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## Professional Development Experiences of Autodidactic Teachers

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### Abstract

In this study, it was aimed to determine the views of self-learning teachers on their professional development. In this direction, phenomenological research design from qualitative research methods was used in the research. In the research group, there are 16 teachers working in Meram district of Konya province between June and December in 2023 and giving importance to their professional development. The data were collected through a semi-structured interview form and content analysis method was used to analyse the data. As a result, it was concluded that the participant teachers frequently participated in in-service training activities for their professional development experiences, used social media effectively, felt the need for professional development because they did not consider their current training sufficient, they have been learning teachers since they started their profession, and their motivation and self-confidence increased after the trainings they attended, that they have learning outside the profession and that they learn through social media, professional courses and experts, that their sources of motivation for professional development are student expectations and appreciation, that they receive support from their families, but that they are not provided with sufficient support by their managers and colleagues.

### Key Words

Autodidactic teacher • Professional development • Self-directed learning

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## **Introduction**

Today, changes and transformations are very fast due to technological developments and it is difficult for people to keep up with this situation. Teachers are expected to have various qualifications in order to keep up with the developing world conditions. The most important task in gaining these qualifications falls to education (Karagöz, 2003). Change has manifested itself in people's working areas as in every field. For this reason, people's individual and professional development after starting their profession has become as important as their pre-service training. In this context, organisations need to give importance to the development of their employees in order to keep up with the changing world conditions and to maintain their existence.

It is an obvious fact that the achievements of an individual who graduates from an educational institution will not be sufficient to ensure continuous success, stability and efficiency during his/her employment in any profession (Gebel & Bozkurt, 2021). The ability of public officials to do their jobs effectively and efficiently depends on their self-development. The knowledge and skills gained through pre-service training are not sufficient to maintain professional life effectively and efficiently (Erdem & Şimşek, 2013). Individuals who fulfil the teaching profession should improve themselves and keep up with the requirements of the age, especially since their capital is human.

In a rapidly changing world, the tasks expected from educational institutions are differentiating. The roles and responsibilities expected from teachers in educational institutions are also diversifying and increasing due to these changes. Training qualified teachers who will fulfil their duties successfully is a necessity for the success of the education system (Özoğlu, 2010). The teaching profession involves a process that is not static from past to present due to its structure (Uştu et al., 2016). Therefore, it is important for teachers to improve their training and skills within the profession. Factors such as changes in legislation, change and development of instructional technologies and other professional development needs make it necessary for teachers to improve themselves (Taşlıbeyaz et al., 2014).

## **Lifelong Learning**

Rapidly developing technology brings many changes in human life. This change makes it necessary for people to learn throughout their lives. Because the current knowledge of human beings can lose its validity very quickly with the constantly changing and developing world. The adaptation of people to the society in which they live and keeping up with the innovations and developments in business life can only be possible by renewing themselves. It is the learning activities in the life of the individual that will ensure this. Lifelong learning is defined as all kinds of learning activities in which the individual is involved throughout his/her life in order to improve his/her knowledge, skills and competences with an approach related to factors such as individual, social, social and employment (MEB, 2009). According to another definition, lifelong learning is all learning activities that aim to improve the knowledge, skills and competences that the individual will use throughout life in personal, social or professional dimension (Çetinkaya et al., 2019).

Schools are no longer the only place where learning is provided. Learning is a lifelong process and is spread to every stage of human life, from formal school education to in-service training at workplaces, from the use of

technology to museum visits. When people have the desire to learn, the sources to learn are very diverse. Such people can turn everything around them into learning opportunities. Lifelong learners are individuals who are interested in innovations and developments. The characteristics of these individuals such as perseverance, curiosity, organising learning and motivation come to the fore (Diker Coşkun & Demirel, 2012). In other words, in order to realise learning, the individual must be determined, curious, regulate his/her own learning process and have full motivation. In short, motivation, which can be defined as the power that pushes the individual to work to achieve the goal, is one of the important factors of the learning process. The individual must feel enough energy to complete the process and reach the goal in new or long-standing jobs. Lifelong learning can be realised by motivated individuals who feel the necessity of learning. Because a large part of lifelong learning consists of individual learning.

There are three main functions of lifelong learning. These are lifelong learning for economic development, personal development and self-realisation, social inclusion and democratic understanding and action. If we think in terms of teaching profession, thanks to lifelong learning, teachers will ensure their personal and professional development and contribute to their self-actualisation processes. In addition, teachers who have developed themselves with lifelong learning will raise well-equipped students, which will contribute positively to the economy and employment. Again, by giving importance to learning and development, it will become easier for teachers to accept themselves to the society, and at the same time, they will contribute to the formation of a more democratic and livable society. The classification of lifelong learning is adult education, vocational education, continuing education and self-directed education (Wetzel 2010, Jarvis 2004, Livingstone 2001, Eraut 2000; cited in Toprak and Erdogan 2012). Looking at the literature, there are some basic skills that lifelong learners should have. These can be listed as the desire for continuous learning, taking responsibility for one's own learning, reading comprehension, basic numerical skills, oral and written communication skills, effective use of information technologies, personal development ability, effective use of high-level thinking skills, self-regulated learning skills and research skills (Diker Coşkun & Demirel, 2012). Individuals with these basic skills can realise lifelong learning. However, various approaches are used in lifelong learning. These approaches are self-directed learning, on-demand learning, cooperative learning and organisational learning (Yazıcı, 2020). Among these approaches, self-directed learning comes to the forefront because teachers take responsibility for their own learning, choose their own professional development goals and participate in activities to achieve these goals, and willingly participate in learning activities.

