

Children's creative thinking abilities and social orientations in Finnish early childhood education and care

Teemu Nikkola , Jyrki Reunamo & Inkeri Ruokonen

To cite this article: Teemu Nikkola , Jyrki Reunamo & Inkeri Ruokonen (2020): Children's creative thinking abilities and social orientations in Finnish early childhood education and care, Early Child Development and Care, DOI: [10.1080/03004430.2020.1813122](https://doi.org/10.1080/03004430.2020.1813122)

To link to this article: <https://doi.org/10.1080/03004430.2020.1813122>



© 2020 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 06 Sep 2020.



Submit your article to this journal [↗](#)






View related articles [↗](#)



View Crossmark data [↗](#)

Children's creative thinking abilities and social orientations in Finnish early childhood education and care

Teemu Nikkola ^a, Jyrki Reunamo ^a and Inkeri Ruokonen ^b

^aFaculty of Educational Sciences, University of Helsinki, Helsinki, Finland; ^bFaculty of Education, University of Turku, Rauma, Finland

ABSTRACT

The study presented in this article is part of a larger study called Progressive Feedback (blogs.helsinki.fi/orientate), which is an early childhood education and care (ECEC) research and development project. The aim of this article is to find out (a) how children's tested creative thinking abilities, fluency, originality and imagination correlated with children's social orientations in kindergarten and (b) how children's participative orientations occur in relation with the teacher and peers. The data consist of Reunamo's child interview tool and the Thinking Creatively in Action and Movement (TCAM) test. The data (280 children from 23 kindergartens and pre-primary schools) were gathered from two municipalities in southern Finland. The results show that the participative orientation was strongly connected with creative thinking abilities, but it was rare in social situations concerning adults. In participative orientation, children concern the situation and intend to change it.

ARTICLE HISTORY

Received 6 May 2020
Accepted 17 August 2020



KEYWORDS

Creative thinking ability; early childhood education; social orientations

Introduction

The purpose of this study is to understand how children's creative thinking abilities are connected with children's social orientations in everyday situations in Finnish early childhood education and care (ECEC). Creative thinking abilities can be considered both from the personal and environmental points of view. By connecting creativity with social orientations, we seek to clarify the concept of creativity and to highlight the social aspects of creativity in ECEC everyday activities. For studying children's creative abilities, we use the Thinking Creatively in Action and Movement (TCAM) test (Torrance, 1981), and for studying children's social aspects, we use Reunamo's interview tool (Cheng, Reunamo, Cooper, Liu, & Vong, 2015; Reunamo, 2007a).

Creativity is often considered a solution to present-day and future challenges (Leggett, 2017; NACCCE, 1999). Continuing change in the world is a state of affairs with which we have to live. Creativity is a strategy that is essential in adjusting to new circumstances (see Ershadi & Winner, 2020, p. 147; Sternberg, 2007; Vygotsky, 2004), and the importance of creativity is recognized as an essential twenty-first-century skill (Ahmadi & Besançon, 2017; Amponsah, Kwesib, & Ernestc, 2019; Kupers, Lehmann-Wermser, McPherson, & van Geert, 2019; Piirto, 2011). Historically, creative human beings have used, for example, stones and wood to develop tools to facilitate their living. In the present and future, digital technology is a more important tool for human beings to facilitate their living (Kumpulainen, Byman, Renlund, & Wong, 2020; Marsh et al., 2015).

CONTACT Teemu Nikkola  teemu.nikkola@helsinki.fi  Faculty of Educational Sciences, Department of Education, University of Helsinki, Siltavuorenpenger 10. P.O. Box 8, Helsinki FI-00014, Finland

© 2020 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

Creativity in ECEC

It is possible to promote creative attitudes and creative thinking in education. Fostering creativity should begin in ECEC (Cheung, 2012; Fasko, 2001; NACCCE, 1999, p. 11; Shaheen, 2010; Yates & Twigg, 2017). In ECEC, creativity has been an important goal but an under-researched area (Cheung, 2012; Feldman & Benjamin, 2006). Creativity has often been connected with arts and skills and play (see FNAE, 2018; NACCCE, 1999, p. 10; Prentice, 2000), but children also use their creative thinking abilities in everyday situations. For enhancing creative development and creative thinking abilities, creativity has to pass through the curriculum and through the whole day – not only in particular situations. In this article, we concentrate on the creativity of everyday activities in ECEC.

Creativity is considered important in ECEC for at least three reasons. Firstly, in early childhood, children's natural potential for creative thinking has been considered greater than when they are school age (Ershadi & Winner, 2020, p. 144). Children use and develop their creative potential in play, which is a natural component of children's everyday lives and a key practise in ECEC (Pramling Samuelsson & Asplund Carlsson; FNAE, 2018, p. 59). It is important to preserve and enhance children's creative potential so they can become creative adults (Duffy, 2006, p. 12; Yates & Twigg, 2017).

Secondly, creativity is an essential element of pedagogy in ECEC. Play and arts and skills, which are closely connected to creativity, have been in the core pedagogy in ECEC and an important part of its identity. Play and a playful environment are intertwined in many ways to creativity both empirically and theoretically. Vygotsky (2004) stated that play is the most authentic example of creativity. According to Amabile (1996, p. 102), an open or heuristic process, which is a prerequisite for creativity, can be described as play. The closed or algorithmic process, which is finding the shortest and safest path to the outcome, can be described as work. Play emphasizes the process and intrinsic motivation, and work emphasizes the result and extrinsic motivation.

Versatile working methods in ECEC, which are play, exploration, physical activity and arts and skills promote children's creativity, participation and learning. At the same time, they are processes that have an intrinsic value (FNAE, 2018, p. 58). A positive relationship has been proven between play and children's creativity (Holmes, Romeo, Ciraola, & Grushko, 2015; Russ, 2016; Russ & Dillon, 2011). Children's play promotes the affective and cognitive processes, which are critical in their creativity (Saracho, 2012, p. 18). According to Bateson (2014), the link of play to creativity and hence to innovation in humans is strong. Fostering creativity also enhances other competency and skills, such as language abilities (Holmes et al., 2015) and social skills (John, Cameron, & Bartel, 2016).

