's acquisition of language, music and culture. While the words in lullabies form children's first vocabulary, the melodies shape their musical tastes. Lullabies are not only sung to put children to

sleep, but also fulfill many functions such as teaching them moral, religious and national values, making them dream and establishing emotional bonds. The content of lullabies is quite diverse. They can reflect positive emotions such as prayers, wishes, advice and praise, as well as express emotions such as reproach, complaint and fear. This shows that lullabies reflect every aspect of life. Lullabies are also closely related to other genres of folk literature. Similar characteristics to lullabies can be seen in genres such as lullaby, nursery rhyme, lament, folk song, legend and fairy tale. Some lullabies have even emerged as a mixture of these genres (Şimşek, 2016).

Lullabies are much more than just sleep songs. With their melodic structure, they provide children with their first acquaintance with language and music, while at the same time conveying to them the values of the culture they belong to, its history and the richness of its language. The words and forms of expression in lullabies help children better understand and love their mother tongue. Just like the treasures hidden beneath the soil, between the lines of lullabies there is cultural and historical information waiting to be discovered. For this reason, lullabies are an important tool for developing children's language awareness, keeping our cultural heritage alive and teaching the meaning of life (Karagöz, İşcan; 2016).

Lullabies are special poems that reflect both the love, hopes and concerns of mothers for their children and children's first impressions of the world. Although they do not have to follow a specific pattern, these melodies, which usually consist of quatrains and have a rhythmic structure, become even more meaningful with certain words repeated at the beginning or end. The content of lullabies can include wishes for the development of children, feelings about family ties, scenes from daily life and sometimes even references to social events. In this respect, lullabies function as both individual and social memories (Gelişli Yazıcı, 2014).

Lullabies are not just simple melodies used to lull children to sleep. These oral products serve as an important bridge that transfers the cultural heritage of a society to future generations with the rich content they contain. The lullabies that mothers sing to their children reflect the family structure, values, beliefs, lifestyle, dreams and expectations of that society. For example, the foods, clothing style or professions mentioned in a lullaby give important clues about the social and economic structure of that period. In this way, lullabies, like a time capsule, carry the traces of the past and pass them on to future generations (Kırcı, Uğurlu; 2014).

3.THE IMPORTANCE OF LULLABİES İN HİSTORY AND CULTURE TRANSMİSSİON

Lullabies are oral literature products that exist in different cultures around the world and have an important place in the child-rearing process. Turkish people have been singing lullabies to their children for centuries, lulling them to sleep, calming them and instilling cultural values. One of the first scientific studies on Turkish lullabies was conducted by the Hungarian Turkologist Ignác Kúnos. In his work "Turkish Lullabies" published in 1922, Kúnos made an important contribution to the rich oral culture of the Turkish people. After Kúnos, researchers such as Enver Behnan Şapolyo, M. Nasıh Güngör, Âmil Çelebioğlu and M. Sabri Koz also conducted studies on Turkish lullabies and published important works in this field. Thanks to these studies, the content, characteristics and cultural importance of Turkish lullabies have been better understood and passed on to future generations (Çıblak Coşkun, 2013; p. 501).

The origins of lullabies are quite old. Dating back to 1074, lullabies have played an important role in the development of children for centuries. Although it is not known whether the people of that period consciously pursued educational purposes while creating lullabies or simply wanted to express their love for their children, the impact of lullabies on children's development is an undeniable fact.

The lullabies our grandparents sang to their children were not just sleep songs. These lullabies reflected the hopes, dreams, anxieties and boundless love of the people at that time for their children. We grew up with these lullabies, learned our language and culture, laid the foundations of our numerical skills and even experienced our first teacher-student relationship. Even if we did not fully understand the words in the lullabies, we felt love and trust in these songs sung by our parents in their warm voices. Even today, the reason why we feel a sense of warmth and peace when we hear a lullaby that we often heard in our childhood is because lullabies were ingrained in us during our childhood years.

https://blog.uppyforkids.com/aktiviteler/bebek-ninnileri-ve-cocuk-gelisimindeki-onemi/ .

4.THE IMPORTANCE OF LULLABİES İN TURKİSH FOLK CULTURE

Lullabies are considered one of the oldest and most widespread forms of oral literature in human history. This special type of folk song, sung to lull children to sleep, is much more than just a sleep song. Lullabies are special poems that reflect the love of mothers for their children, their instinct to protect and their hopes for the future, and contain cultural and social

values. Turkish lullabies are usually short and in quatrains and are quite diverse in content. Some lullabies carry traces of legends and laments, while others wish a good future for the child. Separation and expatriation are also common themes in lullabies. This diversity shows that lullabies are not only a sleep song, but also an important oral literature product that reflects the values of a culture and a society (Abbasova & Akkaynak, 2017).

Lullabies can be selected as cultural accumulation and, like other types of music, differ from region to region. In the world, it has a structure that has been influenced by many social relations and has transferred its own culture to other communities. This situation continues with the existence of various cultural elements within the country. Turkey is located in seven different regions, each region has its own unique living conditions, housing characteristics, food cultures and music traditions. Considering these characteristics, each region has developed its own music genres. Lullabies are also influenced by the factors that are effective in the emergence of these music genres and show differences in the regional region. People living in mountainous structures have conveyed their lifestyles to children in their lullabies; they have wished to enrich their livelihoods through lullabies of obstruction and restriction; those living at sea have included ships in their lullabies; and those living in multi-tree settings have described forests in their lullabies. These examples show that the subjects of lullabies reflect people's lifestyles (Güleç Ersoy & Yücetoker 2011).

Lullabies are more than just a sleep song, they are an important bridge that carries the heritage of our culture from generation to generation. Through the lullabies that mothers sing to their babies, the values, beliefs and lifestyle of our society are passed on to new generations. In this way, babies begin to form their cultural identity from the very first years of life. Lullabies also contribute to babies' language, music and emotional development. However, in changing times and conditions, the content of lullabies also changes and is updated. In this process, mothers build a special world for their children by bringing together both the wisdom of the past and the realities of the present (Büyükokutan Töret, 2018).

5.LULLABİES AS A SOCİAL VALUE

Values are elements that are effective in shaping the life of the individual, strengthening his/her bond with social life, guiding him/her from how his/her behavior should be to how he/she should overcome the obstacles in his/her life, and covering his/her whole life (Kanak et al. 2018).

Societies are dynamic structures that are formed by individuals coming together and are in constant interaction. While individuals live their lives within the framework of norms and values determined by the society, they are also among the elements that shape this society. Common values

such as culture, customs and traditions are the basic building blocks that enable society to live together. These values protect the peace and welfare of society, while at the same time giving individuals a common identity and sense of belonging. However, societies, just like individuals, change over time and one of the most important factors in this change is the individuals themselves (Tut & Kıroğlu, 2017).

Preschool education programs adopted from Western education systems contain important principles for the development of children. However, the foundations of these principles were laid much earlier in lullabies that have been sung in Anatolia for centuries. Lullabies should be seen as a versatile educational tool that contributes to the emotional, mental and social development of children (Demir, 2008).

Lullabies sung with the warm and reassuring voice of mothers make important contributions to the emotional development of babies. These melodies strengthen the sense of trust in babies and give them a sense of belonging. At the same time, the words and melodies in lullabies support children's mental development and help them learn language. The values transmitted to children through lullabies play an important role in the formation of their personalities (Güven, 1999: 163-165).

Assmann emphasizes the importance of a process he calls "binding structure" in the formation of cultural identity. This structure brings people together by creating a symbolic meaning world of shared experiences and expectations. Through cultural narratives and legends, a bridge is built between the past and the present and individuals gain a sense of "we". In this way, individuals feel that they have a common past and act with a sense of belonging to the culture. The basic principle of this binding structure is the constant repetition of past experiences and values, thus ensuring cultural continuity (Assmann, 2018: 23).

Tension is inevitable in a society where negative situations such as disrespect and injustice prevail. Since this situation will negatively affect all individuals, it is of great importance to transfer the basic values of society to new generations. The people who can fulfill this task in the best way are undoubtedly mothers. In special moments alone with their babies, mothers instill social values by singing lullabies to them. In this way, children learn to distinguish between right and wrong, good and bad at a young age (Büyükokutan Töret, 2018).

Lullabies, which are an important part of the cultural heritage of societies, are used not only to put children to sleep, but also to teach them the values and rules of society. These words whispered by mothers leave deep traces in the minds of children and make them a part of society. Values such as family ties, respect and cooperation emphasized in lullabies contribute

to the peaceful and orderly functioning of society (Dönmezer, 1984: 286).

6.CONCLUSION

As a result, it was revealed that Turkish folk lullabies are important in the context of cultural transmission. In this direction, it is important to keep the lullaby tradition alive.

Beyond strengthening the bond between mother and baby, lullabies play a multifaceted role in the development of children. First of all, children learn their mother tongue through lullabies. At the same time, they learn about many subjects such as kinship relations, religious and moral values, social life, community relations and national values. Lullabies sung to melodies develop children's aesthetic tastes and help them socialize. Lullabies are also a mirror of mothers' inner world. While mothers wish well for their children in lullabies, they also reflect their own feelings. Depending on their relationships with their spouses, family elders or the environment, lullabies may also include feelings of disappointment, fear, loneliness, longing and expectations. This shows that lullabies are also an important tool for emotional comfort for mothers. Psychological comfort for both mother and child increases the overall happiness of the family. A happy family establishes more tolerant and loving relationships with its environment. Therefore, it can be said that lullabies are an important tool for the health of not only children but also families and society (Çıblak Coşkun, 2013).

It is imperative that the values found in all of our lives are given to our students, who will take our place and whom we prepare for the future, through education. Therefore, the importance of an effective values education increases (Yalar & Yelken, 2011).

In Turkish culture, lullabies are not just simple songs used to put babies to sleep. In fact, they are an important cultural heritage that reflects the values of our society and is passed on to future generations. Lullabies are like the first seeds planted in children's minds and play a major role in the formation of their value judgments. The rich cultural structure of our country also shows itself in lullabies. Lullabies varying according to regions reflect the cultural diversity of our country. In this way, lullabies serve as a cultural bridge between generations and help us create a common identity.

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CHAPTER 2

MIXED METHODS RESEARCH AND ITS APPLICATION IN THE FIELD OF GUIDANCE AND PSYCHOLOGICAL COUNSELING

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INTRODUCTION

The two common traditions in scientific research, quantitative and qualitative approaches, adopt different principles toward reality, knowledge, and, consequently, research processes based on distinct philosophical paradigms. Until the second half of the 20th century, the dominance of the positivist paradigm manifested itself in both natural and social sciences through a reductionist perspective, aiming to achieve generalizable results and, ultimately, objective reality via valid and reliable measurements within the quantitative tradition.

Advancements in social sciences and the growing need to go beyond the numerical meanings of phenomena in the changing modern world have paved the way for the development of postpositivist and interpretive/constructivist paradigms (Denzin & Lincoln, 2011). The interpretive paradigm, with its perspective on the complex, mutually causal nature of reality and its rejection of objectivity, found its reflection in the qualitative research tradition that embodies a pluralistic viewpoint in scientific studies (Yıldırım & Şimşek, 2016). Both approaches exhibit strengths and limitations.

The multidimensional nature of events and phenomena, which cannot be fully explained through data obtained from a single approach, has necessitated enrichment in research methodologies. This need has led to the evolution of "mixed methods research," which integrates elements of both approaches. According to Creswell and Plano Clark (2018), the complexity of research problems demands answers that extend beyond the numerical data obtained through quantitative approaches or the verbal data gathered through qualitative approaches. The integration of both offers the richness required to provide the most comprehensive answers to multidimensional problems.

Although the combined use of both methods in scientific research dates back further, mixed methods research began to emerge as a distinct field in the 1980s and 1990s, with an increasing focus on methodological conceptualization (Creswell, 2021). The inclusion of multiple data collection methods and analyses in research introduces numerous risks concerning validity and reliability threats across processes such as sample selection, data collection, analysis, and reporting of findings (Yıldırım & Şimşek, 2016). This has created a need for both researchers and those engaging with such studies to establish a clear pathway that goes beyond merely juxtaposing two different datasets, aiming to enhance the quality and comprehensibility of the research (Creswell, 2003). Mixed methods research is a young methodology that emerged as a result of researchers' efforts to meet these needs.

While there is no consensus yet on elements such as the naming, definition, and philosophical perspective of mixed methods research, it is widely recognized as the "third research paradigm" or the "third methodological movement" (Teddlie & Tashakkori, 2009).

Today, mixed methods research is supported by the Mixed Methods International Research Association (MMIRA) and is a recognized field in international literature, with ongoing methodological discussions and developments in journals such as *Journal of Mixed Methods Research*, *International Journal of Multiple Research Approaches*, *International Journal of Mixed Methods in Applied Business and Policy Research*, and *Quality and Quantity*, among others.

1. THE THEORETICAL CONTEXT OF MIXED METHODS RESEARCH

1.1. The Development of Definitions and Philosophical Perspectives in Mixed Methods Research

Mixed methods research has been referred to by various names and definitions in the literature. As a young field, different perspectives emerging within mixed methods methodology have been reflected in varying terminologies and definitions. Terms such as mixed method(s), mixed research, mixed methodology, mixed methods research, multiple methods, integrated research, and qualitative and quantitative methods have been used in the literature (Toraman, 2021).

The diversity in these terminologies reflects researchers' perspectives on defining mixed methods, whether as a method, methodology, or philosophical approach. In terms such as integrated research, the emphasis is placed on combining two datasets (Steckler et al., 1992). Other terms like qualitative and quantitative methods or hybrid research highlight a methodological combination in mixed methods research (Fielding & Fielding, 1986; Ragin et al., 2004, as cited in Creswell & Plano Clark, 2018). Meanwhile, terms such as mixed methodology and mixed methods research suggest not only a focus on methods but also the presence of underlying philosophical assumptions (Creswell, 2003; Teddlie & Tashakkori, 2009).

In the mixed methods literature, different conceptual perspectives have been expressed through mathematical formulations. The "1+1=1 perspective" aligns with the view of mixed methods as a third research paradigm. Johnson and Onwuegbuzie's (2004) term "mixed research" reflects this perspective. This perspective is also seen in practices like transforming qualitative data into numerical variables or representing codes and themes through frequencies.

The "1+1=2 perspective" corresponds to conducting qualitative and quantitative research separately without integration (Fetters, 2018). In this perspective, results obtained from independently conducted sampling and data collection processes remain unconnected.

The "1+1=3 perspective" emphasizes the importance of integration in mixed methods research, arguing that the outcomes derived from mixed methods are more than the sum of the two types of data alone (Fetters, 2018).

Today, the most widely accepted term in international literature is "mixed methods research." Its Turkish equivalent, however, has been critiqued by Toraman (2021), who argues that it should be "karma yöntemler araştırması" (mixed methods research) following Crotty's (1998) conceptualization.

In the methodological examination of mixed methods research, Crotty's (1998) conceptualization of the research process is frequently referenced (e.g., Almalki, 2016; Creswell & Plano Clark, 2018; Hall & Howard, 2008; Migiro & Magangi, 2011; Toraman, 2021). Crotty (1998) identified four fundamental building blocks in designing the research process: philosophical perspective, theoretical perspective, methodological approach, and methods. A study's philosophical perspective reflects its view of knowledge and reality, shaping its theoretical perspective in line with the adopted paradigm. The theoretical framework guides the chosen methodology. Methodology refers to the knowledge of how the research will be conducted, while methods indicate the specific procedures for data collection and analysis (Schwandt, 2007).

Creswell and Plano Clark (2018) define mixed methods research at the methodological level as "an approach that involves the collection, analysis, and purposeful integration of qualitative and quantitative datasets, shaped by philosophical and theoretical foundations, to understand a research phenomenon." The philosophical and theoretical integration emphasized in this definition is a persistent topic of discussion in mixed methods research. Despite the belief that a study must adhere to the principles of either the positivist/postpositivist or interpretivist paradigm, the foundational philosophical underpinning of mixed methods research is pragmatism (Johnson et al., 2007). Mixed methods research aligns with interpretivist paradigms in the assertion that the multidimensional nature of phenomena cannot be comprehended using a single method. However, the pragmatic perspective advocates for a pluralistic, problem-focused, and practice-centered approach to research topics, suggesting that achieving the best research design to address the research problem should take precedence over philosophical paradigms (Teddlie & Tashakkori, 2009).

In addition to pragmatism, mixed methods research also incorporates Mertens' (2007; 2010) transformative-emancipatory paradigm, critical realism, and dialectical pluralism as philosophical approaches.

In mixed methods methodology, researchers need to adopt deductive, inductive, and subjective thinking simultaneously. Greene (2005) describes this flexible mindset as a "transformative perspective," emphasizing its importance for conducting coherent research that transcends the rigid boundaries of traditional research paradigms. Structuring research within a transformative perspective often involves the integration of theories addressing feminism, social justice, or disability studies, reflecting a growing trend in the field.

1.2. Characteristics of Mixed Methods Research

The general characteristics of mixed methods research can be summarized as the collection and analysis of both qualitative and quantitative data to answer research questions, leveraging the strengths of both methods, integrating the two datasets through a design unique to mixed methods, and framing this process within a theoretical or philosophical perspective (Creswell, 2021). These characteristics enhance the credibility of the research. Based on these features, Greene et al. (1989) identified five key functions of mixed methods research:

1.Triangulation: Qualitative and quantitative data are used to verify and enhance each other. Investigating the same dimensions of a research problem using two different methods contributes significantly to data diversity and validation.

2.Complementarity: Different dimensions of a research problem are examined using different methods, and the results complement each other, providing a comprehensive understanding of the problem.

3.Development: One method enhances the other. For instance, qualitative or quantitative data can guide the development of data collection tools or processes for the other method.

4.Initiation: Mixed methods research can introduce new meanings or perspectives regarding an event or phenomenon. It facilitates understanding while also leading to exploration from a different angle.

5.Expansion: Research previously conducted using a single, limited method can be expanded into a multidimensional and broader framework through mixed methods.

Not all of these five functions are equally present in mixed methods studies. The research design provides insight into the extent to which these functions are reflected in the study.

1.3. Key Concepts in Mixed Methods Research

In their study, Creswell and Plano Clark (2018) identified 14 key concepts of mixed methods research and emphasized the necessity of incorporating these concepts into studies. These concepts are defined as follows: "including the term mixed methods research in the title, justification for using mixed methods, paradigms and assumptions, mixed methods research design, sampling, qualitative and quantitative methods in data collection and analysis, timing of qualitative and quantitative methods, priority of methods, integration techniques, results of qualitative and quantitative analyses, integrated mixed methods results, contributions of using mixed methods, and the development of the field of mixed methods research."

1.3.1. Including the Term "Mixed Methods Research" in the Title

Creswell and Plano Clark (2018) recommend including the term "mixed methods research" or other representative key concepts in the study title. This practice facilitates researchers' accessibility to the study, reflects its methodological stance, and contributes to the mixed methods methodology.

1.3.2. Justifying the Use of Mixed Methods Research

Researchers are expected to justify their use of mixed methods and explain how this design contributes to solving the research problem. It is recommended to specify which of the five fundamental functions proposed by Greene et al. (1989) will be predominantly utilized and how they will illuminate the research problem.

Bryman (2006) suggested the following guiding questions to determine the typology of the research:

1.What is the timing of qualitative and quantitative data collection (simultaneous/sequential)?

2.Which approach is prioritized in terms of weight or importance?

3.For what purpose (triangulation, explanation, exploration) is integration used?

4.At what stages of the research process (design, data collection, analysis, discussion) is the use of multiple methods implemented?

1.3.3. Paradigms and Assumptions

Mixed methods research is positioned not at the extremes but at the intersection of the postpositivist and constructivist paradigms. By its nature, mixed methods allow for the integration of results derived from these two paradigms and the analysis of different types of data using dialectical pluralism. A study may bear traces of both paradigms.

It is recommended that researchers reflect on their stance toward the problem, consciously acknowledge their adopted perspective and values, and explicitly state them in their study (Creswell & Plano Clark, 2018).

1.3.4. Mixed Methods Research Designs

The mixed methods research methodology provides guidance for researchers to design their studies and address their research problems through appropriate designs. To meet this need, various typologies have been developed by mixed methods researchers. Frequently used typologies in the literature include those developed by Creswell (2003), Morse (2003), Johnson and Onwuegbuzie (2004), and Leech and Onwuegbuzie (2009) (as cited in Baki & Gökçek, 2012). This review focuses on the typologies described by Creswell and Plano Clark (2018), which are among the most widely used in the literature. In this typology, mixed methods research designs are categorized into two main types: *basic and advanced designs.*

Basic designs are named based on the purpose of using mixed methods in the study and the sequence of collecting and analyzing different types of data. These include three types commonly seen with different names in Turkish literature:

1.Convergent (triangulation/simultaneous/parallel) design

2.Explanatory sequential design (quantitative → qualitative sequence)

3.Exploratory sequential design (qualitative → quantitative sequence)

For the convergent/triangulation design, alternative terms such as concurrent or integrated design are also used in the literature. In this design, quantitative and qualitative data are collected and analyzed simultaneously, and the results are integrated through comparison. This approach aims to derive different but directly related data to address the research questions. The use of both data types together contributes to data validation and the credibility of the study (Yıldırım & Şimşek, 2018). In this design, where quantitative and qualitative methods are given equal importance, research questions equally reflect both methods. Different approaches can be followed during data analysis: quantitative and qualitative data may be analyzed and reported separately, or they may be converted and analyzed collectively. The purpose of the study and research questions shape the analysis approach (Creswell, 2021).

Creswell and Plano Clark (2018) recommend using pragmatism in parallel designs, offering a more inclusive perspective rather than combining different philosophical paradigms.

