# Promoting Creative Thinking in Early Childhood

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To Lior, Tahel, Reut and Ronnie

With love

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# INTRODUCTION

Kindergarten is a magical kingdom where everything is possible. The children sail or travel to all kinds of imaginary places using a chair that is sometimes a train and sometimes a spaceship. They create buildings, draw, move, invent stories and different languages, celebrate a doll's birthday and even eat invisible sweets. A piece of fabric can be a flying carpet, a bag, a flag, a skirt or anything you can imagine.

This imaginative creative expression characterizes children of preschool age, and establishes an important life skill – the ability to think creatively. Our world is dynamic and the changes in it are extremely fast. The ability to think creatively helps us deal with the far-reaching changes occurring in our world, allows us to express ourselves, and brings pleasure to our lives. Who would have thought twenty years ago that in the palm of our hand there would be a device with which we would not be able to part? A device that remembers phone numbers for us, reminds us what we have to do and when, allows us to be in touch with anyone, without space or time limitations, and even finds almost everything we are looking for – and all with a tiny touch of a finger. Who would have thought that in 2020, there could be a situation in which the whole world would switch to learning from home, instead of in school, due to a pandemic?

Although we do not know what the future holds for us, we certainly understand that the future will be different. To live well in a changing world, we must adopt creative thinking – be mentally flexible, apply our knowledge in new situations, experiment with new things and materials, and communicate with different people all over the world. To survive, we need creative thinking whose spark is naturally embodied in children. We have to take care that the spark will shine and intensify, because creative children will grow into creative adults. The ability to embrace creative thinking is crucial for our society's continued existence, success, and adaptation to global changes.

This book aims to enrich the academic and professional knowledge concerning creative thinking in early childhood years. It presents the most up-to-date information, theoretical and applied, in this important field – an area that has become of interest in many countries.

## The Structure of the Book

Two central assumptions underlie this book. The first one is that everyone has the potential to think creatively, and that it is possible to encourage and enhance such thinking via awareness and practice/training. The second assumption is that it is desirable to begin this process in the early childhood years.

The book is about expanding knowledge and increasing awareness of creative thinking. It presents an overview of theories, current research and programs in this field, focusing on early childhood. In addition to this, the purpose of the book is to provide tools that help release fixations that block creative thinking and free people from misconceptions, which can help improve creative thinking. I invite you on a short journey, where you can read about the newest research in the field of creative thinking in early childhood, and acquire practical ideas to promote creative thinking.

The **first chapter** is dedicated to the definition and clarification of the concept of "creative thinking," which focuses specifically on creative thinking in early childhood. In this chapter, the importance of developing creative thinking at an early age is clarified, and the preconditions that form the basis for its cultivation are detailed. At the end of the chapter, I provide a review of the development stages of creative thinking.

In the **second chapter**, I discuss three central issues in relation to perceptions of creative thinking. One issue answers the question: Is creative thinking a result of heredity or environment? The second issue discusses the relationship between intelligence and creativity, and various models are presented that explain this relationship. The third issue answers the question: Is creative thinking a "domain general" or "domain specific" ability? At the end of the chapter, the psychological barriers that suppress creative thinking are noted, and ways to remove these barriers are examined.

The **third chapter** details three models that describe the creative thinking process. These models complement one another, and their contribution to the field of education is discussed. Moreover, this chapter focuses on two prominent and important elements in the field of creative thinking: divergent thinking and imagination. The selected models and studies are accompanied by practical pedagogical tools to enrich these areas in pre-school frameworks.

The **fourth chapter** deals with one of the most fascinating research fields in recent years: "Embodied Cognition." This chapter examines the effect of various environmental stimuli – color, noise, screen and the

visibility of the environment – and asserts that all physical and sensory experiences influence creative thinking.

In the **fifth chapter**, a discussion of the educational changes in the 21st century is presented. In this chapter, I delve deeper into the pedagogy that promotes creative thinking, examining it from two main aspects. One focuses on developing creative thinking in early childhood, detailing applied pedagogical principles in the physical and psychological environment. Here, I also review curricula from various fields worldwide which aim to promote creative thinking in early childhood. The second aspect focuses on integrating creative teaching by the educator. Here, examples are provided that demonstrate ways to engage in this teaching.

The book is complete with examples from everyday life and pre-school-aged children's lives. It is my hope that the book will deepen understanding of creative thinking in early childhood and establish connections between theory and practice. I invite you, educators – learners, lecturers, pedagogical instructors, preschool educators, and parents – everyone who is involved in early childhood, who wish to expand their knowledge on the subject and promote both their creative thinking and the creative thinking of very young children – to take part and enhance the creativity.

# CHAPTER 1

# WHAT IS CREATIVE THINKING?

Rapid changes in many fields characterize the 21st century. Therefore, it is no wonder that creativity is defined as one of the most essential skills of this century. To successfully adapt to such a complex and fast world, we need mental flexibility, imagination, the ability to create new connections between different fields, and the ability to develop original ideas. In such a world, we must think differently and think creatively (Duffy, 2000; Robinson, 2011). What is this creativity? Moreover, why is the word, "thinking" attached to it?