Thirdly, the most important point for the focus of this article is that, according to the Convention of the Rights on the Child, the children's perspectives have to be considered. This means that the educational process cannot be predetermined but is open for the agency and participation of children (Värri, 2002). In a playful operational culture, considering children's perspectives has been noticed to be easier (FNAE, 2018, p. 44). According to Tsai (2012), a playful environment provides appropriate stimulation and cultivates the risk-free learning environment needed for creativity. A playful environment has also been found to increase children's participation and agency (Cheng et al., 2015; Rajala, Kumpulainen, Rainio, Hilppö, & Lipponen, 2016). Pramling Samuelsson and Asplund Carlsson (2008) are connecting play, learning and creativity in their concept of the playing learning child. They argue that if children's perspectives are considered, learning is always playing learning and room for creativity is increased. Makerspaces are another example of the concept, which make room for creativity (Marsh et al., 2017).

Creativity in Finnish ECEC

The Finnish curriculum for ECEC (FNAE, 2018) lays the foundation for children's transversal competences and future skills. Transversal competence means an ability to apply learned values, knowledge, skills, attitudes or will for acting in a given situation. Thinking and learning, which are transversal skills that pass through the curriculum, are connected with creative thinking abilities. The role of ECEC is to

support children's thinking and learning skills. Structuring and creating new information requires creative thinking abilities, for which the foundation is set in ECEC. In everyday play and social situations, children have the opportunity to use creative thinking, do experiments together and explore the world. The community encourages everyone in ingenuity and using one's own expression and creativity.

From the viewpoint of enhancing creative thinking, Finnish ECEC includes several benefits. According to the directing documents of Finnish ECEC, typical characteristics are a holistic approach, children's participation and autonomy of personnel. According to the Act on Early Childhood Education and Care (540/2018), ECEC refers to 'a systematic and goal-oriented whole consisting of education, instruction and care with particular emphasis on pedagogy'. The purpose of the national steering of ECEC in Finland is to 'create equal preconditions for the holistic growth, development and learning of the children participating in early childhood education and care' (FNAE, 2018, p. 8). A child's individual ECEC plan plays a central role in the Finnish ECEC curriculum. The basis for the plan is the interest and needs of the child. The objectives set out in the plan concern pedagogical activities – not the child (FNAE, 2018, p. 14). According to Salminen (2017), personnel in Finnish ECEC have a high degree of autonomy in choosing how to implement the daily pedagogy along the national core curriculum.

Guidelines and recommendations for evaluating the quality of ECEC (Vlasov et al., 2019) lays the foundation for the evaluation of the structure and content of ECEC both at the national and local level in Finnish ECEC. The document includes self-evaluation and enhancement-led evaluation of personnel and organizations, which stress that the evaluation is carried out to develop the organization's own activities and not for the benefit of an external evaluator or some other actor.

The definitions of creativity and creative thinking ability

Creativity is a broad concept, and it has been difficult to define in academic research. The concept of creativity has been examined from both process and product perspectives. In ECEC, the creative process has been more in focus than the product (Reunamo et al., 2014).

An often-used product perspective definition (Prentice, 2000) states that the creative product has to be both new or original and appropriate or valued (Runco & Jaeger, 2012). The novelty or *originality* of a creative product can be in relation to previous efforts, the context of a peer group or the context of the whole world in some field (NACCCE, 1999, p. 32; Prentice, 2000). According to Kudryavtsev (2011), a creative product or process can be a discovery for oneself or for others. Capital C and small c have been used to describe creativity as a phenomenon, which is possible only for a few people (capital C) or almost everyone (small c) (Kaufman & Beghetto, 2009). In ECEC, it is reasonable to consider creativity as new for a child or peers. When a child is learning something for the first time, the process can be defined as creative (Kaufman & Beghetto, 2009; Runco, 2003; Torrance, 1977, p. 7; Vygotsky, 2004).

According to Csikszentmihalyi (1997), people who are working in a certain domain are evaluating creative products. In ECEC, teachers and peers are judging the appropriateness or value of creative products (see Kalliala, 2008, p. 61). For example, during play, socially skilful children know how to use toys or develop the play in interesting and understandable ways (Uren & Stagnitti, 2009). Ideas that are too original might be rejected by peers (Torrance, 1963, p. 119). The educational culture of ECEC is socially constructed (see Dahlberg, Moss, & Pence, 2007; Gergen, 2009). Children learn how they are expected to behave even without any rules defined (Kalliala, 2008, p. 61; Rutanen, 2009, pp. 225–226).

In ECEC, the standard definition of creativity includes a tension between the child and the environment. Children will take risks that their ideas might not be accepted or understood by peers and teachers (see Sternberg, 2006). If new ideas are not accepted by teachers, the reason may be the security of the children, but it may also be the security of the teachers (see Prentice, 2000; Torrance, 1963, pp. 10–11). According to Ershadi and Winner (2020, p. 146), external pressure to think and behave according to conventions may diminish children's creative potential.

Autonomy and control in creativity

Creativity and education have had an ambivalent relationship. Creativity has not always been a hoped-for phenomenon in education (Torrance, 1963, pp. 10–11). New creative acts break the routines, and unforeseeable elements make the situations difficult to control (see Alasuutari, 2007, p. 51; Prentice, 2000; Rainio, 2008). An open process is more difficult to control than a closed or pre-determined process (see Amabile, 1996; Reunamo, 2007a; Reunamo, Saros, & Ruismäki, 2012). Security is important, and creativity causes uncertainty and discomfort (Torrance, 1963, pp. 10–11). According to Rainio (2008), there is a contradiction between agency and control in education.

According to Torrance (1963, p. 25), the dichotomy of work and play has been typical in Western culture. This dichotomy has hampered the status of creativity in education (Prentice, 2000). Work is reasonable, disciplined and belongs to adulthood whereas play is frivolous, undisciplined and belongs to childhood (see Pramling Samuelsson & Asplund Carlsson, 2008; Prentice, 2000). Furthermore, academic skills are understood to develop better in a teacher-directed, academically oriented environment than in a child-centred, play-oriented environment (Cheng et al., 2015).

Creativity, as well as education, is an interaction between a person and the environment (Amabile, 1995, 1996). In a creative environment, enough autonomy and space are needed, but also structure is required (Davies et al., 2013). There should be balance between autonomy and control in all creative activities (Joubert, 2001, p. 30). Firstly, space and autonomy are needed to make decisions, but structure is needed for getting support (UN, 1989). Secondly, sufficient structure means that children's skills are appropriate to the tasks (Laevers, 1997). Both aspects are combined in a creative process, which can be described as 'flow' (Csikszentmihalyi, 2008). Flow tasks are not too difficult or too easy for a person's skills (Csikszentmihalyi, 1997). According to Laevers (1994, 1997), when a child is at the highest level of involvement, there is always creativity in the action, and the action takes place in the zone of proximal development (Vygotsky, 1978).

