INTERNATIONAL JOURNAL OF FILM AND MEDIA ARTS (2025) Vol. 10, Nº. 2 pp. 85-105

ijfma.ulusofona.pt
doi: 10.24140/ijfma.v10i2.9448

THE UNFOLDING OF ARTISTIC ACTIVITY IN FILM EDUCATION: A CASE STUDY

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The article has been supported by FilmEU Centre of Excellence funding. The FilmEU European Universities Alliance for Film and Media Arts (2020-2023) and FilmEU+ (2023-2027) are co-funded by the Erasmus+ Programme of the European Union. FilmEU Ref. 101004047, EPP-EUR-UNIV-2020 | FilmEU+ ERASMUS-EDU-2023-EUR-UNIV Project: 101124314
The work by EL has been supported by Dr Pia Tikka's team project "Cinematic minds behind-the-scenes" funded by the Estonian Research Insitute (PRG2109 2024-2028).

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Schedule for publication
Paper Submitted: 30th May 2024
Accepted for Publication: 7th February 2025
Published online: 29th December 2025

Abstract

This article addresses the challenge of assessing artistic growth in film students, a largely unexplored area in the field of art education. Drawing on insights from art psychology, cognitive science, and educational philosophy, it proposes a tentative framework rooted in the interdependence of experience and perception. The framework is exemplified in a semi-longitudinal review of student exercises in filmmaking at the Baltic Film, Media, and Arts School. Through this analysis, the article examines the development of perceptual thinking, the creation of perceptual forms, and the acquisition of cinematic representational skills over the course of one semester. This study fills a gap in existing literature and provides insights for educators and institutions seeking to support the artistic growth of aspiring filmmakers.

Keywords: artistic growth, embodied cognition, film education, perceptual professionalisation, visual thinking

1. Introduction

Film education has traditionally prioritized technological models to equip students with practical skills essential for success in the industry. Teaching the use of cameras, editing software, and other production tools is crucial, as employers in the film industry typically seek candidates proficient in the latest technology. This preference arises from the rapid evolution of film technology, the demand for proficient professionals in the job market, and the inherent engagement that learning about new technology provides students. This "technological approach", as Philip Cowan (2019) coined it, is also reflected in the pedagogical literature on filmmaking. While there exist many handbooks on the technical qualities and processes in the production of the cinematic image, much rarer are books on how film practitioners think and make creative decisions. A shared belief that has contributed significantly to this oversight is the widespread assumption that filmmaking is intuitive and felt, as a consequence of which it defies further description and analysis. More recently, filmmaker-scholars such as Karen Pearlman, Kersti Grunditz Brennan and Elen Lotman have challenged this view by asserting that doing actions intuitively and unselfconsciously, does not mean, that it cannot be understood, developed or even enhanced (e.g., Brennan & Pearlman, 2023; Lotman, 2021; Pearlman, 2012, 2016). In her own work on editing, Pearlman (2016, p. 10), for example, draws an important distinction between intuition and instinct arguing that while instincts are innate, intuition is cultivated through experience, making it culturally acquired and learned. As such it can be described and unpacked. This, in turn, raises the educational question of how art schools can foster the development of creative skills to enrich the storytelling prowess and conceptual sophistication of their students. This view also aligns with Ted Nannicelli's recent work in the field of aesthetic philosophy, which challenges the conventional view of aesthetic education as a matter of shaping taste (Nannicelli, 2024). Instead, he advocates for a "perceptual-cognitive model," arguing that the primary purpose of aesthetic education is to develop perceptual and cognitive capacities that enhance aesthetic experience and improve appreciation.

While earlier classical studies in art education already have emphasized the significance of perceptual-cognitive abilities in the artistic activity of young children (e.g., Golomb, 1999, 2003; Jolley, 2009; Kindler & Darras, 1994; Milbrath, 1998; Rostan, 1998; Winner, 1993), research on the cognitive skills of film students remains rather scarce. This article aims to address this previously unmapped area by proposing a tentative discussion of artistic development and skilled creative cognition in the field of film education. To this aim the article is organized in two parts. In the first part we draw on insights from art psychology, cognitive science and educational philosophy to summarize four key theoretical observations about creative thinking in the arts and filmmaking. The embodied, extended and distributed characterization of this faculty that will emerge from this discussion, will then serve as a guiding theoretical background for the second empirical part of the article in which we provide a modest semi-longitudinal review of some of the students' exercises ("etudes") in filmmaking over the timeline of the first semester of their studies at Baltic Film, Media and Arts School (henceforth, BFM) at Tallinn University film arts curriculum. A description of this educational output will support a developmental argument in terms of growth in perceptual thinking, the invention of perceptual forms and the acquisition of effective graphic schemas and cinematic representational skills.

2. Creative thinking in film practice: Four key tenets

What do we mean by growth in the creative cognitive skills of film students? As a starting point to this question we may turn to the great psychologist of art, Rudolf Arnheim (1983, p. 10), who in a short article, foregrounds three fundamentals

of (art) education: perceiving, thinking, and forming. Together they are the three faculties of what he calls the "productive mind", and as one educates one of them, one always has to educate them all three because they are not separate abilities. As he writes: "There is no perceiving without thinking and forming, no thinking without perceiving and forming, and no forming without perceiving and thinking". This idea, which rejects the traditional dualistic split between seeing and thinking and does not reduce cognitive development to either perceptual or conceptual processes, is central to the concept of "visual thinking" that Arnheim spelled out in his seminal work of the same title (Arnheim, 1969, 1980).[1] With this concept Arnheim refers to the cognitive process wherein individuals utilize visual imagery, spatial reasoning, and perceptual organization to understand and solve problems.

The arts then serve as the training ground par excellence for comprehending these relationships as it is within artworks viewers can witness the end results of a constructive and problem-solving artistic mind at work.[2] Growth in artistic thinking amounts to the refinement and advancement of the ability to think visually and to solve problems in the realm of perception. In the subsequent part of this article, we will see this activity at work in some of the exercises that were undertaken by film students at BFM. However, for now, let us deepen our understanding of these perceptual-cognitive skills by emphasizing four key points about them. Firstly, the development of creative cognitive skills relies on both experience and practice, as the capacity to think perceptually cannot be seen as separate from actions. Secondly, these cognitive abilities should not be viewed separately from technological skills, as creative thinking inherently involves utilizing tools. Thirdly, in the context of a collaborative medium like film, these skills should not be perceived as developing in isolation but rather in a highly participatory and distributed manner. Lastly, advancement in these skills does not necessarily correlate with increased visual realism. Let us discuss each point in turn.

2.1. Artistic minds are embodied minds

If creative thinking occurs in the realm of perception then it also occurs in the realm of experience as perception cannot be studied separately from the actions that pervade our daily lives.[3] In the field of philosophy, one can see an important precursor to this view in the writings of the preeminent American pragmatist and educational theorist John Dewey (1934, 1938; for a review see also Ansbacher, 1998). In what is generally considered his most influential contribution, *Art as Experience* (1934), a book that has also been extremely influential within the arts themselves, Dewey laid the foundation for a much richer embodied understanding of art and education based on experience. Driven by the intention to restore the continuity between works of art and their environment, Dewey sets out to understand the meaning of arts by having recourse to what he describes as "the ordinary forces and conditions of experience that are usually not regarded as esthetic" (Dewey,

1 Art educator Henry Schaefer-Simmern, who shared ideas throughout his life with Arnheim, speaks of a process of "visual conceiving", defined as "the mental activity of conceiving relationships of form in the realm of pure vision", the pictorial realization of which he calls "visual conception", "that which is conceived or begotten in the mind and which causes the birth of a visual configuration of form, that is, the artistic form" (Schaefer-Simmern, 1961, p. 13).