## Creative thinking - Definition and characteristics

Torrance Ellis Paul was one of the leading researchers in the field of creative thinking. In one of his interviews, when asked about the definition of "creative thinking," he responded that he had been struggling with this question for 40 years (Torrance & Shaughnessy, 1998). Even today, researchers highlight the complexity of defining creativity (Kampylis & Valtanen, 2010; Plucker et al., 2004; Puryear & Lamb, 2020; Runco & Jaeger, 2012; Walia, 2019). The basic dictionary definition of creativity, in the psychological context, is the ability to produce a unique and original idea (Reber, 1995). Sometimes, original ideas may be irrelevant to a task or context, so a combination of three characteristics is required for an idea to be considered creative: (1.) originality (2.) efficiency and (3.) surprise (Runco & Jaeger, 2012; Simonton, 2012).

Incorporating these characteristics still narrows the definition of creative thinking, as the emphasis is on identifying and evaluating the creative idea rather than understanding the process leading to its creation. Creativity has dynamic and developmental aspects not fully captured by this definition. For instance, even when producing an idea that is not original or highly useful, it is still part of the creative process and the motivation to continue generating creative ideas (Corazza, 2016). We will first discuss these characteristics in-depth and then complete the definition

and understand why the word "thinking" is accompanied by the word "creativity."

When my nieces were four and 10 years old, they invented the "tooth lollipop," a special lollipop for children. When sucked or eaten, it cleans and brushes the teeth. That is, the lollipop is both tasty and pleasant, and it cleans the teeth. We will examine the three characteristics – novelty, efficiency, and surprise – using this example.

The innovation characteristic refers to a personal process of creating a new and original idea, different from its predecessors, resulting from engaging in non-routine lines of thought. Originality is a behavior that has a low chance of appearing. In the above example, a tooth-brushing lollipop meets the originality criterion since there is no such lollipop (yet).

The characteristic of efficiency reflects the execution of the new idea, its utilization, impact, and value to society and individuals. In other words, it reflects its relevance to life. Here, relevance relates to the meaning for the individual producing it. The invention of a tooth lollipop is useful for the inventor and the child population (perhaps even adults would enjoy such a tooth lollipop), as it enables teeth brushing and maintenance, along with the enjoyable action of eating sweets.

Usually, efficiency and relevance are objectively assessed by experts. Children's ideas are expressed through drawing, language, play, and personal expression, free from barriers. However, these ideas are not always considered utilitarian for society. Many of the new things children discover are new to the children themselves, not necessarily to society. For example, a child who turns a box into a house or a spaceship, even though this idea does not seem to meet the definition of creativity – the fact that the idea is new to the child justifies a different approach to originality and efficiency. The idea will be measured in relation to children, not in relation to the society. Therefore, children's creative ideas should be seen as efficient for the children themselves and the children's community (Duffy, 2000; Leggett, 2017).

Chaim Shapira (2018), the inventor of the game "Taki," mentioned in one of the interviews that while his creative process starts differently each time, it always ends with the question: Will people like the idea? While an idea begins from a personal notion, in the end, the product must become something interesting to everyone and valuable, which is precisely the characteristic of "efficiency."

The third characteristic is "surprise". Surprise is an emotional result of an unusual idea that steps away from the expected and is expressed in the mismatch between expectations, based on past experiences, and the presented idea (Yannakakis & Liapis, 2016). For example, a child who

sees steam from the chimneys of the electric company and says, “It is a cloud chimney house,” is creating a surprising idea. Usually, the unexpected and surprising combination of different elements evokes a feeling of surprise (Becattini et al., 2017).

In the book, *The Perfect Purple Feather*, Piven (2002) creates images of figures made from various materials – a bird made from a banana, scissors and forks, an elephant made from metal pipes, and many other figures from various materials. Jacob, the story’s hero, finds a purple feather passing from character to character, until it disappears and the children are invited to look for it. Inside the book cover is an envelope with a real purple feather. The surprised facial expressions of the children when they discover a real feather coming out of the book are an example of a real surprise that comes from an idea that goes beyond the expected.

Another feature that leads to surprise is the magnified reduction or absence of a specific component reflected in the new idea (for further detail, see Boyd & Goldenberg, 2015). For example, passengers were convinced to give up the escalators and walk up the stairs at a train station. The stairs were turned into huge piano keys (magnification), so that going up or down the stairs produced piano sounds. This visual, musical and oral change of stairs is unexpected and, therefore, surprising. This useful innovation, combined with surprise, encouraged the passengers and pedestrians to use the stairs and give up using escalators. Therefore, the idea is both original, useful and surprising[1].

A children's book and television series will help illustrate the three characteristics of the creative product.

