



CHILDREN'S DIFFICULTIES IN TRANSITION TO PRIMARY SCHOOL IN GREECE

Marina Besi¹ⁱ,

Maria Sakellariou²

¹PhD Candidate,
University of Ioannina,
Greece

²Professor,
University of Ioannina,
Greece

Abstract:

In recent years, extensive research has been carried out concerning the transition of children from pre-school to primary school. However, little has been done in Greece. The purpose of this paper is to record the opinions of Greek teachers regarding which children are to experience difficulties in their transition to the next educational level. The survey was carried out on a sample of 1,602 teachers from the entire Greek educational domain. The tool used was a questionnaire consisted of closed-ended questions. It was also analyzed how their responses varied according to their gender and job position. Teachers believe that children with behavioral problems, learning difficulties, low self-esteem and discipline problems in the classroom, are at greater risk of experiencing a difficult transition. On the contrary, they do not consider that the gender of the children, their age and the area they live in, have a significant impact on their transition from pre-school to primary school.

Keywords: school transition, pre-school, primary school, Greece

1. Introduction

The period during which the child transitions from pre-school to primary school is considered a crucial period of significant changes. The transition is a very complex process of change that does not refer to the fact that the child simply goes from one building (pre-school) to another (primary school). It requires an adaptation to a new peer group, a new role, a new teacher and new expectations (Margetts, 2004. Pianta &

ⁱ Correspondence: email marinabesi@gmail.com

Kraft-Sayre, 2003). For some researchers, the transition from pre-school to primary school is a necessary challenge for children, through which they will grow and learn to be more flexible, while others emphasize the continuity of their lives and their education (Einarsdottir, 2010). The family's relationship with the school affects how well the child adapts to school and how much the child benefits from school.

The transition from pre-school to primary school is an example of discontinuity. The bigger the divergence between the environment of pre-school and primary school is, the more difficult the transition for the pupils becomes. Generally, pre-school aims at the cultivation of capacities and skills of infants and puts emphasis on the process, while primary school focuses mainly on the learning outcome. In order to bridge this gap between pre-school and school education, it is necessary to implement the suitable transition activities in schools.

Another factor that contributes to the development of readiness is the participation in a high quality pre-school program. Previous research efforts (Barnett, 2011; Camilli et al., 2010; Rimm-Kaufman et al., 2009) have shown that quality pre-school experiences support and increase children's school readiness, smooth their potential difficulties and prepare them to succeed in primary school.

Teachers consider social skills to be more important than academic qualifications (Dockett & Perry, 2004) and that they should provide additional help, attention, and instructions which are related to deficits in transition skills (McMullen et al., 2005).

Students who have difficulty in listening and following instructions, paying attention, showing self-confidence, working independently or working with others in the group, communicating with teachers and peers, lacking a willingness to learn, have no curiosity, seem to show difficulties during their transition to primary school (Blair & Raver, 2015; Schmitt et al., 2015; Mistry et al., 2010).

Many researches link the lower socio-economic background of the family with negative effects on the social and academic performance of children (Hopson & Lee, 2011. Sektnan et al., 2010. Welsh et al., 2010 Ayoub et al., 2009), while school success is closely linked to the profession, financial status and educational level of parents (Yoshikawa et al., 2012. Dubow et al., 2009).

Teachers also point out how important it is for children to know the basic uses of language in order to understand the teacher's instructions, express their ideas, ask questions, and engage in conversations with their peers (Pianta & Kraft-Sayre, 2003). Linking the knowledge that children already have in school allows teachers to ensure that children's values, languages and cultural knowledge will be an integral part of teaching and learning practices (Dockett & Perry, 2008). In addition, children with disabilities face more difficulties as they go to upper school grades, in unknown environments and with less focus on each child. (Janus et al., 2007).

Many researchers (Ahtola et al., 2012) concluded that when the transitional practices that are used are increasing in number, there is an easier transition for children to primary school. Children who had participated in transitional activities were more socially active and had fewer behavioral problems at the beginning of school (Wildinger & McIntyre, 2012. LoCasale-Crouch et al., 2008). In Greece, in recent years

the issue of transition from pre-school to primary school has preoccupied researchers and teachers in order to find solutions to face any difficulties.