2 This is, how for instance, students in their own perceptual endeavors to convey an idea may encounter similar visual problems in existing works of art. Take, for example, the following account in which one of Schaefer-Simmern's students recounts her museum experience of watching a painting of Cezanne: "I was about to turn away, still unhappily indifferent, a sudden recognition flashed through my mind. In the whole formation of his landscape – though his technique, colors, and representation of rocks and trees were beyond my ability to understand – I realized that he had used the same principle of dark and light to form his rocks and tree trunks…this discovery of my own was as if I had received a present" (Schaefer-Simmern, 1961, p. 174).

3 "We perceive in order to act and we act in order to perceive", as one of the leading contributors to the field of visual perception, James J. Gibson (1979), aptly put this coupling of the organism to the environment.

1934, p. 4), but that constitute the "raw" sources of art and meaning.

In contemporary discourse, Dewey's attention to the integration of theory and practice, and the situated nature of cognition echoes core tenets of embodied cognition (e.g., Claxton, 2015; Gibbs, 2005; Johnson & Schulkin, 2023; Lakoff & Johnson, 1999; Tversky, 2019; Seth 2021). This theoretical framework asserts that cognitive processes do not rely on symbolic mental representations in the brain that are separate from sensory and motor systems (i.e., the traditional view of cognition). Rather they are deeply rooted in the body and its interactions with the environment. Thinking, as humans experience it, depends deeply on our having the kinds of bodies that we have. It suggests that sensory-motor experiences, bodily sensations, and perceptual processes play a crucial role in shaping cognition, perception, and behavior.[4]

In an "empirical aesthetics of human meaning", as the American philosopher Mark Johnson (2013) calls it, a central role is occupied by so called "image schemas". This term was coined by Johnson and his colleague, cognitive linguist, George Lakoff, to describe recurrent Gestalt "patterns of organism/environment interactions that are automatically, non-consciously, and directly meaningful to creatures with bodies and brains like ours, in interaction with our shared environments" (Johnson, 2013, p. 30; see also Lakoff & Johnson, 1999). The container schema, for example, is a fundamental image schema that arises from our physical experiences with containers such as boxes, bowls, or rooms. It involves the concept of containment, where one entity encloses or encompasses another. For example, when we talk about putting objects "in" a box or "inside" a room, we are using the container schema. Schemas such as container are fundamental cognitive structures that shape how we perceive and understand the world around us and allow use to make sense of abstract concepts and to reason about the world. As such they are deeply intertwined with creative thinking processes, serving as the cognitive building blocks that underpin our ability to generate novel ideas, make analogical leaps, and explore imaginative and narrative possibilities, as will be further illustrated in the next part of this article.

Turning to the field of film practice, filmmaker and scholar Elen Lotman has argued more recently that filmmakers rely heavily on their own tacit, experiential knowledge, which encompasses the accumulated insights, intuitions, self-perceived past failures and practical know-how gained through their experiences in the field. To describe this phenomenon, she introduced the concept of "experiential heuristics," which refers to the intuitive knowledge or rules of thumb that film professionals apply when making creative decisions (Lotman, 2021; Lotman et al., 2023). They are based on past experiences and an intuitive understanding of how certain elements affect the audience's experience, are often developed over time through trial and error, observation, and analysis of successful films. For instance, film professionals often rely on heuristics regarding the placement of subjects within the frame, such as the rule of thirds, to create visually compelling and emotionally resonant images. Similarly, editors develop heuristics for pacing and rhythm in editing, based on how different cuts and transitions affect the audience's engagement and understanding of the narrative. Sound designers and mixers draw on their accumulated experiential knowledge to craft immersive auditory experiences, leveraging specific sounds or techniques to heighten tension or accentuate pivotal moments, and so on.

4 For the implications of embodied cognition for teaching, see among others, the work of Macrine and Fugate (2021, 2022). These cognitive psychologists emphasize the importance of integrating physical actions and interactions with the environment into the learning process. They promote a holistic approach to education that incorporates body-based techniques and embodied learning (EL), aiming to enhance curriculum development, teaching methods, and research by involving both the physical bodies and cognitive processes of teachers and students. Techniques used in EL encompass application, hands-on activities, project-based learning, and various body-based strategies, ranging from simple tools to the use of advanced technologies such as augmented reality (AR) and virtual reality (VR).

The concept of experiential heuristics raises the question of how growth in experience can be measured in film art education. This topic has received limited attention so far, with a notable exception being a recent study by Lotman, Mõttus, and Tikka (2023). In this study an eye-tracking experiment was conducted to determine if perceptual professionalization could be measured based on how audiences observe moving images. Interestingly, their study revealed significant perceptual differences between novices and professionals. Instead of conducting such an experiment ourselves, we will analyze, as the second part will make clear, the students' creative visual output to determine if we can identify any development towards skilled perceptual thinking.

2.2. Artistic thinking is thinking with tools

The embodied cognitive abilities essential for artistic thinking are inseparable from the technological skills needed to actualize and transform the inner embodied representations of the artistic mind into perceptible forms. That is, creative perceptual thinking implies thinking with tools, an idea that aligns closely with the extended mind hypothesis (Clark & Chalmers, 1998; Menary, 2010). This hypothesis suggests that cognitive processes are not confined to the "naked" brain alone but can extend into the environment through the use of external artefacts. Individuals can use tools or external resources as cognitive aids to enhance their thinking processes. These tools can range from physical objects like pen and paper to digital devices like computers or smartphones. It is argued that both the tools and the bodily movements involved in utilizing them are integral components of problem-solving activities, operating in conjunction with internal neural processes (Garrett, 2016, p. 2-3). As Andy Clark highlights in his book *Natural-Born Cyborgs* (2003), tools like the sketch pad are not merely convenient aids for artists; they facilitate an interactive process between internal mental representation and external media, such as the physical act of mark-making. As he writes: "The sketch pad is not just a convenience for the artist, nor simply a kind of external memory or durable medium for the storage of fully formed ideas. Instead, the iterated process of externalizing and re-perceiving turns out to be integral to the process of artistic cognition itself" (Clark, 2004, p. 77).