Lifelong learning is a must for professional development. We are witnessing many innovations and changes in business areas that we had difficulty even imagining ten years ago. As such, people need to attach importance to their professional equipment and fulfil a number of learning activities to keep their professional knowledge and competences up to date.

### **Professional Development of Teachers**

Teaching is a profession that requires professionalism. Duties and responsibilities are determined by various legal regulations. Both teachers' own success and the success of their students are directly related to their professional development. Because professional development has important contributions in terms of increasing performance,

making practices efficient, facilitating the implementation of educational policies, and realising change and transformation (Blanford 2000; as cited in Can, 2019). Teachers need to keep their professional knowledge and skills up-to-date.

Professional development in teaching is defined as the processes and activities aimed at improving the knowledge, skills and behaviours of educators in the profession in order to ensure the success of students (Guskey, 2003). Professional development is a learning process that continues throughout the professional life of teachers and covers all the learning that teachers realise in this process. (Eroğlu & Özbek, 2020).

Various models related to professional development have emerged over time. Although there are various models in the literature, the modelling by Gaible ve Burns (2005), which examines professional development in three dimensions according to its characteristics, stands out. These are standard, region-based and individual-oriented models. Among these models, individual-oriented models are also known as self-managed models. Kızılkaya (2012) also categorised professional development activities as Traditional Professional Development Activities and Innovative Professional Development Activities. While traditional professional development activities include activities such as courses, seminars, conferences and workshops known in the classical sense, innovative professional development activities are activities that are not in a specific environment, but spread to the whole learning process and environment. It is seen that innovative approaches include activities such as coaching, mentoring, classroom observation, sharing experiences, peer teaching, cooperative learning. In addition to these models, Ekinci (2015), Yurdakul (2013), Şahin et al. (2016) also mentioned various different models in their studies. In new professional development approaches, teachers develop not only in the professional field but also in individual and social fields. Teachers' professional development does not only include formal experiences, but informal experiences also contribute to professional development (Atal & Sancar, 2021).

### **Self-Directed Learning**

Self-directed learning is the ability to manage one's learning by taking responsibility for one's own learning and to be in control of learning (Tekkol & Demirel, 2016). It is the learner's responsibility what, when, how to learn and how to evaluate what is learnt (Guglielmino & Guglielmino, 2001). Self-directed learning is seen as effective and efficient for reasons such as providing contributions for the specific needs of the learner, offering flexibility in the learning process, providing immediate and long-term gains in developing problem-solving skills, providing highly focused learning, and reducing the cost of learning (Durr, 1992; cited in Uzundiz, 2022).

Self-directed learning is used more in adult education. This is because self-directed learning includes learning outside the fields of education and the individual realises his/her learning according to the goals he/she sets himself/herself. Self-directed learning is closely related to adult education and lifelong learning (Recepoglu, 2021). Therefore, these learning activities are extra important for professional development. Because individuals can determine the subjects that they have deficiencies in the professional field thanks to their self-management in the profession, and they can continuously learn and improve themselves by planning their own learning process to overcome their deficiencies. For this reason, teachers who need to constantly improve themselves and keep



themselves up to date should also have self-directed learning skills. (Şahin & Erden, 2009). Towle and Cottrell (1996) listed these self-directed learning skills as follows:

- Setting their own learning goals,
- Identify appropriate learning resources,
- Choosing appropriate learning strategies,
- To distinguish between unimportant information and important information,
- Integration of material from different sources,
- Time management,
- Monitoring the achievement of learning outcomes,
- Monitoring the effectiveness of personal work habits.

Self-directed learning takes place in five different stages in the process. These stages can be listed as identification, planning, implementation, reviewing-reviewing and sharing (Knowles, 1975; cited in Bayram, 2023). In the identification stage, learning needs are identified. In the planning stage, learning objectives are formulated. In the implementation phase, resources to be utilised are determined. In the review-review stage, the learner selects and applies learning strategies for learning needs. In the sharing step, the learner determines the learning products. At this stage, concrete evidence is needed to see the effectiveness of the learner in the process. A road map was determined at the point of implementation of these stages in educational environments and this was named as self-directed learning cycle (Bayram, 2023). In this cycle, goal setting (pre-assessment and informing about the gains), evaluation (evaluation of strengths and weaknesses), planning (making a plan suitable for the process), implementation-monitoring (implementation of learning strategies and monitoring of the process), reflection (reflection and evaluation of learners' own performances) steps are included.

Determining the perceptions of teachers who are able to self-learn about professional development will make important contributions to the process of making plans and developing strategies for teachers' professional development. On the other hand, it is seen that most of the studies in the literature are related to in-service training of teachers or professional development of all teachers; there are few studies on teachers who can provide professional development and learn to learn. This study will also contribute to filling this gap in the literature. In this study, it was aimed to determine the views of self-learning teachers about their professional development experiences.