The explanatory sequential design involves collecting and analyzing quantitative data in the initial phase of the research, followed by an in-depth exploration and explanation of these data using qualitative methods. Creswell and Plano Clark (2018) suggest that this design, which includes a sequential application of two different methods, can accommodate different paradigms. The dialectical pluralism approach allows the coexistence of paradigms underlying the two methods used in the study.

In the exploratory sequential design, the research problem is first explored and examined in detail using qualitative methods. The qualitative findings guide the procedures to be applied in the second phase using quantitative methods. Examples within this design include scale development, experimental intervention design, and taxonomy studies. In this design, following the transformation of qualitative findings into a quantitative measurement or intervention tool, a third step involves the application and examination of effectiveness. Creswell (2021) refers to this design as a "three-stage design."

Advanced designs represent the other category of mixed methods research designs. They combine various methodologies or theoretical approaches in three ways:

1.Embedding a quantitative or qualitative research design within another approach (embedded design).

2."Intersecting" a mixed methods design with another methodology.

3."Intersecting" it with a theoretical perspective (Toraman, 2021).

Experimental/Intervention Designs: In this design, researchers collect and analyze data using both methods, integrating this information into an experimental or intervention trial. This design typically prioritizes quantitative experimental approaches while enriching the experimental process with qualitative data collected before, during, or after the experiment (Creswell, 2012).

Mixed Methods Case Study Design: This design incorporates a basic mixed methods design within a single or multiple case studies. It represents an intersection of the case study methodology with another mixed methods design (Creswell & Plano Clark, 2018). Guetterman and Fetters (2018) propose two alternatives for conceptualizing mixed methods case studies: embedding the case study into a mixed methods research design or embedding the mixed methods design into a case study.

Transformative/Social Justice Designs: These designs apply basic mixed methods approaches within the framework of social justice or transformative theories, such as feminist theory, queer theory, or critical race

theory. This design aims to improve individuals' lives, with the researcher reflecting their theoretical perspective throughout the study. The concluding section, titled "Call for Change," outlines the researcher's stance and the social justice objectives (Creswell, 2021).

*Multiphase Evaluation Designs***:** These designs assess the effectiveness of activities or programs over time. They are frequently seen in program evaluation studies where quantitative and qualitative approaches are used sequentially to develop, adapt, and evaluate specific programs. Each phase represents an independent study, hence the designation "multiphase" (Creswell & Plano Clark, 2018).

1.3.5. Qualitative and Quantitative Methods (Sampling, Data Collection, and Analysis)

The research design serves as a fundamental determinant that researchers must consider when designing qualitative and quantitative methods in a study. The methodological consistency of the research with the chosen design is expected to enhance its credibility (Creswell & Plano Clark, 2018).

In mixed methods, sampling involves selecting units or events for research using both random sampling techniques (to increase external validity) and purposeful sampling techniques (to enhance transferability) (Baki & Gökçek, 2012). Discussions surrounding sampling strategies vary depending on the design.

In the **parallel/convergent design**, the participant group for both datasets should be selected from the same source. While there is no consensus in the literature on whether the sample size should be the same for both data types, as long as the researcher justifies and communicates their decision in alignment with the study's purpose, using different sample sizes is acceptable.

In the **explanatory sequential design**, random sampling is commonly used in the quantitative phase, while purposeful sampling is used in the qualitative phase. Since the sample sizes naturally differ in this design, the most common practice is to select qualitative participants from among the quantitative participants on a voluntary basis (Creswell & Plano Clark, 2018).

In the **exploratory sequential design**, the sampling strategy develops in the opposite direction of the explanatory design. Purposeful sampling is employed in the qualitative phase to collect in-depth data from a small number of participants related to the topic. In the subsequent quantitative phase, a larger random sample is used to focus on understanding the broader population (Teddlie & Tashakkori, 2009).

In **advanced mixed designs**, sampling methods largely resemble those of the basic designs. In intervention designs, the timing of qualitative data collection introduces variation. For instance, if qualitative data are collected before the intervention, participants are selected through purposeful sampling. If collected during the intervention, sampling varies based on the purpose of the study and whether data are collected from the experimental group, the control group, or both. If collected post-intervention, the sampling naturally involves participants from the intervention (Creswell & Plano Clark, 2018).

1.3.6. Timing of Qualitative and Quantitative Methods

Another key aspect emphasized by Creswell and Plano Clark (2018) is the timing of the methods used in a mixed methods study. The processes of data collection and analysis, determined by the research design, are referred to as "sequence." Researchers are expected to clearly state this sequence and provide a rationale for it in their studies.

1.3.7. Priority of Qualitative and Quantitative Methods

Indicating which method—qualitative or quantitative—takes precedence, or in other words, which is given more weight or importance, is crucial for readers to understand the researcher's perspective.

Researchers may describe their approach as "qualitatively dominant," "quantitatively dominant," or "equally important." For studies expressed in sequential typologies (quantitative → qualitative, qualitative → quantitative, or concurrent qualitative + quantitative), the emphasis on priority can also be denoted with uppercase letters (e.g., sequential QUANTITATIVE → qualitative). When both methods are equally weighted, no uppercase emphasis is used (Toraman, 2021).

1.3.8. Integration Techniques

At its current stage, mixed methods methodology emphasizes that the combination of two methods should be more than a random juxtaposition of approaches (Johnson & Onwuegbuzie, 2004). The integration of different approaches is the backbone of mixed methods research. Researchers are expected to clarify how qualitative and quantitative methods are integrated into the study and how the results are synthesized (Creswell & Plano Clark, 2018).

Plano Clark (2019) suggests that researchers address the following questions concerning integration in mixed methods research:

1.Why are we integrating? The necessity of including an integrative mixed methods question in the research problem is emphasized.

2.What are we integrating? The interaction between qualitative and

quantitative data sources should be designed, and their collective role in answering the research question should be identified.

3.When are we integrating? The timing of integration and the points of connection should be determined. Integration can occur during data collection, analysis, or in the presentation of results. Plano Clark (2019) recommends using methodological diagrams for this purpose.

4.How are we integrating? Researchers should consider integration techniques and explicitly state their use in the methodology section.

During reporting, researchers are encouraged to use "joint displays"—designs that visually combine quantitative and qualitative data results with integrated mixed methods outcomes and interpretations—to concretize integration and interpretation (Guetterman et al., 2015).

The critical point in integration techniques is ensuring that the selection aligns with the study design and is thoroughly justified in the methodology section. Creswell (2021) proposes four integration techniques:

1.Comparison of datasets: Common in parallel designs, this involves merging and comparing qualitative and quantitative data for analysis.

2.Explanatory integration: Common in explanatory sequential designs, this involves using qualitative data to explain quantitative findings.

3.Developmental integration: Frequently used in exploratory sequential designs, this involves integrating data to develop interventions, scales, or programs based on qualitative findings.

4.Embedded integration: Often seen in complex intervention designs, this involves embedding qualitative data within the intervention process to support quantitative data.

Integration techniques in mixed methods research embody the "1+1=3" perspective, offering flexibility consistent with the inherently adaptable nature of mixed methods. By incorporating methodological advancements into their studies and aligning integration techniques with their designs, researchers contribute to the development of high-quality mixed methods research.

1.3.9. Integrated Mixed Methods Research Outcomes

As in the entire research process, the research design also plays a determining role in reporting the results. For instance, in an exploratory sequential mixed methods study, qualitative findings should be presented alongside the phases and results of the quantitative method that followed these findings. In parallel mixed designs, the order of reporting can be shaped based on the prioritized content of the study (Creswell & Plano Clark, 2018).

1.3.10. Contributions of Using Mixed Methods and Advancing the Field

The justification for using mixed methods (see Section 1.3.2) should include an explanation of the method's contribution to the study and the literature when presenting the problem statement. Creswell and Plano Clark (2018) emphasize that demonstrating the contributions of a relatively new methodology like mixed methods is crucial for clarifying the researcher's methodological choice within the literature.

Another benefit of this explanation is to provide a justified basis for the use of mixed methods, especially given their growing popularity. Highlighting the rationale prevents arbitrary usage and underscores methodological rigor.

The final element recommended by Creswell and Plano Clark (2018) is "advancing the field," which applies specifically to methodological studies. Researchers who are not conducting methodological work but are using mixed methods to answer research questions are not expected to address the concept of "field development."

1.4. Purpose and Research Questions in Mixed Methods Research

The purpose statement is the most critical part of any research as it explains the general objective of the study. In mixed methods research, the purpose statement should include language suitable for qualitative, quantitative, and mixed methods purposes, indicating the mixed methods approach to be employed to achieve these objectives (Creswell, 2021).

In addition to stating the purpose, the statement should provide information about the design, data, and methodological justification (Creswell & Plano Clark, 2018). For example: Purpose: The knowledge or change the researcher aims to achieve by the end of the study.

Design: The mixed methods design to be used and how the methods will be integrated.

Data: Sampling, variables, and phenomena to be examined.

Justification: Why the selected design, data collection methods, and participants are included in the study.

Research questions in mixed methods studies should include qualitative, quantitative, and mixed methods questions. A mixed methods research question should highlight the integration of qualitative and quantitative data and emphasize the method used (Creswell & Plano Clark, 2018).

Content-focused mixed methods research questions specify the content and types of data used in the study. For instance, in a concurrent paral-

lel design, a question like, "To what extent are 9th-grade students' self-esteem scores consistent with their self-perception?" could be an example of a content-focused question.

The third and most desirable type of mixed methods question combines both method- and content-focused approaches. These questions integrate purpose, content, and the combination of different data types. For instance, "To what extent do quantitative results on self-esteem align with focus group data on 9th-grade students' self-perception?" is an example of such a question (Creswell & Plano Clark, 2018).

1.5. Validity and Reliability in Mixed Methods Research

The integration of two different methods in mixed methods research presents both advantages and disadvantages in terms of validity and reliability. While the use of two data types contributes to data validation, it also introduces potential validity threats.

Creswell and Plano Clark (2018) recommend controlling validity threats to both qualitative and quantitative data as part of the overall validity of mixed methods research. The quality of findings in mixed methods studies is evaluated based on the quality of qualitative and quantitative findings. In other words, the validity and reliability of mixed methods studies are assessed by evaluating the qualitative and quantitative components within their respective frameworks, guided by the research design. Measures for each method are used within mixed methods research, except in cases where data integration results in new insights.

For data resulting from the integration of two types, Teddlie and Tashakkori (2009) suggest using the term "inference quality" instead of validity and reliability. Creswell and Plano Clark (2018) propose that validity in mixed methods research is not universally defined but should be evaluated based on the design implemented. Accordingly, rather than using pre-established measures, mixed methods research should involve a structure where researchers anticipate, calculate, and address validity threats specific to their design.

2. EVALUATING MIXED METHODS RESEARCH IN COMPARISON TO OTHER METHODOLOGIES

While there are contested aspects of the definition of mixed methods research, as discussed in previous sections, one uncontested aspect is its recognition as an approach that integrates both qualitative and quantitative research methods. Rather than comparing a research method that inherently encompasses both approaches with its constituent parts, it is more meaningful to discuss its advantages and limitations compared to other methodologies.

Like all research methods, mixed methods research has its strengths and limitations. As a methodology that includes both qualitative and quantitative approaches, it offers the opportunity to leverage the strengths of both methods and broaden the scope of research. While quantitative methods provide the advantage of generalizability, their reductionist perspective often overlooks individual differences, and the limiting lens of the positivist paradigm, particularly in social sciences, is a drawback. On the other hand, the interpretivist paradigm of qualitative research highlights individual differences and the relationships between events and phenomena without the concern for generalizability, but its reliance on limited participants often prevents broader applicability.

Mixed methods research balances the limitations of each method while benefiting from their strengths. However, this advantage has historically led to the perception of mixed methods as a shallow approach used merely to address the shortcomings of the other two methods (Jick, 1979, as cited in Creswell & Plano Clark, 2018). While it is now widely accepted that mixed methods research is more than just the sum of qualitative and quantitative methods, holistic and comprehensive studies that balance the limitations of different approaches continue to make significant contributions, particularly in large-scale projects and policy development processes (Sandelowski, 2012).

The flexible and diverse nature of mixed methods research allows researchers to address complex research questions that cannot be answered using a single method. Findings from mixed methods studies are naturally more robust, as they are derived from a combination of diverse data sources (Johnson & Onwuegbuzie, 2004).

Researchers can design studies that draw on both approaches, incorporating sampling, data collection, and analysis methods from qualitative and quantitative paradigms. This approach combines numbers and words, enabling researchers to integrate deductive and inductive reasoning in a practical research framework (Creswell & Plano Clark, 2018).

Each of the strengths mentioned for mixed methods research also brings corresponding limitations. Two key factors emerge as critical determinants of success: the researcher's competencies and the resources required to conduct a comprehensive research process (Creswell & Plano Clark, 2018). Guetterman (2015) identified four dimensions of the skills needed to design and conduct mixed methods research: professional experience, professional knowledge, research skills, and personal attributes. As such, researchers need a deep understanding of their field and mastery of both qualitative and quantitative methods. Unlike studies that employ only one approach, mixed methods research requires researchers to pos-

sess advanced proficiency in both methods. The combination of these two methods, while offering advantages, also introduces multi-faceted validity and reliability challenges at every stage of the research. Researchers must possess the knowledge and skills to anticipate and address these challenges, as they are critical to the quality of the study.

Another challenge in mixed methods research is the limitation of resources. Comprehensive, multidimensional studies designed using mixed methods can be labor-intensive and costly. Researchers are advised to plan resources carefully and create a realistic timeline during the design phase.

The methodological flexibility available to researchers in mixed methods research, while an advantage, can also pose challenges. As a developing methodology, many methodological questions in mixed methods literature remain unanswered, leaving decisions to the researcher's discretion (Johnson & Onwuegbuzie, 2004). This flexibility can be particularly challenging for novice researchers during the research process.

While qualitative and quantitative research methods each have their own strengths and limitations, the limitations of mixed methods research seem to arise from its attempts to balance and compensate for the weaknesses of these two approaches. The challenge lies in establishing the structure needed to achieve this balance effectively.

3. THE USE OF MIXED METHODS RESEARCH IN THE FIELD OF COUNSELING AND GUIDANCE

The field of counseling and guidance developed within the science of psychology and emerged initially in the United States. Although the branches of psychology have historically been areas of thought, their establishment as a discipline within social sciences is linked to the opening of the first psychology laboratory by Wilhelm Wundt in Germany in 1879 (Harper, 1950). The positivist paradigm, which dominated the scientific research landscape in 19th-century Europe, and the concern for the recognition of social sciences as a scientific field, shaped psychological research for many years through the dominance of quantitative traditions.

In a study conducted by Bangert and Baumberger (2005), it was found that 80% of studies in the counseling field between 1990 and 2001 were conducted using quantitative methods (as cited in Leech & Onwuegbuzie, 2011). Despite the limitations of quantitative research methods in addressing the complex and multifaceted nature of human beings, their long-standing dominance as the primary research methodology has been criticized by many researchers as being ill-suited to human nature (Hill et al., 1997; Leary, 2001; Smith, 2001).

Over the years, various theories and counseling approaches that address human nature from different perspectives have emerged within psychology (Seligman & Reichenberg, 2015). The Person-Centered Theory by Rogers (1961), which serves as the foundational theory in counseling, is rooted in the humanistic-existential tradition and emphasizes evaluating individuals in their unique contexts. Contrary to the longstanding "normal/abnormal" debates in psychology, Person-Centered Psychology positively embraces differences, focusing on adaptability during the process.

However, the quantitative tradition's reliance on scores to understand individuals' experiences is insufficient for addressing the philosophical perspective of the counseling field. The limitations of the quantitative tradition, along with emerging perspectives, have paved the way for the inclusion of interpretivist-oriented qualitative research in psychology literature (Haverkamp et al., 2005). Although the depth-oriented perspective of qualitative research contributes significantly to psychological literature, its limitations—such as the need to demonstrate the efficacy of counseling approaches developed under theoretical frameworks to reach broader populations and the significant threat posed by researcher bias in complex psychological phenomena—remain significant challenges.

A well-designed mixed methods study, therefore, has the potential to align with the philosophical perspective of counseling while contributing multidimensionally and profoundly to its ultimate goal: enhancing individuals' well-being. Plano Clark (2005) emphasized that mixed methods research could be particularly effective and efficient in answering research questions in the counseling field that cannot be addressed by a single method.

Parallel to the increasing use of mixed methods research in recent years, its application in counseling has also become more widespread. In a study examining doctoral dissertations in Turkey's counseling and guidance field, Nadir et al. (2022) found that no dissertations using mixed methods were conducted between 1987 and 2001. Mixed methods research began to appear with three studies between 2001 and 2014, followed by a significant increase after 2015.

Similarly, a study by Güven and Aslan (2018), which examined journal articles published in the field of counseling and guidance, showed that mixed methods research began to appear in the literature starting in 2012. In an analysis of articles published between 2010 and 2015, mixed methods studies constituted only 7.3% of the sample. Among these, the concurrent parallel design was predominantly used. Findings by Seçer et al. (2014) support this trend. Their study on research trends in articles published between 2007 and 2011 in Turkey revealed that mixed methods constituted only 1.2% of studies, all of which employed the concurrent parallel design.

Keldal and Bilge (2016) also found similar results in their study on mixed methods research in the counseling field, noting that while the overall proportion of mixed methods studies was low compared to other methodologies, the concurrent parallel design was predominantly used.

The low proportion of mixed methods studies within the broader methodological landscape is likely due to its status as a relatively young methodology and the greater expertise required to design and conduct such research compared to other methods. In both international and Turkish contexts, the emphasis on quantitative research methods in counselor education programs limits the development of researchers equipped to conduct mixed methods studies (Keldal & Bilge, 2016; Leech & Onwuegbuzie, 2011).

Despite these limitations, studies have been conducted to serve as methodological guides for the use of mixed methods in counseling, helping address researchers' methodological uncertainties (e.g., Leech & Onwuegbuzie, 2010, 2011; Hanson et al., 2005; Smith, 2012).

An analysis of mixed methods studies in Turkey reveals that the "integration" phase—a cornerstone of mixed methods research—is often omitted. Instead, studies tend to adopt the "1+1=2 perspective," where the two methods are conducted separately (Toraman, 2021). This perspective is evident in the predominant use of concurrent parallel designs in counseling studies.

Recent mixed methods dissertations in counseling (e.g., Al Khatib, 2022; Fırıncı, 2019; Kılıç, 2022; Kıral, 2019; Uçak, 2022) also reveal a lack of full implementation of integration, suggesting that researchers have not fully adopted mixed methods research methodology. However, Şam (2022) demonstrated careful integration of methods in their doctoral dissertation, which utilized an exploratory sequential design to develop an "academic resilience model."

In the study by Keldal and Bilge (2006) examining mixed methods research in the field of counseling, it was observed that the preferred topics were predominantly in the domain of positive psychology. These topics included assertiveness skills, relationship satisfaction, conflict resolution skills, decision-making skills, academic procrastination, and anger management. Similarly, Yıldırım Kurtuluş (2021) conducted a doctoral dissertation that adhered to the methodology of mixed methods research, successfully reflecting the "1+1=3 perspective." This study addressed the contemporary and highly relevant topic of "supervision" in the counseling field.

Supervision, regarded as the "signature pedagogy" of the counseling field, is one of the most significant components of counselor training (Baltrinic & Wachter Morris, 2020). The multidimensional interactions among the client, counselor, and supervisor, as well as the variability introduced by supervisory process models and techniques influenced by both supervisor and counselor-trainee variables, make supervision a complex and multifaceted domain. Data obtained through a single research method in such studies are often insufficient. Consequently, mixed methods research is frequently employed to leverage its richness in supervision studies (Martin et al., 2021). Teke and Avşaroğlu (2022), in their study examining research conducted in Turkey on supervision, found that 73% of the studies used qualitative or mixed methods research.

Another area where mixed methods research proves advantageous in the counseling field is process and outcome studies. These studies aim to identify the factors contributing to clients' positive progress during the counseling process (Lambert, 2004). Given the many variables associated with both clients and counselors—such as the therapeutic relationship, counseling skills and interventions, theoretical orientation, and the topics emphasized during counseling—relying on a single methodological perspective is considered inadequate.

In the literature, mixed methods research has been used and recommended for process and outcome studies in counseling (Wester & McKibben, 2019). However, no studies in Turkey have been identified that examine the use of mixed methods research in process and outcome studies.

Mixed methods research also offers significant advantages in multicultural counseling. The transformative/social justice design, included in advanced mixed designs, enables researchers to integrate their philosophical perspective directly into their studies and focuses primarily on creating change. Social justice research, a practical component of multicultural counseling, involves addressing the inequalities and injustices experienced by participants within their social contexts while empowering individuals (Pontoretto et al., 2013).

The significant overlap between social justice research and counseling indicates that mixed methods research could provide valuable contributions to this field (Abreu et al., 2022; Mertens, 2007; Pontoretto et al., 2013).

The philosophical perspective, inclusiveness, and advantages of mixed methods research align well with both the philosophical approach and the unique needs of the counseling field. As a developing methodology, its increasing prevalence in counseling research is anticipated and is expected to bring significant contributions to the field.

4. CONCLUSIONS AND RECOMMENDATIONS

Mixed methods research is a versatile, inclusive, and flexible methodology that allows researchers to employ any method and skill within their competence, removing limitations in the scientific research process. While its strengths are notable, as a developing methodology, the limited number of models and examples in the literature combined with its inherent flexibility may create uncertainty for novice researchers, potentially leading to poorly designed studies.