This process of thinking with tools, rather than relying solely on internal cognition, plays a pivotal role in the creation of finished artworks. While scholars have already made similar claims about the plastic arts and literary creativity (e.g., Van Hulle, 2005), a similar process occurs in filmmaking. One tool that bears witness to this is the "director's viewfinder," whose sole purpose is to extend the filmmaker's imagination in making specific camera position and lens choices. When students of filmmaking work on a project, their mental processes are not confined solely to their brain but also extend into the tools they use, such as cameras, editing software, and storyboards. These tools become integral components of their cognitive processes, influencing how they perceive, conceptualize, and create their film. For instance, the camera becomes an extension of their minds, allowing them to capture specific perspectives and visual elements that contribute to the storytelling process. The editing software serves as a tool for organizing and manipulating footage, shaping the narrative structure and pacing of the film. Even the storyboard, a tangible representation of the film's sequence, becomes part of the filmmaker's cognitive toolkit, aiding in the planning and visualization of scenes. Moreover, the collaborative nature of filmmaking, as further couched by the next section below, exemplifies the extended mind hypothesis. Filmmakers often work in teams, collaborating with actors, cinematographers, editors, and other crew members. Each individual brings their own expertise and perspectives, contributing to the collective cognitive process and shaping the final outcome of the film. In essence, the extended mind hypothesis illustrates how the tools of filmmaking become integrated into the cognitive processes of filmmakers, extending their thinking beyond the confines of the brain and into the external environment.

2.3 Artistic creativity is distributed

Creative minds are not only embodied and extended, they are also distributed, especially in the case of collaborative filmmaking, which stands as "one of the most complexly layered forms of artistic production" (Pearlman & Sutton, 2022, p. 86). Despite its highly interactive nature, both socially and technologically, discussions within popular and academic spheres often attribute the creative authorship of films solely to directors. This concept of the director as the single author was crystallized by Andrew Sarris (1962) into the auteur theory, which posits that the director is the primary creative force behind a film and should be regarded as its author. While this theory may have waned in influence in film criticism, texts continue to credit the director for the creation of a film, often overlooking the collaborative contributions of others involved (Cowan, 2022). As Pearlman and Sutton (2022, p. 86) note, texts still "refer to 'a Scorsese film,' not a film by 'Scorsese et al.'"

In their work on distributed creativity in filmmaking practice, Pearlman and Sutton have argued that this attribution of creative responsibility solely to directors is a misconception rooted in individualist assumptions about creativity. While the association between creativity and authorship is deeply ingrained in both industry norms and public perception of cinema, it is crucial to recognize, as these authors point out, that these two concepts are not synonymous. In their view creativity is a psychological and aesthetic concept characterized by varying degrees and necessitating careful examination of the process involved. In contrast, authorship, they argue, is a somewhat puzzling and imported concept within the realm of film, pertaining to legal, political, and economic matters, focusing on issues of credit, responsibility, and marketing (Pearlman & Sutton, 2022, p. 87).

In their view the romanticized notion of a singular genius undermines the public value inherent in a more inclusive understanding of filmmaking. By "public value," they refer to "the potential to enhance social and cultural well-being, particularly in working lives and collaborative undertakings in the screen industries" (Pearlman & Sutton, 2022, p. 86). A more comprehensive grasp of the systemic and communal aspects of creativity in filmmaking has the potential to democratize aesthetics, which they view as a "clear public good". According to these scholars, creative processes are not typically confined to the mind or brain of a single individual. Instead, they are often distributed across collaborating participants' brains and bodies, as well as various objects, technologies, locations, systems, and environments. These processes encompass cognitive, imaginative, emotional, motor, and social aspects that drive creative endeavors, resulting in outcomes that are novel, surprising, and valuable. Some of these processes that the authors list include "visualizing, feeling, decision-making, designing, acting, interacting, selecting, remembering, making, wondering, composing, and perceiving" (Pearlman & Sutton, 2022, p. 92). While everyone engages in these activities, they manifest in diverse ways and contexts. Moreover, the idea that creativity is distributed suggests that in culturally embedded art forms like film, dance, and music, creative processes are spread across specific systems, that what Pearlman and Sutton (2022, p. 92) refer to as "*ecologies* of practice". Influenced by embodied and situated movements in cognitive sciences, this perspective views mental and emotional experiences as inherently cultural, collaborative, and somewhat creative.

2.4 Artistic minds extend beyond visual realism

Lastly, it is important to note that development in visual thinking and in perceptual-cognitive skills does not equate with growth in visual realism, a conception that has been traditionally linked with Piaget's influential theory of drawing development (Piaget, 1928). As Claire Golomb, one of Arnheim's close followers, notes, Piaget aligns the development of children's drawings foremost with their

spatial-mathematical reasoning, where "children's intuitive understanding of Euclidean and projective geometry, attained during the middle childhood years, would correspond to visual realism and the use of perspective in their drawings" (Golomb, 1993, p. 12). This view, however, which sees realism as an optimal and higher form of developmental achievement, has been critically challenged by Golomb and others (including Schaefer-Simmern). Drawing on Arnheim's psychological theory of representation in the arts, Golomb contrasts the nature of artful representation with that of replication, arguing that the former requires creative visual thinking, "the invention of forms that are structurally or dynamically equivalent to the object". As she notes, such artistic representation does not fall together with a compulsion to copy reality. The aim of artful representation is not to establish a "one-to-one correspondence of elements", but to capture the structural essence of an object or an event in a visual configuration. In the addendum to his book *The Unfolding of Artistic Activity*, for which Dewey provided the foreword, Schaefer-Simmern provides a vivid illustration of this statement by contrasting two versions of a drawing of a tree which he connects to two opposing faculties of the mind (Schaefer-Simmern, 1948, p. xviii). The first drawing, here illustrated in Fig. 1, still A, results from what he coins visual memory. Visual memory tries to remember the elements of an object in a piecemeal fashion. It deals with such questions as how the object may look, how big or small, thick or thin it may be, what the proportions are, and so on. In Schaefer-Simmern's view such an endeavor can never yield organized forms for it involves "rational calculation", not "visual conceiving": "It puts parts of objects together without any interfunctional relationship of the shapes to each other. The outcome is a remembering, a putting together of disjunct members, isolated details; parts can be changed without affecting the whole. Such weak structures, arranged willfully in order to re-collect various members of objects, can never lead to the establishment of visual configurations" (Schaefer-Simmern, 1948, p. xvi).

Fig. 1 Visual memory versus visual conceiving (after Simmern, 1948, p. xviii)

The opposite can be seen in the second drawing that results from visual conceiving. Unlike the first drawing the image now reveals a definite visual order in the relationship of all parts to each other. This order is manifested in the way all elements are interdependent on one another: "if a change is undertaken in any part, either in the relationship of the figure to its empty background or in the definite relationship of the directions of the slanting lines, the whole drawing loses the particular quality of its configuration" (Schaefer-Simmern, 1948, p. xviii).