## **Method**

### **Research Design**

This research, which aims to determine the opinions of teachers about their professional development experiences, was conducted using qualitative research method. Qualitative research is a research method in which qualitative research methods such as observation, interview, document analysis are used as data collection methods and a qualitative process is followed to reveal events and perceptions in a realistic and holistic way in a natural environment (Tutar & Erdem, 2022). In this study, phenomenology, which is one of the qualitative research method

designs, was used as the design. This design focuses on phenomena that are aware of but do not have a detailed and in-depth understanding. The phenomena can be encountered in various ways such as event, experience, orientation, situation. However, this does not mean that the phenomena are understood. Phenomenology can be used for studies aiming to investigate these phenomena that are not fully understood (Yıldırım & Şimşek, 2021). Phenomenology aims to reach the essence of one's experience and focuses on attitudes, prejudices, thoughts and experiences. Since the research aims to determine the views of teachers on professional development experiences, the research is characterised as a phenomenological study.

### **Study Group**

The research was carried out with 16 teachers working in Meram district of Konya province who volunteered to participate in the research. Criterion sampling was used in the selection of the study group. The basic understanding of criterion sampling is to study all situations that meet a predetermined set of criteria (Yıldırım & Şimşek, 2021). Two basic criteria were determined as that the participants had participated in various activities on professional development and that they were actively working. In addition, snowball (chain) sampling technique, which is the most appropriate for the content of the research, was used in the selection of the participants. This method is a sampling method in which the researcher finds new participants through these individuals after finding the first research group or individuals, and then reaches new ones through them. The aim of this method is to enrich the information by defining situations by reaching from person to person and from person to events (Creswell, 2021). This method allows in-depth study of situations that are thought to have rich information. In this context, a teacher who is thought to attach importance to professional development and to be able to realise his/her own learning was interviewed and new participants were identified through him/her. Each newly interviewed participant was asked whether he/she knew anyone suitable for the research group and other participants were reached and interviews were conducted. The data on the socio-demographic characteristics of the teachers participating in the study are shown in Table 1.

Table 1

*Socio-demographic characteristics of the teachers participating in the study*

Variables		<i>f</i>	%
<b>Gender</b>	Male	7	44
	Female	9	56
<b>Age</b>	20-30	3	19
	31-40	7	44
	41-50	5	31
	51 and above	1	6
<b>Education Level</b>	Bachelor's Degree	11	69
	Master's Degree	5	31
<b>Duration of Professional Seniority</b>	1-10	6	38
	11-20	5	31
	21 and above	5	31
<b>Branch</b>	English	2	13
	Science	2	13
	Classroom Teaching	6	38
	Psychological Counselling and Guidance	1	6
	Special Education	1	6
	Maths	1	6
	Preschool	3	18
Total		16	100

### Research Instruments and Processes

Interview method was used as a data collection tool in the study. This method is the most frequently used data collection method in the field of social sciences and this is due to the fact that the interview method is a very effective method for obtaining information about individuals' attitudes, opinions, complaints, experiences, feelings, complaints and beliefs (Briggs, 1986; as cited in Yıldırım & Şimşek, 2021). Although interviewing seems to be an easy method in data collection, it has various difficulties in itself. For this, a detailed plan on how to ask the questions prepared in advance and how to collect the data should be made and implemented.

The data collection tool used in the study consists of two parts. The first one is the "Personal Information Form" which aims to learn the socio-demographic information of the participant teachers. The second one is the "Semi-Structured Interview Form" in which teachers' views on their professional development experiences are collected. In this form, teachers were asked open-ended interview questions prepared by the researcher with the support of experts. There are eight open-ended questions in the interview form. These are as follows:

1. Which resources do you use for your professional development, what kind of activities do you participate in?
2. How did you feel your need for professional development?

3. How long have you been a learning teacher, what are the factors that motivate you to learn?
4. For what purpose do you attend in-service trainings organised by the Ministry of National Education?
5. What kind of changes did you feel after the trainings you received for your professional development?
6. Is the learning in your life only related to your profession? What else do you learn? Where do you learn from?
7. What are your motivation sources for self-improvement?
8. What do you think about your environment supporting your learning?

The interviews conducted in the study were carried out between June and December 2023. The availability of the teachers was learnt and suitable environments were provided where they could express themselves comfortably. No guidance was given during the interview and the purpose of the interview was explained in detail. The answers given by the teachers were recorded with a voice recorder, and the answers of the participants who did not consent to be recorded were written on the interview form and the data were collected. Thus, it was tried to determine the opinions of the teachers about their professional development experiences.

#### **Validity and Reliability**

Validity in qualitative research is briefly expressed by [Creswell \(2016\)](#) as the accuracy and reasonableness of the findings. Validity is possible by collecting and interpreting the data appropriately so that the research results accurately reflect the real world studied ([Yin, 2011](#)). For this purpose, in order to ensure the validity of the research, the sample was defined in detail, snowball sampling model was used as the sample, literature review was made, theoretical framework was created, data collection tools and data analysis process were explained in detail, the process steps and application process of the research were explained, participants were selected on the basis of volunteerism, interviews were recorded and participant confirmation was made, direct quotations were included in the study. In short, it is tried to ensure that the reader can draw lessons and experiences related to his/her own life and that the controls made to ensure consistency in the research are understood by the reader.