Although the growing prevalence of mixed methods research is expected, it is crucial to ensure that this quantitative growth is accompanied by qualitative improvements. The competencies required for mixed methods research can be challenging for novice researchers. However, the dissemination of high-quality mixed methods studies by experienced researchers could serve as a valuable guide and foster development in this area.

As noted in earlier sections, one reason for the relatively low prevalence of mixed methods research is the emphasis on quantitative methods in the education of researchers across many fields. Despite advancements, the dominance of the quantitative research tradition in social sciences continues. For a transformation that allows for greater inclusion of qualitative and mixed methods, it is essential to train researchers capable of conducting high-quality studies in these areas.

To achieve this, it is recommended that undergraduate research methods courses across disciplines include a balanced focus on quantitative and qualitative research methods. At the graduate level, courses should offer opportunities for in-depth study of mixed methods research methodology.

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CHAPTER 3

READING ACTIVITIES IN BLENDED LANGUAGE LEARNING: SAMPLE OF TEACHING TURKISH AS A FOREIGN LANGUAGE

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Introduction

The role of reading activities in language teaching is of great importance, offering learners valuable opportunities to develop their language skills and deepen their understanding of the target language. With the advent of blended language teaching, which incorporates both face-to-face and online materials, the landscape of reading instruction has evolved significantly. Blended teaching approaches provide an innovative and effective way to enhance reading skills, offering a combination of in classroom interactions and digital resources. By integrating traditional classroom practices with the flexibility and interactivity of online platforms, educators can create a rich and comprehensive reading curriculum that caters to language learners' diverse needs and preferences. This study focuses on blended teaching in reading activities. It briefly discusses the significance of reading skills in language teaching and explores relevant literature on blended teaching. Additionally, the study offers practical suggestions for incorporating blended teaching materials into reading activities to teach Turkish as a foreign language.

Material Developing for Reading Skills in Language Teaching

The development of materials to enhance reading skills is a process that requires careful consideration of the various stages involved. In order to create effective materials, it is imperative to first establish a clear understanding of the specific purposes of reading, the reading strategies that can be employed to achieve these purposes, and the various models of reading that can inform instruction.

Reading Skill

Grabe & Stoller (2013:6) have compiled a list that presents various objectives for reading, each contributing to distinct aims in language development and comprehension. They state purposes for reading by the list below:

1. Reading to search for simple information *(This objective involves locating specific and straightforward details or facts within a text, commonly used when seeking quick answers or information on a particular topic.)*

2. Reading to skim quickly *(Skimming entails rapidly scanning a text to grasp its general content, enabling readers to identify main points, key concepts, or overall structure without reading every word in detail.)*

3. Reading to learn from texts *(This purpose engages readers in acquiring new information on a subject, an essential aspect of education and lifelong learning, empowering individuals to broaden their understanding and expertise in various domains.)*

4. Reading to integrate information *(Integrative reading combines insights from multiple sources to form a comprehensive understanding of a topic or to create new perspectives by connecting various pieces of information.)*

5. Reading to write *(Writers frequently read extensively to gather data, facts, and ideas to back their writing projects, utilizing reading as a research tool to ensure content accuracy and credibility.)*

6. Reading to critique texts *(Critical reading entails analyzing and evaluating texts to assess their strengths, weaknesses, and the validity of arguments. It involves questioning the author's perspective, evidence, and logical reasoning presented in the text.)*

7. Reading for general comprehension *(This objective pertains to reading to fully comprehend and grasp a text's central meaning and message, constituting a fundamental reading skill utilized in various contexts, from leisurely reading to comprehending complex academic texts.)*

The list encompasses many reading purposes, emphasizing the multifaceted nature of reading in language learning and beyond. Each purpose significantly improves language skills, expands knowledge, and fosters critical thinking abilities. Language learners and readers can benefit from engaging with texts for these diverse purposes, depending on their needs and goals.

Grabe & Stoller (2013), Nunan (1999), and Tomlinson (2013) summarize the strategies for reading. Nunan (1999: 265) categorized reading strategies in listed below.

1. Having a Purpose
2. Previewing
3. Skimming
4. Scanning
5. Clustering
6. Avoiding bad habits
7. Predicting
8. Reading actively
9. Inferring
10. Identifying genres
11. Identifying paragraph structure
12.Identifying sentence structure

13. Noticing cohesive
14. Inferring unknown vocabulary
15. Identifying figurative language
16. Using background knowledge
17. Identifying style and its purpose
18. Evaluating
19. Integrating information
20. Reviewing
21. Reading to present

To provide a more comprehensive understanding of the strategies listed, each strategy has been examined by considering its underlying rationale ('why') and the specific methods by which it can be implemented ('how').

1. Having a Purpose:

Why: Setting a clear goal helps focus attention and guides understanding.

How: Before reading, ask yourself: "What do I want to learn from this text?"

2. Previewing:

Why: Quickly getting an overview helps activate prior knowledge and set expectations.

How: Scan the title, headings, subheadings, and any visual elements to get a sense of the text's structure and content.

3. Skimming:

Why: Quickly getting a general idea of the text's main points.

How: Read the first sentence of each paragraph and any bold or italicized text.

4. Scanning:

Why: Locating specific information within a text.

How: Use keywords to guide your search and quickly move your eyes across the page.

5. Clustering:

Why: Processing information in chunks improves comprehension.

How: Group related words or phrases together and read them as a unit.

6. Avoiding Bad Habits:

Why: Subvocalization (saying words silently) and finger-pointing can slow down reading speed.

How: Practice reading silently and using a pen or pencil to guide your eyes.

7. Predicting:

Why: Activating prior knowledge and making connections to the text.

How: As you read, make guesses about what might happen next.

8. Reading Actively:

Why: Engaging with the text by asking questions and seeking answers.

How: Formulate questions before, during, and after reading.

9. Inferring:

Why: Understanding implied meanings and drawing conclusions.

How: Use clues from the text and your knowledge to make inferences.

10-13. Analyzing Text Structure:

Why: Understanding how a text is organized helps to comprehend its main ideas.

How: Identify the genre, paragraph structure, sentence structure, and cohesive devices.

14. Inferring Vocabulary:

Why: Expanding vocabulary and understanding unfamiliar words.

How: Use context clues, word parts, and reference materials to determine word meanings.

15. Identifying Figurative Language:

Why: Understanding literary devices and the author's intent.

How: Recognize metaphors, similes, and other figurative language techniques.

16. Using Background Knowledge:

Why: Connecting new information to prior knowledge.

How: Relate the text to personal experiences, other texts, or current events.

17. Identifying Style and Purpose:

Why: Understanding the author's intent and the effectiveness of their writing.

How: Analyze the author's use of language, tone, and rhetorical devices.

18. Evaluating:

Why: Critically assess the information presented in the text.

How: Consider the author's credibility, evidence, and potential biases.

19. Integrating Information:

Why: Connect ideas across the text and build a coherent understanding.

How: Use highlighting, note-taking, and mind mapping to organize information.

20. Reviewing:

Why: Consolidating understanding and identifying key points.

How: Summarize the main ideas and review key details.

21. Reading to Present:

Why: Sharing knowledge and insights with others.

How: Thoroughly understand the text, organize your thoughts, and practice your presentation.

While developing reading activities, Nunan's (1999:265) typology of reading strategies should be considered. These strategies can contribute to creating more effective and efficient reading activities in language teaching practices. Grabe & Stoller (2013: 25) propose two ways of viewing models of reading. These models can be found in Table 1.

Metaphorical models of reading	**Specific models of reading**
1. Bottom-up models 2. Top-down models 3. Interactive models	1. Interactive Compensatory Model 2. Word Recognition Model 3. Simple View of Reading Model 4. Dual-Coding Model 5. Psycholinguistic Guessing Game Model

Table 1. *Two ways of viewing models of reading (Grabe & Stoller, 2013:25)*

1. Metaphorical models of reading:

Bottom-up models: These models emphasize the importance of processing individual text elements, such as letters, words, and sentences, and gradually building a complete understanding of the text.

- *Top-down models:* Unlike to bottom-up models, top-down models focus on using prior knowledge, context, and expectations to interpret the text and make predictions about its content.

- *Interactive models*: Interactive models combine elements of both bottom-up and top-down processing, suggesting that reading involves a continuous interplay between processing incoming information and using existing knowledge

2. Specific models of reading:

- *Interactive Compensatory Model:* This model posits that different reading skills (e.g., word recognition, background knowledge) can compensate for each other, allowing readers to overcome difficulties in one area by relying on strengths in another.

- This model emphasizes the significance of efficient and accurate word recognition as a foundational skill for reading comprehension. The ability to rapidly and automatically recognize words is essential for fluent reading and constructing meaning.

- Si*mple View of Reading Model:* This model proposes that reading comprehension is a complex process dependent upon the interplay of two primary components: word recognition and language comprehension. Sufficiently developed skills in both areas are necessary for successful reading comprehension.

- *Dual-Coding Model:* This model suggests that reading comprehension benefits from the combined processing of verbal and non-verbal information representations.

- *Psycholinguistic Guessing Game Model:* This model proposes that readers use various strategies, such as predicting, guessing, and confirming, to make sense of a text. Readers continually formulate hypotheses about the content and revise them as they encounter new information.

Overall, these models provide different perspectives on how reading occurs and the factors that contribute to successful comprehension. Researchers and educators often draw from these models to better understand reading processes and develop effective instructional methods to improve reading skills in individuals of all ages.

Saraceni (2022), Tomlinson (2011, 2013, 2022), Jolly & Bolitho (2011), Peçenek (2005), McDonough& Shaw&Masuhara (2013), Ur (1996) propose methods for preparing reading materials.

Blended Language Teaching

Blended Learning offers a promising approach to language teaching, as it can effectively address individual student needs, mitigate the impact of peer pressure, and optimize the use of classroom time and space. This pedagogical approach facilitates the integration of authentic language use into both in-class and out-of-class activities, enhancing student engagement and fostering the development of linguistic proficiency. Garrison and Kanuka (2004: 96) define blended language teaching as "the thoughtful integration of classroom face-to-face learning experiences with online learning experiences." Blended learning means using various delivery methods to best meet the course objectives by combining face-to-face teaching in a traditional classroom, including online teaching (Akkoyunlu & Yilmaz Soylo, 2006).

Graham (2006) suggests that blended learning occurs across different levels: activity level, course level, program level, and institutional level. Graham (2006) emphasizes that the nature of this blend is influenced either by the learner or the material designer and teacher. In certain instances, learners have the flexibility to decide on the blend, particularly at the institutional and program levels. Conversely, the designer/teacher determines the blend for the course and activity levels.

Many case studies and review studies show that blended learning is a practical teaching approach. Bataineh&Mayyas (2017), Dowling, Godfrey & Gyles (2003), Graham (2006), Hartle (2022), Kim (2014), Rahimi & Yadollahi (2018) and Sujana et al. (2022), Yajie & Jumaat (2023) have researched blended learning and its effects on student achievement. Yajie & Jumaat (2023:370), in their systematic review study Blended Learning in English courses in higher institutions, show that BL proves to be effective, efficient, and beneficial in ETL practice. The effect of BL depends on the following three variables: BL design, participants, and technologies.

Yajie&Jumaat (2023:367) indicate that Moodle is the most widely used platform for blended learning in English language teaching. Both students and instructors have expressed positive sentiments toward English language learning facilitated by Moodle, as illustrated in Figure 1.

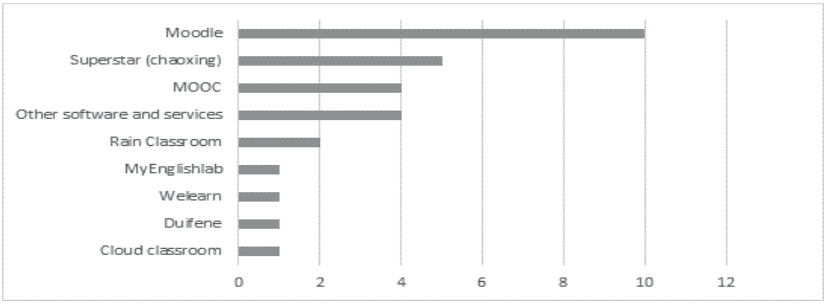


Fig. 1. *Frequency of online learning platforms Yajie&Jumaat (2023:367).*

Hart (2023) survey to determine the most frequently used online learning tools for personal learning (PPL), workplace learning (WPL), and education (EDU). The results, including a top 10 list and other platforms, are available on their website. Çetin (2022, 2023a) introduced blended teaching tools and discussed the material preparation process.

Turkish Reading Activities in Blended Language Teaching

Çetin (2023a, 2013b) presents Blended Learning Sample Lesson Plan for A1 Level Students. Çetin (2013b) has utilized the headings adapted from Brown (2001) and McDonough, Shaw, and Masuhara (2013) in that sample plan. The headings of the sample plan are Goals/Objectives, Duration, Materials, Procedures, and Evaluation. The present study aimed to develop instructional materials designed to enhance A2 Turkish as a foreign language students' understanding of emotional words. The materials are exemplified below and can be adapted in terms of content and duration to suit the specific needs of students. For instance, the reading passages can be adjusted in terms of complexity, and the accompanying activities can be modified to cater to different learning styles. This flexibility allows for differentiation of instruction and ensures that all learners can access and engage with the material at a level appropriate for them. Furthermore, the materials were designed to be culturally responsive, reflecting the students' diverse backgrounds in the target population. This study seeks to support educators in creating inclusive and effective learning environments by providing teachers with adaptable materials.

Goals/Objectives	The instruction is focused on teaching vocabulary related to emotions.
Duration (approximately 95 minutes)	Online Activity: 25 minutes Classroom Activity: 20 minutes Online Activity: 50 minutes + 20 minutes reading friends' story
Materials	Online and classroom materials will be used. The materials presented below serve as examples that can be modified in terms of content and temporal structure to accommodate the diverse needs of learners.
Procedures	**Online Activities:** 1. Click on the link and match the visuals with the words (5 minutes). 2. Fill in the blanks in the paragraphs with the appropriate words. (10 minutes) 3. Put the paragraphs in order to form a meaningful narrative text. (10 minutes) **Classroom Activities** 4. Please check your story for any errors. (5 minutes) 5. What would be an appropriate title for this story? (5 minutes) 6. Fill in the blanks in the table according to the story you read. (10 minutes) **Online Activities** 7. Write a story about your memory. (30 minutes) 8. Write questions about your story. Share your story and questions to your friends via Google Docs or a similar application. (20 minutes) 9. Read your friends' texts and answer their questions. (20)
Evaluation	**The following questions can be used to evaluate the effectiveness of the materials:** How interested were the students in the activities? Did the students actively participate in the activities? Did the students learn new information? Did the activities enhance the students' creativity? Did the activities contribute to the development of the students' social skills? **Google Forms questionnaire can be used to evaluate the effectiveness of the materials:** **Sample Question:** Bu etkinlikle ne kadar eğlendin? (1-5) *How much did you enjoy the activities? (1-5)* Bu etkinlikle yeni bir şey öğrendin mi? (Evet/Hayır) *Did you learn anything new from these activities? (Yes/No)* Bu etkinlikten sonra daha iyi hissettin mi? (Evet/Hayır) *Did you feel more confident after these activities? (Yes/No)*

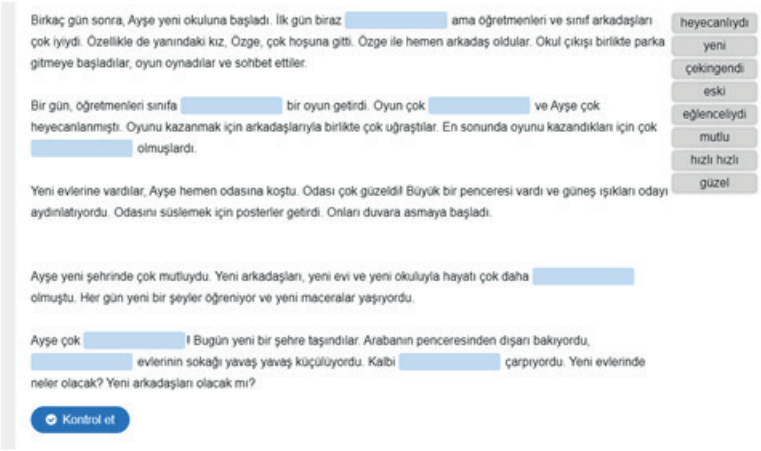
Sample Materials:

1. Linke tıklayın ve sözcüklerle görselleri eşleştirin. (*Click on the link and match the visuals with the words*).

Details about exercise 1:

The word-image matching task was designed to align with the constructivist learning theory, encouraging students to actively construct their understanding of emotion-related vocabulary through a hands-on, visual-based activity. The link led to an interactive online platform where students could drag and drop the corresponding images onto the words. "*Wordwall*" can be used for this type of activity. If the classroom is equipped with internet connectivity and students have access to digital devices such as smartphones or tablets, it can be incorporated gamification elements into the lessons. For instance, interactive quiz platforms can be used like Kahoot to conduct competitive word and image matching activities, making learning more engaging and enjoyable for students.)

2. Metindeki boşlukları uygun sözcüklerle doldurun. (Fill in the blanks in the paragraphs with the appropriate words.)

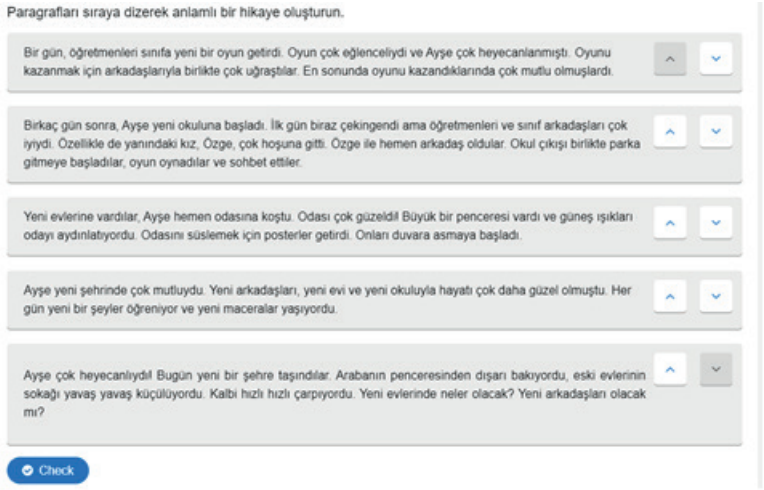


Details about exercise 2:

The following text generated by Gemini was used as a response to the question: "*Could you write a story of 200 words, suitable for A2 level learners of Turkish as a foreign language, that conveys feelings of happiness and excitement*?" The production of Gemini was adapted according to the level and aim of the activity.

A drag-and-drop activity was designed to facilitate vocabulary acquisition by requiring students to place words in the appropriate blanks within a given text. The activity was developed using Lumi Education and can be disseminated to students via both QR codes and direct links. Similar activities can be created using various digital tools such as Google Slides, Wordwall, Canva, and Genially.

3. Paragrafları sıraya dizerek anlamlı bir hikaye oluşturun. *(Put the paragraphs in order to form a meaningful narrative text)*



Details about exercise 3:

Using the Lumi, educators can guide students in an exercise where they sequence paragraphs to construct a meaningful story. This activity allows students to manipulate paragraphs by either dragging and dropping or utilizing the directional arrows on the right-hand side of the interface to reorder the text. Implementing a paragraph-jumbling activity in a digital learning environment like Lumi can significantly enhance students' reading comprehension skills. By requiring students to sequence paragraphs based on logical connections and textual cues, this activity promotes deeper engagement with the text and fosters the development of higher-order thinking skills.

4. Aşağıdaki hikayeyi okuyun ve kendi sıralamanızı kontrol edin. *(Read the story below and verify the order of the paragraphs you have arranged.)*

Ayşe çok heyecanlıydı! Bugün yeni bir şehre taşındılar. Arabanın penceresinden dışarı bakıyordu, eski evlerinin sokağı yavaş yavaş küçülüyordu. Kalbi hızlı hızlı çarpıyordu. Yeni evlerinde neler olacak? Yeni arkadaşları olacak mı?

Yeni evlerine vardılar, Ayşe hemen odasına koştu. Odası çok güzeldi! Büyük bir penceresi vardı ve güneş ışıkları odayı aydınlatıyordu. Odasını süslemek için posterler getirdi. Onları duvara asmaya başladı.

Birkaç gün sonra, Ayşe yeni okuluna başladı. İlk gün biraz çekingendi ama öğretmenleri ve sınıf arkadaşları çok iyiydi. Özellikle de yanındaki kız, Özge, çok hoşuna gitti. Özge ile hemen arkadaş oldular. Okul çıkışı

birlikte parka gitmeye başladılar, oyun oynadılar ve sohbet ettiler.

Bir gün, öğretmenleri sınıfa yeni bir oyun getirdi. Oyun çok eğlenceliydi ve Ayşe çok heyecanlanmıştı. Oyunu kazanmak için arkadaşlarıyla birlikte çok uğraştılar. En sonunda oyunu kazandıklarında çok mutlu olmuşlardı.

Ayşe yeni şehrinde çok mutluydu. Yeni arkadaşları, yeni evi ve yeni okuluyla hayatı çok daha güzel olmuştu. Her gün yeni bir şeyler öğreniyor ve yeni maceralar yaşıyordu.

Details about exercise 4:

In order to validate the sequence of paragraphs they established during the online activity, students are given the original version of the story in class and asked to compare their own arrangement.

5. What would be an appropriate title for this story?

_____

Details about exercise 5:

When students are asked to brainstorm titles for a story they have read, they are prompted to engage in a deeper level of critical thinking. This activity encourages them to carefully analyze the story's main themes, characters, and plot points, fostering a more active and engaged reading experience. By evaluating various potential titles, students develop their analytical skills, learning to infer information and support their ideas with textual evidence. The process of crafting a title also stimulates creativity, as students must find unique ways to express their understanding of the story. Choosing a title allows students to express their personal interpretation of the story, forming a stronger connection to the reading material. Additionally, this activity helps students refine their writing skills by teaching them to select concise, evocative, and relevant words.