In this article, we are using children's social orientations to discuss autonomy and control in everyday situations in ECEC (Reunamo, 2007a). Social orientations in this article are children's different ways to act in everyday social situations in ECEC. Children's different ways to act are studied and analysed in this article with Reunamo's child interview instrument (Cheng et al., 2015). The Vygotskian and Piagetian theoretical background of the instrument is presented in early papers (Reunamo, 2007b). The instrument has been used, for example, to study children's role play (Reunamo et al., 2013), stress and cortisol levels (Reunamo, Sajaniemi, et al., 2012) and bullying situations in ECEC (Reunamo et al., 2015).

Methods

We present data that are part of a larger study called Progressive Feedback (blogs.helsinki.fi/orientate). Our data consist of child interviews and the TCAM test.

The research questions are:

- (1) How are children's tested creative thinking abilities, fluency, originality and imagination correlated with children's social orientations in kindergarten?
- (2) How are children's participative orientations related with teachers and peers?

Participants

Altogether, 280 children participated in the research in 23 kindergartens and preschools (for simplicity, we use the word kindergarten for all institutions in this article, even though the data include day care centres and preschool classes). Participating day care centres ($N = 23$) were municipal day care

centres in two municipalities in southern Finland. The participation of the centres was based on the staff's decision to participate; thus, convenience sampling was used in this study.

Teachers interviewed children and organized the TCAM test between January and May 2015. The age range of the children in the groups was 13–83 ($M = 65.74$, $SD = 15.00$) months. No age data were reported for 23 (8.2%) children. The participants included 138 (50.0%) boys and 138 (50.0%) girls. No gender data were reported for four (1.4%) children. Special needs were reported for 29 children (10.4%). No special needs data were reported for 29 (10.4%) children.

Torrance's TCAM creativity test

This article focuses on creative thinking, which is assessed through the TCAM test. It consists of the behavioural observations of four different tasks. The TCAM test defines the creative thinking abilities, *fluency*, *originality* and *imagination*, as increasing a person's chance to act creatively (Torrance, 1965, 1981). The TCAM test assumes that divergent thinking is predicting creativity (An, Song, & Carr, 2016; Runco & Acar, 2012). Divergent thinking is not the same as creative thinking, but it can be considered an indicator of potential creative thinking. Usually divergent thinking tests include *fluency*, *originality*, flexibility and elaboration (Runco & Acar, 2012). According to Guilford (1968, as cited in Hoffmann & Russ, 2016), divergent thinking is the ability to generate a variety of ideas and associations for a problem. Divergent thinking is related to the potential for creative thought (Runco, 1993). Creative abilities are possible to transfer from one domain to another (see Amabile, 1996). For example, in play, children are developing their creative abilities and divergent thinking, which they can utilize in any creative process (Russ, 2016; Russ & Dillon, 2011). The ability to think divergently in childhood also predicts creativity in adulthood (Russ & Wallace, 2013). In this study, we are examining how children's social orientations are connected with children's creative abilities. Because creativity is an interaction between a person and environment, we will discuss the role of children's creative thinking abilities and environment in children's orientations.

Torrance's TCAM test is a classic test of early childhood creative thinking in action and movement. Even though it is not a new test, according to Zachopoulou, Makri, and Pollatou (2009), it is still a valid and reliable instrument to measure creative movement in preschool children. In the TCAM test, the environment and tasks are considered in the test instructions. According to Torrance (1981, pp. 2–3), there are four important issues to consider when measuring the creativity of preschool children. Firstly, moving is a more appropriate way for preschool children to be creative than, for example, writing or verbal answers. Secondly, there should be a warm up and motivating procedure. Thirdly, tasks should make sense to children and are important in the lives of children. Fourthly, tests should be easy to administer and score, and they should be natural to experiences of children and not take too much time.

According to Kim (2007, pp. 134–135), the TCAM test is in widespread and worldwide use because it has good reliability, has proven validity, is easy to use and is neutral to a wide variety of factors such as gender, race, community status, language and culture. There are also critiques to awaken the divergent thinking approach and TCAM. Creative abilities are not merely affecting creativity but also the environment and motivation (Amabile, 1996). TCAM has not updated either since 1981, which has an impact on the *originality* table (Kim, 2007, p. 134). According to Kim (2007), TCAM test scores have shown significant positive relationships with other creative characteristics. Scores have also had significant relationships to children's home environment and parenting styles that allow greater autonomy to a child. There are weaker relationships between IQ tests and TCAM scores, which shows that TCAM is not measuring general mental capacity but creative thinking skills (Kim, 2007, pp. 132–135).

In the TCAM test there are three activities that measure *fluency* and *originality*. In Activity 1 (How many ways?), children are asked to move from a yellow line to a red line using as many ways as they can invent. In Activity 3 (What other ways?), the child is asked to put a paper juice cup in the waste basket using as many ways as they can imagine. In Activity 4 (What might it be?), the child is asked to imagine how many different things they can do with the paper cup. *Fluency* is measured by counting

different things or ways the children will produce. *Originality* is measured by scoring 0–3 points to responses that the children will produce.

Activity 2 (Can you move like?) is designed to sample the child's ability to imagine. There were six tasks where children were asked to pretend to:

- move like a tree in the wind
- hop like a rabbit that is being chased by somebody
- swim like a fish in the river
- crawl like a snake in the grass
- drive a car on the highway
- push an elephant that is standing on something she or he wants.

Imagination was measured using the Likert scale, where 1 means no movement, 3 is adequate and 5 is excellent.

A total of 280 children participated in the TCAM test, and 235 children achieved results that were possible to standardize according to Torrance. The standardizing is made for 3–6-year-old children, and minimum and maximum points are demanded for standardizing (Torrance, 1981). The data have been converted from raw score to standard score in every age group using a table that was developed by Torrance. The total score (*creativity test score*) has been obtained by finding the average of *fluency*, *originality* and *imagination* scores.