Reliability in the traditional sense refers to the consistency and reproducibility of research findings. Since the research tool in qualitative research is the researcher himself, the data obtained may not always be consistent and reproducible. The reason for this is what the researcher sees, what conclusions he/she reaches, personal characteristics and experiences ([Yağar & Dökme, 2018](#)). However, various methods are used to ensure reliability in qualitative research. These methods include ensuring that the sample size is sufficient, more sources and opinions are consulted, the data are stored well, the study environment and the position of the researcher are fully specified, and the study is conducted impartially ([Yıldırım & Şimşek, 2008](#)). In short, in order to be able to talk about reliability in qualitative research, the researcher must meticulously carry out and report all processes, starting from the beginning of the interview, including the reporting of the analyses ([Arslan, 2022](#)). In this context, in order to ensure the reliability of the research, the sample size was selected in accordance with the research topic, semi-structured interview form was used, expert support was received, the research process was reported in detail, support was

received from the theory during the research and attention was paid to be impartial, the interviews were recorded and carefully kept, and the findings were directly reported.

### **Data Analysis**

Data analysis in qualitative research includes the preparation and organisation of data for analysis, coding the data and reducing them to themes by combining the codes, and finally presenting the data in figures or a discussion (Creswell, 2021). One of the most important processes of qualitative research is data analysis. Because the aim is to make the findings meaningful. Content analysis type was used to analyse the data in the study. The content analysis process is based on conceptualising the data and explaining the patterns between concepts through themes (Yildirim & Şimşek, 2021). The process is actually to bring together similar data within the framework of concepts and themes and to organise and interpret them in a way that the reader can understand. In the research, the opinions of teachers about their professional development experiences are tried to be determined.

In order to ensure the confidentiality of the participants in the interviews, the participants were coded as P1, P2, P3, .... The audio recordings during the interviews were listened to and transcribed by the researcher. Based on the sub-questions used in the research, themes were determined and grouped and the analysis process was carried out based on these themes.

### **Results**

The data collected through semi-structured interview forms were analysed and the findings related to teachers' professional development experiences are given below.

#### **Activities Participated in and Resources Utilised for Professional Development**

In the research, the participants were asked the question "Which resources do you use for your professional development, what kind of activities do you participate in?" and the answers were analysed. Teachers generally stated that the resources they benefit from for their professional development are face-to-face and distance in-service trainings of the Ministry of National Education, social media, scientific publications. Regarding the activities they participate in, branch/field trainings, national and international project trainings come to the fore. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 2.

Table 2

*Resources utilized for professional development and activities attended*

<b>Themes/Codes</b>	
<b>Sources Utilised</b>	<i>f</i>
Social Media	9
Scientific Publications	9
Experts/Academics	4
Ministry of National Education Face-to-Face In-Service Trainings	10
Ministry of National Education Remote In-Service Trainings	12
Books	
Colleagues	6
Training and Congresses Organised by Universities	3
European Distance Education Platforms	5
Trainings of Education Foundations	6
CBIKO Distance Education Gateway	1
	1
<b>Activities Participated</b>	<i>f</i>
Digital Designs (Game, graphics etc.)	1
Coding	3
Web 2/Web 3 tools	2
Branch/Field Trainings	12
National and International Project Trainings	9
Model Aircraft Construction	1
Drama	1
Artificial Intelligence	1
Effective Communication	1

Note: Some teachers expressed more than one opinion.

Some teachers' opinions about the resources utilised for professional development and the activities attended are as follows:

(P2): "First of all, the most important resources I use are scientific researches and articles. Especially after I started my master's degree, I learnt that the main information is from there and in recent years, I have been using scientific researches for professional development. In addition, another source I use is social media and the posts or guidance of teachers or academics interested in this field on the internet and youtube."

(P4) "I follow the developments related to my branch. I try to buy new books and publications. Since my branch is intertwined with many fields, I participate in artistic, drama, seminar, workshop, etwinning, erasmus projects in order to develop in many fields. I try to take part in local and European projects."

(K9): "Actually, I did not make much effort to develop my profession until I met e-Twinning. For example, before, I used to try to attend all kinds of in-service training courses, I used to submit petitions, most of them were not

accepted, I don't know why. After e-Twinning, I continue my professional development through online training platforms on the internet such as School Education Gateway, e-Twinning Eba Online, Bill Gatesnet."

(P14):" For my professional development, I mostly attend seminars and courses organised by the Ministry of National Education. I also read articles and written materials, mostly international publications. The types of activities I participate in are courses and seminars for both my own development and the development of students. For example, I participate in project writing, robotic coding, model aircraft making, Etwinning-erasmus project trainings and technology-based activities."

### Reason for Feeling the Need for Professional Development

Regarding the second sub-question of the study, the participants were asked the question "How did you feel your need for professional development?" and the answers were analysed. Teachers generally stated that the reasons for feeling the need for professional development were not seeing their current education as sufficient, being productive for students and technological changes. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 3.

Table 3

*Reason for feeling the need for professional development*

Themes/Codes	
Reason for Feeling the Need for Professional Development	<i>f</i>
Change in Student Profile	4
To be efficient to students	6
Not Considering Current Education Insufficient	9
Intrinsic Willingness to Learn	3
Technological Changes	8
Limitation in Social Activities	1
Willingness to Show Yourself	1

Note: Some teachers expressed more than one opinion.

Some teachers' opinions about the reasons for feeling the need for professional development are as follows:

(P1): "I determine my professional development needs according to the student profile. Our student profile changes every 4 years. Each new generation is more technological and more insatiable. In order to respond to the demands of these children, I definitely engage in a new activity to renew myself every 4 years in my teaching life."

(P5) "My need for professional development emerged when I wanted to acquire new skills and improve my existing skills. I can list the things that make me feel this need as realising that my current skills are insufficient, comparisons in my environment, being open to innovations and changes, the desire to deepen in the fields I am interested in, the limited social activities in my environment."