This fundamental distinction in rendering objects is so influential that it also pervades the visual practices of modern science. An illuminating experiment in this regard was conducted in 2013 by researchers from King's College in London. In this study (Hay et al., 2013) different classes of participants in the visual practice of neuroscience were instructed to "draw a neuron" in order to assess any categorical differences in research experience. They included the neuron cell drawings of undergraduates, trainee scientists, and leading neuroscience researchers in a single research-intensive university (see Fig. 2). The results of their study revealed some striking differences. With the exception of only a few drawings, every undergraduate produced

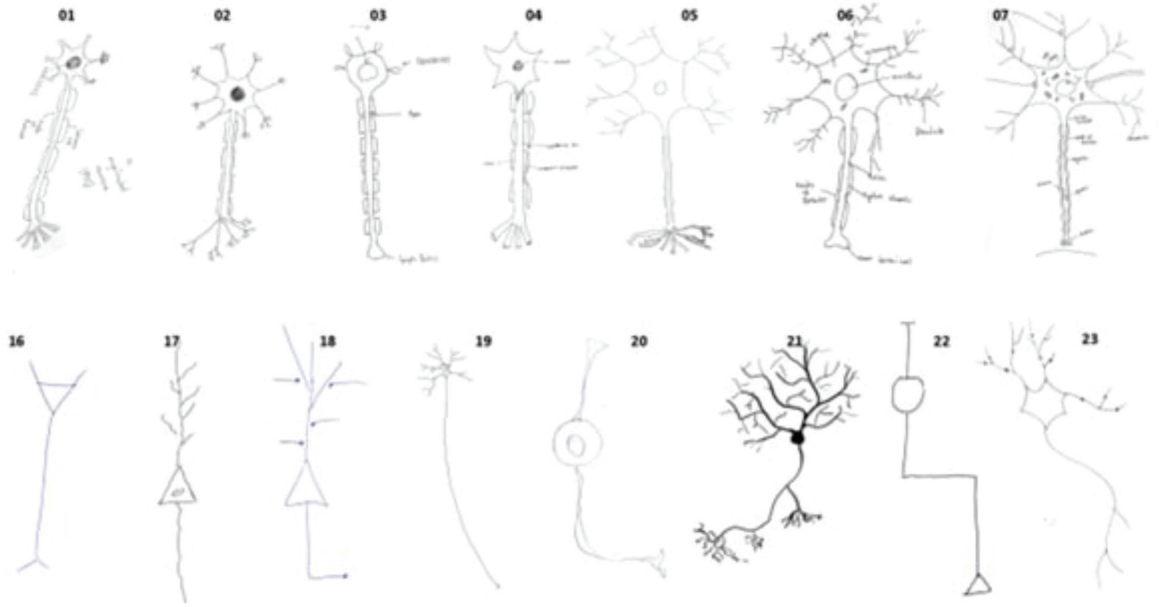

Fig. 2 Two different ways of drawing a neuron undergraduates (top row: 01–07) versus laboratory leaders (bottom: 16–23) (© Hay et al., 2013).

a faithful and truth-to-nature representation of an ideal (or archetypal) brain cell of a famous classical textbook regardless of whether the drawings were made at the beginning, the middle, or the end of the teaching. Adopting the terminology of Simmern we could say that these drawings resulted from visual memory rather than from visual conceiving. The principal investigators, by contrast, provided a representation that was more stylized without any claim to be scientifically objective. Reminiscent of the second version of Schaefer-Simmern's tree, they challenged a truth-to-nature depiction of the textbook, tending instead toward what the researchers describe as "the schematized representation of a research concept: blending a sense of what the hidden neuron cell identity might be with suggestions about how future inquiry might be carried out and forcefully asserting an individual experimental model" (Hay et al., 2013, p. 482). In other words, they gave visual conceiving priority over rational calculation.

While these studies offer examples of visual conception in drawings, we will now present a case of visual conceiving in cinematic storytelling by examining some of the educational assignments of film students at the Baltic Film, Media, and Arts School.

3. Artistic growth in film education: A case-study

Above we have presented a perspective on artistic creativity in film practice that takes experience, growth in embodied perceptual thinking and distributed cognition as its core concepts. To provide a more tangible demonstration of this perspective and to further our understanding of artistic growth in filmmaking, we will now describe some of the assignments (etudes) that the students at Baltic Film, Media and Arts School were instructed to perform during their first year of

the Film Arts (BA level) study programme. This programme is dedicated to film and accepts students in seven specialisations (directing, production, scriptwriting, cinematography, production design, editing and sound design). The study period is 4 years and during the first year the whole course studies together, to acquire the basics of film language and filmmaking, followed by three years of studying their respective specialisations. Very much in the spirit of John Dewey, the program is very "hands-on" and students do a lot of practical exercises during their studies. The first year exercises are smaller and grow into short filmmaking during the following years. Curriculum adopts a system similar to the so-called "scaffolding system" at place in many successful film schools all over the world (it has been called "scaffolding system" in the National Film School of Denmark, but it exists or has existed in other schools everywhere in the world; the system is built around exercises that have very specific limitations, but the limitations are not to guide the content of the exercises, but the production and form, thus allowing students to learn things by doing without being proficient at what they are learning yet). Following the methodology of Simmern, the case-studies described here are no attempts at interpreting artistic activity as an expression of emotional and personal factors. Rather they intend to unfold the organized perceptual energies in the artistic process of the students. In line with the author's statements, the emphasis is not on differences between the various students, although unquestionably those differences exist, but rather on certain fundamental laws of perceptual learning and specifically artistic growth which can be shown to apply universally.

For these aims, excerpts from a series of assignments of two groups of students were analyzed. Each group was instructed with the task of visualizing an event (the "scaffolding" for the exercise was worded through the following task: create a situation with one event and two characters. Conditions: 1 shot, black and white, wide shot, without sound, on a tripod - without camera movement. Length - max 1 minute; the story is not abstract, but a real-world event with specific characters. In choosing your shot and its content, remember to follow the FFF rule - form follows function.). This exercise is repeated multiple times throughout the first semester of the studies with elements of film language being progressively added following the film history timeline (editing, sound, color, camera movement). With each exercise (called an "etude") the class and the teacher give the feedback for the construction of the following exercise. Thus creative growth is thought to be a formative and cumulative process. As the case-study studies below will demonstrate, with each experience, the abilities of the learning students were further developed, a growth which could be seen manifested in their work as it grew organically with them to its further improvement.

3.1 First case-study

The first case-study describes the development of a short film created by L.T., H.L.A. and E.A. These students took as their main subject the small and charming narrative of a boy and a girl eating sushi together in a restaurant. The clumsiness in which the boy tries to master the chopsticks results in humor when the boy suddenly drops the sushi roll, thus making the girl laugh. At their first attempt (see Fig. 3, stills A to C), which does not yet include the sushi-roll as a prop, but an egg sandwich, the event was filmed in one static shot. Because the camera is placed at a position behind the girl, all attention is directed at the boy. This creates a rather unbalanced set-up as we cannot view the girl's reaction when he drops the egg from his sandwich. This inequality was restored on the next attempt (see Fig. 3, stills D to F) when the students decided to shoot the event up front, thus creating a more symmetrical framing that renders their relationship and the comical flow of causality (dropping triggering smiling) visually more intelligible. In contrast to the prior exercise, the viewer is now invited to see how the imaginary lines or index vectors created by their gazes interact with each other, making the whole more dynamic and engaging.

The first two etudes are unsegmented in the sense that the spatial-temporal unity of the event was not yet broken down in various smaller parts with each part being continuous with the whole. As such there is not yet a rhythm of editing that could potentially unveil a cognitive and formative process of visual thinking and decision-making. According to film practitioner and cognitive film scholar Karen Pearlman, author of *Cutting Rhythms*, the content an editor works with is movement, and the editor's decisions are creative decisions about the selection of kinds of movement and its phrasing. She distinguishes between three cognitive tools or operations that editors draw on in order to shape movements into a significant form: timing (choosing of a frame, choosing duration of the shot, choosing the placement of the shot), pacing (rate of cutting, rates of changes within a shot), and trajectory phrasing (Pearlman 2012, 2016). Since these tools are cognitive they provide a valuable resource for assessing perceptual thinking in editing.