Lilnana Paparotnik Zopnik, who goes by her literary nickname, Lila Prap, is a Slovenian illustrator who wrote and illustrated the book *1001 Stories* (Prap, 2006). In this book, the three characteristics of the creative product are emphasized. While in a typical book, we read from the beginning to the end, the

[1] You can see the video, Piano Stairs - TheFunTheory.com - Rolighetsteorin.se https://www.youtube.com/watch?v=2lXh2n0aPyw

innovative idea in Prap's book is that at the end of each page, two possibilities for continuation are presented to the reader. Based on the choice, the reader moves to the chosen page, continues the story, and so on. The author created a different reading experience and endless options for reading the same book. This original idea includes characteristics of novelty and utility. Evidence of this is that the book has been translated into many languages. Furthermore, this book surprises readers, completely changing their reading habits, as they have additional options opening up each time they read the book.

Another example is the illustrated character, Dora, from the popular children's television series. The innovation in this series is that it involves the children. Dora asks the viewers questions; she waits for their answers, and even asks the young viewers to repeat the words that she says. Children feel a sense of partnership with the character in the series, and become an active part of it. This innovative idea arouses wonder, since, typically, the viewer is passive when watching television.

As we have seen, the three characteristics that constitute the basic definition of creativity emphasize the final part of the process – the product or the idea. In the field of education, we want to emphasize the thought process, the dynamics, and the development of creativity, while emphasizing the children's community. Therefore, to highlight the cognitive process, the dynamism, and the development of creativity, while focusing on the children's community, we will use the definitions offered by Leggett (2017) and Plucker (et al., 2004) and define creative thinking as the following:

> Creative thinking is a directed cognitive process that develops through the interaction of abilities, processes, and the environment. The result is the production of an innovative and efficient idea in the socio-cultural context. This mental activity yields benefits for the quality of life of its producers.

The creative thinking process can be learned and developed, and this will be expanded further in the book (See, Aminolroaya et al., 2016; Cheung, 2013; Cliat et al., 1980; Dere & Ömeroğlu, 2018; Esquivel, 1995; Yates & Twigg, 2017).

## How do young children define creative thinking?

Very few studies have examined how young children define creative thinking. One of the recent studies on this topic was a dissertation by an Australian student (Radanovic, 2020) that investigated how children define creativity. In interviews with groups of children aged 5 to 12, Radanovic asked them what the word creativity meant for them, who creative people are, when they feel creative, and more. From the children's responses, she found that when children defined creativity, they included characteristics of originality and efficiency, similar to the accepted definition of creative thinking. Additionally, the children connected the concept of creativity and the advancement of society in science and technology. They saw creative thinking as a tool to expand their imagination and develop independence.

It is worth noting that another study, which dealt with older children, illustrated that the perception of the term, creative thinking, varied in different cultures (Delany et al., 2019). In this study, children aged 12 to 13, from Japan, China, and the United States were compared to one another. They were asked to write down the characteristics of a creative person. It was found that American children ascribed actions, such as singing and reading, and emotions, like happiness, to creative people. In contrast, the Chinese and Japanese children noted characteristics, such as being diligent, wise, funny, and more.

These studies are intriguing, and further research is undoubtedly needed to understand how young children perceive the concept of creative thinking. Discovering the different perceptions and definitions will allow us to understand creative thinking and its purpose, and thus promote it differentially and optimally for each child.

## Why is it essential to promote creative thinking, specifically in early childhood?

The prevailing belief is that children are inherently creative. If so, why is it essential to nurture an existing ability at an early age? First, the prerequisites for promoting creative thinking in early childhood will be presented, and then the preconditions that form the basis for promoting creative thinking will be answered.

## The underlying conditions that serve as a foundation for promoting creative thinking

In his book, *With My Mummy*, Brown (2017) describes the endless giving of a mother to her child, a giving that never ceases from the start of the day until its end. On each page, the illustrations accompanying the story reveal an animal and its offspring, highlighting the unique bond that universally exists between a mother and her child.

Early childhood is a unique, sensitive, and significant period in a person's life, in which parents and educators have a meaningful and critical role. They shape and reinforce the foundations for the children's future, for better or worse. Their role is to weave a deep and ongoing emotional connection with the child, based on love and responsiveness to their needs. The basic need of an infant, as well as later in life as a child and as an adult, is a need for love, warmth, and touch. Responding to these needs creates a special bond between the infant and the caregiver. This special bond is called attachment, and it has far-reaching effects on the infant's mental, social, and cognitive development (Bowlby, 2008; Çetin & Ata, 2020; Doyle & Cicchetti, 2017). The early social and emotional experiences are embedded in the infant's brain and continue to accompany them throughout their life (Malekpour, 2007).

Children, whose attachment quality to their parents (or primary caregiver) is secure are children whose parents constitute a secure base to which they can turn in times of distress or hardship. These secure children feel loved and feel that they can rely on someone at all times. They have an internal model of maternal availability or the availability of a significant caregiver (such as a father, grandparent, and nanny). Availability signifies the accessibility of the adult for the children, as well as cooperation that respects their independence. When children are secure in the emotional availability of the caregiving figures, they perceive the world as a safe place. This feeling triggers an exploration mechanism. Secure children are free to explore their environment, imagine, ask questions, and develop their creative thinking, knowing that their caregiving figure is always there to assist them. Moreover, it is clear to them that they are always loved and that the caregiver is present and by their side.