(K8): "I was very bored while doing the activities in the books sent by the Ministry of National Education. In the first years of my profession, there was a teacher's manual. It was going step by step like this. I teach the

*sequence, but the children finish it as soon as possible. So I said that this activity is not enough for them. In other words, it is not a sufficient activity. My adventure started with how to improve it."*

*(P11): "The first thing that lit the fire was when I came to the teachers' room, I realised that many words and concepts were foreign to my mind when teachers who were 15 years and 10 years older than me were talking, and I felt inadequate."*

**Teacher Learning Time and Mobilising Factors for Learning**

Regarding the third sub-question of the research, the participants were asked the question "How long have you been a learning teacher, what are the factors that motivate you to learn?" and the answers were analysed. Almost all of the teachers stated that they have been in the learning process since the first day. Regarding the factors that motivate them to learn, the main views of the teachers were efficient lesson teaching, pleasure of learning, changes and transformations in the world. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 4.

Table 4

*Teacher learning time and mobilising factors for learning*

<b>Themes/Codes</b>	
<b>Learner Teaching Duration</b>	<i>f</i>
Since the beginning of the profession	13
Since the beginning of university	2
For 5 years	1
<b>Motivating Factors for Learning</b>	<i>f</i>
Curiosity	4
Efficient lesson processing	7
Pleasure of learning	6
Keeping information up to date	2
Acquiring a new environment	1
Desire for specialisation	1
Changes and transformations in the world	6
Desire to be a leader	1
Starting postgraduate education	1
Environment	1

Note: Some teachers expressed more than one opinion.

Some of the teachers' opinions about the learning teacher training period and the factors that mobilise them for learning are as follows:

*(P3): "I have been trying to be a continuously learning teacher for about 4 years since I graduated. The main thing that motivates me in learning is my sense of curiosity. I enjoy learning."*



(P6): "I have been a learning teacher for 5 years. I can say that the most basic factor that motivates me to learn is the developments in the world, technological developments, the change in the educational needs of students every year, and the change in education."

(P12): "I have been trying to learn since I started my profession. The sharing of my clients in the counselling process, my desire to be productive for them, the needs of my students, the developments in my field stimulate my learning."

(P15): "I am always open to learning. The more I learn, the more I realise that I need to know more. New things excite me and support my students to grow up in accordance with this age."

### **Reason for Attending In-Service Trainings within the Ministry of National Education**

Regarding the fourth sub-question of the study, the participants were asked the question "For what purpose do you attend in-service trainings within Ministry of National Education?" and the answers were analysed. Professional development and personal development are the main reasons for teachers to attend in-service trainings within Ministry of National Education. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 5.

Table 5

*Reason for attending in-service trainings within the ministry of national education*

<b>Themes/codes</b>	<b><i>f</i></b>
<b>Reasons for Attending In-Service Trainings within the Ministry of National Education</b>	
Issuance of a certificate	2
Professional development	15
Personal development	6
Ex officio delivery of trainings	3
Getting to know new people	2

Note: Some teachers expressed more than one opinion.

Some of the teachers' opinions about the reason for attending in-service trainings within Ministry of National Education are as follows:

(P7): "The Ministry of National Education determines and implements trainings due to a need. I choose the ones that will support my own professional development and contribute to my own development."

(P10): "I attend for professional development purposes. I listen to every training I receive ex officio or voluntarily and try to understand it. It definitely comes in handy one day. From time to time, trainer trainings of the trainings I receive are opened. Being a formator or mentor makes me happy to share what I have learnt with colleagues other than my students and to get to know new people. "

(P13): "I participate to improve myself and to learn about innovations and changes in our profession and to apply what we have learnt in our class."

(P16): "I participate in order to improve myself, to keep up with the developing system and to follow my profession in its current state. The certificates given as a result of the trainings may also be necessary in the courses we will open or in the tasks we will take."

**Changes Felt After The Trainings**

Regarding the fifth sub-question of the research, the participants were asked the question "What kind of changes did you feel after the trainings you received for your professional development?" and the answers were analysed. Teachers stated that after the trainings they received, they taught efficiently, they realised the unknowns, and their self-confidence and motivation increased. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 6.

Table 6

*Changes felt after trainings*

<b>Themes/codes</b>	
<b>Changes Felt After Trainings</b>	<b>f</b>
Efficient lesson processing	6
Realisation of the unknown	6
Increased self-confidence	4
Increased motivation	4
Willingness to attend other trainings	2
Increased communication skills	1
Critical view	2
Understanding the necessity of development	2
Being the centre of attention	2
Sense of professional competence	2

Note: Some teachers expressed more than one opinion.

Some teachers' opinions about the changes felt after the trainings on professional development are as follows:

(P2): "The biggest change I felt in myself was to realise how much I did not know. After both face-to-face in-service trainings lasting one week in other cities and some online in-service trainings, I realised how much knowledge and experience our profession requires."

(P5): "I think that the trainings we receive for professional development provide me with various advantages. For example, my knowledge and skills about the content provided increase, my self-confidence increases and I am willing to participate in different trainings, my communication skills improve, I gain motivation and feelings of satisfaction, I have different perspectives."

(P12): "The science of psychology is a vast field, my learning process will never end, I enjoy getting to know people, my admiration increases and I feel inadequate from time to time."