6. Hikayeye göre tablodaki boşlukları doldur. *(Fill in the blanks in the table according to the story you read.)*

Kişiler	
Yer	
Zaman	
Olay	
Hikayedeki Duygular	

Details about exercise 6:

Analyzing the characters, setting, time, and emotions within a story offers numerous benefits for foreign language learners. By breaking down a narrative into its constituent parts, learners can enhance their comprehension, expand their vocabulary, and practice grammar in context. Additionally, exploring the cultural nuances embedded in a story fosters intercultural understanding. Critical thinking skills are honed as learners make inferences, draw conclusions, and support their interpretations with evidence from the text. Moreover, analyzing stories provides learners with models for their own writing and speaking, improving their language production skills. Ultimately, such activities can make language learning more engaging and motivating.

7. Sen de duygularını anlatacak bir hikaye yaz. (Write a story about your memory.)

Details about exercise 7:

Students will be asked to write a story about their own feelings and upload it to an online platform. To provide more specific guidance, they will be given prompts such as "How did you feel when you visited a place for the first time?", "Have you ever moved to a new place? Describe your experiences.", or "Describe your first day at a new school, including your feelings." The goal is to foster the integrated development of language skills.

8. Hikayen hakkında sorular yaz. Hikayeni ve soruları Google Docs ya da benzer bir uygulama ile arkadaşlarına gönder. (Write questions about your story. Send your story and questions to your friends via Google Docs or a similar application.)

Details about exercise 8:

To promote peer assessment and critical thinking, students will generate questions to elicit deeper understanding of their classmates' narratives. These inquiries will be disseminated via our shared online learning environment, thereby fostering a collaborative and asynchronous learning experience. This innovative approach is anticipated to enhance student engagement and motivation.

9. Arkadaşlarının hikayelerini oku ve sorularını cevapla. (Share your story and questions to your friends via Google Docs or a similar application)

Details about exercise 9:

The quantity of texts students read during this activity will fluctuate based on the group size. In larger groups, expecting one student to read all of their peers' texts and respond to their questions is neither practical nor motivating. While assigning each student one peer's text to read could be an option, it might not be equitable. Consequently, it would be more suitable for the teacher to form pairs and have them exchange texts, answer each other's questions, and provide feedback using an online platform. The duration of this activity will depend on the number of texts involved.

Conclusion

This study delves into the research on reading skill development and examines the various applications and platforms of blended learning. It further proposes a blended learning model designed explicitly for Turkish language teaching. Although the proposed model has yet to be tested, it offers a promising direction for future research. The existing body of research strongly suggests that blended learning is an effective pedagogical approach.

The findings of Djiwandono's (2018) research indicated a significant difference in reading comprehension ability between the two groups. The results suggested that BL potentially influenced students' behavior in the Experimental group, setting them apart from their peers in the Control group. It is highly likely that when allowed to engage in online learning, the Experimental group's practices were somewhat aligned with digital literacy requirements. Karkour (2014) proposes a blended learning model for Egyptian schools, arguing that text manipulation and blended learning are effective tools for teaching reading in foreign languages. Yu-Fen Yang (2012) indicates that blended learning effectively enhances students' reading proficiency through the well-managed combination of on-site and online instruction. They state three significant factors to help students integrate their on-site with online learning. Ahmad (2021:125) states that in the conclusion part of their case study, "*The findings of quantitative and qualitative surveys conducted on both ELT instructors and English language learners corroborate the conclusion that the implementation of a blended approach is essential in the digital age to cope with the current volatile situatio*n." and they emphasize that *"Blended approach offers teaching and learning opportunities both inside and outside the classroom. By embedding technology, teachers, and learners both can have more autonomy, individualized and personalized experiences."* Many studies (Bataineh&-Mayyas, 2017; Dowling, Godfrey & Gyles, 2003; Kazu&Demirkol, 2014; Kim, 2014 etc.) on blended learning discovered that a blended learning approach significantly improved language proficiency**.**

Developing reading skills is essential to language learning, and blended language teaching has proven to be an effective approach to enhancing students' reading abilities. Blended language teaching combines traditional face-to-face instruction with online learning components, creating a dynamic and engaging learning environment. Here are some critical points about developing reading skills through blended language teaching:

- Integration of Diverse Learning Resources

Blended language teaching enables the incorporation of an extensive array of learning resources to support reading development. Conventional classroom materials, such as textbooks and printed texts, are complemented by digital resources, including interactive content, e-books, audiobooks, videos, and multimedia tools. This diversity accommodates learners' varying interests, proficiency levels, and preferences, ensuring exposure to texts of different complexities and genres.

- Enhanced Text Engagement through Digital Tools

Online platforms offer functionalities such as text annotation, highlighting, and underlining, allowing learners to interact more actively with reading materials. These tools, combined with integrated activities like quizzes and comprehension exercises, provide immediate feedback and foster a deeper engagement with the text.

- Personalized Learning Paths

Blended learning facilitates the creation of tailored learning paths based on individual student profiles, including their strengths, areas for improvement, and progress. Students can learn at their own pace, while educators leverage data from digital platforms to identify and address specific needs. This personalized approach ensures targeted interventions and promotes effective skill development.

- Promotion of Collaborative Learning

The blended model supports collaborative opportunities through tools such as online discussion forums, group projects, and virtual book clubs. These activities encourage peer-to-peer interaction, the exchange of diverse perspectives, and the cultivation of critical thinking skills, all of which contribute to enhanced reading abilities.

- Flexibility and Accessibility

By combining in-class and online components, blended teaching offers flexibility in terms of time and location, catering to the diverse needs of learners and educators. Students can access resources and complete activities outside the classroom, promoting continuous learning. Moreover, online platforms ensure accessibility for learners with different needs or

those in remote locations.

- Sustained Teacher Support and Feedback

While technology plays a significant role in blended learning, the teacher's involvement remains central. Educators provide crucial guidance, support, and personalized feedback, ensuring that students receive comprehensive assistance in their journey to improve reading skills.

- Fostering Lifelong Learning Habits

A key advantage of blended language teaching is its potential to instill lifelong learning practices. By familiarizing students with online tools and resources, this approach encourages continued skill enhancement beyond formal educational settings, preparing learners for sustained personal and professional growth.

In conclusion, blended language teaching offers a powerful platform for developing reading skills in language learners. By combining traditional and online approaches, educators can create a more engaging, interactive, and personalized learning experience, fostering a deeper understanding and appreciation of the language through reading.

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CHAPTER 4

SOCIOECONOMIC STATUS-BASED DIFFERENCES, INEQUALITIES AND GAPS IN SOCIALIZATION AND EDUCATION PRACTICES AND CHILDHOOD OUTCOMES

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The present study investigates the association between socialization and education practices, and socioeconomic (SES) differences, inequalities, and gaps in children's cognitive, educational, social and emotional outcomes. It demonstrates and confirms that there are increasingly significant differences and gaps in parental involvement, engagement and time management between families in higher socioeconomic stratums or social classes and families in lower socioeconomic stratums or social classes. It is suggested that the less quality time children who are born into less educated families with lower income spend with their parents is associated with their relative economic disadvantage**.** Research has asserted that lower-educated parents with lower income wish to undertake the majority of the same activities that better-educated and higher-income parents do. However, they are less able to perform such activities and practices that need to read to their children, engage them in educational experiences and take them to parks, museums and field trips. Theories strive to explain differences and gaps in socialization and education practices. The family stress theory posits that financial strain and hardship as well as family stress stemming from low income and poverty are crucial factors contributing to differences and gaps in socialization and education practices. The theory suggests that when financial tension, strain and stress increase in the family, this may inhibit the emotional and cognitive functioning and operability of parents and impede parent-child interaction for cognitive and intellectual stimulation, nurturing, enhancement as well as emotional education, care and rearing of children. The significance of implementing policies and programs that can narrow down and reduce socialization and educational differences and gaps between lower SES and higher SES families has also been emphasized.

A study revealed that SES was correlated across generations and that 43 % of adults who had grown up in the lowest quintile of society's wealth dispersion now had incomes in the lowest quintile, and 70 % had incomes almost in the poorest half. On the other hand, the study demonstrated that 40 % of adults who had grown up in the highest quintile of the wealth distribution had incomes in the richest half, while 53% had incomes almost in the richest half (Urahn, et al., 2012). It was also reported that socialization and education practices influenced this intergenerational correlation and played a crucial and essential role in this intergenerational correlation. Socialization and education practices such as undertaking enriching activities with children, involving in their lessons and school work, providing them with teaching materials, and

demonstrating warmth and patience were deemed to be significant. It was suggested that parental behavior in socialization and education practices most likely accounted for half of the difference in adults' economic outcomes and consequently made a significant contribution to the intergenerational mobility of a society (Björklund, Lindahl, & Lindquist, 2010).

Through a variety of disciplines, a myriad of studies determined differences in the behaviors undertaken by higher and lower SES parents to socialize and educate their children and addressed in what way and to what extent these differences were important for children's cognitive and academic achievement. Higher SES parents spent more time in learning activities with their children, created more cognitively stimulating, nurturing and enhancing learning settings at home, and allocated more parental time for reading and doing math-related activities (Guryan, Hurst, & Kearney, 2008). Parents differed in their discipline strategies based on their SES, with lower-income and less-educated parents being more inclined to resort to applying severe physical punishment to their children compared with their wealthier and more highly educated peers (Ryan, Kalil, Ziol-Guest, & Padilla, 2016).

Parental styles of behavior in the socialization and education processes have a significant part in development of children. Research revealed that the bulk of evidence confirming these theoretical linkages was correlational (Bornstein, 2019). This research consistently established that mean differences in parental behaviors across socialization and education processes predicted cognitive and behavioral results that were indicative of adult achievement (Blair & Raver, 2012). Research discovered evidence of plausible causal connections between socialization and education practices, and development of children. The quantity of time parents allocate to and spend with their children has been suggested to have a direct and plausible causal influence on cognitive test grades of children (Fiorini & Keane, 2014).

The present study examines research that defines SES regarding family income and parental education and concentrates on specific socialization and education practices that have better empirical and theoretical connections with children's development. It also explores in what way and to what extent these socialization and educational practices differ according to SES. This provides a description of what theorists and researchers know about how differences in SES-related parental behaviors regarding socialization and education contribute to differences,

inequalities and gaps in children's SES- based cognitive and behavioral outcomes. The study explores the theoretical roots of these differences in parental socialization and education behaviors with regard to SES. Parental behaviors can be influenced by not only socioeconomic factors such as economic difficulties and tight work programs, but also opportunities and limitations in the parental setting such as accessing to knowledge and exposure to stress and violence, as well as cultural variables such as values, norms, rules, beliefs, expectations and habits. The study also discusses the effectiveness of schedules and policies considered to narrow down and reduce socioeconomic status-based differences in behaviors regarding socialization and education. Notwithstanding the fact that parental behavior is significant beyond the early childhood years, the study focuses on early childhood due to the fact that brain development is rapid in early childhood and the foundations for cognitive and emotional skills are laid throughout the life course and that priority and role of parental impact during this developmental phase are deemed important.

Differences in Socialization and Education Applications According to SES

Across a range of disciplines, an array of research has revealed that parents in lower social class and counterparts their in higher social class interact differently with their children and that these differences affect development of children. Developmental psychology determines two key dimensions of parenting behavior in the socialization and education processes: (1) the level of children's cognitive stimulation, nurturing and enhancement; and (2) the quality of emotional support. Parents stimulate, nurture and enhance their children cognitively through educational and enriching behaviors such as reading and other literacy-based activities, arts and crafts, and teaching mathematical concepts. Parents interacted positively and socio-emotionally with their children through parental affection, warmth, consistency as well as lack of severe discipline or corporal punishment. On the average, research revealed that parents with higher education and income were more engaged and involved in stimulating, nurturing and enhancing their children cognitively compared to parents with lower education and income, and they interacted with their children with bigger affection, warmth and coherence and implemented less severe discipline.

Socioeconomic Status-Based Differences in Cognitive Stimulating, Nurturing and Enhancement of Children

Research revealed that higher SES parents were more engaged in activities stimulating, nurturing and enhancing cognitive development of their children, both in quantity and quality, compared to parents in lower socioeconomic status. Some of the most powerful evidence for this came from time diaries. Research findings indicated that parents with higher education and income spent more time on educational activities of their children than their peers in lower socioeconomic status (Guryan, Hurst, & Kearney, 2008; Kalil, Ryan, & Corey, 2009). It was suggested that parents with higher education were more effective in allocating and spending time for their children and that they customized their educational activities and investments to their children's developmental stages (Kalil, Ryan, & Chor, 2014). These parents demonstrated their most explicit and distinct educational involvement and disposition during total childcare time (Kalil, Ryan, & Corey, 2010). Higher SES parents spent more time on children's development and were more likely to adopt messages indicating that undertaking educational activities and making investments in children in early childhood were crucial factors in long-term achievement of children (Carneiro & Heckman, 2003).

Studies that explored the frequency with which parents engaged in educational and enrichment activities expressed a similar view. Parents were asked how frequently they were engaged in reading, math and other educational and enrichment activities at home per week or per month. Higher SES parents responded that they read more books and dıd more math-associated with activities with their children and provided a greater number of materials, such as books, puzzles and games, for these activities (Bradley & Corwyn, 2002). Indeed, during the last 30 years, higher SES parents engaged more often in a broad range of educational and enrichment activities inside and outside the home, such as reading to their children and taking them to the library or a museum, compared with their lower SES counterparts (Kalil et al., 2016).

One of the most common socioeconomic status-based differences in stimulating, nurturing and enhancing children's cognitive development was observed in research conducted on stimulation, nurturing and enhancement of children's language. Higher SES parents were found to exert greater effort to stimulate, nurture and enhance language and speech skills when interacting with their children compared to parents in lower socioeconomic status (Hart & Risley, 1995; Phillips, 2011; Romeo,

Leonard, Robinson, Martin, Mackey, Rowe, & Gabrieli, 2018). A particular study thoroughly observed the language and speech skill patterns of 42 families who have young children and exposed these SES-based differences in stimulating, nurturing and enhancing children's cognitive skills. While children in families with higher SES heard an average of 2,153 words per hour, children in working-class families heard an average of 1,251 words per hour. On the other hand, children in poor families on welfare heard an average of 616 words per hour. By four years of age, children in poor families on welfare heard 32 million fewer words than children in higher SES families (Hart & Risley, 1995).

Research revealed that the magnitude of differences in the number of words heard by children from families in higher socioeconomic status, as against lower SES families, was caused by words spoken and expressed directly to children, rather than words not spoken when children were present, It was found that the language and speech skills used in higher SES families were more diverse, rich and conscious in terms of children's speech compared to those in lower SES families (Romeo et al., 2018). It was also asserted that these SES-based differences in language and speech skills plausibly contributed to socioeconomic status -based differences and gaps in fundamental early language and speech skills of children, particularly bearing in mind the strong and solid evidence relating the quantity and quality of parental speech to young children and fundamental early language development of children (Hoff, 2003; Rowe, Levine, Fisher, & Goldin-Meadow, 2009).

Socioeconomic Status-Based Differences in Emotional Support Provided by Parents towards Their Children

Parents exhibited differences in terms of socioeconomic status not only in the quantity and quality of their cognitively stimulating and nurturing of children but also in the level of emotional support they provided to children. Parents'sensitivity has been described as the ability to detect signals and cues of children, to interpret them correctly and to provide prompt and appropriate responses. This parental sensitivity is associated with emotional and behavioral outcomes of children, such as self-regulating, social functioning, operability and early cognitive skills (Ainsworth, Bell, & Stayton, 1974; Mesman, van Ijzendoorn, & Bakermans-Kranenburg, 2012). Mothers living in poverty demonstraed less sensitivity towards their infants across interactions that their peers in higher SES families, These differences could explain differences, inequalities and gaps in fundamental early language and speech

outcomes and behavior problems of children in descriptive analysis (Raviv, Kennesich, & Morrison, 2004; Yeung, Linver, & Brooks-Gunn, 2002).

In a broader sense, parents with higher SES were inclined to display more authoritative, as against authoritarian, attitudes and behaviors in the socialization and education processes, compared to parents with lower SES. The authoritative style of child socialization and education has been defined as displaying high levels of parental affection, warmth and sensitivity toward children, as well as placing high demands on them, The authoritarian style of socializing and educating children, on the other hand, has been defined as parents' tendency to be harsher and more rigid with children, exhibit less warmth, establish less dialogue and implement more punishment. (Darling & Steinberg, 1993; Maccoby & Martin, 1983). In their endeavors to socialize and educate their children, more educated parents were more authoritarian or authoritative than less educated parents, who were either authoritarian or permissive with fewer parental demands and higher levels of parental warmth. Research revealed that less educated parents were either more authoritarian or permissive with their children during the socialization and education processes and that parents with lower-income used more instructions, directives and prohibits in parent-child conversations compared to middle-income parents (Dornbusch et al., 1987; Pinderhughes et al., 2000). In a study, researchers discovered a significant negative correlation between income and very severe or correctional behavior, such as shouting and knocking (Hashima & Amato, 1994).

Socialization, education and discipline strategies are regarded as a core element of the parents socioemotionally interacting with children and as a crucial factor in the difference between authoritative and authoritarian attitudes and behaviors in socialization and education. Authoritarian attitudes and behaviors in socialization and education comprised corporal punishment, including beating and hitting with objects, as well as other acts that intentionally and deliberately inflicted physical pain, whereas authoritative attitudes and behaviors were linked to nonphysical strategies, such as breaks, time-outs and explaining for desirable conducts (Steinberg et al., 1994). Research indicated that parents in low social classes were more inclined to beat their children and resorted to other forms of physical discipline compared to parents in higher social classes. Families in higher social classes were more likely to undertake corrective strategies that involved reasoning and fostered autonomy in children (Phelps, 2018; Dodge, Pettit, & Bates, 1994;

Steinberg et al., 1991). It was also reported that the connections between corporal punishment, such as hitting and beating, in the socialization and education processes and a wide array of unfavorable and negative cognitive and socioemotional child outcomes. (Gershoff, 2002). Differences in education and discipline accounted for a significant proportion of the socioeconomic status-based differences, inequalities, and gaps, particularly in children's socioemotional outcomes (Linver, Brooks-Gunn, & Kohen, 2002).

It has been asserted that parents in lower and higher socioeconomic status exhibit obvious differences not only in the manner they bring up and rear their children but also in behaviors that estimate cognitive and socioemotional skills of children. Bearing in mind the well-documented and verified connections between parents'socialization and educational behaviors and skills of children, it seems plausible to assume that socioeconomic status-based differences in socialization and educational behaviors contribute to the intergenerational transmitting and passing of economic status. In order to comprehend the differences, inequalities and gaps in socialization and education and to determine an efficient policy and programmatic intervention that can narrow down and reduce them, research studies on some possible roots of socialization and educational differences were examined and the evidence supporting each mechanism was assessed.

Mechanisms Underlying SES-Based Differences, Inequalities and Gaps in Socialization and Education Practices

Research showed many potential and possible roots of SES-based differences, inequalities and gaps in socialization and education practices and showcased potential and possible mechanisms. Neuroscience and different branches of social sciences, distinguished these mechanisms and existing evidence that helped to explain SES-based socialization and educational differences, inequalities and gaps in a plausible manner. Moreover, research studies attempted to shed light on and explain promising goals for policy and interventions in order to narrow down and reduce socioeconomic status-based differences, inequalities and gaps in socialization and education practices.

Financial Constraints and Dificulties

Theorists and researchers attributed the most distinct and obvious reason why parents of higher SES might use different socialization and education practices compared to their lower SES counterparts to the fact

that higher SES parents had more money. This was due to the fact that parents of higher SES could afford to purchase materials and experiences that would stimulate, nurture and enhance the well-being and cognitive and educational development of their children thanks to their economic capital and money. Nevertheless, it was asserted that some parents might still prefer to spend their money on their own free time and consumption rather than on their children (DeLeire & Kalil, 2005). Parents invested in their children's education and made monetary expenditures for cognitive stimulation, nurturing and enhancement. Parents earmarked and spent money to equip their children with materials, such as books, toys and games, to increase time with their children, to provide experiences related to monetary expenditures, such as dance, music and sports lessons, and to offer educational opportunities such as private lessons, museum visits and artistic performances. The difference in monetary expenditures undertaken to purchase such educational and enrichment products and services could produce a direct impact on children's cognitive, educational, academic and psychosocial development by increasing the quality and quantity of their cognitive stimulation, nourishing and enhancement. Moreover, the difference in monetary expenditures undertaken to provide educational and enrichment products and services could also affect the ability and opportunity of parents to allocate and spend time with their children to increase their cognitive and psychosocial development.

The evidence of differences in spending cash on children through socioeconomic strata or social classes in society came from a study making use of data from the Consumer Expense Study (CE), which provided data on the expenses, income and demographic features of consumers. The study established that the differences, inequalities and gaps in spending were widening although parents at all income levels earmarked and distributed an growing portion of their income to their children and that parents with lowest-income spent the largest portion. The analysis was extended by investigating income-based inequalities in parental expending on young children, especially from 1972 to 2010, and it was indicated that there was enhanced expending among parents at the top of the wealth distribution and a small increase among parents at the bottom. The study emphasized that much of the increased spending stemmed from additional spending on child care. It was also established that spending money on educational and enrichment goods, materials and activities, such as books, toys, games and services, increased substantially

among families with higher-income and not at all among families with lower-income during that period of time (Kornrich, 2016).