Children's social orientations (interview)

Reunamós interview and analysis tool (2007a; Cheng et al., 2015) was used to study children's social orientations in everyday situations in ECEC. A set of pictures that cover 15 everyday situations in ECEC were used in the interview. The pictures were presented to the participants, and then they were asked to tell the interviewer their responses. Two examples of the 15 situations are (Figure 1):

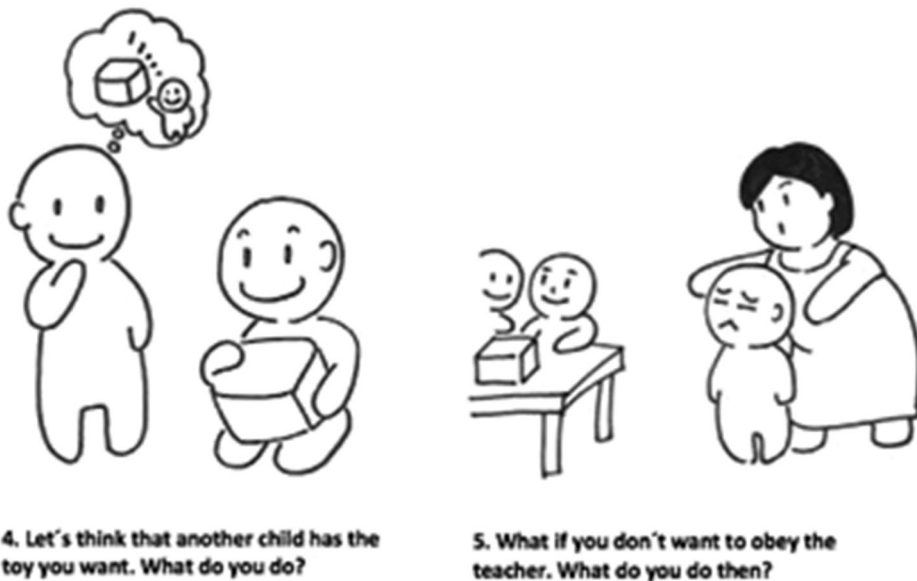


Figure 1. Examples of interview questions from Reunamo's (2007a) instrument.

- Lets think that another child has the toy you want. What do you do?
- What if you don't want to obey the teacher? What do you do then?

The teachers of the children's own group interviewed the children and wrote down their answers. The researcher analysed the answers and numbered them according to social orientations (*adaptive* = 1, *participative* = 2, *dominant* = 3, *withdrawn* = 4, *uncertain* = 5 and *unclear* = 6). The number of answers in each category was used in the correlations with the creativity test results.

In *adaptive* orientation, children are open to the situation but do not change it. In *participative* orientation, children are open to the situation and work to change it. In *dominant* orientation, children do not consider the situation openly but still change it. In *withdrawn* orientation, children do not process the situation openly, and they do not try to change it. The questions and children's classified answers with examples are described in the results section.

Analysis and reliability

Quantitative analyses of the connections between the parts of the TCAM test and children's social orientations were conducted using IBM SPSS Statistics. The reliability of the three items of the TCAM (the standard scores of *fluency*, *originality* and *imagination*) was .840 (Cronbach's alpha), which means that the three items describe the same phenomenon (creativity) well enough. The mean of the standard scores of *fluency*, *originality* and *imagination* were also analysed (*creativity total score*).

The standardized scores of *fluency*, *originality* and *imagination* correlated with children's age (*creativity total score* -.303, *imagination* -.240, *originality* -.268 and *fluency* -.284). The children's answers correlated with children's age [*adaptive* (.225) and *participative* (.428) correlated positively and *withdrawn* (-.398) and *unclear* (-.315) correlated negatively with children's age]. This indicates that children's age may be an intermediate variable when studying the correlations between test scores and children's social orientations. To prevent age being an intermediate variable, we use partial correlations to control age. The TCAM test was translated and edited in Finnish by one of the authors of the article. The TCAM was organized by the teachers but scored by the researcher according to written results – for example, 'running' in Activity 1. The only exception was Activity 2, which was organized and scored by the teachers. The interviews were organized by the teachers and scored by the researchers. Teachers were trained for the interview and for the TCAM by researchers.

Kindergarten teachers organized the TCAM for the children of their own group in their own day care, so the organizer and the space where the test was organized were familiar to the children. Only the task was new to the children. Torrance (1981, p. 12) emphasizes the importance of a sufficient warm up. On the other hand, the ability to handle unstable conditions is one of the essential abilities of creative acts. The reliability between researchers was not studied in this research; however, in earlier TCAM research, the reliability was high between researchers (.89–.91) (Ourda, Gregoriadis, Mouratidou, Grouios, & Tsorbatzoudis, 2017; Zachopoulou et al., 2009). The reliability of children's social orientations between researchers was .797 in question 4 and .746 in question 5 (Cohen's Kappa, $p < .0005$).

Ethics

The training for administering the interviews and TCAM test included aspects of respecting children's rights and feelings. The consent forms for the children to participate in the research were collected from the parents and guardians. The children's names, birthdates, social security numbers and other data making the identification of the child possible were not collected. Neither the personal information of the parents nor the teachers were collected. Each child and child group received a number that was used on the child interviews and the TCAM. The research data do not create an

identifiable register of the research participants. The participating staff received feedback on the group activities to help them enhance their work with the children. This feedback did not include any identifiable data. The results of the TCAM and its connections to the other parts of the project were also introduced and discussed.

Results

The TCAM test

The results of the TCAM test include three creative thinking abilities: *imagination*, *fluency* and *originality*. The mean of the parts of the test can be calculated resulting in the creativity thinking measure. The mean of the test should be 100 and standard deviation 20. The results show that the test was carried out successfully (Table 1).

The creative thinking abilities were studied together (Table 2). *Fluency* and *originality* correlated highly with the whole. *Imagination* differed from other creative abilities and did not add to the test reliability. However, the internal consistency of creative abilities was found to be high. Because of this ambivalence, both the total score and individual abilities were included in the analysis.

Creative thinking abilities and social orientations

Creative thinking abilities and children's social orientations were studied with correlations. The results showed that creative abilities had statistically significant correlations mainly with *participative* and *unclear* answers. The strongest correlations were between *imagination* scores and the number of *participative* answers ($r = .357, p < .0005, N = 234$). This means that children's abilities to act in a highly imaginative way in given roles (*imagination*) correlated positively with children's open and changing ways of relating to situations (*participation*).

Imagination scores correlated negatively with the number of *unclear* answers to the presented 15 questions ($r = -.213, p < .0005, N = 234$) (Table 3). To be classified as *unclear*, children's answers did not provide enough information to be classified according to the criteria of openness and change in the situation.

Imagination scores correlated negatively with the number of *uncertain* answers ($r = -.200, p = .002, N = 234$). Children's answers were classified as *uncertain* if the children answered that they did not know what to do in the situation. In other words, children's *imagination* correlated negatively with the ability to explain their actions in relation to openness.

The mean score, including *imagination*, *originality* and *fluency*, of the creative thinking abilities (*creativity test score*) had a statistically significant correlation with the number of answers classified as *participative orientation* ($r = .237, p < .0005, N = 234$). To put it another way, the overall *creativity test score* correlated positively with children including both open and changing answers in the kindergarten contexts. Overall creative thinking abilities correlated positively with participatory shared creation.