2. Methodology

This paper is part of a national research and was done using a questionnaire. The quantitative research was chosen as it allows the collection of large volumes of data from a wide sample of respondents and the connection of two or more characteristics (Bryman & Bell, 2015).

The technique that was applied is the Proportional Stratified Sample Survey. According to this technique, the sample was divided according to the characteristics of the population in the layers (educational regions of Greece) and then random samples were selected from each layer. The stratified sample survey was designed to ensure the representation of all sections of the population, to reduce the estimation error and to have a sufficient number of subpopulation subjects. This technique generally leads to estimations with a high level of precision.

The aim of this paper is to investigate the opinions of Greek teachers on which children are more likely to experience difficulties in their transition from pre-school to the primary school.

3. Research Tool

In this research paper, the questionnaire was chosen as the most appropriate tool for collecting research data, as it can lead to quick, accurate and cost-effective collection of research data (Bryman & Bell, 2015). In particular, a questionnaire of closed-ended questions was developed based on the research objective. There were 14 cases of children who may experience difficulties in transition to the next level and teachers were asked to answer to what extent they agree or disagree with each of them.

3.1 The sample

The target population is Teachers of Primary Education (pre-school teachers, Teachers of 1st and 2nd class of Primary School and Directors of Primary Schools) of the 13 educational districts of Greece.

The sample of the survey was selected by the laws of sampling and represents 4% of all pre-school teachers, 4% of Teachers of 1st and 2nd class of the total of each educational district and 4% of the Directors of Primary Schools of the total of each educational district. The figures for the total number of teachers in each district were provided by the Ministry of Education. The final sample size was 1,602 teachers and more specifically 784 pre-school teachers, 634 teachers and 184 directors of primary schools. The sample also consists of 19.7% (315) men and 80.3% women.

3.2 Research Data

The data analysis provided by the primary data survey was done using the statistical analysis program SPSS 23.0.

Table 1 shows the absolute (*f*) and relative (%) frequencies as well as the mean (*M*) and standard deviations (*SD*) of teachers' responses concerning their opinions on groups of children who may have a higher risk of experiencing a difficult transition from Pre-School to Primary School. The questions are presented in the order of priority, from the highest to the lowest average.

According to the findings, there are strong fluctuations in teachers' opinions on which group of children have a higher risk of experiencing a difficult transition from pre-school to primary school. As it is obvious from the average of their answers, which is well above the average of the scale, that equals to 3, the groups of children who, according to teachers, are most at risk of experiencing a difficult transition are children with behavioral problems (reactions, nerves, crying frequently, etc.), with learning problems (poor concentration, lack of skills, etc.), low self-esteem and discipline problems in classroom (compliance with rules, etc.). For example, in total, more than nine out of ten teachers say that they agree (50.2%) or totally agree (41.4%) that children with behavioral problems are at greater risk of experiencing a difficult transition from pre-school to primary school. Accordingly, almost nine out of ten teachers say they agree (44.3%) or totally agree (44.1%) that children with learning problems are at greater risk of experiencing a difficult transition.

Table 1: Absolute (*f*) and relative (%) frequencies, mean (*M*) and standard deviations (*SD*) of teachers' opinions on groups of children who may have a higher risk of experiencing a difficult transition from pre-school to primary school

	"I totally disagree"	"I disagree"	"Neutral attitude"	"I agree"	"I totally agree"	<i>M</i>	<i>SD</i>
	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)	<i>f</i> (%)		
Children with behavioral problems (reactions, nerves, crying frequently...)	6 (0,4)	21 (1,3)	107 (6,7)	805 (50,2)	663 (41,4)	4,31	,69
Children with learning problems (poor concentration, lack of skills ...)	10 (0,6)	31 (1,9)	146 (9,1)	709 (44,3)	706 (44,1)	4,30	,76
Children with low self-esteem	10 (0,6)	27 (1,7)	161 (10,0)	720 (44,9)	684 (42,7)	4,27	,76
Children with discipline problems in classroom (compliance with rules ...)	8 (0,5)	32 (2,0)	181 (11,3)	765 (47,8)	616 (38,5)	4,22	,76
Children who have no pre-school experience	32 (2,0)	68 (4,2)	246 (15,4)	527 (32,9)	728 (45,5)	4,16	,97
Children with difficulties in the family environment	11 (0,7)	43 (2,7)	253 (15,8)	844 (52,7)	451 (28,2)	4,05	,78
Children with special needs	28 (1,7)	99 (6,2)	332 (20,7)	591 (36,9)	551 (34,4)	3,96	,98
Children from minority groups	57	165	526	596	257	3,52	1,00