(P16): "First of all, making an effort on behalf of one's own profession makes oneself and one's profession valuable. Therefore, the spiritual pleasure is very nice. When you feel good spiritually and physically, this synergy completely surrounds you. It provides a great transition to your students to your target audience."

### Learning Outside The Profession And The Places Where They Are Learnt

Regarding the sixth sub-question of the research, the participants were asked the question "Is the learning in your life only related to your profession? What else do you learn? Where do you learn from?" and the answers were analysed. It was found that the main learning of the teachers outside the profession were handicrafts, difficulties encountered in daily life, sports branches and the use of technology. Social media, professional courses and experts come to the forefront regarding the places where teachers realise these learnings. The themes/codes and frequency values for all the answers given by the teachers are shown in Table 7.

Table 7

*Learning outside the profession and the places where they were learnt*

<b>Themes/Codes</b>	
<b>Learning</b>	<b><i>f</i></b>
Sport disciplines	5
Language training	2
Difficulties encountered in everyday life	7
Music	2
Technology use	5
Personal health	2
Graphic design	1
Handicrafts	6
Communication Skills	3
Plant cultivation	1
Kitchen work	4
Mysticism	1
History	1
<b>Places Learnt</b>	<b><i>f</i></b>
Professional Courses	5
Social Media	9
Scientific publications	1
Experts	5
In-service trainings	2
Colleagues	3
Books	3

Not: Note: Some teachers expressed more than one opinion.

Some of the teachers' views on learning outside the profession and the places where they are learnt are as follows:

(P7): "I try to improve myself in many areas, not only learning about my profession. I have received training in pastry, wood painting, vitroy, jewellery design, traditional arts, chocolate making, buckle making, painting, handicrafts, diction, computer, English and drama. I follow the trainings through Instagram, social media, circle of friends and school."

PK6): "We have learnt outside the profession, but this is more based on manual skills, that is, we can go to the group of handicrafts that are about to be forgotten. I am interested in plant growing, gardening and similar works. I benefit from public education courses. I ask for help from people who know this job from our own environment and I learn a little bit by trial and error method."

(P8): "Well, I am always a professional development person, actually, I really admire those who develop their hobbies, they ride horses, swim and so on. Unfortunately, I only have professional development because I can't keep up, otherwise I don't really do anything else."

(P14): "Of course not. Social media, friends and family push people to learn. The deficiencies I encounter in daily life force me to learn about these issues, we learn different things about the needs. Social media is a driving force in this regard."

### Sources of Motivation for Professional Development

Regarding the seventh sub-question of the study, the participants were asked the question "What are your motivation sources for self-improvement?" and the answers were analysed. It was found that student expectations and appreciation were the main sources of motivation for teachers' professional development. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 8.

Table 8

*Sources of motivation for professional development*

<b>Themes/Codes</b>	
<b>Sources of Motivation for Professional Development</b>	<b><i>f</i></b>
Desire to do the best	1
Using the learnt knowledge	3
Occupational satisfaction	3
Student expectations	8
Belief in knowledge/science	3
Appreciation	6
Teamwork	1
Enjoyment	1

Note: Some teachers expressed more than one opinion.

Some of the teachers' views on the sources of motivation for professional development are as follows:

(P1): "My source of motivation is generally the idea that if I am doing a job, I should do the best. If others can do it, why can't I do it? The expectations of my students also push me to learn and improve myself."

(P3): "Curiosity and my desire to know are the main things that motivate me. I also think that my desire not to stay away from current developments is also a big factor. My students are one of my biggest sources of motivation."

(P9): "Being appreciated. For example, in the previous years, I had a teacher profile that was pushed around a lot. In recent years, especially after I met eTwinning, my supervisors and my fellow teachers appreciated and encouraged me. This was motivation for me."

(P15): "The fact that the people around me support me and sometimes congratulate me, appreciate me, share my happiness and make me think that I am useful motivates me."

### Environment Supports Learning

Regarding the eighth sub-question of the research, the participants were asked the question "What do you think about your environment supporting your learning?" and the answers were analysed. All of the participant teachers stated that their families had positive support. In addition, it was found that there were colleagues, administrators and friends who supported teachers' learning as well as those who tried to prevent it. The themes/codes and frequency values related to the answers given by the teachers are shown in Table 9.

Tablo 9

#### Environment supports learning

<b>Themes/Codes</b>	
<b>Supporting</b>	<b>f</b>
Family	16
Colleagues	7
Friends	8
Managers	7
<b>Trying to Stop</b>	<b>f</b>
Colleagues	6
Friends	2
Managers	4

Note: Some teachers expressed more than one opinion.

Some of the teachers' opinions about their environment supporting their learning are as follows:

(P4): "People around me generally support my learning in a positive way. When they see that I gain new knowledge and skills and transfer them to my students, I get positive reactions from my whole environment."

(P11): "Thanks to them, teachers and administrators in my close environment support me. There is an unlimited cheque from my family, and I thank them for this."

(P13): "I don't think that my environment gives me enough support. My family supports me, but I don't think that my colleagues and friends support me. My colleagues and school administrators have even said that the training I received was unnecessary."

(P10): "My family, my wife, my children are very supportive. Our provincial directorate also supports all our teachers in this regard, but I have never received any support from my school administration."

### **Discussion, Conclusion & Suggestions**

This study, which aims to determine the views of teachers on the professional development experiences of self-learning teachers who attach importance to their professional development, was conducted with 16 participant teachers. Conclusions, discussions and suggestions regarding the findings obtained in the study are given below.