The total test score of *creativity* correlated negatively with the number of *unclear* answers ($r = -0.169, p = 0.009, N = 234$). In other words, *creativity* correlated negatively with the ability to express oneself regarding personal and environmental change.

Table 1. The means, medians and standard deviations of the test items.

| | N | Mean | Median | Std. Deviation |
|----------------------------|-----|--------|--------|----------------|
| Std. creativity test score | 234 | 98.08 | 95.33 | 16.81 |
| Std. imagination | 234 | 96.46 | 97 | 17.11 |
| Std. fluency | 234 | 97.19 | 93 | 20.65 |
| Std. originality | 234 | 100.55 | 96 | 20.27 |

Table 2. Reliability of the TCAM test.

| | Scale mean if item deleted | Scale variance if item deleted | Corrected item-total correlation | Cronbach's alpha if item deleted |
|------------------|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| Std. imagination | 197.73 | 1617.298 | .463 | .965 |
| Std. originality | 193.65 | 1059.117 | .817 | .642 |
| Std. fluency | 197.02 | 1001.090 | .857 | .594 |

Table 3. The correlations between creative thinking abilities and social orientations ($N = 234$).

| | | Adaptive | Participative | Dominant | Withdraw | Uncertain | Unclear |
|-------------|------|----------|---------------|----------|----------|-----------|---------|
| Creativity | Cor. | .005 | .237 | .014 | .057 | -.126 | -.169 |
| | Sig. | .944 | < .0005 | .829 | .386 | .053 | .009 |
| Imagination | Cor. | .032 | .357 | .049 | -.017 | -.200 | -.213 |
| | Sig. | .623 | < .0005 | .455 | .795 | .002 | .001 |
| Originality | Cor. | -.008 | .117 | -.012 | .095 | -.074 | -.090 |
| | Sig. | .905 | .073 | .849 | .145 | .260 | .168 |
| Fluency | Cor. | -.010 | .163 | .005 | .058 | -.066 | -.143 |
| | Sig. | .877 | .012 | .941 | .373 | .310 | .028 |

The largest correlation was between *imagination* and *participative*; that is, *imagination* in given roles and the number of answers with both openness and change in the same answer. In other words, acting imaginatively (like a tree, rabbit, fish, snake, car or elephant) correlated positively with the number of options provided to work out new solutions together. Typical *participative* answers to the question 'If another child has the toy you want, what do you do?' are:

- I would ask, may I play with it?
- Can we take turns playing?
- I ask, can we play together?
- I will suggest take my toy
- I would say, I want to play a moment

Typical *participative* answers to the question "What if you don't want to obey the teacher. What do you do then?" are:

- I would say, 'I want to play for a moment'.
- I tell her about my opinion.
- I will ask if I need to do this.
- Well I will answer that now I would not want to do this.
- I ask for the permission.

The *unclear* answers had a statistically significant negative correlation with the creative thinking abilities, with the exception of *originality*. *Unclear* answers are answers that are not possible to categorize into any social orientations or *uncertain* answers. In *unclear* answers, children are not answering the question but telling something else. Often children connect the question with a situation with no relation with the question. *Unclear* answers to the question 'If a friend will not play with you, what do you do?' are:

- I want to draw, too.
- I put my hand down.
- I remember nothing.
- I don't want to know.
- It has never taken place.

In the first of these answers, a drawing situation has for some reason connected with the situation where the child has had a possibility to participate in play. The answer 'I put my hand down' refers to a situation where it is unclear how putting a hand down is related to playing together.

In this study, creative thinking abilities, *fluency*, *originality* and *imagination*, were studied in movement and action. According to this study, children's divergent thinking, creative abilities measured in movement and action and *participative* orientation measured with the interview tool correlated positively with each other. Because social orientation adds an interactive and environmental dimension to creativity, we next look more closely at *participative* orientation, which had the strongest positive correlation with *imagination* and *the total score of creativity*.

Participative orientation in a situation concerning peers and adults

Participative orientation had the strongest connection with creative thinking abilities. The social situations in interviews were concerning both other children and adults. The questions concerning adults were:

- What if you don't want to obey the teacher? What do you do then?
- If the teacher gives orders you do not like, what do you do?

The questions concerning other children were:

- Let's think that another child has the toy you want. What do you do?
- If the other children do not include you in the play, what do you do?
- When you are playing a game with somebody and the other does not follow the rules, what do you do?
- If somebody comes to disturb and tease you, what do you do?
- If the other children make suggestions you do not like, what do you do?

Next, we will study how children's social orientations relate to situations concerning peers or adults (Figure 2). Only a few children were *participative* in the situations concerning adults (6%). On the other hand, *participative* answers were common to the questions concerning other children (59%). To the question, 'What if you don't want to obey the teacher? What do you do then?', *participative* answers were, for example:

- I ask, do I have to do this?
- I speak to him about my opinion.

This result showed that children know what the rules of ECEC centres are. It may be difficult to achieve changes in the situation when there is a contradiction between agency and control in education (Rainio, 2008). The conflict situations in ECEC concerning teachers are not likely to be considered creatively. Especially in situations concerning teachers, *participative* orientation may describe the difficulty to find a solution.

Discussion

In our research questions, we wanted to know how children's tested creative thinking abilities were connected with children's social orientations acquired by interviewing children. We were especially interested in *participative* orientation. *Participative* orientation was strongly connected with creative thinking abilities, but it was rare in social situations concerning adults. The questions were modelling conflict situations in ECEC; therefore, it is not the whole picture of interaction between adults and

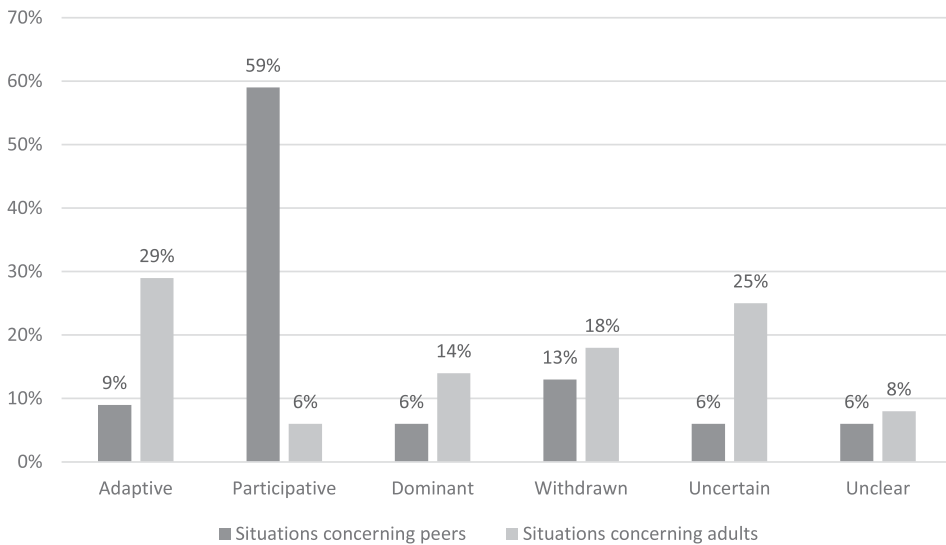


Figure 2. Social orientations in situations concerning peers or adults.