Before promoting various cognitive skills, including creative thinking, we must establish a foundation of trust and security between parents and their children, as well as between children and their educators. As educators,

we need to establish an emotional connection with the children, a connection that allows them to feel that their environment is safe, that their needs are met, and that they are desired and loved. We need to create an environment that allows them to express themselves, act, explore, and, in times of fear or anxiety, receive emotional support from us. Therefore, the emotional connection is a significant primary factor in developing creative thinking.

A study conducted in the 1970s (Dudek, 1973), showed a connection between creativity, spontaneity, sociability, and mental health, among children in elementary school (first through sixth grade). Mental well-being, a sense of security, and trust in the world were based on the children's understanding that they are not alone in the world and that someone would take care of their needs and would be with them whenever they needed help. When children (and adults) have good mental health and experience well-being, they become open, spontaneous, and sociable. These qualities are of great importance for developing creative thinking.

Another basic ability, derived from the relationship between parents and their children, which affects creative thinking, is the children's self-regulating ability. Personal characteristics influence self-regulation, but the environment, including the parents, also affects children's self-regulation. The quality of the relationship between the significant caregiver and the children helps in the optimal development of self-regulation. In a study conducted among 1,116 Chinese children, aged 4-6 years (Yeh & Li, 2008), it was found that the ability to regulate emotions is related to the ability to think creatively. In order to regulate emotion, processes are required that include initiative, response regulation, and emotional intelligence. These abilities allow children to share ideas, interact with others and talk with them. All of these are prerequisites for creative thinking, which allow children to successfully manage their emotional arousal and function in a social and efficient manner.

In a study undertaken in the US, Diener and colleagues (2016) examined 94 kindergarten children. The children's creative thinking was tested using a divergent thinking task (producing many original ideas). The researchers also asked the children's mothers and teachers to report the level of shyness of the children participating in the study and to evaluate their social behavior, by focusing on how assertive and self-confident they thought the children were. Creative thinking was found to be related to the children's level of assertiveness. The more assertive and self-confident the children, the higher their divergent thinking score. It appears that creativity requires the strength to stand up to the opinions of others and even oppose them, not to be afraid to express ideas, even if they

are different from what is accepted, and to stand up, in general, to the pressures of society. This balance between conservatism and assertive behavior is determined by the children's ability to emotionally regulate themselves – an ability that parents continue to help their children develop. That is why it is useful to encourage assertiveness among preschool children and let them find the courage that will lead to the blossoming of creativity.

It is clear that there are several critical factors that create a stable basis for the development of creative thinking in children: the strong initial connection between the caregiver and the child, connections between children, the child's emotional well-being, a sense of security in the environment, the ability to regulate emotions and the child's ability to stand up for themselves and be assertive. These are the bases needed for the development of creative thinking at an early age.

## The importance of promoting creative thinking in early childhood

When we cultivate and promote creative thinking at an early age, we help children solve everyday problems and challenges in various ways. Creative thinking provides tools to deal with changes and to be adaptable and flexible when a new event suddenly arises. Almost every day, children, like adults, meet something new that they did not know – a new event, a new problem, a new object, a new food, a behavior of another child that they did not know before, a reaction of an adult that was not seen before, and more.

When children face a problem or a challenge (it is not meant only for complicated mathematical problems, but rather for everyday personal, social, and/or family problems), how many solutions are in front of them? They can cry, get angry, bite, talk, and more. When children are used to creative ways of thinking, this allows them to think of various solutions that can help them. They expand the options at their disposal so that their response is not reduced to one solution (which is sometimes unsuccessful). They adopt different and rich forms of thinking; they practice looking at a problem from several perspectives and observe reality in a different, original, new way, without barriers or obstacles. They learn that it is allowed to make a mistake, and from the mistake, you can grow. Children learn to use knowledge and past experience, transfer it to new situations, add new combinations with mental flexibility, and use unconventional ways to solve problems (Duffy, 2006). The sooner we teach them this, the better

off they will be, and the easier it will be for them to deal with problems and challenges later in life.

We now examine how creative thinking develops over the years.

## The development of creative thinking

### The development of creative thinking, over the years, in the general population,

General trends of how creative thinking develops, which were accepted by most researchers, were shaken up in 2020 (and not because of COVID-19), when a new and surprising study found contradictory results concerning data that were the basis of many studies. Since this is an academic 'dramatic series,' we will start the story from the beginning.

In 2011, Kim, published an article in which she revealed, for the first time, the creativity crisis of recent years. She discovered that from 1990 to 2008 the level of creative thinking in the American population decreased, both, in general, during those 20 years, and, in specific, from children's entry into school. This decrease reflected a loss in the generation of creative ideas for solutions and challenges, a finding she also presented in an updated article in 2017. This decrease in the ability to think creatively can create difficulties in dealing with new situations, which may affect the individual in the future and society as a whole (Kim, 2011). Based on its data, this finding was fertile ground for subsequent studies (through September, 2023, the article was cited 1098 times).