To unfold the workings of these conceptual tools we have to look into the next two etudes in which the students used principles of continuity editing to blend multiple camera shots into a consistent rhythm. The first rhythm, as shown in Fig. 4, cuts down the scene in 18 individual shots. The scene starts inductively with a close-up of an event detail (still A). An overview shot (still B) then places the detail into a sensible event gestalt. At various moments the students make use of an exit-entrance cut to motivate the viewer's eyes to move to provide the smoothest cut. For example, as the girl picks up some sushi sticks in the overview shot (still B), the film cuts in the middle of her movement in order to continue its path in the next medium shot (still C). This perceptual logic repeats itself immediately after when the students cut into the boy's action of taking the soy sauce and pouring it into a bowl (still D). Similarly, when the girl hands over the sticks to the boy (still E), the film cuts smoothly to a close-up of his face as he smiles upwards towards her (still F). With each alteration, there is vector continuity as the camera stays on the same side of the index vector line, as a result of which, both characters remain in their previous screen position. As basic all of these choices may seem, they already betray the workings of a visual mind that is aimed at conveying the essence of the screen event in its most effective way. Moreover, the inclusion of the extreme close-up of the boy's eyes adds something, a thought about his feelings towards the girl which was absent from the prior exercises. It is interesting to note how in the next etude the students made

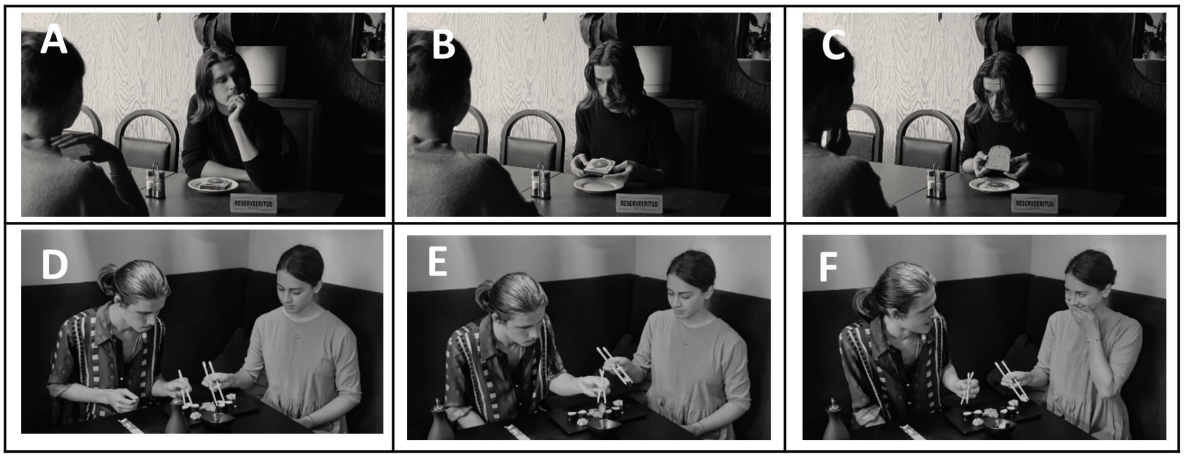

Fig. 3 L.T., H.L.A. and E.A, first two etudes.

Fig. 4 L.T., H.L.A. and E.A, third and fourth etude.

Fig. 5 H.K., E.K. and L.M.K, first etude.

two changes to improve the rhythm of the scene. Shots G, H, I and M (here marked in lighter gray) were eliminated as they were seen as redundant to the overall narrative. The students decided to visualize the dropping of the sushi roll in close-up (still N) rather than in overview shot (still M) to link it more logically to the prior shot (still L). There is a good cognitive reason for doing so: in shot M there was still the risk that the viewer would be distracted by other elements in the overview shot. By excluding this visual information by tightening the frame, the viewer's attention is solely narrowed down to the essential action. As such the creative decision is not merely trivial or automatic. The choice holds significance because it represents the act of selecting one option over others based on cognitive perceptual reasoning. Because of the presence of an alternative, the choice becomes a meaningful message (Lotman & Tsivian, 1994).

3.2 Second case-study

The second case-study we want to discuss in detail is made by H.K., E.K. and L.M.K. The event these students aimed at visualizing, revolves around a game of chess between two young men: the leg shaking of one of them gets the other on his nerves, causing him to lose the game. In the first etude (see Fig. 5) this flow-of-emotion scenario is couched in one individual shot. As in the first etude above, the actions are unsegmented. They are not yet shaped into a visual rhythm, a meaningful pattern that expresses the essential quality of the event with optimal clarity and accented effect.

This changes in the next etude (see Fig. 6), which, as above, uses the techniques of classical editing to impose some logical form and structure upon the event. The choosing of the cuts is motivated by the chess moves of the characters (e.g., cuts from B to C and from I to J), while the increase of tension of the play is conveyed by an inductive transition from long medium shots to close-ups. Underlying this basic visual logic is a basic embodied logic, as discussed under the first tenet above, and which understands the increase in emotional intensity metaphorically in terms of the increase of substance in a container (Kövecses, 2003, p. 64). According to this metaphor, which adheres to the more general metaphor "emotions are forces", humans have a natural tendency to conceptualize the rising of a strong emotion (e.g., joy, anger, fear) inside a person's body in terms of the increase of a substance inside a container. When the substance level in the container is low (as in a long shot), the pressure remains low, resulting in subdued emotions. Conversely, as the substance increases, pressure rises (similar to the camera closing in on the characters' faces), amplifying emotional intensity. Once the game is played and the winner declared, tension releases, and the film returns to its initial wide shot, creating breathing space again within the frame.[5]

5 For more examples of how embodied structures such as the container schema influence processes of artistic meaning-making in film, see, among others, Coëgnarts (2019, 2020, 2023), Coëgnarts and Kravanja (2012, 2015) and Ortiz (2011, 2023).

Notice also the distinction that is drawn in how the two characters are framed in their respective shots: while the character on the left is presented alone with the chessboard clearly visible at the center frame (stills E and K), the personal space of the character on the right is obscured by the presence of the other character (stills B and D). This visual arrangement, again grounded in the very basic bodily logic of containment, suggests that the left character holds dominance. From the beginning of the scene, the outcome of the game is hinted at through the perceptual design crafted by the students. One can discern a conceptual sophistication in visual conceiving which was not manifested in the first etude.