children in ECEC. *Participative* orientation is easier with peers than with adults (see Rajala et al., 2016), but it is also a process that is possible to develop. *Participative* orientation has been shown to be more common in preschools focused on play than in academically focused preschools (Cheng et al., 2015). The educational culture in ECEC is also essentially defining what children are expected to do in social situations and what is not worth trying (see Sternberg, 2006).

In the introduction of this article, we stated creative thinking is a strategy that is essential in present and future challenges. Old solutions are not valid when the environment is changing. Education has been a part of the solutions but, at the same time, a part of the problem. The solution to the changing situation has sometimes been to hold on to the old and familiar traditions in education (see Alasuutari, 2007, p. 51). A certain control of the situation is a prerequisite for education, but if the control is an intrinsic value, there is little space for creativity. It is possible to promote a creative attitude and creative thinking skills in education (Cheung, 2012; Fasko, 2001; NACCCE, 1999; Shaheen, 2010). The sufficient structure and control in educational situations depend on the objectives. Are the structures for fostering children's participation or to keep the teaching frames intact?

According to the United Nations Convention on the Rights of the Child (UN, 1989), the perspective of children has to take account for ECEC. Hence, an educational process should be open and not predetermined (see Amabile, 1996; Värri, 2002). According to Värri (2002), in dialogic education, the child's perspective is always considered. The reasoning for the teachers' actions has to be found repeatedly. In functional education, a child is only adapting to the given situation. According to Värri (2002), functional education cannot be defined as education; it is only adapting. If being defined as ethical, an educational process cannot be predetermined; it has to be open. A teacher has to be ready to change his or her plan. If the perspective of the child is considered, the path will not be predetermined. In social orientations, the kind of situation might occur when both the teachers' and child's views are open and changing. In other words, both change a shared situation.

If not studied directly in social situations, creativity is mentioned as a precondition or way to consider children's views. Children's agency-teacher control contradiction can be solved creatively (Rajala et al., 2016). Amabile (1996) definition of the creative process as play can be detected to find some support. According to Rainio (2008), play world pedagogy will create a dialogic space where it is possible to overcome the contradiction between agency and control. Cheng et al. (2015) have also shown that play-oriented, child-centred preschools had more *participative* orientations and less uncertain

orientations than academically oriented, teacher-directed preschools. Maybe we should be more aware of the work-play dichotomy in the educational culture of ECEC? Do our processes have to be so straightforward that there are no possibilities for alternative ways to search?

Education in ECEC institutions can be seen as searching for a balance between autonomy and control. What are the objectives of education in ECEC institutions? The creative process as play emphasizes the process. The closed process as work emphasizes the product. To have the courage to be creative, the environment needs to be safe, warm and accepting.

In *participative* orientation, children concern the situation and intend to change it. The strategy highlights contact with others' and children's agency. In *participation*, children learn to build the future while at the same time considering others.

The perspective of creativity is important both from the personal and environmental points of view. In this article, creativity includes all kinds of everyday activities in kindergarten – not just arts or planned creativity. The personal aspects of creativity highlight the importance of valuing children's creative efforts, even though the act may have been created by others previously. The environmental aspects of creativity highlight the importance of children participating in the creation of both the curriculum content and educational conduct.

The limits of the research include that the data were collected only in Finland and may not be generalizable to other countries. In this article, we have studied the correlations between two instruments related to creative thinking abilities, a test and an interview, but we do not consider children's observed activities in relation to either of the instruments, which means that the results are related to only two measures and not on children's actual everyday creative behaviour. For the sake of space limitations, we needed to save those results for another article. However, because the tests were not related to each other and classifications for both tests were done without access to the identity of the child, the two tests are independent. Thus, the correlations need to have a real-world connection between them. This adds up to the criterion validity of the results.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Teemu Nikkola is a master of education whose doctoral studies are a part of the early childhood education research and development project Progressive feedback. His main interest is children's creativity in early childhood education. He is working as a day-care centre director in Hyvinkää, Finland.

Jyrki Reunamo is a principal investigator and university lecturer at the Faculty of Educational Sciences, University of Helsinki. He is the principal investigator in the early childhood education research and development project Progressive feedback (blogs.helsinki.fi/orientate).

Professor of Early Childhood Education **Inkeri Ruokonen** is working as a vice dean in Faculty of Education, University of Turku. She is a Doctor of Education, (University of Helsinki, 2005), music teacher (1987, Sibelius Academy) and a licentiate of music education, (Sibelius Academy, 1998), she has a title of Docent in music education (University of Helsinki, 2010). Inkeri Ruokonen has worked as a Director of Master Program in Educational Sciences (2016-2019) in University of Helsinki, where she has worked as a teacher educator from 1995. She is a member of Helsinki University Teachers Academy. Her main research interests are early childhood education, music education, teacher education, arts pedagogy, learning environments, early giftedness, intercultural arts education and creative thinking. She has published over 160 scientific articles and edited several scientific journals and books.