Two researchers, Barbot and Said-Metwaly (2020), published a fundamental article in 2020 in which they cast a heavy shadow over Kim's findings, claiming that her conclusions were based on a problematic interpretation of the statistical findings. They examined the phenomenon in a slightly wider sample compared to Kim's (330,000 participants compared to 273,000, respectively) and over a wider span of years – from 1974 to 2017. Their findings ruptured the myth of the creativity crisis and proved that there had been no decline in creative thinking over the years. These new findings optimistically illuminated the global development trends regarding creative thinking.

### Personal development depends on age

In her book, *Nobody*, Ronit Hacham (2002) writes about a girl who is looking for Nobody. The book demonstrates the typical

way of thinking in early childhood and accurately and humorously describes the development of children's thinking, from concrete thinking to abstract thinking. From the point of view of the heroine of the story, if everyone is talking about Nobody, this is probably a being who exists. The active search for Nobody, as a tangible figure, ends with the understanding that Nobody is an abstract figure that cannot be seen. Therefore, it is called "No-body."

Children's concrete thinking is reflected in the way they explain the world. The explanations preschool children give for various phenomena are formed from their concrete and intuitive thinking. For example, when my niece was four years old, she creatively explained why it was forbidden to travel by air during the COVID-19 pandemic:

> *"Corona has a gigantic heart, and if she wants to break something, she becomes as strong as a lion, and then she breaks the plane, and that's why you can't fly when there's Covid."*

Her explanation was creative, as it met the characteristics of creative thinking: it was useful for children, as it allowed them to reach an acceptable explanation of why flying was prohibited during the pandemic. This explanation demonstrates concrete thinking in early childhood, which slowly develops into abstract and logical thinking.

It is understood that the development of thinking is an outgrowth of the development of the brain. During infancy, the brain develops intensively, and from birth to age five, the brain builds the foundations for different cognitive abilities for the growth and development of creative thinking, control, self-regulation, emotional stability, and various social skills. The plasticity of the brain allows it to adapt to environmental changes. These facts support the idea that creative thinking should develop with age. However, in practice, the development of creative thinking is characterized by sudden declines (slumps) and jumps (Barbot et al., 2016). Creative thinking does not develop in direct proportion with age: this ability sometimes decreases and even stops. This is because this skill – to think creatively – arises from relationships between the level of a person's resources (divergent thinking, motivation, domain-based knowledge and openness), environmental influences (parenting and pedagogy) and specific requirements of the assignment. Everyone has the potential to think creatively, and its development depends on the opportunities in front

of them and the investment of time and energy people devote to creative thinking.

The development of creative thinking is expressed through five distinct levels, which are described below: (1.) expressive creativity; (2.) technical creativity; (3.) inventive creativity; (4.) innovative creativity; and (5.) emergent creativity (Taylor, 1959 in Kampylis et al., 2009).

A parallel, more innovative model is Kaufman and Beghetto's (2009) model, known as the C4 model (the letter C comes from the word, creativity). The model demonstrates the course of development of creative thinking in a person's life and presents a framework for conceptualizing and classifying different levels of creative expression: (1.) mini-creativity (mini-c); (2.) little creativity (little-c); (3.) professional creativity (pro-c); and (4.) big creativity (big-c). Both models emphasize the importance of the potential of creative thinking. At all levels of creative thinking development, the assumption is that everyone has the potential to think creatively. These models are parallel to one another and even strengthen one another. The levels of development, according to these two models, are described below. The distinction between the levels is not definite, but this division allows us to understand the development of creative thinking.

In Fania Bergstein's poem, "Letter to Father" (1974), a boy is described as writing a letter to his father. The letter is unique because it was not written using words, as is customary since the child does not know how to write. Therefore, the words are represented by drawings. He writes to the father and tells him about what happened to him that day, using the drawings. A drawing of a rooster symbolizes the morning, and a drawing of a child watering the garden describes the child's activity in the garden. This is the first level of creative thinking.

**The first level**, associated with early childhood, is expressive creativity. At this level, no specific skills are required: it is based on impulsive instincts. Children are creative by nature, and they express themselves in a simple and free creative way, through their active involvement in different games, in their imagination, in their experimentation with the materials, and in the many ways they express themselves. For example, a toddler who holds a toy in her mouth so that her hands are free for crawling, or, as Fania Bergstein's poem shows, a child who writes a letter without words, but through drawings, is exhibiting creativity.

The parents are the primary influencing factor at this level of development. They influence the development of creative thinking in early childhood, both in their attitude toward their children and in the personal example they set (Çetin & Ata, 2020). Parents, who maintain an environment that provides emotional security for children, allow them to express themselves and begin the initial developmental stage of creative thinking. On top of that, the parents are role models for the children, and when they behave in creative ways, the children learn that it is acceptable and possible to act in original ways. In this context, in one video on Instagram, a girl is filmed crying non-stop, and her father quite creatively asks her to stop crying for a minute, because it is his turn to cry now. The girl is surprised by the father's request and stops crying. The father cries a little, stops, and tells her: "Now it's your turn to cry." This dialogue of crying developed into laughter, and uncovered the heart of the problem and its solution. This creative response of the parent and this unique approach seeps in slowly and helps the child think in original ways and gain legitimacy for thinking differently from what is accepted.