Combined with other studies that had discovered the differences in the availability of books, toys and games in the homes of lower-income and families with higher-income, this research precisely explained some of the socioeconomic status-based differences, inequalities and gaps in socialization and education practices as well as unequal spending on children (Bradley et al., 2001). In a study on parental reading time with children in low-income families, the parents stated that they were unable to read to their children due to the unavailability of appropriate books (Mayer et al., 2019). Parents were able to undertake many educational and enriching activities that did not require spending money, such as talking to children, telling stories and playing games. Hence, differences, inequalities and gaps in experiences of children by socioeconomic status may stem partly from differences in parents' ability and potential to spend cash on educational products, tools and services that may be cognitively enhancing and enriching for their children. All the same, financial constraints and difficulties within the family could not provide a precise explanation for SES-based differences, inequalities and gaps in socialization and education practices.

Time Constraints

Theorists and researchers expressed that another potential reason for parents in lower socioeconomic status to engage less in cognitively stimulating, nurturing and enhancing activities with their children and to allocate less time to them in general was that these parents merely had less time to distinguish and spend. Research revealed that parents in lower socioeconomic status were more likely to have unpredictable and nonstandard work schedules than higher SES parents (Presser & Ward, 2011; Henly & Lambert, 2014). It was claimed that lower SES parents had little or no time to spend or 'invest' in their children because of their busy work schedules, such as working on weekends and at night. For that reason, it was also asserted that those parents found it difficult to participate in developmentally stimulating, nurturing and enhancing activities with their children. An array of quantitative studies demonstrated that SES-based differences, inequalities and gaps in time spent with children remained substantial even when other family differences, such as work hours, were explained. Nevertheless, little research has so far examined in what way and to what extent the timing or regularity of work or study may account for SES-based differences,

inequalities and gaps in parental time spent with children (Guryan, Hurst, & Kearney, 2004; Sayer, Gauthier, & Furstenberg, 2004; Dani Carrillo et al., 2017). Although higher-SES parents, mothers in particular, tended to work longer hours at work and had less discretionary time than lower-SES parents, they still had more time to spare and spend for their children. Lower-SES mothers tended to devote more of their childcare time to being available to their children and mostly engaging in housework or leisure activities. Higher-socioeconomic status in parents, especially mothers, tended to spend more of their childcare time essentially engaging their children in activities (Kendig & Bianch, 2008). It was suggested that differences in time spent with children between more highly educated and less educated mothers reflected differences in beliefs concerning socialization and education rather than time constraints. A great number of the socioeconomic-based differences in time spent with children resulted from parents' decisions about how to allocate and spend parental time. Knowledge, values, and preferences could shape parents' decisions about time allocated to and spent with their children.

Knowledge, Values and Preferences Regarding Socialization, Education and Child Development

Parents in lower-socioeconomic status spent less time with their children not only because they had less time to spend with their children, but rather because they allocated and spent the time they had for different activities. Bearing this fact in mind, it seems plausible to assume that socioeconomic status-based differences, inequalities and gaps in this domain are partly as a result of differences in knowledge, values or preferences for allocating and spending time for educational and enrichment activities with children. This hypothesis can be extended to include emotionally supportive behaviors. Research has suggested that parents in lower-socioeconomic status have less knowledge about, or weaker preferences for parents warmly, sensitively interacting with children that can be beneficial to emotional development of children. Here, knowledge, values, and preferences are highlighted as distinct concepts. Information generally pertains to parents' knowledge about development and activities of children that foster this process. Values demonstrate parents' objectives for their children and their ideal characteristics. Preferences indicate factors of pleasure and taste that can influence parenting behavior, such as level of happiness, degree of satisfying and contentment or usefulness (Rowe, 2008; Kohn, 1989; Alwin, 1988).

To understand how and to what extent these factors moderated socioeconomic status-based differences in parenting behavior, the research needed convincing evidence suggesting that knowledge, values and preferences varied according to SES. However, the most up-to-date evidence indicated that parents in all income levels believed in the importance of developing children and equipping them with skills that would prepare them to be successful at school and in life. Parents also shared similar beliefs related to the values they wanted to teach and instill in their children. The researchers strived to predict the role and share of parents in teaching and helping children acquire various skills in early childhood, such as counting to 20, knowing and recognizing the letters of the alphabet, behaving well and holding still. These skills were rated as "very important" or "essential" before entering kindergarten The study discovered that there was an enhance between 1998 and 2010 in the proportion of parents in the bottom quintile of the socioeconomic status distribution who evaluated these skills as important. Moreover, the proportion of parents in the bottom quintile of socioeconomic status who stated that the skill was important for each of the skills was greater than those in the top quintile of SES. Thus, it appears unlikely that great SES-related differences, inequalities and gaps in the actual skills of children entering kindergarten would emerge due to disadvantaged parents' absence of knowledge about the importance of such skills (Mayer, Kalil, & Klein, 2016). Parents from all income levels believed that it was important to equip their children with skills to prepare them for achievement at school and in life. Parents shared similar beliefs concerning the values they wanted to teach and instill in their children (Mayer, Kalil, & Klein, 2016).

Another crucial factor of the parental belief system is that the characteristics that parents believed should be taught and instilled in their children in order to prepare them for life and the values for their children were deemed to be important and given priority (Alwin, 2001). The concept of values was frequently brought up in discussions of "cultural beliefs" as it pertained to socialization and education. Researchers stated that difference in values over time among parents at different socioeconomic status and social class positions within distribution in of the income or education was one source of the continuation, perpetuation and persistence of social class across generations (Kohn; Weininger & Lareau, 2009). From a historical perspective, parents in high-socioeconomic status valued "independent thinking" and "self-direction" more than their counterparts in low-social classes, while parents in low-

social classes attached more value to “obedience” and “consistency.” From a theoretical perspective, it was asserted that differences in parental values helped, to a certain extent, explain the reproduction of social class due to a great variety of ways these differences affected how parents prepared their children for their academic and professional futures. Research revealed that views of higher SES parents and their lower-SES peers regarding the characteristics that children needed to achieved in life, such as hard work, helpfulness and independent thinking, had largely converged over the past three decades. It was also pointed out that no significant difference was observed in parents’ adoption of values based on education or income (Ryan, Kalil, Hines, & Ziol-Guest, 2016). Similarly, another study utılizing a nationally representative survey discovered no differences in contemporary standards of socialization and education according to parental education. Parents of all social classes strongly supported and accepted time-intensive, child-centered socialization and education as the most appropriate form of parenting, which sociologist Annette Lareau described as “concerted cultivation”. On the other hand, parents from all social classes displayed little support for a less intensive, adult-centered form of socialization and education that was coined as “natural growth” by Lareau (Ishizuka, 2018).

Although all parents harbor similar aspirations for development of children and school readiness, parents with lower socioeconomic status may think about and expect a lower return, gain or reward for the investment they make in their children. However, researchers showed that parents with low-income thought about and expecedt a positive return, gain, or reward for the parental time they spent on the educational activities of their children. In one study, parents’ beliefs predicted allocating time to, spending money on and investing in young children in very low-income families (Mayer et al., 2013; Cunha, 2018). A study conducted on parents of school-age children discovered no SES-based differences in thinking about and expecting returns, gains or rewards for time and money investments made in children. Although all parents thought about and expected high returns, gains or rewards for allocating time and money and investing in child development, lower-SES parents were able to think about and expect relatively lower returns, gains, or rewards compared to higher-SES parents (Attanasio, Boneva, & Rauh, 2019; Agee & Crocker, 1996; Boneva & Rauh, 2018). Economists have long held the opinion that better educated parents believed that investing more time and money in children than their less educated peers was a form of “investment behavior” as a tool and means of enhancing their

children's future human capital (Guryan, Hurst, & Kearney, 2008). This framework may help provide an explanation for why highly educated parents allocate to and spend more time on socializing, educating and caring for their children than less educated parents, who work the same number of hours and have the same number of children. On the other hand, the same theories alleged that parents with higher education were able to spend comparatively more time with their children because they enjoyed and took more pleasure from the activity. Another research pointed to the connection between individuals' self-reported well-being and their activities and time-use patterns. It investigated how mothers felt about child socialization, education and care as well as other activities, and also sought empirical evidence related to economic theories of time allocating. Speaking of all mothers, spending time on child socialization, education and care was related to higher positive emotions than spending time on other activities. This finding did not back up the hypothesis that mothers with higher education adopted, enjoyed and took more pleasure from the socialization, education and care of their children than their less-educated counterparts (Kalil, Mayer, & Gallegos, 2019).

In summary, research has produced only mixed evidence suggesting that knowledge, values or preferences moderate differences in socialization and educational behavior across the social stratums or social classes. When compared with parents in higher-socioeconomic status, parents in lower- socioeconomic status can have less difference ideas about how and how much to foster development of children and can underestimate the benefits of allocating and spending time that enhances development of children. However, parents with high socieconomic status and low socieconomic status similarly perceived and valued educational and enrichment behaviors with children, such as reading, and appeared to use, enjoy and make the most of this time in an equal manner.

Family and Environmental Stress

The family stress model was developed by sociologist Glen Elder to explain in what way and to what extent economic damages and losses during the Great Depression impacted the well-being of parents and children (Elder, 1974). Based on this perspective, low-income families were confronted with substantial financial pressure as they struggled to pay their bills and bu essential goods, products and services. This financial pressure, in turn, created more widespread stress and tensions in the lives of families with low-income and led to psychological distress, suffering and harm to poor parents, which eventually interrupted and

damaged the parent-child interactions (McLeod & Kessler, 1990). While the family stress model was originated to explain the impacts of economic damages and losses on well-to-do families, it was also used and implemented to explain how and to what extent severe and persistent economic stress, tension, pressure and specifically poverty can somehow damage and destroy the quality of socialization and education in the family (Conger et al., 2002; Gershoff et al., 2007).

Research proved the majority of the hypothesized relations in the family stress model to be true in empirical studies. Parents and children in families with low-income experienced more daily stress than those in families with higher-income. Parents with low-income reported that they had experienced higher levels of stress and demoralization in socializing, educating and rearing their children and adolescents (Almeida et al., 2005; Evans and English, 2002; National Scientific Council on the Developing Child, 2009). More particularly, research discovered that poor mothers of infants were two and a half times more likely to express feeling demoralized compared to non-poor mothers. These research studies only determined correlations between poverty, stress and parental well-being. Nevertheless, more causal evidence was obtained from a study finding reporting that among parents, especially those already in low-income groups, lower income levels estimated enhances in maternal symptoms of depressed mood and the likelihood of receiving a clinical diagnosis of depression (Dearing, Taylor, & McCartney, 2006).

As per the family stress theory, this distress spreads throughout all family associations. As parents strive to reach set goals and as their demoralization, anxiety, concern and stress to socialize and educate their children enhance, their interacting with each other and their children become more adverse and aggressive (Brody et al., 1994; Conger & Elder, 1994). Researchers who used a household study on income dynamics that followed family members over time examined household income, employment, health and well-being, discovered evidence of these relationships. Parental job loss, especially the father's, was related to increased marital conflict and violence between persons. This finding was also found in other studies (Kalil & Wightman, 2010; Garfinkel, Wimer, & McLanahan, 2016). In turn, parental psychological distress and interparental conflicts were not only associated with socialization and education practices that were, on average, punitive, severe, strict and inconsistent but also characterized by less nurturing, less stimulation and less sensitivity to children's needs (McLoyd, 1990). Research on early child development consistently demonstrated and confirmed that

household economic tensions and pressures lead to psychological stress in parents and that this psychological stress in parents can disrupt, undermine and destroy family relationships and interactions as well as socialization and education processes of children (Duncan, Brooks-Gunn, & Klebanov, 1994; Gershoff et al., 2007; Linver, Brooks-Gunn, & Kohen, 2002).

The family stress model focuses on environmental conditions and parental mental health and expands understanding of how and to what extent stress influences neurobiological and cognitive functioning and operability. In particular, research revealed that in the conditions of poverty, including absence of cash, parents could mostly make decisions that expressed and emphasized for short time rather than for long time gains and benefits (Mani et al., 2013; Mullainathan & Shafir, 2013; Shah, Mullainathan, & Shafir, 2012; Shonkoff, 2012). Such decisions by parents greatly decreased the possibilities of conscious and meaningful socialization and training. When considered together with the information about the family stress model, this expanding field of research asserted that financial burden and economic pressures could disrupt and destroy parents' ability to ensure cognitively stimulating, nurturing and enhancement to their children as well as display of emotional behavior; and this could eventually alter emotional and cognitive functioning and operability in some manner.

Cognitive Biases and Decision-making

Seemingly, lower-SES parents wished to perform many of the same activities that higher-SES parents did. These, in particular, included activities that were linked with more positive cognitive consequences for children, such as reading aloud and going on educational field trips. However, it was alleged that parents in lower-social classes were less likely to actually do these activities. Research revealed a wider inequality and gap between what lower-SES parents intended and wanted to do and what they actually did. Researchers determined cognitive biases that could lead to such inequalities and gaps between knowing and realizing. People give too much weight to present consequences instead of future consequences which often lead to poor choices. It has been alleged that decisions pertaining to socialization and education, like many other decisions, are complicated. As parents cannot easily learn and master the complexities of socialization and education, their capacity to make optimal decisions may be limited. Therefore, parents tend to depend on

cognitive shortcuts and heuristics to make computationally cheap decisions (Gigerenzer & Selten, 2002).

Existing Biases

For many parenting decisions pertaining to socialization and education, the returns are not obtained until future years. Decisions related to investing in and spending cash and time on education, training, extracurricular activities, health-fostering conducts and other activities may refer to making financial investments with uncertain gains to enhance children's cognitive and psychosocial consequences. Research has suggested that people give too much weight to present consequences instead of future outcomes, which often leads to poor choices. (Castillo et al., 2011; Chabris et al., 2008; Meier & Sprenger, 2010; Sutter et al., 2013). Existing bias suggests that parents prioritize spending their time on activities that provide instant gratification rather than spending time with their children. Although parents believed in the benefits of reading and having books at home and understood the association between parental reading aloud and cognitive development of children, they seemed less likely to routinely read to their children. When the outcome or reward of an activity is distant and uncertain in the future, it can be tempting for parents to do something else at a time when they need to fulfill their promise, obligation, and responsibility to spend time on an activity. Theorists and researchers have not reached a consensus on the factors explaining the differences in children's time preferences. Many preliminary sociological studies presented observational evidence that children's time preferences were culturally acquired (LeShan, 1952; Cohen & Hodges, 1963; Banfield, 1990; O'Rand & Ellis, 1974)

Conclusion and Discussion

The evidence reviewed above indicates that both limitations and differences in preferences or beliefs of parents cannot possibly elucidate much of the variation in behaviors related to socialization and education by socioeconomic status. Differences in the amount of money available to parents in high-socioeconomic status and parents in low-socioeconomic status surely affected the parents' financial investments in child education. Nevertheless, differences in parental time spent with children could not be explained by money. Research discovered coherent evidence suggesting that parents from lower-social classes and parents from higher- social classes interacted with their children differently and spent and provided time and money for their children due to the fact that lower-

SES parents were exposed to and experienced more daily and often "toxic" stress than their counterparts in higher-socioeconomic status. This type of stress increases parent demoralization as well as parental anxiety and distress and may impede their ability to focus cognitively on long-term rather than short-term goals. It was asserted that the influence of the economic context of socialization and education on mental health led to certain cognitive biases in parents. Research established that these cognitive biases encouraged parents to focus on the present as opposed to future returns and to depend on habit rather than consciously problem-solving when making decisions regarding the socialization and education of their children.

Policies and Programs to Narrow down and Reduce SES-Based Differences, Inequalities and Gaps in Socialization and Education

What kinds of policies and schedules would most efficiently narrow down and reduce socioeconomic status-based differences, inequalities and gaps in socialization and education? On the basis of the mechanisms discussed above, research on programs aimed at improving socialization and educational behaviors was re-examined. Research also reviewed the evidence from studies that compared treatment groups with control groups. Correlational evidence was reviewed for differences in mechanisms by socioeconomic status or for correlational connections between each mechanism and socialization and educational behavior.

Spending Money on Children

Since a major reason why parents from low-social class and parents from high-social class socialize, educate and rear their children differently is that parents in low- socioeconomic status have less money, policies should ensure transmission of money to parents with low-income. As income increases are rarely casual, it is hard to predict the causal impact of this on parental behavior related to socialization and education. On the other hand, research on spending patterns of low-income parents provided some insights and perceptions about the behavioral changes resulting from giving money to parents. Earned Income Tax Credit is a tax credit that serves to counterbalance wage taxes and additional compensation for low-income workers and employees. Studies comparing yearly spending patterns for earned income tax credit recipients compared with nonrecipients discovered that earned income tax credit beneficiaries were more likely to spend their checks on paying their debts or on purchasing durable goods such as cars or home

appliances, instead of spending on children's education per se (Barrow & McGranaham, 2000; Goodman-Bacon & McGranaham, 2008). Nevertheless, in a research study conducted by Manoli and Turner (2018), it was asserted that additional money could sometimes go toward and be spent on a child's education. The research also expressed that a child receiving the earned income tax credit in the spring of senior year of high school increased the probability of enrollment of low-income students in college. Taken together, this study suggested that ensuring more money to poor families wasn't likely to change daily parental time or money spent on educational and enrichment activities for children; however, providing more money to poor families might increase parents' spending and investment in greater costs and expenses for their children, like enrolling them in college (Manoli and Turner, 2018).

A study on members of the American Indian Community examined how and to what extent a sudden change in family income and an unexpected sum of money obtained from casino winnings can affect families (Akee et al., 2010). It was suggested that for children who were never poor, an enhance in income of parents was found to have no impact on their high school graduation or academic achievement. For children in poor families, on the other hand, additional income of parents was found to increase educational attainment by about one year and the opportunity or chance of graduating from high school by 30 percent. More significantly, an unexpected casino payment was found to be related to a 5 percent enhance in parental monitoring and supervising of children and also a 4 percent enhance in positive mother-child intercating. These findings implied that income, by itself, might not increase socialization and education and, hence, children's cognitive and psychosocial outcomes. However, the study highlighted that the income increase was likely to be as much as 100 % more significant for poor families than the implementation of public policies.

A new intervention could explain the smaller potential impacts of still significant income increases on socialization and educational behavior. A team of eminent researchers launched the first years of babies study, an experimental program in which low-income mothers were randomly assigned to receive either an unconditional money transfer of $4,000 per year or a very small cash transfer of $20 per month. A few years later, the study examined the impacts of this income not only on development of infant but also on parental mental health and parents' socialization and educational stress as well as parental socialization and education practices. The first years of babies study, aimed to respond two

questions: Does additional money, by itself, increase socialization and education practices? And does it do so by healing parental mental health and mitigating parental stress? (Magnuson et al., 2019)

Allocating to and Spending Time with Children

Another policy approach that could change parental behaviors focused on increasing the quantity of time suitable to parents with low-income to expend time with their children. It was pointed out that education-based differences in parental time allocation and spending continued to exist even when policies tried to balance opportunities for children's development by providing effective and ample family support (Sayer, Gauthier, & Furstenberg, 2004). All the same, considering that stress impairs and damages mental health, concentration and attention of parents, policies that promote and enhance the stability and estimating of low-income parents' work programs can make a significant difference in socialization and educational conduct and the development of children (Schneider, Harknett, & Collins, 2019).

Knowledge, Values and Preferences

Another probable strategy included interventions designed to influence parents' knowledge, values or preferences for allocating and investing both time and money in the socialization and education of their children. Home visiting programs were implemented as the most widespread policy approach to influence parents' knowledge, values or preferences. Home visiting programs aimed to narrow down and reduce socialization and educational differences, inequalities and gaps between parents in higher-social classes and parents in lower-social classes. These programs usually focused on the mother-infant association and attempted to increase child development by modeling or directly educating parents about the care, socialization and education of infants, toddlers, and preschoolers. This approach hypothesized that parents who perceived the significance of certain socialization and education behaviors and learned how to engage in such behaviors would often behave in this manner (Michalopoulos et al., 2019). Home visiting programs had positive impacts on socialization and educational outcomes and modest or small impacts on mothers' ability to interact with their children in a responsive or encouraging, nurturing and enhancing manner (Green et al., 2016; Caldera et al., 2007). Another home visiting program, namely the Home Education Program for Kindergarten Children, specifically addressed parents' reading and educational activities with children in preschool

period and demonstrated strong and robust impacts on academic performance of children (Baker, Piotrkowski, & Brooks-Gunn, 1998). Home visiting programs can enhance the extent of cognitive stimulation, nurturing and enhancement of children at home and may mitigate the frequency of parents' use of severe or aggressive disciplinary practices (Michalopoulos et al., 2019; Schneider, Harknett, & Collins, 2019).

Family and Environmental Stress

All home visiting programs defined thus far have attempted to reduce stress in parents and cure mental health of parents among other aims. Averaging across model programs, home visiting was closely related to statistically significant decrease in maternal depressive symptoms. Programs that involved enhancing parental mental health by making use of specific clinical approaches looked promising for improving socialization and educational behaviors. Targeted programs revealed that enhancing parental mental health or decreasing stress led to improvements in socialization and educational behaviors. The Mothers and Babies program, a six-week cognitive-behavioral intervention, achieved a decrease in depressive symptoms and prevented episodes of depressiveness among women during prenatal and postpartum periods, and as a result, it increased mothers' responsiveness to their infants (MFarlane et al., 2017; Tandon et al., 2018). Interventions were able to improve and increase the quality of socialization and education in families with low-socioeconomic status by reducing emotional and interpersonal stress of parents and enhancing their mental health.