ORCID

Teemu Nikkola  <http://orcid.org/0000-0002-0253-6170>

Jyrki Reunamo  <http://orcid.org/0000-0002-4605-8000>

Inkeri Ruokonen  <http://orcid.org/0000-0003-0190-3378>

References

- Act on Early Childhood Education and Care. (540/2018). Ministry of Education and Culture. Finland.
- Ahmadi, N., & Besançon, M. (2017). Creativity as a stepping stone towards developing other competencies in classrooms. *Education Research International*, 2017, 1357456. doi:10.1155/2017/1357456
- Alasuutari, P. (2007). *Yhteiskuntateoria ja inhimillinen todellisuus* [Social theory and human reality]. Helsinki: Gaudeamuskirja.
- Amabile, T. (1996). *Creativity in context. Update to the social psychology of creativity*. Boulder, CO: Westview Press.
- Amabile, T. M. (1995). Attributions of creativity - what are the consequences? *Creativity Research Journal*, 8(4), 423–426.
- Amponsah, S., Kwesib, A. K., & Ernestc, A. (2019). Lin's creative pedagogy framework as a strategy for fostering creative learning in Ghanaian schools. *Thinking Skills and Creativity*, 31, 11–18.
- An, D., Song, Y., & Carr, M. (2016). A comparison of two models of creativity: Divergent thinking and creative expert performance. *Personality and Individual Differences*, 90, 78–84.
- Bateson, P. (2014). Play, playfulness, creativity and innovation. *Animal Behavior and Cognition*, 1(2), 99–112.
- Cheng, D., Reunamo, J., Cooper, P., Liu, K., & Vong, K. P. (2015). Children's agentic orientations in play-based and academically focused preschools in Hong Kong. *Early Child Development and Care*, 11–12(185), 1828–1844. doi:10.1080/03004430.2015.1028400
- Cheung, R. H. P. (2012). Teaching for creativity: Examining the beliefs of early childhood teachers and their influence on teaching practices. *Australasian Journal of Early Childhood*, 37(3), 43–51.
- Csikszentmihalyi, M. (1997). *Creativity. Flow and psychology of discovery and invention*. New York, NY: Harper Perennial.
- Csikszentmihalyi, M. (2008). *Flow – The psychology of optimal experience*. New York, NY: HarperCollins.
- Dahlberg, G., Moss, P., & Pence, A. (2007). *Beyond quality in early childhood education and care: Languages of evaluation*. London: Routledge.
- Davies, D., Jindal-Snape, D., Colliera, C., Digby, R., Haya, P., & Howe, A. (2013). Creative learning environments in education—A systematic literature review. *Thinking Skills and Creativity*, 8, 80–91.
- Duffy, B. (2006). *Supporting creativity and imagination in the early years* (2nd ed.). Maidenhead: Open University Press.
- Ershadi, M., & Winner, E. (2020). Children's creativity. In M. A. Runco & S. R. Pritzker (Eds.), *Encyclopedia of creativity* (Vol. 1, pp. 144–147). London: Academic Press.
- Fasko, D. (2001). Education and creativity. *Creativity Research Journal*, 13(3–4), 317–327.
- Feldman, D., & Benjamin, A. (2006). Creativity and education: An American retrospective. *Cambridge Journal of Education*, 36(3), 319–336.
- FNAE. (2018). *National core curriculum for early childhood education and care 2018*. Regulations and guidelines 2018:3c. Helsinki: Author.
- Gergen, K. J. (2009). *An invitation to social construction* (2nd ed.). London: Sage.
- Guilford, J. P. (1968). *Intelligence, creativity and their educational implications*. San Diego, CA: Knapp.
- Hoffmann, J. D., & Russ, S. W. (2016). Fostering pretend play skills and creativity in elementary school girls: A group play intervention. *Psychology of Aesthetics, Creativity, and the Arts*, 10(1), 114–125. doi:10.1037/aca0000039
- Holmes, R. M., Romeo, L., Ciraola, S., & Grushko, M. (2015). The relationship between creativity, social play, and children's language abilities. *Early Child Development and Care*, 185(7), 1180–1197.
- John, B. A., Cameron, L., & Bartel, L. (2016). Creative musical play: An innovative approach to early childhood music education in an urban community school of music. *Action, Criticism, and Theory for Music Education*, 15(3), 21–36.
- Joubert, M. M. (2001). The art of creative teaching: Nacce and beyond. In A. Craft, B. Jeffrey, & M. Leibling (Eds.), *Creativity in education* (pp. 17–34). Bloomsbury: A&C Black.
- Kalliala, M. (2008). *Kato mua! kohtaako aikuinen lapsen päiväkodissa?* [Look at me! Does the adult truly see and respond to the child in Finnish day-care centres?]. Helsinki: Gaudeamus.
- Kaufman, J. C., & Beghetto, R. A. (2009). Beyond big and little: The four C model of creativity. *Review of General Psychology*, 13(1), 1–12.
- Kim, K. H. (2007). The two Torrance creativity tests: The Torrance tests of creative thinking and thinking creatively in action and movement. In A. G. Tan (Ed.), *Creativity: A handbook for teachers* (pp. 117–141). Singapore: World Scientific.
- Kudryavtsev, V. (2011). The phenomenon of child creativity. *International Journal of Early Years Education*, 19(1), 45–53.
- Kumpulainen, K., Byman, J., Renlund, J., & Wong, C. (2020). Children's augmented storying in, with and for nature. *Education Sciences*, 10(6), 149.
- Kupers, E., Lehmann-Wermser, A., McPherson, G., & van Geert, P. (2019). Children's creativity: A theoretical framework and systematic review. *Review of Educational Research February*, 89(1), 93–124.
- Laevers, F. (1994). The innovative project experiential education and the definition of quality in education. In F. Laevers (Ed.), *Defining and assessing quality in early childhood education* (pp. 159–174). Leuven: Leuven University Press.
- Laevers, F. (1997). *Toimintaan sitoutuneisuuden arviointiasteikko leikki-ikäisille lapsille. Käsikirja* [The Leuven Involvement Scale for Young Children, LIS-YC]. Studia Pedagogica. Helsinki: Koulutuksen arviointipalvelut, Helsingin yliopisto.
- Leggett, N. (2017). Early childhood creativity: Challenging educators in their role to intentionally develop creative thinking in children. *Early Childhood Education Journal*, 45(6), 845–853.