	(3,6)	(10,3)	(32,9)	(37,2)	(16,1)		
Children who have no friends at the beginning of the school year	68 (4,2)	204 (12,7)	557 (34,8)	563 (35,2)	209 (13,1)	3,40	1,01
1. The younger children	109 (6,8)	346 (21,7)	699 (43,8)	352 (22,1)	89 (5,6)	2,98	,97
2. The first born children	468 (29,1)	440 (27,5)	491 (30,7)	164 (10,2)	40 (2,5)	2,30	1,07
3. Children who live in urban areas	505 (31,6)	473 (29,6)	497 (31,1)	95 (5,9)	30 (1,9)	2,17	1,00
4. Boys	594 (37,1)	429 (26,8)	479 (29,9)	72 (4,5)	26 (1,6)	2,07	1,00
5. Girls	608 (38,0)	444 (27,8)	479 (29,9)	50 (3,1)	19 (1,2)	2,02	,95

Moreover, high enough are also the levels of teachers' opinions that consider that children who have no pre-school experience, who have difficulties in their family environment and who have special needs are in danger of experiencing a difficult transition to primary school. Then, teachers have relatively modest levels of agreement on the opinion that children who come from minority groups, who have no friends at the beginning of the school year, are at greater risk of experiencing a difficult transition, as it is shown by their average answers that is just above the middle of the scale, that equals to 3.

On the contrary, as it is shown by the average of their responses that are below the middle of the scale, teachers have low levels of agreement on the opinion that younger children, first-born children, children who live in urban areas, boys and, finally, girls are in danger of experiencing a difficult transition to primary school.

Then, a two-way analysis of variance was performed, with gender and service as the "independent" variables and as "dependent" variables for each of the above cases of children who may be at greater risk of experiencing a difficult transition. At this point, the findings in which a statistically significant deviation was found will be presented.

As for children with behavioral problems, the influence of gender was found to be statistically significant ($F(1, N = 1602) = 5.36, p = 0.021$). In particular, female teachers are more likely to agree that children with behavioral problems are at risk of having difficulties in their transition compared to their male colleagues.

In the case of children with learning problems, it is found that the influence of gender is statistically significant ($F(1, N = 1602) = 6,28, p = 0,012$), of the position of service ($F(2, N = 1602) = 7,85, p < 0.001$). In particular, female teachers agree more on the fact that children with learning problems are at risk of having difficulties in their transition compared to their male counterparts. Also, pre-school teachers are more likely to agree that children with learning problems are at risk of having difficulties in their transition compared to teachers ($p < 0.001$).

Then, it was found that the influence of the position was statistically significant ($F(2, N = 1602) = 4.73, p = 0.009$), that children with low self-esteem are at risk of having

difficulties in their transition, with pre-school teachers agreeing more with this compared to teachers ($p = 0.003$).

With regard to the variable that children with discipline problems in classroom are at risk of having difficulties in their transition, it was found that the influence of gender ($F(1, N = 1602) = 9, 57, p = 0,002$) ($F(2, N = 1602) = 4.14, p = 0.016$) was statistically significant. Specifically, female teachers agree more than their male colleagues ($p < 0.001$).

It was found that the influence of gender ($F(1, N = 1601) = 9, 46, p = 0,002$) and position of service ($F(2, N = 1601) = 5.11, p = 0.006$) are statistically significant as for the importance of pre-school experience. Female teachers and pre-school teachers are more likely to agree that pre-school children are at risk of having difficulty in transition from pre-school to primary school compared to their male colleagues and teachers ($p < 0.001$). Finally, it was found that the influence of the position of service is statistically significant in relation to the fact that the first born children ($F(2, N = 1601) = 4.30, p = 0.014$), boys ($F(2, N =) = 6, 13, p = 0,002$), and girls ($F(2, N = 1600) = 5, 21, p = 0,006$) are at risk of having difficulty in their transition. In particular, pre-school teachers agree less with teachers ($p = 0.002, p < 0.001$ and $p < 0.001$ respectively) and directors of primary schools ($p < 0.001, p = 0.040$ and $p = 0.044$ respectively).