Cognitive Bias and Decision-making

As a field experiment, a study on parents and children tested a behavioral intervention to enhance the amount of time low-income parents spent reading with their children (Mayer, Kalil, & Oreopoulos, 2019). This study hypothesized that present-day biases might play a crucial role in understanding why parents in low-socioeconomic status read aloud to their children less frequently than parents in higher-socioeconomic status. The intervention on parents and children was designed to help parents form regular reading habits to "bring the future into the present" and sought to overcome and eliminate these biases using a set of behavioral tools, such as goal-setting, feedback, time reminders and social prizes. On the average, this intervention program was able to more than double the amount of time parents allocated to reading with their children.

Results and Policy Implications

Numerous theories attempted to elucidate why parents of higher SES were more involved in their children, especially in educational activities, compared to parents of lower or more disadvantaged SES backgrounds. Researchers and theorists clarified this point using the differences in the quantity of time and resources available to parents and the differences in the returns expected from the amount of time spent with children, as well as the differences in knowledge or beliefs related to the significance of educational activities or in what way and to what extent they should be involved and engaged in them. Current research has not yet come up with sufficient empirical evidence to demonstrate that these mechanisms account for most of the differences in socialization and educational behaviors, especially with respect to socioeconomic status. Nevertheless, the hypothesis that knowledge will alter socialization and educational behavior has led to models of socialization and educational interventions through early childhood education programs, particularly home visiting and parental support. Research studies reviewed in this study have asserted that by dealing with parents' emotional stress and cognitive biases, programs can narrow down and reduce socialization and educational differences, inequalities and gaps between higher-SES and lower-SES parents.

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CHAPTER 5

THE IMPACT OF SOCIOECONOMIC STATUS ON CHILDREN'S EXECUTIVE FUNCTION, COGNITIVE DEVELOPMENT AND EDUCATIONAL SUCCESS

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Introduction

It has been pointed out that executive function (EF) skills play a significant role in supporting children's academic skill development and contribute to socioeconomic status (SES)-based educational success differences, inequalities and gaps. The study has demonstrated that global executive function (EF) structures mediated the relationship between SES and academic achievement of children. However, it has been noted that less attention and emphasis is given to explaining the role of particular components of executive function (EF) structures in associating socioeconomic status with educational success of children. The current study analyzed data from the NICHD Study of Early Child Care and Youth Development (N = 1273) to evaluate direct and indirect relationships between indicators of SES, preschool executive function (EF) skills, and achievement in first-grade mathematics and reading. The study used path analyses and discovered that parental education and children's working memory uniquely and most significantly predicted both math achievement and reading success of children. Moreover, only children's working memory mediated the relationship between parental education and math success of children after checking for basic academic skills, verbal ability and another child- and family related covariates. These findings indicated specific mechanisms for the negative and detrimental impacts of socioeconomic disadvantage on children's educational success and provided a wider perspective for policies and interventions targeted contributing to academic development of children and narrowing and resolving SES-based academic achievement differences, inequalities and gaps.

Differences, inequalities and gaps in academic achievement between children from lower and higher SES backgrounds were emphasized; also, it was clearly established and well-documented that these SES-based differences, inequalities and gaps in academic achievement played a significant part in shaping children's life trajectories and had long-term implications (Duncan & Murnane, 2011; Sirin, 2005). Children born and raised in poverty, even before entering kindergarten, lagged significantly behind children of higher-SES parents in the cognitive, emotional and social skills required for academic success (Lee & Burkam, 2002), and these SES-based differences, inequalities and gaps in academic achievement continued throughout elementary and secondary school education (Heckman, 2006; Reardon, 2011). Attempts to comprehend the mechanisms underlying SES-based differences, inequalities and gaps in academic achievement evidenced that a multitude of child, family and school factors contributed to SES-based inequalities and gaps in children's educational and academic development (Hackman, Farah, & Meaney, 2010). Executive function (EF) skills of children, including behavioral inhibition, attentional control

and working memory, were found to contribute to SES-based differences, inequalities and gaps in academic achievement and strongly predicted academic skill development, particularly among children from impoverished or lower SES families (Blair & Raver, 2014).

All the same, some structural issues pertaining to the usage of executive function (EF) skills in accounting for SES-based differences, inequalities and gaps in educational success still remain unexamined. First, it was pointed out that while there was evidence that global executive function (EF) components mediated the relationships between socioeconomic status of parents and children's educational success, less attention was attached to the role that particular executive function (EF) elements played in associating socioeconomis status of parents and educational success of children. Taking into account the fact that earlier studies have demonstrated that basic executive function (EF) skills differentially predict short- and long-term educational consequences of children (Ahmed, Tang, Waters, & Davis-Kean, 2019; Nguyen & Duncan, 2019), exploring the role of individual executive function (EF) elements may ensure a more accurate awareness of the cognitive paths underlying the relationships between socioeconomic status of parents and academic performance of children. Even though recent studies have demonstrated and documented that crucial executive function (EF) skills, parental education and SES indicators, such as family income, contribute differentially to cognitive and academic development of children (Davis-Kean, Tang, & Waters, 2019), how and how much unique cognitive mechanisms contribute to differences, inequalities and gaps in children's cognitive and academic progress through different indicators of unfavorable socioeconomic status remains largely unknown. Understanding and explaining the factors that contribute to achievement inequalities and gaps based on specific child- and family-level SES can enhance the particularity of theories and ensure more explicit goals for policies and interventions targeted narrowing and resolving SES-based differences, inequalities and gaps in cognitive and educational success. The current study used a large national data set and examined the relative contribution of three specific preschool executive function (EF) skills, namely behavioral inhibition, attentional control and working memory, to the relationship between distinct indicators of SES and both math and reading success of children in first grade.

Executive Function (EF)

Despite various definitions, it has been indicated that executive function (EF) involve a set of cognitive skills employed for conscious, goal-oriented behavior that is highly significant for studying and performing successfully in school and beyond (Diamond, 2013). These cognitive skills emerge in early childhood as behavioral inhibition, attentional control and

working memory, and they continue to develop in adulthood (Friedman et al., 2016). Behavioral inhibition pertains to the ability to stop, prevent, or eliminate impulsive behavioral reactions and has been defined as behaving in a more proper, goal-oriented manner (Logan, 1994). Attentional control requires exclusively focusing and concentrating on a task undeterred by possible disruptions and shifts in attention (Anderson, 2002). Working memory refers to the temporary retention of information in storage while executing mental tasks. These cognitive skills have been linked to simultaneous success and prospective educational achievement (Best, Miller, & Naglieri, 2011) and long-term consequences regarding health, wealth and involvement in the judicial system (Moffitt et al., 2011).

Across the preschool period, executive function (EF) skills of children go through swift development and variance (Morrison & Grammer, 2016). Some research studies asserted that executive function (EF) operated as a more comprehensive component during this stage of development throughout the preschool years (Wiebe, Espy, & Charak, 2008; Willoughby); whereas, other researchers established that executive function (EF) components were differentiated and statistically loading onto separate factors (Simanowski & Krajewski, 2019). Besides, evidence of unique relationships between different executive function (EF) skills and educational and behavioral consequences of children emphasized the benefits of different executive function (EF) skills in predicting the impacts of children's educational and behavioral consequences individually (Morgan, Farkas, Hillemeier, Pun, & Maczuga, 2019).

Executive Function (EF) and Academic Success

As learning specifically calls for the ability to consistently focus and concentrate on tasks in order to remember and adhere to regulations and instructions, and also to prevent inappropriate behavior, complex executive function (EF) skills have been beneficial in children's education efforts and learning environments (Morrison, Cameron Ponitz, & McClelland, 2010). As a matter of fact, children's executive function (EF) has been an important element in preparation for school (Blair, 2002). A broad range of research studies asserted that early executive function (EF) skills were crucial for children's educational success during early childhood (McClelland et al., 2014) and that this contribution and importance for academic success continued during adolescence (Ahmed et al., 2019; Watts et al., 2014). These relationships persisted even after checking for intelligence, previous academic abilities and indicators of socioeconomic status (Blair & Razza, 2007; McClellandet et al., 2007). In spite of the implications of these findings, the majority of studies explored the role of only one executive function (EF) element or were based on potential or structured combined measures of executive function (EF). Besides, several of these stud-

ies attempted to test the assumption that executive function (EF) would predict ability within a single domain of study, such as math. It was argued that these analytical approaches fail to provide important information pertaining to in what way and to what extent certain executive function (EF) components might support educational success more compared to others and whether these patterns varied for math and reading success of children.

In an attempt aimed at identifying components of executive function (EF) that can particularly support academic skill development, a wide range of research studies have adopted a segmental method to explore the associations between executive function (EF) and performance in preschool students. So far, some of these studies have established that children's behavioral inhibition most strongly and exclusively predicts their early math skills (Montoya et al., 2019), while other studies have discovered connections between children's working memory and their more complicated math skills that necessitate the use of knowledge (Purpura, Schmitt, & Ganley, 2017). Apart from the contributions of other executive functions, it was denoted that the evidence promoting the function of children's attentional control in estimating their early math abilities, (EF), was varied (Blair and Razza, 2007; McClelland et al., 2014; Purpura et al., 2017). It was also pointed out that the results for emergent literacy skills were more versatile. Some studies stated that children's behavioral inhibition (Blair & Razza, 2007), attentional control (Lan et al., 2011) and working memory (Montoya et al., 2019) had a unique contribution to predicting their kindergarten literacy, while some other studies mentioned minimal impacts for all the components of executive function (EF) (Purpura et al., 2017).

Evidence for relationships between executive function (EF) elements and emerging math and literacy skills is varied; however, a more coherent pattern of results has come out when relationships between executive function (EF) elements and math and reading are examined through the period of formal education. While research usually observed unique relationships between multiple executive function (EF) skills and academic achievement of children, accumulating evidence showed that children's working memory most strongly predicted both math and reading performance (Cortés Pascual, Moyano Mu˜noz, & Quílez Robres, 2019). A study showed that kindergarteners' working memory was specifically strong in estimating third-grade math and reading performance, even after explaining another executive function (EF) skills, fundamental success and a multitude of child- and family-related factors (Nguyen & Duncan, 2019). It was observed that these findings expanded into adolescent academic outcomes. After checking basic educational skills and child- and family-related factors, preschool working memory was found to be the only executive function (EF) element that predicted math (Watts et al., 2014) and reading

achievement (Ahmed et al., 2019) at age 15. Working memory helped and facilitated problem-solving and strategic thinking, which allowed children to be involved in higher-level learning (Cowan, 2014). Indeed, working memory was found to mediate the impacts of inhibition and attention on learning capability of children, and it was asserted that inhibition and attention might constitute working memory (Ropovik, 2014). Thus, among the major executive function (EF) skills, working memory seems to play a crucial part in promoting, nurturing and fostering educational success of children, especially during early childhood and adolescence.

Socioeconomic Status (SES) and Executive Function (EF)

Considering the function of early executive function (EF) skills in promoting educational success of children, researchers have started to display increasing enthusiasm for determining the content-based processes that mould executive function (EF) development (Hackman et al., 2010). A wide range of literatüre has revealed and documented relationships between SES and a variety of conditions, such as toxins, violence in surroundings, and school quality, as well as family-related factors, such as beliefs and behaviors of parents (Evans, 2004). SES consistently and strongly predicts a range of developmental consequences, including academic performance, and functions as a valuable beginning point for determining features of the developmental factors that are instrumental in moulding executive function (EF) of children (McLoyd, 1998).

A wide range of research has demonstrated and documented relationships between SES and executive function (EF) through different phases of development. Children from higher SES families exhibit, on average, more advanced executive function (EF) skills compared to their peers from lower socioeconomic status backgrounds (Lawson, Hook, & Farah, 2018). These differences, inequalities and gaps in executive function (EF) skills have been observed across research not only when global measures of executive function (EF) are used (Raver, Blair, & Willoughby, 2013; Rhoades et al., 2011) but also when executive function (EF) elements are incorporated individually (Little, 2017). So far, little research has simultaneously evaluated the comparative contribution of various SES indicators to particular executive function (EF) skills in children. Simultaneous assessment of the comparative contribution of various socioeconomic status indicators to specific executive function (EF) skills of children has the potential to ensure a more nuanced awareness of the pathways underlying the widely reported relationships between socioeconomic status and executive function (EF) and also to produce particular objectives for policy and intervention.

Research studies have utilized combined measures of SES and information pooled across multiple indicators of SES to approximate families'

socioeconomic position (Bornstein, Hahn, Suwalsky, & Haynes, 2003). It has been emphasized that correlations between such SES indicators as parents' academic acquisition and family income are well-determined and that associations between parents' academic acquisition and family income are often modest or moderate at best (Braveman et al., 2005). It has also been noted that even though they are associated, family education and income reflect different resources that are beneficial to children in unique ways (Duncan & Magnuson, 2012). While income, as economic capital, ensures families with the monetary funds to acquire first class resources, education, which reflects knowledge and skills as human or cultural capital, indirectly benefits children through nonmaterial investments such as cognitively enriching home learning environments (Davis-Kean et al., 2019). The fact that parental education and family income reflect different resources that are beneficial in unique ways and contribute differently to children's academic achievement has led researchers to attach less importance to examining broad SES inequalities and gaps in cognitive, academic educational and sociopsychological outcomes of children. In investigating SES inequalities and gaps in cognitive, academic educational and sociopsychological outcomes of children, researchers have looked into and focused on designing the distinctive routes by which different SES indicators can mould cognitive and psychosocial development of children (Duncan & Magnuson, 2003). A mounting amount of research has embraced this procedure, with evidence indicating that parents' academic acquisition more strongly predicts children's cognitive consequences (Davis-Kean, 2005; Davis-Kean & Sexton, 2009).

Characteristically, when multiple indicators of SES were taken into the scope of the research to predict children's executive function (EF) skills, individual contributions of each SES indicator were discovered (Hackman et al., 2015). On the other hand, other studies reported unique impacts of parental education (Noble, Norman, & Farah, 2005) or family income (Piotrowski, Lapierre, & Linebarger, 2013) on executive function (EF) skills of children. For definite clarification, exposition and explanation of these findings, Conway, Waldfogel, and Wang (2018) explored the comparative contributions of parental education and family income to executive function (EF) skills of children at school entry. The results revealed that unique impacts of both education of parents and and income of parents on each executive function (EF) measure were discovered and that SES-based performance differences, inequalities and gaps persisted through stages of parental education. Collectively, these findings supported the theory and the studies displaying the specifically powerful contribution of parental education in moulding children's development of executive function (EF) skills (Davis-Kean et al., 2019) and highlighted SES-related performance

differences, inequalities and gaps in executive function (EF) skills of children that were observable at school entry.

Indirect Impacts of Socioeconomic Status (SES) on Cognitive, Educational and Academic Success through Executive Function (EF)

It has been suggested that children's executive function (EF) mediates the relationships of socioeconomic status with cognitive and educational success owing to its connection with both SES and cognitive, educational and educational success. Thus, a wide range of research has investigated the role of children's executive function (EF) in explaining socioeconomic status-related differences, inequalities and gaps not only in school readiness (Micalizzi, Brick, Flom, Ganiban, & Saudino, 2019) but also in first grade (Nesbitt et al., 2013) and fifth grade (Crook & Evans, 2014), as well as in cognitive, educational success (Lawson & Farah, 2017) in a sample of children aged 6 to 15. Results obtained from these studies have revealed evidence that children's executive function (EF) mediates the relationship of SES with cognitive and educational success across stages of development, especially for math skills (Lawson & Farah, 2017). However, a number of important questions cease unanswered.

As emphasized above, firstly, the majority of the research studies utilizing composite measures of executive function (EF) derived their findings from children's average achievement through individual EF tasks or a potential executive function (EF) variable. It was also highlighted that understanding and explaining the global relationships between children's executive function (EF) and their cognitive, was alleged that these analytical approaches did not allow for the evaluation of potential unique impacts special to one or more executive function (EF) elements on children's cognitive, educational and academic achievement consequences and how these relationships might differ for math and reading. Evidence that key executive function (EF) skills differentially predict children's cognitive, educational and academic success underlines the significance of estimating the impacts of each executive function (EF) skill on children's cognitive, educational and academic success individually (Ahmed et al., 2019; Nguyen & Duncan, 2019). Secondly, it was asserted that existing studies relied on composite measures of SES and overlooked the potential of a single indicator of SES to predict children's executive function (EF) and cognitive, educational and academic achievement, or both. It was also emphasized that parental education and family income had impacts on children's cognitive, educational and academic development via different mechanisms, and therefore it was proposed that the contributions of parental education and family income to children's executive function (EF) and cognitive, educational and academic achievement should be designed and examined individually (Davis-Kean et al., 2019; Duncan & Magnuson, 2012). Third-

ly, only several of these studies dealt with control variables such as demographic features or other cognitive abilities in their analyses. Failure to explain the impacts of such factors, in turn, might limit confidence in the validity of the results and might also give rise to upwardly biased estimates (Jacob & Parkinson, 2015).

The Current Study

The current study used a large, national dataset to demonstrate direct and indirect relationships among indicators of SES, children's executive function (EF) skills and emergent cognitive, educational and academic performance. The study aimed to address each of these SES-based differences, inequalities and gaps in children's executive function (EF) skills and cognitive, educational and academic achievement reported in the literature. The study especially focused on the role of preschool executive function (EF) elements, such as behavioral inhibition, attentional control and working memory, and examined them as a potential pathway mediating the relationships between indicators of socioeconomic status, such as education of parents and family income, as well as first-grade math and reading success of children. As a power control, a rich set of covariates was included to establish if the predictive power of socioeconomic status indicators, such as parental education and family income, relied on alternative model specifications. Therefore, the current review proposed the research questions and hypotheses cited below:

1. What are the comparative contributions of children's executive function (EF) elements in mediating the relationships between family and parental education, as two major predictors of socioeconomic status, and educational success of children in first grade? In the current research, executive function (EF) components were measured when children were 54 months old, family income was averaged from 1 month after birth to 36 months, and parental education was measured one month after birth. The current study assumed that all of the children's executive function (EF) elements would make unique contributions. On the other hand, it was expected that children's working memory would explain more of the variance in students' first-grade math and reading success than their behavioral inhibition or attentional control. Secondly, the study hypothesized that parental education would explain more of the variance in children's overall executive function (EF) skills and also in first-grade math and reading success outcomes compared to family income.

2. Are the relationships among indicators of SES, executive function (EF) elements, and math and reading performance weakened with the incorporation of children's basic academic skills into the model? The research predicted that children's working memory would significantly me-

diate socioeconomic differences, inequalities and gaps in their cognitive, educational and academic achievement, whereas it assumed that all predicted impacts would decline when children's previous performance was incorporated into the model.

Methods

Participants

Data for the current study were obtained from Phases I and II of the National Institute of Child Health and Development Study of Early Child Care and Youth Development (NICHD SECCYD). A total of 1,364 families were included in the scope of the study and interviewed in the first stage of data collection. The sample for the current study was limited to 1,273 families.

Measures

Socioeconomic Status (SES)

Parallel to the research objectives, two main indicators of SES, namely family income-to-needs and parental education, were examined. Family income-to-needs for each child was computed as a ratio of their family's total household income divided by the official poverty threshold, which was determined based on appropriate family size. Income-to-need was defined as the average from when the child was 1, 6, 15, 24, and 36 months old, with a mean of 3.39 and a standard deviation of 2.65. An income-to-needs value equal to or less than 1 showed that a family was living under impoverished conditions (McLoyd, 1998). Parental education, which was measured when the child was 1 month old, referred to the total years of education completed by the parents. The mean years of parental education was 14.97 and the standard deviation was 2.61.

Executive Function (EF)

In the current study, executive function (EF) was measured when children were 54 months old, and it was defined as the sum of behavioral inhibition, attentional control and working memory. Behavioral inhibition and attentional control were both measured using the Continuous Performance Task (CPT; Rosvold, Mirsky, Sarason, Bransome, & Beck, 1956). The task comprised looking at pictures of common objects displayed on a computer screen and pressing a button when a target stimulus, such as a chair, appeared on the screen. Children's mistakes were recorded throughout the task, and decreases in performance could be calculated as an indicator of executive function (EF) skills. In this study, behavioral inhibition was operationalized as the number of task-related mistakes made by the child, and the mean was determined as 14.33, with a standard deviation of

21.65. Attention control reflected the number of mistakes related to forgetting and omitting, and the mean was determined as 9.13, with a standard deviation of 7.58. For convenience of data interpretation, both measures were reverse coded, with higher scores indicating better performance in this domain. The Continuous Performance Task (CPT) has been widely utilized to measure attentional control and behavioral inhibition (Duncan et al., 2007; Watts et al., 2014). Also, it has exhibited test adequacy, test applicability and test-retest reliability (rs = .65–74) as well as high construct validity (Halperin, Sharma, Greenblatt, & Schwartz, 1991). The Memory for Sentences subtest of the Woodcock-Johnson Revised (WJ-R) Tests of Cognitive Ability (Woodcock & Johnson, 1989) was utilized to measure and assess children's working memory. In this task, children listened to a researcher reading aloud words, phrases and sentences, and were instructed to repeat each item correctly. As the content of children's memory expanded over time, it became increasingly difficult for them to perform this task. Children were awarded 2 points for repeating the item correctly, 1 point for answers with one error, and 0 points for answers with two or more errors. The raw scores, namely W-scores, were converted to a scale with even intervals and used for the current analyses, with a mean of 457 and a standard deviation of 18.42.