The next etude (see Fig. 7 and Fig. 8) renders the event and the tension of the game even more dynamically by adding movement to the scene. The character on the left is introduced with a forceful entrance into the frame (Fig. 7, stills A1 and A2), creating a strong diagonal motion vector directed

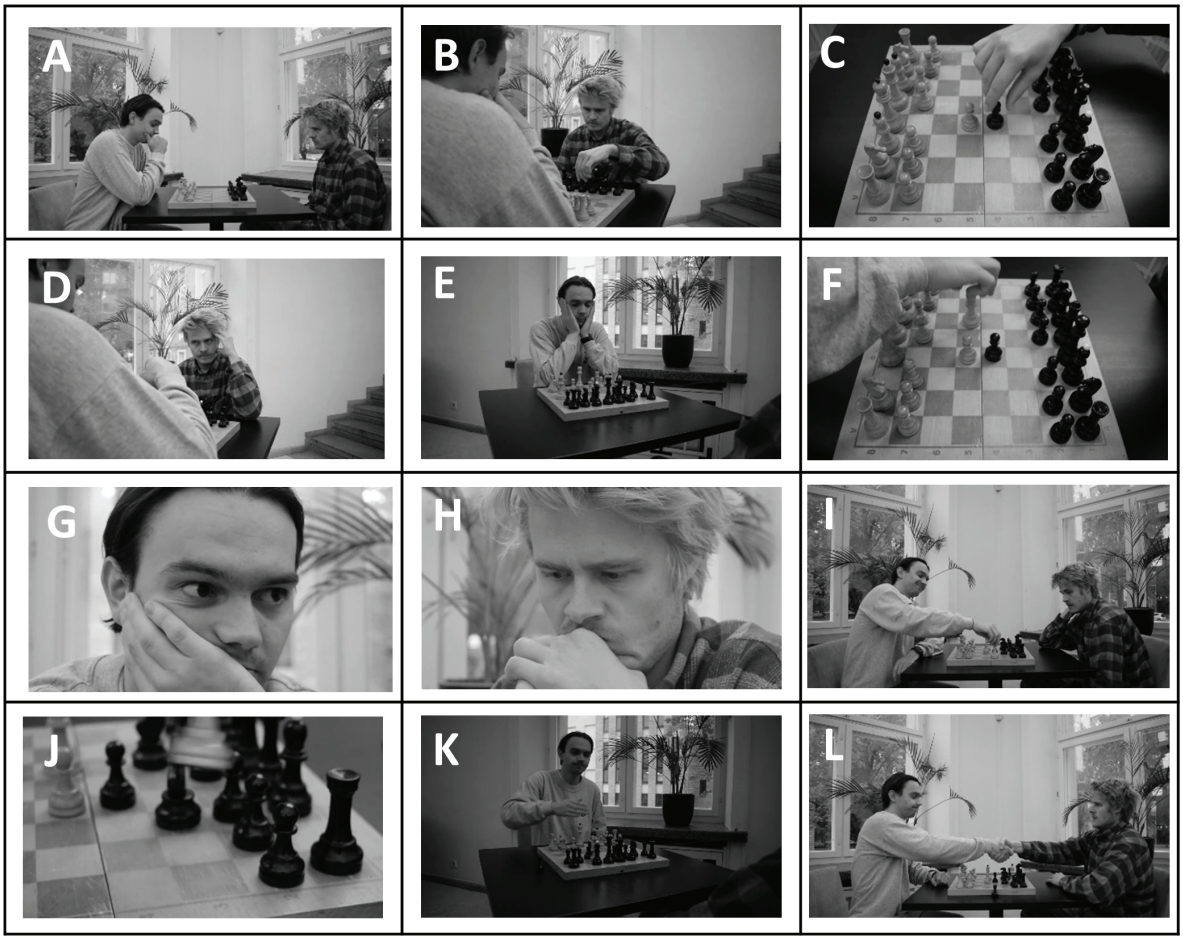

Fig. 6 H.K., E.K. and L.M.K, third etude.

towards the character on the right who is framed stationary in the right bottom corner. Baring Arnheim's theory of visual balance in mind, this framing generates a gravitational pull downwards, accentuating the right character's vulnerable position. Also here, the students continue to exploit the embodied container logic with optimum effect to represent the asymmetrical power dynamics between the two players. The left character intervenes the personal container of the right container twice, at the beginning and at the end of the game (Fig. 7, still B and Fig. 8, still S1, respectively), thus imposing a strong circular form to the scene. While close-ups are also used to couch the increasing tension of the game, this time the pacing of the editing is also heightened. The nervousness of the right character, as provoked by the other character's leg shaking, is made tangible by increasing the rate of cuts, thus making the emotional cause-effect chain visually intelligible to the viewer. As the left character makes the decisive move and the winner is determined, the pacing eases and tension

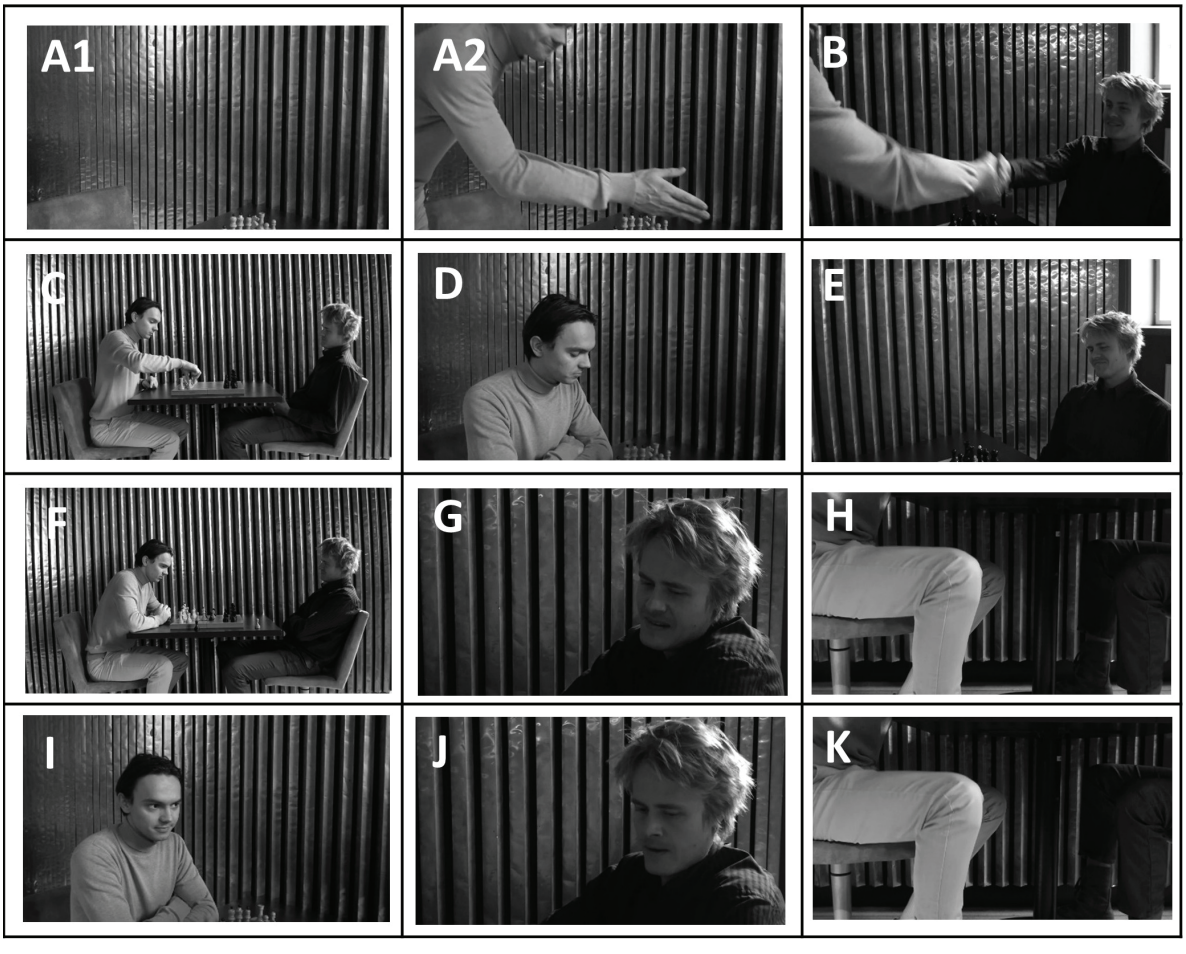

Fig. 7 H.K., E.K. and L.M.K, fourth etude.

dissolves, returning the scene to its initial state. Notably, unlike the previous exercise, this scene features only one close semi-top shot of the chessboard, reserved for the final and decisive move (Fig. 8, still Q), thereby producing a much higher impact.