4. Discussion and Conclusions

According to the answers that were given by the teachers who formed the sample of the present survey, there are strong fluctuations in teachers' opinions on which group of children is at greater risk of experiencing a difficult transition from pre-school to primary school.

More specifically, the groups of children that according to teachers have a higher risk of experiencing a difficult transition are the children with behavioral problems (reactions, nerves, crying frequently, etc.) with learning problems (poor concentration, insufficient skills, etc.) with low self-esteem and discipline problems in classroom (compliance with the rules, etc.). For example, in total, more than nine out of ten teachers declare that they agree (50.2%) or totally agree (41.4%) that children with behavioral problems are at greater risk of experiencing a difficult transition from pre-school to primary school. Accordingly, almost nine out of ten teachers say they agree (44.3%) or totally agree (44.1%) that children with learning difficulties are at greater risk of experiencing a difficult transition.

All teachers agreed that the groups of children who have a higher risk of experiencing a difficult transition are children with behavioral and discipline problems and those with low self-esteem (O'Kane & Hayes, 2006). Behavioral problems, such as aggressive behavior, nerves, etc., affect school (Fantuzzo et al., 2007). According to Wildenger and McIntyre (2012), any problems and difficulties faced by the child are transferred to the school environment and make it harder for them to join, but also for their successful interaction, learning and of course their transition from pre-school to primary school. The regulation of behavior allows children to successfully adapt to the

classroom and is a determining factor in their academic progress. Adaptation to school and therefore the transition to the next educational level are more difficult for children who do not know the rules (McClelland et al., 2007 Dockett & Perry, 2004. Margetts, 2004). School rules are useful as they provide children with a frame of reference and a school-based guidance that helps having the sense of belonging.

Numerous enough are also the opinions of teachers' sample who believe that children who have no pre-school experience, who have difficulties in their family environment and who have special needs are at risk of experiencing a difficult transition to primary school (O'Kane & Hayes, 2006). The recognition of the value of pre-school has been highlighted by many researchers (Kiernan, et al., 2008 O'Kane & Hayes, 2006), who found that the transition of many children was less successful due to the lack of school readiness, that is related to the intendance of pre-school education. Many studies present teachers' opinions who believe that children from disadvantaged families and children with special needs face particular difficulties when they go to primary school (Brooker, 2008; O'Kane & Hayes, 2006). Children from underprivileged families that face difficulties encounter obstacles during their transition, perhaps due to less knowledge and skills or lack of support from their parents (Lloyd, et al., 2007). In particular, students with disabilities face transitions in many areas, therefore the collaboration and the continuity between scientists and sectors, as well as the supportive infrastructure and the use of transient practices are essential for their successful transition (Rosenkoetter, et al., 2007). Of course, more research is needed, precisely for identifying the difficulties in family and children's disabilities.

Then, teachers have relatively modest levels of agreement on the opinion that children from minority groups (Biedinger, et al., 2008 O'Kane & Hayes, 2006) are more influenced by the cultural values of their community and about children who have no friends at the beginning of the school year (White & Sharp, 2007). On the contrary, creating and maintaining friends can facilitate the transition. Children who start school with friends are happier, have better socio-emotional adaptation and better student performance. Some schools have introduced programs with friends at school, where children of older classes have young students under their protection. Given the vital role that friends can play in school, these programs deserve greater attention in our country. On the other hand, teachers have to promote the development of friendships by providing appropriate opportunities for children.

The teachers of the sample have low levels of agreement on the opinion that younger children, first-born children, children that live in urban areas, boys and girls are at risk of experiencing a difficult transition to primary school (Dockett & Perry, 2004). Many discussions have been made about the age that the child should reach before starting school. Although age is not related to school success, teachers often invoke it for the inappropriate adaptation of children to the new school environment. There are many differences between children in terms of learning, maturity, growth in different areas, and they are not the same as the age. The same applies to boys and girls. Gender is another issue that needs to be examined in terms of school readiness.