Being aware of this level, as an important element in the development of creative thinking, helps to perceive creative thinking as a skill that develops in every person and allows educators and parents to identify the unique creative potential inherent in each child, right at the beginning (instead of seeing it as an obstacle, for example). This understanding prevents considering creative thinking as a gifted ability or quality that exists only in outstanding individuals. We can nurture and promote this initial creativity when we recognize it.

This is the level equivalent to the mini-creativity level proposed in Kaufman and Beghetto's model (2007, 2009). Creative thinking at the mini-creativity level refers to intrapersonal creativity, which is part of the personal learning process. This creative expression does not have to be meaningful to others, because the assessment of its degree of innovation is intrapersonal. This distinguishes this level from the other levels, in which the creative expression is judged by others and should be meaningful to them, as well. This initial level is found in pioneers' creative attempts, the seeds of creativity that will develop into different and advanced forms of expression of creative thinking at the higher levels. When a preschool child imitates a certain behavior or copies something to which they are exposed, this is not creative thinking. However, when the child changes and reorganizes the same behavior or experience, it can be argued that this is the basis for the development of creative thinking. It is understood that the transition to a higher level of creativity depends on the existence of

this creativity, its recognition, appreciation, and encouragement by those around, including educators.

**The second level** is performance technical creativity. At this level, knowledge and skills are required to be assimilated and the child can apply methods and techniques that are usually new to them, but not to others. For example, children who make a tent from pillows, chairs, and blankets for the first time are being creative: they are required to use motor and technical skills to make sure that the chairs are stable, the structure is stable, and will hold together with clips or by tying the blanket. This level is equivalent to the little creativity noted in Kaufen and Baghetto's model. This is an expression of creative thinking in everyday challenges. Even a non-expert can solve these challenges creatively.

**The third level** is inventive creativity, in which existing ideas and materials are used, but applied in new or unusual ways. For example, the Theremin electronic musical instrument, which was invented in 1919, is made of a hollow wooden cube and two antennae. These are existing materials that are the components of the instrument; however, this instrument is played without physical contact. Thus, it is innovative. The musician plays the instrument in the air around the Theremin, by vibrating their hands. The music that they produce, thus, is unique to each musician[2]. Similarly, the tooth lollypop, invented by my nieces, also meets the criteria of this level, since an existing material is used, but in a different way.

This level can develop due to learning, which advances toward a more professional level of creative thinking (professional creativity, according to Kaufen and Baghetto's model), or it can stop there. Not everyone is inclined to continue thinking creatively at a higher level. While most people use creative thinking to express and organize their thoughts in order to create a product, not everyone reaches a high level of creative thinking that will result in an innovative invention for the world (Kaufman & Beghetto, 2009).

**The fourth level** is innovative creativity. At this level, conceptualizing skills and expanding methods, principles, and techniques are required. To reach creative ideas at this level, expertise in the field is also required, achieved after years of learning, active experience, and research. This level is equivalent to the level of professional creativity in Kaufman and Baghetto's model, which also emphasizes these prior stages of investment in learning and gaining of experience. This expertise is achieved after about 10 years (Kaufma & Beghetto, 2009), and takes about 10,000 hours of work (Gladwell, 2008).

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[2] See Theremin, Over the Rainbow – https://www.youtube.com/watch?v=K6KbEnGnymk

An example is the invention of the *Babysense* (an Israeli invention), a device designed to alert the parent/caretaker when a baby stops breathing while sleeping. Developing such an innovative device requires high levels of knowledge and skill. The device was developed by an electronics engineer, Victor Yotam, and by a technical development professional, Haim Shetelried, as reported on the Israeli innovation website – Innovation Israel.[3]

**The fifth level** is emerging creativity. This level is characterized by the invention of abstract theories and new thoughts, for example, Einstein's Theory of Relativity. This level is equivalent to the great creativity level in Kaufma and Beghetto's model (2009), and it expresses the creativity of outstanding achievements that leave a legacy.

A review that focused on high and low points in the development of creative thinking showed a lack of continuity in its development throughout life (Barbot et al., 2016). For example, at the age of five, upon entering school, a decline in the development of creative thinking among children was observed. Moreover, there was a further decline at the ages of 9-10 (Hui et al., 2019; Kim, 2011; Torrance, 1968; Urban, 1991). Beghetto and Kaufman (2014) organized the factors for trends in the development of creative thinking (decreases and increases) using two main categories. One related to personality factors and the other to environmental factors.