3.3 Main findings in the discussed case studies

The case studies presented in this chapter illustrate the developmental trajectory of students in their first year of film education, particularly focusing on their artistic growth through embodied perceptual thinking and distributed cognition. Initially, students approached filmmaking with a limited understanding of how perceptual-cognitive processes shape cinematic storytelling. Their early exercises lacked segmentation, rhythm, and a conscious structuring of visual elements, as demonstrated in their first etudes where events were captured in static, unsegmented shots.

As students progressed, their perceptual thinking evolved through iterative feedback and structured exercises. They began to recognize how framing, gaze direction, and movement within the frame could guide the viewer's attention and enhance narrative clarity. The first case of L.T., H.L.A. and E.A exemplifies this transformation, as they shifted from a static, imbalanced composition to a more dynamic and visually coherent sequence. Their increasing command of visual rhythm, continuity editing, and shot sequencing signified a deeper understanding of how perceptual patterns are distributed in film.

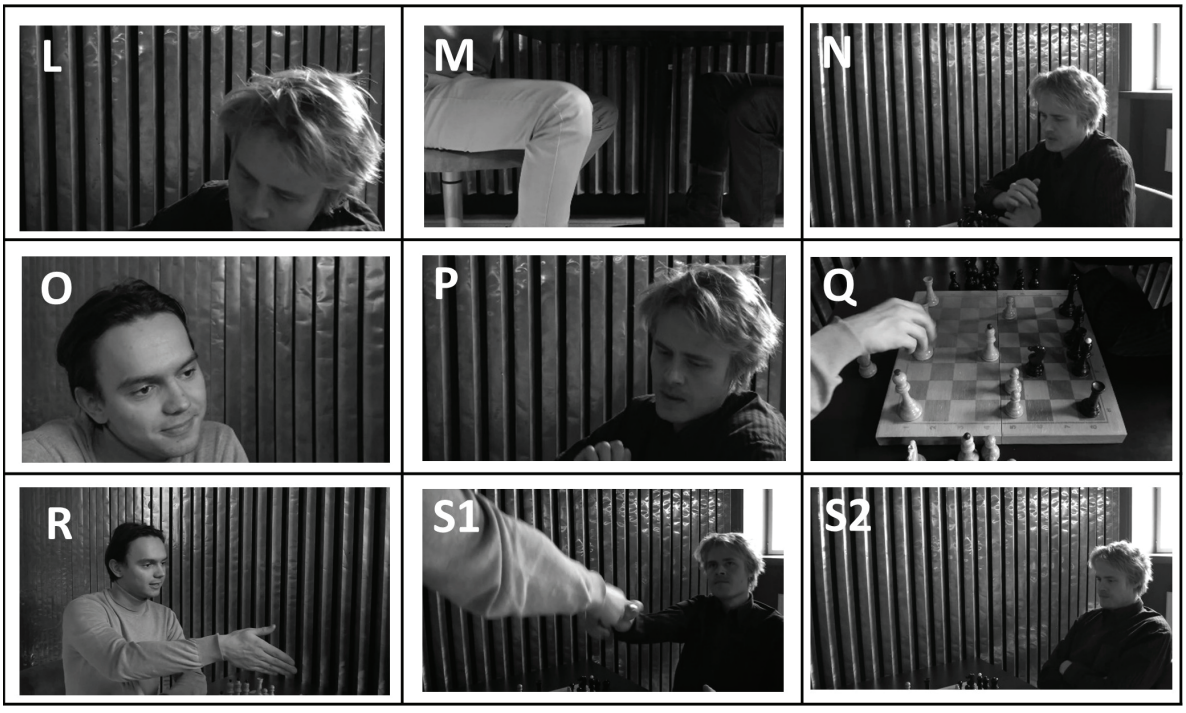

Fig. 8 H.K., E.K. and L.M.K, fourth etude (continued).

The refinement of their work was not merely a result of individual skill development but also stemmed from collective discussions, peer feedback, and an evolving ability to share creative responsibilities. This shift is evident in the second case study of H.K., E.K. and L.M.K, where the refinement of visual metaphors and tension-building techniques emerged through collaborative decision-making. Their ability to externalize ideas—through shared discussions on pacing, framing, and the embodied logic of movement—enabled a more sophisticated execution of their ideas.

By the later etudes, students demonstrated a heightened sensitivity to cinematic form, employing refined techniques to shape meaning through perceptual-cognitive skills. The use of continuity editing, meaningful spatial arrangements, and dynamic pacing reflected a deeper engagement with the medium. Their work evolved from rudimentary visual storytelling to a more nuanced, intentional practice that integrated both individual creativity and distributed cognition.

4. Conclusion

In conclusion, the exploration of artistic growth within the realm of film education presents a significant challenge. While traditional methods of evaluating artistic progression have mainly centered on compositional strategies in various art forms, such as children's artwork, the exploration of cinematic representation skills remains largely unexplored. This article has sought to bridge this gap by proposing a research framework rooted in art psychology, and embodied cognitive science. By emphasizing the interdependence of experience and perception in the development of artistic skills, this framework attempted to offer a promising cognitive-based avenue for understanding and examining the artistic growth of film students. Through a semi-longitudinal review of student exercises at the Baltic Film, Media, and Arts School, this article has illustrated how perceptual thinking, the invention of perceptual forms, and the acquisition of cinematic representational skills, rooted in embodied logic, unfold over the course of a semester. However, future research could further enrich this approach by incorporating students' own reflections on their creative decision-making processes. Examining their experiences in film practice alongside a perceptual-cognitive model of film education. would provide deeper insight into how film students perceive and articulate their artistic progression. By examining the educational output from this perspective, we have shed an exploratory light on the developmental trajectory of film students, providing insights into their artistic evolution and the practice of cinematic thinking. Moving forward, it is imperative for film schools and educators to continue refining methodologies for assessing artistic growth in film students. By adopting interdisciplinary approaches and embracing the embodied cognitive dynamics of cinematic representation, we can better support the development of aspiring filmmakers and cultivate a rich artistic landscape in the realm of film practice.

Acknowledgements

We sincerely appreciate Karen Pearlman's insightful feedback on an earlier draft of this paper. We also extend our thanks to David Alvarez for drawing our attention to the "brain cell drawing" study (Hay et al., 2013). Finally, we thank David B. Hay for giving us the permission of reproducing parts of these drawings in this article. Last, but not least, we want to thank the BFM film arts students for allowing us to use and analyse their works within the current article.

5. References

Ansbacher, T. (1998). John Dewey's experience and education: Lessons for museums. *Curator: The Museum Journal*, 41(1), 36-50.