It is seen that teachers participate in many different activities for their professional development. Participating in different professional development activities contributes to the development of different professional skills (Kwakman, 2003). It was observed that the majority of the teachers participated in in-service trainings conducted by the Ministry of National Education remotely or face-to-face. It is thought that the successful studies and investments made by the ministry on in-service trainings and professional development studies in recent years have an effect on this. According to the findings of the research conducted by Katman and Tutkun (2015), in-service trainings increase teachers' professional knowledge and skills. Teachers' participation in in-service training activities can be seen as an indicator of the importance they attach to their professional development in a world where change is rapid. The fact that the Ministry of National Education makes in-service trainings compulsory also directs teachers to this source (Bayrakcı, 2009). In addition, social media, scientific publications and books are also among the sources that teachers use for professional development. Social media has become indispensable in our lives in recent years with the widespread use of smart phones. In the findings of other studies, it was emphasised that teachers frequently use social media and other internet tools (Sardaş & Deniz, 2018). Teachers and school administrators frequently use social media and can easily access the content presented on the internet (Özmen et al., 2011). In the study conducted by Abakah (2023), it was found that teachers frequently used informal activities for their professional development. The use of scientific publications and books for professional development also shows the importance teachers attach to primary sources of knowledge. Academic readings are very important as they enable teachers to follow the developments affecting their professional fields and to keep up to date (Kwakman 2003; as cited in Eroğlu & Özbek, 2020). Today, information resources are more easily accessible than ever before. Teachers who feel responsible for their own learning can manage their own learning processes and can easily provide their professional development.

The main activities that teachers have participated in are branch/field trainings and national/international project writing trainings. Autodidactic teachers follow the developments related to their branches and attach importance to their development in this direction. In each branch, there are various skills that teachers need to develop specific to themselves (Sardaş & Deniz, 2018). The development of these skills is a factor that will directly affect student

success. In recent years, it is seen that projects such as eTwinning and erasmus are frequently implemented in schools, and the widespread use of these applications makes it necessary for teachers to receive training in project writing. According to the research findings, it is seen that autodidactic teachers give due importance to their development in this field. Such projects contribute to students' 21st century skills such as communication, creative thinking, entrepreneurship and working in cooperation (Karataş & Öztay, 2023). It also provides teachers with learning opportunities in the use of information and communication technologies (Vuorikari et al., 2011).

When the reasons why autodidactic teachers felt the need for professional development were analysed, it was found that the majority of the teachers did not consider their current training sufficient. Pre-professional trainings are not sufficient and lose their validity very quickly in today's world where change and transformation are very fast. At the same time, people may encounter various problems that they cannot solve with the skills they gained in their pre-service education (Başaran, 1966; as cited in Güney, 2018). For this reason, teachers do not consider their pre-service training sufficient and seek various professional development. Teachers see technological changes as another reason for feeling the need for professional development. Especially in the last decade, innovations in the field of technology have caused changes in many areas of our lives. Schools, which should be the pioneers of change and transformation, are expected to keep pace with these changes. This change and transformation also imposes various responsibilities on teachers. Teachers are recognised as change agents in today's society (Bourn, 2015). Therefore, teachers should include technology in their teaching processes, develop their own technological adaptation and try to develop various methods to keep the comprehension levels of students who try to find a place for themselves in this new system high (Kır Elitaş & Sönmez, 2022). As a matter of fact, autodidactic teachers do not remain insensitive to this situation and feel the need for development in technology and refer to various resources. Teachers stated that another reason for feeling professional development is the change in the student profile and being efficient for students. Every practice in schools should put students at the centre. Because the purpose of existence of schools is students. The student profile is constantly changing and the expectations of students from schools are also changing. The change in student profile forms the basis of teachers' professional development needs (Odabaşı & Kabakçı, 2007). Teachers also feel the need for professional development in order to be productive for students and participate in various activities.

Considering how long autodidactic teachers have been learning teachers, it was found that the majority of the teachers have been learning teachers since they started their profession. Continuous professional development is necessary and important for every profession. However, it is more important for the teaching profession. Because one of the most important variables in determining teacher quality is professional development. Through continuous professional development, teachers can make their field knowledge more qualified, follow the developments in their field and bring their skills to the appropriate level with the desired conditions in the institutions where they work (Reese, 2010). In order to be effective and efficient teachers, teachers need to be open to learning and continue this learning. Because the teaching profession requires continuously following all innovations and changes in the world and reflecting the knowledge, skills, experience and understanding gained from them to the learning-teaching processes in the classroom (Özdemir, 2016). When we look at the factors that mobilise teachers in learning, sense of

curiosity, efficient lesson teaching, changes and transformations in the world and the pleasure of learning are among the main findings of this research. Teachers are always in search of efficient lesson teaching and try to learn new things. It is seen that autodidactic teachers also have a sense of curiosity and enjoy learning. Curiosity is a motivating factor in the learning process. When the characteristics of individuals who attach importance to continuous development are investigated, it is seen that curiosity features come to the fore (Diker Coşkun & Demirel, 2012). Considering that an individual will not continue a job that he/she does not enjoy, enjoying learning is an important element in the fulfilment of continuous learning. Because while learning for necessity is limited to knowing the desired amount, learning done with pleasure will make the individual more open to development and learning.