As far as the influence of gender is concerned, it was found that women teachers are more in agreement with the fact that children with behavioral problems, with learning problems, with discipline problems in classroom and those without pre-school experience, are at higher risk of having difficulties in their transition from pre-school to primary school in comparison with their male colleagues.

With regard to differences in teachers' opinions according to their position of service, it was found that pre-school teachers agree more that children with learning problems, with low self-esteem, with discipline problems in classroom and without pre-school experience are in danger of having difficulties in transition compared to primary school teachers. On the other hand, it was found that pre-school teachers are less likely to agree that first-born children, boys and girls are at risk of having a difficult transition, compared to teachers and directors of primary schools.

References

- Ahtola, A., Poikonen, P. L., Kontoniemi, M., Niemi, P., & Nurmi, J. E. (2012). Successful handling of entrance to formal schooling: Transition practices as a local innovation. *International Journal of Transitions in Childhood*, 5(1), 3-21.
- Ayoub, C., O'Connor, E., Rappolt-Schlichtmann, G., Vallotton, C., Raikes, H., & Chazan-Cohen, R. (2009). Cognitive skill performance among young children living in poverty: Risk, change, and the promotive effects of Early Head Start. *Early Childhood Research Quarterly*, 24(3), 289-305.
- Barnett, W. S., Jung, K., Yarosz, D. J., Thomas, J., Hornbeck, A., Stechuk, R., et al. (2008). Educational effects of the Tools of the Mind curriculum: A randomized trial. *Early Childhood Research Quarterly*, 23(3), 299–313.
- Biedinger, N., Becker, B., & Rohling, I. (2008). Early Ethnic Educational Inequality: The Influence of Duration of Preschool Attendance and Social Composition, *European Sociological Review*, 24 (2), 243 – 256.
- Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual review of psychology*, 66, 711-731.
- Brooker, L. (2008). *Supporting transitions in the early years*. Maidenhead, England: Open University Press McGraw Hill.
- Bryman, A, & Bell, E. (2015). *Business research methods*. 4nd edition. Oxford University Press.
- Camilli G, Vargas S, Ryan S, Barnett WS. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record*, 112, 579–620.
- Dockett, S., & Perry, B. (2008). Starting School: A Community Endeavor, *Childhood Education*, 84 (5), 274.
- Dockett, S., & Perry, B. (2004). Starting school: Perspectives of Australian children, parents and educators. *Journal of Early Childhood Research*, 2(2), 171-189.

- Dubow, E. F., Boxer, P., & Huesmann, L. R. (2009). Long-term effects of parents' education on children's educational and occupational success: Mediation by family interactions, child aggression, and teenage aspirations. *Merrill-Palmer Quarterly*, 55(3), 224-249.
- Einarsdottir, J. (2010). Children's experiences of the first year of primary school. *European Early Childhood Education Research Journal*, 18(2), 163-180.
- Fantuzzo, J., Bulotsky-Shearer, R., McDermott, P. A., McWayne, C., Frye, D., & Perlman, S. (2007). Investigation of dimensions of social-emotional classroom behavior and school readiness for low-income urban preschool children. *School Psychology Review*, 36, 44-62.
- Janus, M., Lefort, J., Cameron, R., & Kopechanski, L. (2007). Starting Kindergarten: Transition Issues for Children with Special Needs. *Canadian Journal of Education*, 30 (3), 628-648.
- Hopson, L. M., & Lee, E. (2011). Mitigating the effect of family poverty on academic and behavioral outcomes: The role of school climate in middle and high school. *Children and Youth Services Review*, 33(11), 2221-2229.
- Kiernan, G., Axford, N., Little, M., Murphy, C., Greene, D., & Gormley, M. (2008). The School Readiness of Children Living in a Disadvantaged Area in Ireland, *Journal of Early Childhood Research*, 6 (2), 119-144.
- LoCasale-Crouch, J., Mashburn, A. J., Downer, J. T., & Pianta, R. C. (2008). Pre-kindergarten teachers' use of transition practices and children's adjustment to kindergarten. *Early childhood research quarterly*, 23(1), 124-139.
- Lloyd, D., Austen-Baker, K., Newell, S., Hughes, D., & Dietrich, U. (2007). Box Ridge Transition to School Program 1999-2003: Evaluation Report. Prepared for Health Promotion Unit, North Coast Area Health Service, Lismore, May 2007.
- Margetts, K. (2004). Identifying and supporting behaviours associated with co-operation, assertion and self-control in young children starting school. *European Early Childhood Education Research Journal*, 12(2), 75-85.
- McClelland, M.M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioural regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology*, 43, 947-959.
- McMullen, M., Elicker, J., Wang, J., Erdiller, Z., Lee, S. M., Lin, C. H., & Sun, P. Y. (2005). Comparing beliefs about appropriate practice among early childhood education and care professionals from the US, China, Taiwan, Korea and Turkey. *Early Childhood Research Quarterly*, 20(4), 451-464.
- Mistry, R. S., Benner, A. D., Biesanz, J. C., Clark, S. L., & Howes, C. (2010). Family and social risk, and parental investments during the early childhood years as predictors of low-income children's school readiness outcomes. *Early Childhood Research Quarterly*, 25(4), 432-449.
- O'Kane, M., & Hayes, N. (2006). The transition to school in Ireland: Views of preschool and primary school teachers. *International Journal of Transitions in Childhood*, 2, 4-16.