Personality factors include motivation, openness to experiences, sensitivity and excitement, and cognitive abilities include factors such as divergent thinking and possibility thinking. Possible thinking is the ability to see many possibilities in everything, instead of only seeing limitations. For example, during the COVID-19 pandemic, people with a possible mindset focused on the many options for action in this new situation. For example, they perceived it as an opportunity to change occupations and to channel resources and energy into the family and for personal empowerment. Others, on the other hand, were busy thinking about the many limitations that the pandemic caused, including lack of employment and the inability to leave the house and meet with family and friends. A person busy thinking about the limitations cannot progress and develop their creative thinking (for more on possibility thinking, see Craft et al., 2007). These personality factors, which can change during life, are part of the reasons for the increase or decrease in the development of creative thinking.

In the second category, the environmental factors include education that encourages curiosity and inquiry, giving respect and independence to children, engaging in activities rich in materials, emotional regulation, and providing balanced feedback, based on the children's work, and not on

[3] See http://innovationisrael.mag.calltext.co.il/magazine/80/articles/1542 for details.

their personality. Other environmental factors include how to study at school, preoccupation with electronic games from infancy, less interest in free play that develops the imagination, lack of interaction between adults and children, and a lack of adults really listening to children. Added to this are the misconceptions of educators regarding creative thinking. It is understood that these environmental factors also affect the first category, which includes personal factors.

Another interesting explanation for the decrease in the degree of creative thinking among children lies in the fact that there is an asynchrony in the development of human resources. This means that not all cognitive skills develop simultaneously, and it is possible that the decrease in the level of creative thinking is related to the increase in the level of new skills in other areas. For example, in the fourth grade, there is an increase in logical thinking and a decrease in divergent thinking.

This decrease, observed in many studies of children in the fourth grade, was the focus of a study undertaken by Said-Metwaly and his colleagues (2021), who claimed that it would be simplistic to say that there is a decline in creative thinking at this age without considering the type of test given, the participants, and their country's culture. The researchers found that the decrease in creative thinking in the fourth grade was reflected in Eastern countries, such as China, and less in Western countries. They explained that cultural differences affect an individual's ability to think creatively. In Western countries, such as the United States, values of individualism and independence are strengthened, while in the Far East, such as China, conformity and collectivism are strengthened. When children enter school, they are exposed to this socialization that allows less personal expression and, hence, less creative thinking. They also found that there was a noticeable decrease in creative thinking in the seventh grade. According to the researchers, it is impossible to assume that this decrease was due to transferring to another school (such as to middle school from elementary school) because not all countries transfer to middle school in the seventh grade. The researchers pointed to a neurobiological reason related to changes during puberty, which include the development of the prefrontal cortex. This affects the development of higher cognitive functions, such as the ability to think abstractly and logically. According to the explanation of asynchrony in development, sometimes when one ability peaks, another declines (there is a slump). Moreover, at this age, the child's social identity develops and the need to be accepted into the social group increases, and hence, to adapt to social norms. All of these factors also probably lead to a decrease in creative

thinking. Later (in Chapter 2), the social factor is expanded upon as a barrier that hinders creative thinking.

## Examining the development of creativity using "The Test for Creative Thinking- Drawing Production"

Urban (1991, 2005), studied the development of creativity using a tool he developed with his partner, Hans Jellen (Jellen & Urban, 1986), called the TCT-DP, "The Test for Creative Thinking - Drawing Production." Urban referred to creativity, not creative thinking. That is, the tool deals with the children's product and not with the process. Nevertheless, I present the research here since it clarifies the stages of development through children's creations.

Two-hundred and seventy-two children, aged 4-8 years old, with an equal number of boys and girls, from four kindergartens and three elementary schools in Germany, were asked to complete a drawing based on six segments of different shapes. Five of which were given inside a square (for example: a point, a dotted line, a curved line, etc.) and one shape was outside the square. The children were told that someone started the drawing and did not finish, so they were asked to finish it. Each painting was analyzed according to 10 categories. For example, the researcher checked to what extent the child continued or extended the shapes, if the child added new elements, if they connected all the shapes to one subject, if they used a shape outside the square, if the drawing was two-dimensional or three-dimensional, if there was humor in the drawing, and if the drawing was unconventional, abstract, or fictional. Examining the children's drawings made it possible to pinpoint the development of creativity and determine the six stages that characterize the development of creativity.

*In the first stage*, when four-year-old children are asked to complete the given drawing, they draw without being limited by the shapes on the page. Their drawing is free and seems unrelated to the initial drawing given to them. They do not seem to grasp the drawing and its sections. *In the second stage*, the children seem to relate to the shapes, but they only copy them. *In the third stage*, the children relate to the shapes and complete them. They draw a familiar shape; for example, a half circle will be completed into a circle. *In the fourth stage*, the children complete the shapes to obtain a meaningful object, such as glasses. *In the fifth stage*, the children complete the shapes, so that there seems to be an internal or thematic connection between them. For example, the child groups all the shapes into a house, a man, and a landscape. *In the sixth stage*, the highest

stage of creative expression (according to Urban), the child combines new elements, contributing to a common theme. For example, the child will draw a house, rich in details. (According to Urban, there is no connection between the development of creativity and drawing skill or technique.)