Academic Achievement

In order to measure math and reading performance, the study utilized W-scores from two subtests of the Woodcock and Johnson-Revised Achievement Tests (Woodcock & Johnson, 1989), a test with high validity and reliability. Math performance was measured using the Applied Problems subscale, and the mean math performance score for 54-month-old children was determined as 424.82, with a standard deviation of 19.24, and the mean math performance score again for first graders was found to be 470.09, with a standard deviation of 15.45. The Applied Problems subscale, which was used to measure and assess math performance in this study, instructed children to make mathematical calculations in reply to orally- and visually-presented problems. The Letter-Word Identification subscale, which was used to measure and assess children's reading achievement, instructed children to orally recognize written letters and words. While the mean reading achievement score in 54-month-old children was 369.33, with a standard deviation of 21.14, the mean reading achievement score again in first grade was 452.78, with a standard deviation of 23.75.

Covariates

A set of conceptually motivated covariates were incorporated into the model in order to control for their potential confounding impacts. Taking into account the association between children's language skills and speak-

ing abilities as well as their executive function (EF) and academic skills (Blair & Razza, 2007; Fuhs & Day, 2011), the accomplishment of the children participating in the study was evaluated as a covariate on the Reynell Expressive Language test (Reynell, 1991) and the mean language performance score was found to be 97.26, with a standard deviation of 14.61.

Analytical Plan

The study employed path analyses to investigate the hypothesized direct and indirect associations between SES indicators, children's executive function (EF) elements and their math and reading performance. The first step in the study was to explore the role of specific executive function (EF) elements in potentially mediating the relationships between SES indicators and children's math and reading performance. Children's verbal ability, age at testing, gender, time in child care, and location of data collection area were added to the study as covariates. Together, the theoretical and experimental instructions allowed and enabled the residuals of each of the three components of executive function (EF) to correlate with one another. The study tested the paths from SES indicators to children's executive function (EF) elements as well as the paths from children's executive function (EF) elements to their math and reading performance in order to comprehend and account for the direct effects of SES indicators on math and reading performance. Next, the indirect impacts of SES indicators on children's math and reading performance were tested by examining them through separate executive function (EF) elements (MacKinnon, Fairchild, & Fritz, 2007). As a means to assess the strength and robustness of these findings, the study used a second model to explore if the strength and patterns of relationships between SES indicators, executive function (EF) elements as well as math and reading performance differed when children's prior achievement was incorporated into the model..

Results

Bivariate correlations among study variables are shown in Table 1. The significant correlations provided initial evidence of the hypothesized relationships between SES indicators of parents, elements of children's executive function (EF) and children's math and reading performance. The results of both path models are depicted below after verifying multiple comparisons

Table1. Bivariate correlations among study variables

Variables	1	2	3	4	5	6	7	8	9	10	11
1.Family income-to-needs	-										
2. Parental Education	**0.59**	-									
3. Behavioral inhibition	**0.15**	**0.20**	-								
4. Attentional control	**0.11**	**0.19**	**0.25**	-							
5. Working memory	**0.25**	**0.29**	**0.21**	**0.24**	-						
6. Math performance (1st grade.)	**0.32**	**0.36**	**0.23**	**0.28**	**0.43**	-					
7.Reading performance (1st grade)	**0.22**	**0.29**	**0.17**	**0.22**	**0.30**	**0.57**	-				
8.Change in math performance	**0.15**	**0.15**	0.04	**0.09**	**0.17**	**0.80**	**0.38**	-			
9. Change in reading performance	0.05	**0.11**	0.05	**0.10**	**0.10**	**0.35**	**0.84**	**0.32**	-		
10. Verbal ability	**0.25**	**0.33**	**0.14**	**0.18**	**0.35**	**0.34**	**0.26**	**0.08**	**0.09**	-	
11. Child Age (years)	-0.00	-0.02	0.04	0.06	-0.02	-0.05	0.01	**-0.08**	0.01	-0.01	-
12. Time in child care	**0.15**	**0.11**	0.03	-0.06	**0.07**	**0.10**	0.05	**0.07**	0.02	**0.07**	0.03

Note: Bolded correlations are significant at p < .05. (Waters, Ahmed, Tang, Morrison & Davis-Kean, 2021, p.325).

Direct Impacts

Direct impacts from both path models are presented in Table 2. Firstly, the study evaluated the direct impacts of SES indicators on children's math and reading performance. Results from Model 1 revealed that parental education predicted both children's math performance (ß = 0.10, p < 0.01) and reading performance (ß = 0.13, p < 0.01), while family income-to-needs predicted only children's math performance (ß = 0.10, p < 0.01). After incorporating children's baseline performance into Model 2, neither parental education nor family income-to-needs predicted children's math or reading performance measures.

Then, the study examined the direct impacts of parental education and family income-to-needs on children's executive function (EF) elements. Parallel to the assumption made by the study, results from Model 1 showed that parental education most strongly predicted children's executive function (EF) elements. Higher parental education was related to children's greater behavioral inhibition (ß = 0.14, $p < 0.001$), greater attentional control (ß = 0.15, $p < 0.001$), and greater working memory (ß = 0.14, $p < 0.001$). Contrarily, family income-to-needs predicted only children's working memory (ß = 0.09, $p < 0.05$). These predictions did not change when children's basic achievement skills were added to Model 2.

Lastly, the direct impacts of executive function (EF) elements on first-grade math and reading performance were evaluated in children aged 54 months. Besides, in line with the hypothesis proposed by the study, results from Model 1 revealed that working memory was the executive function (EF) component most strongly related to children's math (ß = 0.26, $p < 0.001$) and reading performance (ß = 0.16, $p < 0.001$). Attentional control also predicted children's math (ß = 0.15, $p < 0.001$) and reading performance (ß = 0.12, $p < 0.001$), while behavioral inhibition predicted only their math (ß = 0.08, $p < 0.05$) achievement. As soon as children's baseline performance was inserted into Model 2, all impacts declined. After the application of Bonferroni correlation, only the relationship between children's working memory and their gains in math achievement continued to have a statistical significance (ß = 0.12, $p < 0.001$).

Table 2 Unstandardized and standardized direct effect estimates for models (N = 1273).

		Model 1			Model 2		
Predictor	Dependent Variable	*b*	*SE*	*β*	*b*	*SE*	*β*
Family income-to-needs	Math	0.03[b]	0.01	0.10	0.39	0.18	0.08
	Reading	0.02	0.02	0.05	-0.17	0.29	-0.02
	Response inhibitation	-0.01	0.27	-0.00	-0.01	0.27	-0.00
	Attention control	-0.07	0.12	-0.03	-0.07	0.12	-0.03
	Working memory	0.03[b]	0.01	0.09	0.03[b]	0.01	0.09
Parent education	Math	0.03[b]	0.01	0.10	0.19	0.19	0.04
	Reading	0.06[b]	0.02	0.13	0.41	0.33	0.05
	Response inhibitation	1.13[b]	0.29	0.14	1.13[b]	0.29	0.14
	Attention control	0.43[b]	0.11	0.15	0.43[b]	0.11	0.15
	Working memory	0.05[b]	0.01	0.14	0.05[b]	0.01	0.14
Response inhibitation	Math	0.01[b]	0.00	0.08	0.01	0.02	0.02
	Reading	0.00	0.00	0.02	-0.02	0.03	-0.02
Attention control	Math	0.02[b]	0.00	0.15	0.10	0.06	0.06
	Reading	0.02[b]	0.01	0.12	0.19	0.20	0.07
Working memory	Math	0.22[b]	0.03	0.26	1.66[b]	0.48	0.12
	Reading	0.21[b]	0.05	0.16	0.91	0.86	0.04
Verbal ability	Math	0.01[b]	0.00	0.16	0.04	0.03	0.04
	Reading	0.01[b]	0.00	0.13	0.10	0.05	0.07
	Response inhibitation	0.06	0.06	0.04	0.06	0.06	0.04
	Attention control	0.08[b]	0.02	0.15	0.08[b]	0.02	0.15
	Working memory	0.02[b]	0.00	0.28	0.02[b]	0.00	0.28
Child Age (years)	Math	-0.34	0.24	-0.04	-8.34	4.25	-0.06
	Reading	0.20	0.43	0.02	3.32	7.04	0.02
	Response inhibitation	8.29	6.44	0.04	7.94	6.43	0.03
	Attention control	5.47	2.47	0.07	5.26	2.47	0.06
	Working memory	-0.03	0.29	-0.00	-0.02	0.29	-0.02
Time in child care	Math	0.00	0.00	0.03	0.05	0.04	0.04
	Reading	0.00	0.00	0.00	0.01	0.07	0.01
	Response inhibitation	0.04	0.06	0.02	0.04	0.06	0.02
	Attention control	0.03	0.02	0.04	0.03	0.02	0.04
	Working memory	0.00	0.00	0.04	0.00	0.00	0.04

Correlations							
Income-to-needs & parent education		4.04[b]	0.23	0.59	4.04[b]	0.23	0.59
Response inhibition & attention control		28.05[b]	4.30	0.19	28.04[b]	4.30	0.19
Response inhibition & working memory		2.31[b]	0.52	0.14	2.30[b]	0.52	0.14
Attention control & working memory		1.03[b]	0.21	0.17	1.03[b]	0.21	0.17
Math & Reading		0.32[b]	0.03		72.43[b]	8.78	0.32

Note: b Significant after Bonferroni correction. (Waters et al., 2021, p.326).

Indirect Impacts

Indirect impacts in both path models in the analysis are shown in Table 3. First of all, the relationships between parents' SES indicators and children's math performance were examined through children's executive function (EF) elements. In Model 1, children's working memory was found to be significantly mediating the relationship between family income and children's math performance (ß = 0.02, $p < 0.05$). However, both children's working memory (ß = 0.04, $p < 0.001$) and attentional control (ß = 0.02, $p < 0.01$) mediated the relationship between parental education and children's math performance. Nevertheless, after the addition of children's baseline performance to Model 2 and the application of Bonferroni's verification, only the relationship between parental education and children's math performance mediated by working memory remained significant (ß = 0.02, $p < 0.05$).

Then, the indirect impacts of SES indicators on children's reading achievement were examined through children's executive function (EF) components. After the application of Bonferonni's verification, there were no significant mediating impacts of executive function (EF) elements on the path from family income to children's reading performance, whereas both children's working memory (ß = 0.02, $p < 0.001$) and attentional control (ß = 0.02, $p < 0.01$) significantly mediated the path from parental education to reading performance. Contrary to the math achievement model, on the other hand, all coefficients were found to be insignificant when children's basic performance was incorporated into Model 2.

Table 3 Unstandardized and standardized indirect effect estimates for models (N = 1273).

			Model 1			Model 2		
Predictor	Mediator	Dependent variable	*b*	*SE*	ß	*b*	*SE*	ß
Income-to-needs	Response inhibition	Math	0.00	0.00	0.00	0.00	0.00	0.00
Income-to-needs	Attention control	Math	-0.00	0.00	-0.00	-0.01	-0.01	-0.00
Income-to-needs	Working memory	Math	0.01[b]	0.00	0.02	0.05	0.03	0.01
Parent education	Response inhibition	Math	0.00	0.00	0.01	0.02	0.03	0.00
Parent education	Attention control	Math	0.01[b]	0.00	0.02	0.04	0.03	0.01
Parent education	Working memory	Math	0.01[b]	0.00	0.04	0.08[b]	0.03	0.02
Income-to-needs	Response inhibition	Reading	0.00	0.00	0.00	0.00	0.00	0.00
Income-to-needs	Attention control	Reading	-0.00	0.00	-0.00	-0.01	0.02	-0.00
Income-to-needs	Working memory	Reading	0.01	0.00	0.01	0.03	0.03	0.00
Parent education	Response inhibition	Reading	0.00	0.00	0.00	-0.02	0.04	-0.00
Parent education	Attention control	Reading	0.01[b]	0.00	0.02	0.08	0.05	0.01
Parent education	Working memory	Reading	0.01[b]	0.00	0.02	0.05	0.05	0.01

Note: b Significant after Bonferroni correction. (Waters et al., 2021, p.326).

Discussion

The current study first considered preschool executive function (EF) skills as potential mechanisms accounting for SES-based differences, inequalities and gaps in children's early educational success and attempted to explore the role of these preschool executive function (EF) skills. The study also discovered that, among all executive function (EF) elements, children's working memory and attentional control uniquely mediated the relationships between parental education and children's math and reading performance. Besides, children's working memory mediated the relationships between family income and math performance. In order to assess the strength of these findings, children's preschool academic skills were eventually incorporated into the model. The results exposed that only children's working memory kept on mediating the relationship between parental education and children's math performance when explaining children's basic academic skills, Various recent studies have investigated how

executive function (EF) of children somehow mediates the connections between parental SES and academic achievement of children. However, a handful of research studies have so far investigated the comparative significance of individual executive function (EF) elements as they pertain to both children's academic performance and their explanatory role in socioeconomic status-associated performance gaps. Comprehending the distinct cognitive mechanisms across socioeconomic disadvantage may provide a preliminary step towards creating more definite goals for policies and interventions targeted contributing to children's academic performance and at narrowing and resolving academic performance differences, inequalities and gaps.

Here, the study replicated and extended previous research in various significant ways. Firstly, two separate indicators of socioeconomic status, namely parental education and family income, were included in the analysis as unique predictors to distinguish their comparative contributions to executive function (EF) and academic success of children. Although they are correlated, parental education and family income may each provide different resources that provide advantages for children via unique pathways (Davis-Kean et al., 2019). It was determined that both education of parents and family income were related to resources available and accessible in the home surroundings. However, parental education had a more powerful effect not only on the expectations that parents held for academic success of their children but also on the behaviors and efforts parents engaged in to realize these aspirations, ambitions and desires (Davis-Kean, 2005). Thus, it was discovered that parental education was more closely related to children's cognitive, educational, academic and psychosocial consequences, but especially to their cognitive development. Parental beliefs and behaviors mediated these relationships between education of parents and cognitive, educational, academic and psychosocial consequences of children (Conway et al., 2019). Parallel to this, the research determined that parental education was connected to all domains of children's executive function (EF) and academic success; however, family income was associated only with children's working memory and math performance. While endeavours towards providing income contributions to families so as to improve children's academic success have been emphasized (Shaefer et al., 2018), less attention has been attached to the development of parent's educational opportunities to provide the same benefits to their children. Research has shown that when mothers, particularly those with lower initial levels of education, continue complementary education after giving birth to a child, this can improve and enrich not only the quality of the home surrounding but also language and academic skills of children (Magnuson, 2007; Magnuson et al., 2009). Hence, providing parents with increased opportunities

to further their education has served as a means of promoting academic achievement of children, particularly considering the fact that complementary education is often linked to a consequent rise in income.

Secondly, a broad range of existing research studies have employed executive function (EF) as a compound or potential variable (Willoughby et al., 2012). Nevertheless, more recent research has suggested that elements of children's executive function (EF) may differ across preschool years (Simanowski & Krajewski, 2019). The research also pointed to the increasing evidence that SES indicators, such as education of parents and family income, uniquely predicted different components of executive function (EF) and children's cognitive, educational and academic results (Ahmed et al., 2019; Morgan et al., 2019). Hence, behavioral inhibition, attentional control and working memory were incorporated into the study as separate predictors in the analyses to assess their unique contributions to children's math and reading performance. It was observed that the findings of the current study were consistent with evidence from studies (Nguyen and Duncan, 2019; Wattset al., 2014) showing that among basic executive function (EF) skills, working memory was most predictive of children's academic success. On account of the fact that working memory mediates the impacts of children's inhibition and attention on learning (Ropovik, 2014), these cognitive skills may play an especially significant part in promoting, nurturing and enhancing children's academic achievement. Interventions aimed at enhancing children's executive function (EF) have usually produced positive impacts (Blair & Raver, 2014; Raver et al., 2011); whereas, attempts to particularly enhance working memory have generated varied consequences (Sala & Gobet, 2017). All the same, quasi-experimental research asserts that if children, especially those from disadvantaged backgrounds or low SES families (Weiland & Yoshikawa, 2013), simply attend preschool, this can improve and enhance working memory and other executive function (EF) skills (Burrage et al., 2008). For this reason, providing increased opportunities for children to enter and continue their education in schools that offer high-quality preschool programs could substantially narrow the apparent SES-related differences, inequalities and gaps in working memory skills of children at kindergarten entry (Little, 2017).

Thirdly, in line with other research, the current study established that children's executive function (EF) components were more predictive of their math performance compared to their reading performance (Cortés Pascual et al., 2019). In particular, it was observed that both children's working memory and attentional control were more closely linked to math performance compared to their reading performance, whereas children's behavioral inhibition alone predicted their math performance. One way of explaining these findings was that children's math achievement called for

a greater level of cognitive control. On the other hand, it was emphasized that the cognitive processes essential for children's reading attainment became gradually more automatic in due course (Blair & Razza, 2007). Yet, executive function (EF) necessitated increased reading achievement as children became more formally engaged with reading comprehension. The measure of reading achievement employed in this study demanded and used children's ability to decipher and interpret letters and words, and it was stated that these skills depended less on executive function (EF) during the transition to school (Fuhs, Nesbitt, Farran, & Dong, 2014). Conversely, executive function (EF) remained associated with reading comprehension throughout development (Follmer, 2018). Several research studies observed relationships between children's executive function (EF) and the progress in their comprehension in the initial phases of reading development (Birgisdóttir, Gestsdóttir, & Thorsdóttir, 2015; Skibbe et al., 2012). For this reason, further research is necessary to explain the potential role of executive function (EF) in facilitating and enabling the development of reading comprehension.

Fourthly, the study included children's basic academic skills in the final model and thus was able to assess whether parental education and family income estimated children's benefits in math and reading performance from 54 months to first grade. In the first stage of analyses, while parental education was found to be uniquely related to both children's math and reading performance, family income only predicted reading performance of children. Nevertheless, when children's earlier performance was incorporated into the model, all effects diminished. These results were in agreement with research demonstrating that children from lower- and higher-SES families attained similar benefits in performance during the first few years of schooling (Caro, McDonald, & Willms, 2009) and that socioeconomic status-related inequalities and gaps in cognitive, educational and academic achievement at school entry remained pretty stable throughout education (Reardon, 2011). Accordingly, considering this comparative stability in early cognitive, educational and academic achievement, the efforts exerted by parents to establish and develop the cognitive skills that provide the greatest support for cognitive achievement in children before kindergarten entry may turn out to be beneficial in creating the most powerful influence on children's long-term educational and academic consequences.

Fifthly, when the study included key variables such as social class, verbal ability and prior success in the model, it was possible to investigate the associations between children's executive function (EF) elements and their acquisitions in math and reading, apart from important child- and family-related features. When such variables were excluded, the estimated relationships between children's executive function (EF) elements and

their academic success might be upwardly biased (Jacob & Parkinson, 2015). The results demonstrated that, after checking verbal ability, age of testing, gender, time spent in child care and socioeconomic status, each of the children's executive function (EF) elements was uniquely and distinctively linked to math and reading performances except for behavioral inhibition, which was not associated with reading performance. On the other hand, when children's previous performance was incorporated into the model, only the relationship between children's working memory and math performance continued to be statistically significant. In addition, the mediation analysis displayed that among all executive function (EF) elements, only children's working memory significantly accounted for the variance in the relationship between parental education and children's benefits in math performance. When taken together, these findings added to an expanding body of literature confirming the significance of working memory in promoting math performance of children across education (Nguyen & Duncan, 2019; Watts et al., 2014), revealing the unique and distinct role of children's working memory for their math success. These results provided a further contribution to our comprehension of the well-documented roles that socioeconomic status of parents and children's executive function (EF) played in moulding academic performance of children (Cortés Pascual et al., 2019; Sirin, 2005). Creating a compound or potential measure of socioeconomic status might have masked and obscured the specific contribution of parental education to executive function (EF) skills of children. In a similar manner, a global executive function (EF) variable could not capture the comparative importance of working memory in promoting academic success of children. When socioeconomic status indicators and executive function (EF) elements were included individually and their unique predictors of math achievement and reading achievement assessed simultaneously, nuanced relationships between these factors and children's educational skill development were exposed.

Limitations and Future Directions

The current study and its findings do have certain limitations. First, even though a longitudinal study model was used and potentially confounding consequences were accounted for, the correlational nature of the study did not allow and facilitate causal effects. Nevertheless, the experimental study revealed that improvements and enhancements in executive function (EF) could explain to some extent the benefits in school readiness of children from socioeconomically disadvantaged families and provided the earliest evidence of a connection between children's executive function (EF) and their cognitive, educational success (Raver et al., 2011). Secondly, even though these data were obtained from a large, national sample, they were not nationally representative. As attempts towards creating more

generalizable science escalate (Falk et al., 2013), researchers should seek to augment these findings with more representative samples and in other countries. Thirdly, this research was limited in both the components represented and the number of executive function (EF) measures incorporated. Considering the absence of consensus in describing and quantifying executive function (EF) skills, especially for small children (Morrison & Grammer, 2016), future research should incorporate a wider range of battery tasks that make use of these and other key executive function (EF) elements, such as cognitive flexibility. Fourthly, it should be pointed out that although the coefficients for the factors affecting the outcome were statistically significant, the standardized impacts were found to be comparably minimal. Nonetheless, particular effort was exerted to isolate the unique impacts of individual indicators of SES and executive function (EF) elements, which were understandably more minimal than the total impacts of combined or potential variables in the research. Lastly, the current research could not explain all of the influences contributing to educational success of children. Socioeconomic status affected more proximal contexts and pathways, such as parents' executive function (EF), parents' socialization and education practices and home environment, and served as a distal factor moulding cognitive development of children, including executive function (EF) (Valcan, Davis, & Pino-Pasternak, 2018). Future research should include both distal and proximal factors in order to more fully understand the interacting forces that mould children's academic achievement.