- Pianta, R. C., & Kraft-Sayre, M. (2003). *Successful kindergarten transition: Your guide to connecting children, families, and schools*. Baltimore: Paul H. Brookes.
- Rimm-Kaufman, S. E., Curby, T. W., Grimm, K. J., Nathanson, L., & Brock, L. L. (2009). The contribution of children's self-regulation and classroom quality to children's adaptive behaviors in the kindergarten classroom. *Developmental Psychology*, 45(4), 958.
- Rosenkoetter, S. E., Hains, A. H., & Dogaru, C. (2007). Successful Transitions for Young Children with Disabilities and Their Families: Roles of School Social Workers, *Children & Schools*, 29(1), 25-34.
- Sektnan, M., McClelland, M. M., Acock, A., & Morrison, F. J. (2010). Relations between early family risk, children's behavioral regulation, and academic achievement. *Early Childhood Research Quarterly*, 25(4), 464-479.
- Schmitt, S. A., McClelland, M. M., Tominey, S. L., & Acock, A. C. (2015). Strengthening school readiness for Head Start children: Evaluation of a self-regulation intervention. *Early Childhood Research Quarterly*, 30, 20-31.
- Welsh, J. A., Nix, R. L., Blair, C., Bierman, K. L., & Nelson, K. E. (2010). The development of cognitive skills and gains in academic school readiness for children from low-income families. *Journal of Educational Psychology*, 102(1), 43-53.
- White, G., & Sharp, C. (2007). It Is Different Because You Are Getting Older and Growing up - How Children Make Sense of the Transition to Year 1, *European Early Childhood Education Research Journal*, 15(1), 87 - 102.
- Wildenger, L. K., & McIntyre, L. L. (2012). Investigating the relation between kindergarten preparation and child socio-behavioral school outcomes. *Early Childhood Education Journal*, 40(3), 169-176.
- Yoshikawa, H., Aber, J. L., & Beardslee, W. R. (2012). The effects of poverty on the mental, emotional, and behavioral health of children and youth: implications for prevention. *American Psychologist*, 67(4), 272-284.

Creative Commons licensing terms

Author(s) will retain the copyright of their published articles agreeing that a Creative Commons Attribution 4.0 International License (CC BY 4.0) terms will be applied to their work. Under the terms of this license, no permission is required from the author(s) or publisher for members of the community to copy, distribute, transmit or adapt the article content, providing a proper, prominent and unambiguous attribution to the authors in a manner that makes clear that the materials are being reused under permission of a Creative Commons License. Views, opinions and conclusions expressed in this research article are views, opinions and conclusions of the author(s). Open Access Publishing Group and European Journal of Social Sciences Studies shall not be responsible or answerable for any loss, damage or liability caused in relation to/arising out of conflicts of interest, copyright violations and inappropriate or inaccurate use of any kind content related or integrated into the research work. All the published works are meeting the Open Access Publishing requirements and can be freely accessed, shared, modified, distributed and used in educational, commercial and non-commercial purposes under a [Creative Commons Attribution 4.0 International License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/).