Arnheim, R. (1954). Art and visual perception: A psychology of the creative eye. University of California Press.

Arnheim, R. (1969). *Visual thinking*. University of California Press.

Arnheim, R. (1980). A plea for visual thinking. *Critical Inquiry*, 6(3), 489-497.

Arnheim, R. (1983). Perceiving, thinking, forming. *Art Education*, 36(2), 9-11.

Brennan, K. G., & Pearlman, K. (2023). Creating character in editing. *Media Practice and Education*, 24(3), 235-252.

Clark, A. (2003). *Natural-born cyborgs: Minds, technologies, and the future of human intelligence*. Oxford University Press

Clark, A., & Chalmers, D. J. (1998). The extended mind. *Analysis*, 58/1, 7–19.

Claxton, G. (2015). *Intelligence in the flesh: Why your mind needs your body much more than it thinks.* Yale University Press.

Coëgnarts, M. (2017). Cinema and the embodied mind: Metaphor and simulation in understanding meaning in films. *Palgrave Communications*, 3, 1–15.

Coëgnarts, M. (2019). *Film as embodied art: Bodily meaning in the cinema of Stanley Kubrick*. Academic Studies Press.

Coëgnarts, M. (2020). How motion shapes thought in cinema: The embodied film style of Éric Rohmer. *Projections: The Journal for Movies and Mind*, 14(2), 26-47.

Coëgnarts, M. (2023). Shaping films from the inside out: Embodied mental schemas in filmmaking and viewing. *Baltic Screen Media Review*, 11(1), 128-147.

Coëgnarts, M., & Kravanja, P. (2012). Embodied visual meaning: Image schemas in film. *Projections: The Journal for Movies and Mind*, 6(2), 84–101.

Coëgnarts, M., & Kravanja, P. (Eds.). (2015). *Embodied cognition and cinema*. Leuven University Press.

Cowan, P. (2019). Aesthetic elements of the cinematographic image. *Cinematography in Progress*. Retrieved from https://cinematographyinprogress.com/index.php/cito/article/view/27.

Cowan, P. (2022). *Authorship and aesthetics in the cinematography of Gregg Toland*. Rowman & Littlefield.

Dewey, J. (1934). *Art as experience*. Southern Illinois University Press.

Dewey, J. (1938). *Experience and education*. New York: Simon & Schuster Inc.

Dillard, J. P. (2020). Currents in the study of persuasion. In M. B. Oliver, A. A. Raney, & J. Bryant (Eds.), *Media effects: Advances in theory and research* (4th ed., pp. 115–129). Routledge.

Garratt, P. (Ed.) (2016). The cognitive humanities: Embodied mind in literature and culture. Palgrave Macmillan.

Gibbs, R. W. (2005). *Embodiment and cognitive science*. Cambridge University Press.

Gibson, J. J. (1979). *The ecological approach to visual perception*. Psychology press.

Golomb, C. (1993). Rudolf Arnheim and the psychology of child art. *Journal of Aesthetic Education*, 27(4), 11-29.

Golomb, C. (1999). Art and the young: The many faces of representation. *Visual Arts Research*, 25(1), 27-50.

Golomb, C. (2003). *The child's creation of a pictorial world*. Psychology Press.

Hay, D. B., Williams, D., Stahl, D., & Wingate, R. J. (2013). Using drawings of the brain cell to exhibit expertise in neuroscience: exploring the boundaries of experimental culture. *Science Education*, 97(3), 468-491.

Johnson, M. (2007). *The meaning of the body: Aesthetics of human understanding*. The University of Chicago Press.

Johnson, M. (2013). Identity, bodily meaning, and art. In Roald, T., & Lang, J. (Eds.). *Art and identity: Essays on the aesthetic creation of mind* (pp. 15-38). Rodopi.

Johnson, M. (2018). *The aesthetics of meaning and thought: The bodily roots of philosophy, science, morality, and art*. University of Chicago Press.

Jolley, R. P. (2009). *Children and pictures: Drawing and understanding*. John Wiley & Sons.

Kindler, A. M., & Darras, B. (1994). Artistic development in context: Emergence and development of pictorial imagery in the early childhood years. *Visual Arts Research*, 20(2), 1-13.

Kövecses, Z. (2003). *Metaphor and Emotion: Language, Culture, and Body in Human Feeling*. Cambridge University Press.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: the embodied mind and its challenge to western thought*. Basic Books.

Lotman, E. 2021. *Experiential heuristics in fiction film cinematography*. [Doctoral dissertation, Tallinn University]. Digar Repository. https://www.digar.ee/viewer/en/nlib-digar:914032/451544/page/1

Lotman, E., Mõttus, M., & Tikka, P. (2023). Cinematographers' perceptual professionalization from novices to experts: Observations from an eye-tracking case Study. *Baltic Screen Media Review*, 11(1), 172-197.

Lotman, Y, & Tsivian, Y. (1994). *Dialog s ekranom*. Alexandra.

Macrine, S. L., & Fugate, J. M. (2021). Translating embodied cognition for embodied learning in the classroom. *Frontiers in Education*, 6, 1-14.

Macrine, S. L., & Fugate, J. M. (Eds.). (2022). *Movement matters: How embodied cognition informs teaching and learning*. MIT Press.

Menary, R. (Ed.). (2010). *The extended mind*. Mit Press.

Milbrath, C. (1998). *Patterns of artistic development in children: Comparative studies of talent*. Cambridge University Press.

Nannicelli, T. (2024). Aesthetic education: A perceptual-cognitive model. *European Journal of Analytic Philosophy*, 20(2), 283-305.

Ortiz, M. J. (2011). Primary metaphors and monomodal visual metaphors. *Journal of Pragmatics*, 43(6), 1568-1580.

Ortiz, M. J. (2023). Embodied cinematography in Mr. Robot. Baltic Screen Media Review, 11(1), 84-105.

Pearlman, K, & Sutton, J. (2022). Reframing the director: Distributed creativity in filmmaking practice. In M. Hjort & T. Nannicelli (Eds.), *A Companion to Motion Pictures and Public Value* (pp. 86-105). John Wiley & Sons.

Pearlman, K. (2012). *Cutting rhythms: Shaping the film edit*. CRC Press.

Pearlman, K. (2016). *Cutting rhythms: Intuitive film editing*. 2nd ed. Focal Press.

Piaget, J. (1928). *Judgement and reasoning in the child*. Routledge.

Rostan, S. M. (1998). A study of the development of young artists: The emergence of on artistic and creative identity. *The Journal of Creative Behavior*, 32(4), 278-301.

Sarris, A. (1962). Notes on the auteur theory. *Film Culture*, 27, 1-18.

Schaefer-Simmern, H. (1948). *The Unfolding of Artistic Activity: Its Basis, Processes, and Implications*. University of California Press.

Seth, A. (2021). *Being you: A new Science of consciousness*. Faber & Faber.

Tversky, B. (2019). *Mind in motion: How action shapes thought*. Basic Books.

Van Hulle, D. (2015). *Modern manuscripts: The extended mind and creative undoing from Darwin to Beckett and beyond*. Bloomsbury.

Winner, E. (1993). Exceptional artistic development: The role of visual thinking. *Journal of Aesthetic Education*, 27(4), 31-44.