Conclusion

The current research provided a thorough examination of the contributions of indicators of socioeconomic status and executive function (EF) skills to previous academic performance of children. It was established that parental education and children's working memory uniquely and most strongly predicted math and reading performance of children. Besides, children's working memory significantly mediated the relationship between parental education and math performance of children, even after children's prior achievements and other covariates were incorporated (Jacob & Parkinson, 2015). Among significant further steps taken were the replication and extension of these findings employing a more representative sample and a divergent battery of executive function (EF) tasks, as well as an investigation of the proximal procedures that contributed to SES-based differences, inequalities and gaps in executive function (EF) skills of children. Research has begun to model the various pathways that can be significant in generating SES-based academic performance differences, inequalities and gaps in order to more fully understand and account for the complex association between family socioeconomic circumstances and academic skill development of children. Only after that could re-

searchers be in a position to address interventions that might be beneficial for narrowing and resolving SES-based academic achievement differences, inequalities and gaps.

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CHAPTER 6

CONCRETE MANIPULATIVES IN PRIMARY SCHOOL MATHEMATICS EDUCATION

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1. The Importance of Concrete Materials in Mathematics Education and the Definition and Characteristics of Concrete Manipulatives

Mathematics education is crucial for students to develop analytical thinking, problem-solving, and logical reasoning skills. However, the abstract nature of mathematical concepts can make learning challenging, especially for elementary school students. In this context, using concrete materials helps students understand mathematical concepts and enhances their learning processes. Concrete materials enable students to visualize abstract mathematical ideas and interact with these concepts (Olkun and Uçar, 2014). Concrete materials are generally objects that allow students to experience mathematical concepts tangibly. These can include items such as blocks, cubes, counting bars, money, geometric shapes, and real objects like apples and oranges (Moyer, 2001). The use of concrete materials in mathematics education is considered a vital strategy to support students' conceptual understanding and develop mathematical thinking skills. According to Piaget's theory of cognitive development, primary school children are in the concrete operations stage and may struggle with abstract concepts (Piaget, 1952). Therefore, concrete materials embody abstract mathematical concepts, making them easier for students to grasp. Moyer (2001) stated that concrete materials help students explore and make sense of mathematical concepts. The National Council of Teachers of Mathematics (NCTM, 2000) advocates for using concrete materials in mathematics teaching and emphasizes that these materials aid students in understanding concepts. NCTM's School Mathematics Principles and Standards recommend using concrete materials to represent mathematical ideas. In this context, concrete materials allow students to explore mathematical relationships, develop problem-solving skills, and engage in conceptual learning.

The importance of concrete materials in mathematics education is supported by numerous studies. For instance, a meta-analysis by Carbonneau, Marley, and Selig (2013) demonstrated that using concrete materials positively impacts students' math achievement. Effectively utilizing tangible materials aids students in better understanding mathematical concepts and relating these concepts to everyday life. Van de Walle, Karp, and Bay-Williams (2013) noted that concrete materials enhance students' mathematical thinking and improve their problem-solving skills. Concrete manipulatives form a significant subcategory of concrete materials used in mathematics education. These are physical objects that students use to visualize and explore mathematical concepts (Van de Walle, 2013). Manipulatives can be both real objects (stones, sticks, blocks, etc.) and virtual objects (computer software, tablet applications, etc.). Moyer-Packenham and Bolyard (2016) defined concrete manipulatives as "tangible or virtual objects that students use to explore, understand, and communicate mathematical con-

cepts." This definition includes both physical and digital manipulatives. Concrete manipulatives help students grasp abstract mathematical ideas by embodying them. Among the main characteristics of concrete manipulatives are the following:

Concreteness. Manipulatives represent abstract mathematical concepts in a tangible way. This feature is particularly important for elementary school students, as Piaget's theory of cognitive development suggests that children in this age group are in the concrete operational stage (Piaget, 1952).

Interactivity. Students can directly interact with manipulatives, moving and modifying them. This interaction promotes active learning and allows students to explore concepts (Moyer, 2001).

Multiple representation. Manipulatives can depict mathematical concepts in various ways. This multiple representation aids students in understanding concepts from different perspectives (Lesh, Post, & Behr, 1987).

Individualizability. Manipulatives can be customized to suit students' individual learning styles and needs, supporting differentiated instruction (Tomlinson, 2001).

Learning from mistakes. Manipulatives enable students to recognize and learn from their mistakes, deepening their conceptual understanding (Hiebert and Grouws, 2007).

Concrete materials and concrete manipulatives were explained above in some respects. Although concrete materials and concrete manipulatives are similar concepts, they are not exactly the same. The main differences between them can be explained as follows: Concrete material is a broader concept. It encompasses all kinds of tangible objects used in the teaching process. Students are not required to touch or manipulate them. For example: posters, models, real objects, paintings, etc. Concrete manipulatives are a subcategory of tangible material. They are objects that students can actively touch and manipulate. Students are expected to hold, move, shape, or arrange them by hand. For example: counting sticks, geometry boards, tangram pieces, etc. Concrete manipulatives are always concrete materials, but not every concrete material is a manipulative. Manipulatives require active participation and physical interaction from students. In conclusion, while these two concepts are closely related, they are not exactly the same. Concrete manipulatives can be thought of as a special type of concrete material.

2. History of the Uses of Concrete Manipulatives

These tools, which today assist students in grasping and understanding abstract mathematical concepts, have a long history. In ancient Egypt and Mesopotamia, pebbles, sticks, and other objects were used to demonstrate mathematical operations. Around 8000 BC, counting stones known as "tokens" (see Figure 1), crafted from clay or partially from stones, were developed (Erol, 2022). During this period, mathematics was primarily focused on practical needs, and tangible objects were the fundamental tools for counting, measuring, and understanding geometric shapes.

Figure 1. *Token Examples*

In 500 B.C., mathematicians like Pythagoras and Euclid used wooden and metal objects to concretely represent geometric shapes and their patterns (Heats, 2013). During this period, although mathematics became more abstract, concrete models of geometric shapes played a crucial role in visualizing and understanding concepts. In the Middle Ages, mathematics was primarily taught in religious schools, and manipulatives were mainly used to promote religious teachings. During this time, mathematics education focused more on interpreting religious texts and calculations (Eves, 1990). In the 19th century, mathematics education became more systematic, and the use of manipulatives became more common. Friedrich Froebel founded the first "kindergarten" in 1837 and encouraged children to learn through play and tangible materials. In Froebel's educational approach, manipulative materials such as geometric shapes, blocks, and beads were frequently used in mathematics teaching (Brosterman, 1997). In the late 19th century, Maria Montessori developed an educational approach where children could progress at their own pace and interact with concrete materials (Lillard, 2005). In Montessori classrooms, various manipulative materials were used, such as counting bars, geometric shapes, and cake models for fractions. Montessori education, in particular, has emerged as an educational philosophy emphasizing children's learning with concrete materials. In the early 20th century, Jean Piaget's theory of cognitive devel-

opment highlighted the importance of children learning through concrete experiences. Piaget's theory argues that children's cognitive development proceeds in stages, and concrete experiences play a vital role in completing these stages. This theory was an important factor in supporting the use of manipulatives in mathematics education. Second Half of the 20th Century In the 1950s and 1960s, the "New Mathematics" movement emphasized a focus on abstract concepts in mathematics education. (Resnick, 1989). During this period, the use of manipulatives decreased. The New Mathematics movement aimed to teach mathematical concepts in a more abstract and formal way. In the 1970s and 1980s, new educational approaches such as "Realistic Mathematics Education" (RME) emphasized students' ability to relate mathematical concepts to everyday life and learn through concrete experiences. RME encourages students to learn mathematical concepts through their own exploration and use them to solve problems of daily life. The use of manipulatives has gained importance again. With the development of Technology in the 1990s and 2000s, virtual manipulatives emerged. These tools provide students with a more interactive and visual learning experience. Virtual manipulatives offer students the opportunity to interact with tangible objects through computers and tablets. Today, in the 21st century, the use of manipulatives in mathematics education still occupies an important place. Both physical and virtual manipulatives help students understand mathematical concepts and improve their problem-solving skills. Nowadays, the use of manipulatives is becoming more diverse to cater to the different learning styles and needs of students.

3. The Process of Concrete Manipulatives Embodying Abstract Concepts

The process by which concrete manipulatives embody abstract concepts consists of processes of exploration and experiencing, modeling, representation, and abstraction.

Discovery and Experience. Students explore mathematical concepts by interacting directly with concrete manipulatives. At this stage, students make their own observations by using the materials freely (Olkun and Uçar, 2014). For example, a student can use concrete cube manipulatives to determine the number of squares that make up the surface of a cube. By cutting the cube into pieces and examining the surface of each piece, the student can determine the number of squares on the surface. Students who try to solve the problem by using concrete manipulatives with their own efforts can create concrete meaning for mathematical concepts.

Modeling. Concrete manipulatives help model mathematical concepts. Students who spend a certain amount of time with exploration and experiences will have concrete knowledge about the mathematical con-

cept. Then, with the help of manipulatives, models of the concept can be constructed. These prepared models are effective in revealing the cause-and-effect relationship in the concept. For example, when performing the total operation in fractions with equal denominators, the student can reach the conclusion that the numerators are added together, and the denominator remains the same.

Representation. Students represent models that they create with concrete manipulatives through drawings, diagrams or symbols. At this stage, mathematical expressions are used meaningfully. For example, the meaning of the numerator, fraction line and denominator in the fraction representation is learned meaningfully thanks to concrete manipulatives and models. This stage is an important step in the transition from the concrete to the abstract. With the help of manipulatives, at the end of the process, it will be certain when and in what situations mathematical representations will be used.

Abstraction. In the final stage, students make sense of and internalize abstract mathematical concepts based on their concrete experiences. How many walnuts are 2/6 of 30 walnuts in the classrooms where activities are carried out in the classroom with sufficient levels of manipulatives? will be able to answer the question in a way that can explain the reasons for the transactions he makes without memorizing. Students can explain why 2/6 of them are 10 walnuts when doing this. For example, "I saw 30 walnuts cut into 6 equal parts. There are 5 walnuts in each piece. I bought 2 x 5 = 10 walnuts because I chose 2 pieces." In this way, students can respond by using manipulatives, embodying mathematical concepts and explaining their reasons. This helps students better understand mathematical concepts and learn with a focus on understanding rather than memorization.

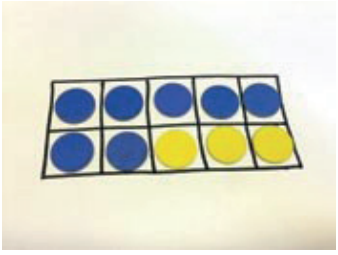
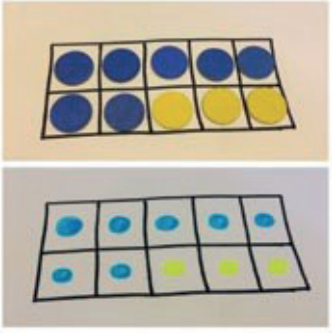
4. Concrete, Representational and Abstract Teaching

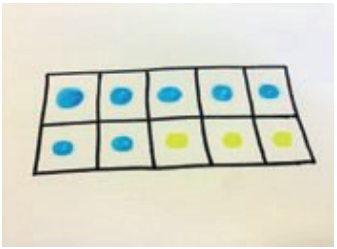
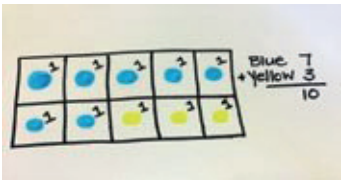
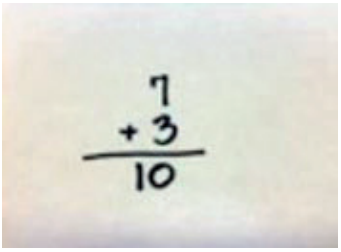
Concrete, Representational, Abstract (CRA) education is a process for teaching and learning mathematical concepts (Jones and Tiller, 2017). This process takes place as follows. The concrete phase is based on students' learning by using concrete materials that they can grasp and manipulate, and that they can perceive visually and audibly. Concrete teaching, which begins with these concrete manipulatives, moves to the representative level. The representational stage is the level at which concrete objects are replaced by representational representations such as drawings, diagrams, graphs, animations, etc. These representations help students visualize and make sense of abstract mathematical concepts. After this stage, the abstract stage is passed. In the abstract stage, abstract representations such as symbols, formulas, and operations are made for concepts. Direct teaching of abstract representations can be challenging, especially for elementary

school level students. Therefore, it is important that the abstract teaching approach is supported by concrete and representative teaching approaches (Baki, 2002).

Concrete, representational, and abstract teaching allows students to learn mathematical concepts step by step. Starting with concrete objects, students move on to representational representations and finally become able to use abstract symbolic representations. When students are first allowed to develop a concrete understanding of the math concept/skill, they are much more likely to build that math skill and truly understand math concepts at an abstract level (Jones & Tiller, 2017). Using these three approaches together helps students learn mathematical concepts in a more permanent and meaningful way (Van De Walle, 2013). The stages of the CRA of the aggregation process are presented in Table 1 (Jones and Tiller, 2017).

Table 1. *CRA instruction materials and practice (Jones & Tiller, 2017).*

Phase	Key Elements	Sample Problem	Explanation
Concrete	Chips, Unifix cubes, front-base blocks		Here, a frame of ten squares with colored columns is used to illustrate the equation 7 + 3 = 10.
Transition to Representation	A combination of tangible and representative materials		Once the concrete materials have been used, students begin to draw their own ten-frames, using the concrete model as a guide.

Representation	Scoreboards, dots, circles, stamps		At the representative level of the CRA, the student is comfortable using pictures to solve the problem.
Transition to ab-stract	A combination of representational and abstract materials		Students now begin to use abstract symbols (numbers in standard form) with their drawings to explain their reasoning.
Abstract	Numbers, mathematical symbols		Students at the abstract level of the CRA no longer need pictures or manipulatives to solve the problem.

Students should be able to connect and interact with mathematical concepts (Maccini, & Gagnon, 2000). Starting teaching with the abstract stage prevents the connection with the mathematical concept. The first connection with the concept occurs as a result of physical contact with concrete manipulatives.

5. Uses of Concrete Manipulatives

Concrete manipulatives can be effectively used in various areas of mathematics education. Below are some examples of where they are utilized in elementary school.

Number and Operations: Manipulatives such as number bars, units, abacus, number stamps, number strips, balance scale, etc., help students understand the concept of numbers and comprehend basic arithmetic operations.

Fractions: Fraction bars, unit cubes, fraction circles, fraction boxes, etc., allow students to embody the concept of fractions and perform operations with fractions.

Geometry: Tangram, geometry nail board, geometric shapes, and three-dimensional geometric objects help students explore geometric concepts and develop spatial thinking skills.

Measurement: Measuring tools such as rulers, tape measures, and scales enable students to understand the concepts of measuring through concrete experiences.

Data: Simple bar graphs can be created using bars of different lengths, circle charts can be created using circle-shaped segments, line charts can be created using points and lines, and classification matrices can be created using blocks of different colors and shapes.

These manipulatives contribute to students' concrete experience in data processing and representation, their conceptual understanding and the development of visualization skills.

6. Design Principles of Concrete Manipulatives

Appropriately designed concrete manipulatives have an effective power in learning concepts in a meaningful and deep way. Manipulatives that are not designed with the desired characteristics can have negative consequences in learning. For this reason, there are basic rules to be considered during the design of concrete manipulatives. These rules are given below in order.

Mathematical Accuracy and Consistency. It is important for concrete manipulatives to accurately and consistently reflect the mathematical concepts they represent. Moyer (2001) states that manipulatives are "physical objects used to visualize and explore mathematical ideas." Therefore, the design of manipulatives should help students understand mathematical concepts correctly. Olkun and Uçar (2014) emphasize that the following points should be considered in order to ensure the mathematical accuracy of manipulatives:

- The mathematical concepts represented by manipulatives must correspond to the level of development of the students.
- The components of manipulatives must accurately reflect mathematical relationships.
- Mathematical errors that may arise during the use of manipulatives should be avoided.

For example, manipulatives representing the concept of fractions are supposed to ensure that the whole is broken down as equal parts and allow students to perform fraction operations correctly.

Balance of Concreteness and Abstractness. Concrete manipulatives are expected to help students concretize abstract mathematical concepts. According to Bruner's (1966) theory of learning, the learning process proceeds from the concrete to the abstract. Therefore, the balance between concreteness and abstractness is important in the design of manipulatives. Moyer-Packenham and Bolyard (2016) explain the balance of concreteness and abstractness in the design of manipulatives as follows:

- Manipulatives need to be concrete enough to help students concretize mathematical concepts.
- However, manipulatives are overly concrete, which can make it difficult for students to transition to abstract concepts.
- Therefore, a balance must be struck in the design of manipulatives in such a way as to facilitate the transition of students from the concrete to the abstract.

For example, when teaching the concept of fractions, students can be made to form fractions by dividing the whole into equal parts. Then, associating these tangible pieces with their symbolic representations can help students understand the concept of abstract fractions.

Interactive and Dynamic Features. It is important that concrete manipulatives have interactive and dynamic features that allow students to participate actively. Moyer (2001) states that manipulatives are objects used by students to visualize and explore mathematical ideas. For this reason, students should be encouraged to take an active role in the design of manipulatives and to explore through trial and error. Moyer-Packenham and Suh (2012) describe the contributions of interactive and dynamic manipulatives to learning as follows:

- Students can explore mathematical concepts by moving manipulatives, changing them, and creating different combinations.
- The dynamic properties of manipulatives allow students to observe mathematical relationships and changes.
- The use of interactive manipulatives promotes students' active participation and self-regulated learning.

For example, while teaching the concept of fractions, students can create different fraction models by dividing the whole into equal parts and experience fraction operations by changing these models.

Visual Richness and Attractiveness. It is important that concrete manipulatives are visually rich and appealing, in a way that engages students and increases their motivation. The visual characteristics of manipulatives can help students understand and remember mathematical concepts more easily. Moyer-Packenham and Westenskow (2013) describe the contributions of visual characteristics to the effectiveness of manipulatives as follows:

- Colorful, vibrant, and engaging visual features increase students' motivation for manipulatives.
- Visual richness helps students understand and remember mathematical concepts more easily.

Relating to real life. Students' association of mathematical concepts with everyday life is essential for meaningful learning. Good design should make this association using real-life problems and contexts.

Adaptation to individual differences. Students' learning styles, readiness levels, and needs are different from each other. A good design should be flexible and adaptable to these individual differences.

7. The Contributions of Concrete Manipulatives to Mathematics Education and Its Future

Concrete manipulatives help students develop a deeper conceptual understanding by embodying abstract mathematical concepts. Especially for elementary school students, it plays a big role in making sense of basic mathematical concepts such as numbers, operations, and fractions. In this process of sense-making, manipulatives enable students to actively participate in the mathematics learning process. Students take responsibility for their own learning by moving, arranging, and exploring objects. This active participation also makes it easier to visualize mathematical concepts and relationships. Visualization makes it easier to understand for many students, while concrete manipulatives support this process, making abstract ideas more accessible. Increased accessibility also helps students develop problem-solving strategies. By modeling problems with concrete objects, it becomes easier to discover and verify solutions. In this process, students learn to express their mathematical ideas using manipulatives. It enhances the expression of ideas, the use of mathematical language and terminology, and encourages collaborative learning among students. Collaboration and active participation make math lessons more engaging and fun. This fun environment increases students' motivation and helps them develop positive attitudes towards mathematics. In addition, manipulatives provide flexibility to teachers in adapting instruction for students with different learning styles and needs, helping to create an inclusive classroom envi-

ronment. In this inclusive environment, concrete manipulatives facilitate students' transition from concrete experiences to abstract mathematical thinking. This transition helps to internalize mathematical concepts and lay the foundation for more advanced mathematics. In the process of internalization, manipulatives allow students to see and correct their own mistakes, developing self-evaluation and critical thinking skills. Finally, especially in the field of geometry, manipulatives help students develop spatial thinking skills, increasing the ability to understand and manipulate two- and three-dimensional shapes.

In the future, we can foresee a greater integration of concrete manipulatives and digital technologies. One of the most obvious examples of this integration will be the use of augmented reality (AR) and virtual reality (VR) technologies. These technologies can offer new learning experiences by enriching physical manipulatives with digital content. Furthermore, artificial intelligence and machine learning algorithms can optimize the use of manipulatives based on each student's individual needs and learning styles. Future manipulatives may include visual and tactile feedback, as well as other sensory inputs such as auditory and even smell, thus offering a more comprehensive learning experience. As the COVID-19 pandemic has shown, distance learning is becoming increasingly important, and in line with this trend, manipulative sets or virtual manipulatives designed for use at home may become more common. With increasing environmental awareness, future manipulatives could be made from more sustainable materials and be recycled. Finally, manipulatives can be more widely used to integrate mathematics with other disciplines (science, technology, engineering, arts), which can support STEAM education and highlight real-world applications of mathematics. All these developments will strengthen the role of manipulatives in mathematics education and make the learning experience richer, personalized, and effective.

This comprehensive perspective reveals the versatile and valuable role of concrete manipulatives in mathematics education. Manipulatives help students develop deep conceptual understanding by embodying abstract mathematical concepts, while also supporting many important educational goals, such as active participation, visualization, problem-solving, collaborative learning, and motivation. Manipulatives, which will be enriched with technological developments in the future, have the potential to provide personalized learning experiences, facilitate interdisciplinary integration, and support sustainable educational practices. As a result, concrete manipulatives will continue to be an indispensable part of mathematics education in the future as they have been in the past, contributing to the development of students' mathematical thinking skills and their ability to learn mathematics in a meaningful way. Therefore, it is critical for educa-

tors and researchers to encourage the effective use of manipulatives and to follow innovations in this field for a quality mathematics education.

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