- Marsh, J., Kumpulainen, K., Nisha, B., Velicu, A., Blum-Ross, A., Hyatt, D., ... Thorsteinsson, G. (2017). *Makerspaces in the early years: A literature review*. University of Sheffield: MakeY Project.
- Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J. C., Lahmar, J., Scott, F., ... Winter, P. (2015). *Exploring play and creativity in pre-schoolers' use of apps: Final project report*. Retrieved from www.techandplay.org
- National Advisory Committee on Creative and Cultural Education (NACCCE). (1999). *All our futures: Creativity, culture and education*. London: Department for Education and Employment.
- Ourda, D., Gregoriadis, A., Mouratidou, K., Grouios, G., & Tsozbatzoudis, H. (2017). Motor creativity intervention in the Greek early childhood education settings: Effects on beliefs about health. *Journal of Early Childhood Education Research*, 6(1), 22–42.
- Piirto, J. (2011). *Creativity for 21st century skills. How to embed creativity into the curriculum*. Rotterdam: Sense Publisher.
- Pramling Samuelsson, I., & Asplund Carlsson, M. (2008). The playing learning child: Towards a pedagogy of early childhood. *Scandinavian Journal of Educational Research*, 52(6), 623–641.
- Prentice, R. (2000). Creativity: A reaffirmation of its place in early childhood education. *The Curriculum Journal*, 11(2), 145–158.
- Rainio, A. (2008). From resistance to involvement: Examining agency and control in a playworld activity. *Mind, Culture, and Activity*, 15(2), 115–140.
- Rajala, A., Kumpulainen, K., Rainio, A. P., Hilppö, J., & Lipponen, L. (2016). Dealing with the contradiction of agency and control during dialogic teaching. *Learning, Culture and Social Interaction*, 10, 17–26.
- Reunamo, J. (2007a). Adaptation and agency in early childhood education. *European Early Childhood Education Research Journal*, 15(3), 365–377.
- Reunamo, J. (2007b). *Tasapainoinen varhaiskasvatus* [A balanced early childhood education, in Finnish]. Helsinki: WSOY.
- Reunamo, J., Lee, H.-C., Wang, L.-C., Ruokonen, I., Nikkola, T., & Malmström, S. (2014). Children's creativity in day care. *Early Child Development and Care*, 184(4), 617–632.
- Reunamo, J., Sajaniemi, N., Suhonen, E., & Kontu, E. (2012). Cortisol levels and children's orientation in day care. *Early Child Development and Care*, 182, 363–382.
- Reunamo, J., Saros, L., & Ruismäki, H. (2012). The amount of physical activity in Finnish day care. *Procedia-Social and Behavioral Sciences*, 45, 501–506.
- Reunamo, J. T., Kalliomaa, M., Repo, L., Salminen, E., Lee, H.-C., & Wang, L.-C. (2015). Children's strategies in addressing bullying situations in day care and preschool. *Early Child Development and Care*, 185(6), 952–967.
- Reunamo, J. T., Lee, H.-C., Wu, R., Wang, L.-C., Mou, W.-Y., & Lin, C. J. (2013). Perceiving change in role play. *European Early Childhood Education and Research Journal*, 21(2), 292–305.
- Runco, M. A. (1993). Divergent thinking, creativity, and giftedness. *Gifted Child Quarterly*, 37(1), 16–22.
- Runco, M. A. (2003). Education for creative potential. *Scandinavian Journal of Educational Research*, 47(3), 317–324.
- Runco, M. A., & Acar, S. (2012). Divergent thinking as an indicator of creative potential. *Creativity Research Journal*, 24(1), 1–10. doi:10.1080/10400419.2012.65292
- Runco, M. A., & Jaeger, G. J. (2012). The standard definition of creativity. *Creativity Research Journal*, 24(1), 92–96.
- Russ, S. W. (2016). Pretend play: Antecedent of adult creativity. In B. Barbot (Ed.), *Perspectives on creativity development. New directions for child and adolescent development* (Vol. 151, pp. 21–32). San Francisco, CA: Wiley.
- Russ, S. W., & Dillon, J. A. (2011). Changes in children's pretend play over two decades. *Creativity Research Journal*, 23(4), 330–338.
- Russ, S. W., & Wallace, C. (2013). Pretend play and creative processes. *American Journal of Play*, 6(1), 136–148.
- Rutanen, N. (2009). Mitä On vapaaleikki? [What is free play?]. In K. Karila & L. Alanen (Eds.), *Lapsuus, lapsuuden instituutiot ja lasten toiminta [Childhood, institutions of childhood and children's action]* (pp. 207–226). Tampere: Vastapaino.
- Salminen, J. (2017). Early childhood education and care system in Finland. *nauki o Wychowaniu. Studia Interdyscyplinarne*, 2(5), 135–154.
- Saracho, O. N. (2012). Young children's creativity in different contexts. In O. N. Saracho (Ed.), *Contemporary perspectives on research on creativity in early childhood education* (pp. 3–27). Charlotte, NC: Information Age Publishing.
- Shaheen, R. (2010). Creativity and education. *Creative Education*, 1(03), 166–169.
- Sternberg, R. (2006). The nature of creativity. *Creativity Research Journal*, 18(1), 87–98.
- Sternberg, R. (2007). Creativity as a habit. In A.-G. Tan (Ed.), *Creativity a handbook for teachers* (pp. 3–25). Singapore: World Scientific Publishing.
- Torrance, E. P. (1963). *Education and the creative potential*. Minneapolis: The University of Minnesota Press.
- Torrance, E. P. (1965). Scientific views of creativity and factors affecting its growth. *Daedalus*, 94(3), 663–681.
- Torrance, E. P. (1977). *Creativity in the classroom: What research says to the teacher*. Washington, DC: National Education Association.
- Torrance, E. P. (1981). *Administration, scoring, and norms manual thinking creatively in action and movement*. Bensenville, IL: Scholastic Testing Service.
- Tsai, K. C. (2012). Play, imagination, and creativity: A brief literature review. *Journal of Education and Learning*, 2(1), 15–20.
- United Nations. (1989). *Convention of the rights of the child*. New York, NY: United Nations.
- Uren, N., & Stagnitti, K. (2009). Pretend play, social competence and involvement in children aged 5–7 years: The concurrent validity of the child-initiated pretend play assessment. *Australian Occupational Therapy Journal*, 56(1), 33–40.

- Värri, V.-M. (2002). *Hyvä kasvatus - kasvatus hyvään: Dialogisen kasvatuksen filosofinen tarkastelu erityisesti vanhemmuuden näkökulmasta* [Good education-education for good: Philosophical examination of Dialogic education especially from the point of view of parenthood]. Tampere: Tampere University Press.
- Vlasov, J., Salminen, J., Repo, L., Karila, K., Kinnunen, S., Mattila, V., ... Sulonen, H. (2019). *Guidelines and recommendations for evaluating the quality of early childhood education and care*. Finnish Education Evaluation Centre, Publications 5:2019. Helsinki: Finnish Education Evaluation Centre.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. London: Harvard University Press.
- Vygotsky, L. S. (2004). Imagination and creativity in childhood. *Journal of Russian and East European Psychology*, 42(1), 7–97.
- Yates, E., & Twigg, E. (2017). Developing creativity in early childhood studies students. *Thinking Skills and Creativity*, 23, 42–57.
- Zachopoulou, E., Makri, A., & Pollatou, E. (2009). Evaluation of children's creativity: Psychometric properties of Torrance's "thinking creatively in action and movement" test. *Early Child Development and Care*, 179(3), 317–328.