These stages demonstrate the development of creativity. However, if creativity is defined as original thinking, can it be claimed that everyone goes through the same stages during life? Is it possible to consider the first stage, in which the children draw freely, as creative thinking that corresponds to the first level of expressive creativity?

In giving a mark for creativity (in Urban's study, he coded the drawings), a gap is created between coding the drawings and the perception of creativity. For example, a high score is given to characteristics, such as humor, connecting different elements, adding an unusual subject, and creating something outside the square. These are prominent characteristics of creative thinking. However, in the fourth stage, which is described as an increase in the development of creativity, there is completion of the drawing of meaningful objects. Where is the originality if everyone connects the shapes to the glasses and gets a high score? Therefore, although Urban's research (1991, 2005) provides an important frame of reference, it is worthwhile thinking more about how to understand the creative product best.

It seems, therefore, that the development of creative thinking begins in infancy. It is inherent in each of us, and, as noted above, primary conditions allow its development: secure attachment, emotional well-being, the ability to regulate emotions, and the children's ability to stand up for themselves. Although children naturally express creativity, the path to fruitful continuation of creative thinking seems to depend on many factors, which are expanded upon in this book. Generally, it can be argued that there are two possible routes: one may cause the delay and suppression of creative thinking, while the other increases, refines, and develops creative thinking. It is clear to us, as parents and educators, which path we would like to choose, especially when our children are in the early childhood stage.

Creative thinking is a potential that can burst forth; everyone expresses it for different reasons. Meta Wagner (2017) organized the motivations for expressing creative thinking by defining five types of people. The first type, the A-lister, is characterized by the desire to be influential and succeed, and is motivated by the recognition and love they receive from the audience. People of this type need applause to continue being creative. For example, stand-up comedians cannot continue their show without the audience's laughter that confirms their creativity.

The second type is called the artisan. The artisan does not need the spotlight like the first type; they are focused on their work, generate ideas, and are content with being behind the scenes. They do not need recognition; they just want to express themselves. For example, composers who create music for films remain behind the scenes. Preschool children often possess the characteristics of this type, because they express themselves in varied and spontaneous ways, through play and art, rather than to gain recognition.

The third type is called the game changer. Game changers are characterized by their vision to do new things and even rebel a little against the existing and accepted. They are a combination of the A-lister type and the persistence that characterizes the artisan type. This type is not afraid of criticism and acts according to their vision. For example, the rock band, Queen, created the song, "Bohemian Rhapsody," which rebelled against the accepted conventions of music, because the band combined two completely different musical genres – rock and opera – and wrote a song that lasted six minutes, which was double the length of most rock songs.

The fourth type is the sensitive soul. This type expresses creativity driven by joy or sadness. They seek to express the anxieties, the pain, and the joy through creative expression. For example, the composer, Modest Mussorgsky, composed 12 works in memory of his friend, the painter Viktor Hartmann, in which he expressed his pain over the death of his friend.

The fifth type is the activist. This is a type that sees injustices and wants to repair them; activists wish to change the world, and work in a creative way. In the mid-1980s, there was a severe famine in Ethiopia, which claimed the lives of approximately one million people[4]. UK artists united for a concert and sang the song, "Do They Know It's Christmas?" The proceeds from the song and the concert performances were transferred to the Ethiopian government to deal with the drought and famine.

Even though these types refer to adults, I believe that preschool children reflect the artisan type. The characteristics meet the first stage mentioned earlier: the development of creative thinking and "expressive creativity: (Taylor, 1959 in Kampylis et al., 2009).

Try to identify what type you are ...

[4] See World Vision – 1980s Ethiopia famine: Facts, what's changed, how to help – https://www.worldvision.org/disaster-relief-news-stories/1980s-ethiopia-famine-facts#:~:text=The%201980s%20Ethiopia%20famine%20was,according%20to%20the%20United%20Nations.

# CHAPTER 2

# CREATIVE THINKING: PERCEPTIONS

In the book, *The Lion that Loved Strawberries*, by Tirtza Atar (2003), the lion thought he loved strawberries, insisted on his love, and tried very hard to get them. After tasting the strawberries, he realized that he actually didn't like strawberries.

We all hold different beliefs and opinions and, sometimes, these perceptions are inaccurate or unfounded.

As an introduction to the discussion of the practical aspects of promoting creative thinking and its improvement, I will present the system of beliefs and perceptions regarding creative thinking prevalent in the population, in general, and among educators, in particular. First, three key issues related to creative thinking and misconceptions about such thinking are presented. The first issue focuses on the question: Is creative thinking an innate or acquired ability? The second key issue presents central models that examine the relationship between intelligence and creative thinking. The third issue examines creative thinking as a "domain-general" ability, compared to a "domain-specific" one. In the last part of the chapter, the focus is on common perceptions of educators regarding creative thinking.

## Everyone has a Spark –Is Creative Thinking Innate or an Acquired Ability?

Whether creative thinking is hereditary or acquired has been fertile ground for many studies. Despite the fact that today innovative research technologies increase the possibility of reaching more accurate findings than was possible in the past, study results often remain inconclusive. In