When the findings related to the reasons for attending in-service trainings within the Ministry of National Education are analysed, it is seen that autodidactic teachers participate in these activities for their professional and personal development. In addition to this, it is also seen that teachers participate in these trainings, albeit to a lesser extent, because the trainings are compulsory and a certificate is given at the end of the training. It is a necessity for teachers working in schools, which are the centre of development, to improve themselves. The easiest way to achieve this is through well-structured in-service training programmes. (Yilmaz & Esen, 2015). In recent years, the Ministry of National Education has been giving the necessary importance to both school-based professional development activities and distance in-service training activities, creating new platforms and providing teachers with plenty of opportunities. It is seen that autodidactic teachers also make use of these resources for their professional development and personal development.

Regarding the changes that autodidactic teachers felt after the trainings, it is seen that they reported that their lessons were productive, they realised that there were many things they did not know and needed to learn, and their self-confidence and motivation increased. Since it is among the findings of this research that teachers feel the need for professional development and that they express their opinions about being productive for their students as one of the factors that mobilise them to learn, the fact that teachers state that their lessons are productive after the training they receive shows that the teachers' goals are realised. One of the important factors affecting the efficiency expected from teachers, who have an important place in the healthy and effective continuation of the education and training process, is the motivation of the teacher (Taş, 2022). Teachers emphasised that their motivation increased after the trainings. Professional learning contributes to teachers' motivation by increasing their self-efficacy (Senge, 2014). Along with motivation, self-confidence also affects the efficiency of the teacher. A teacher with high motivation and self-confidence can serve the aims of education and school. It can be said that the fact that teachers feel that their motivation and self-confidence levels have increased as a result of the training they receive for their development causes an indirect effect on the quality of education and training through professional development activities. Because high motivation levels of teachers have a direct effect on the service quality of education (Yavuz & Karadeniz, 2009). Likewise, teachers' self-confidence will increase the quality of education and training services. Teachers' having a sense of self-confidence increases professional competence and also contributes to the formation of students' self-confidence (Pajares, 2005; as cited in Uysal & Gürol, 2018). In addition to these, teachers stated that



they realised how much they did not know after the training they received. Realising the unknown will push teachers to new learning and contribute more to their development. This will increase the quality of education.

In addition to learning activities related to their profession, autodidactic teachers also participate in various learning activities on handicrafts, sports, culinary work, use of technology, difficulties encountered in everyday life. Teachers learn these mostly through social media, professional courses and experts. Especially with the widespread use of smart phones and technological devices, many activities can be followed on social media platforms and people can easily obtain learning opportunities in line with their needs and interests. Again, public education centres, municipalities and private courses have been providing education services in many fields in recent years, and people can access these courses and get training and have the opportunity to develop in the fields they want.

When the motivation sources of autodidactic teachers for professional development are analysed, it is seen that student expectations and appreciation come to the fore. Economic, cultural, political changes in society and scientific and technological changes also change the student profile and students' expectations from education (Avcı & Durmuşçelebi, 2014). Students' expectations also force teachers to improve themselves. After participating in professional development activities, teachers feel that they can overcome difficulties and feel competent in responding to student expectations, which encourages participation in professional development activities. In fact, the basis of professional development is to improve students. As a matter of fact, professional development of teachers is defined as activities organised to develop professional knowledge, skills and attitudes for the advancement of students (Guskey 2000; as cited in Bümen & Uslu, 2020). According to the findings of the research, being appreciated, which is one of the leading motivation sources in the professional development of teachers, is one of the important motivation sources of individuals not only in the professional development process but also in many other areas. As a matter of fact, being respected in Maslow's hierarchy of needs includes the need to show oneself. People show interest in needs such as recognition, having social position and status, achieving success, being appreciated and being respected after meeting their physiological, security and love needs respectively (Yeşil, 2016). Teachers also care about being appreciated and respected in their professional lives, and it is seen that they participate in professional development activities in order to be recognised and appreciated as a successful teacher. In the findings of a study conducted by Drage (2010), the sources of motivation of teachers for professional development are listed as individual needs, support of colleagues and environment, commitment to lifelong learning, reward system at school, support of school principal, encouragement of family and friends.

All of the autodidactic teachers stated that their families supported their learning in terms of their environment's support for their learning. In addition, the number of those who stated that their close circle of friends supported their learning is in the majority, while the number of those who stated that their colleagues and administrators did not support them but tried to prevent them from learning is at a considerable level. Drage (2010) emphasised that one of the factors that motivate teachers for professional development is the encouragement they receive from their family and friends. Family and friends should encourage and facilitate the teacher's participation in various activities for development. When the responsibilities of the teacher in his/her life other than his/her profession are considered, his/her responsibilities towards his/her family come first. In the professional development process, the teacher will

have to allocate time for his/her development by cutting the time he/she will spend with his/her family. Therefore, without the support of the family, the number of activities that the teacher can participate in for his/her development will be limited. On the other hand, the support of colleagues and administrators is also important in the professional development of teachers. In particular, school administrators should motivate teachers for professional development both as role models and by providing various supports (Çayak, 2022). School administrators may perceive the fact that teachers' classes will be empty during the trainings they will attend and that the work in the school will seem to be disrupted as a problem. However, teachers who participate in professional development activities will contribute much more to the school in the long run. It is thought that the reason why teachers are not supported by their colleagues in terms of professional development and they try to prevent teachers from participating in professional development activities may be the comparison between teachers by others and the feeling of jealousy. However, teachers who attach importance to professional development activities and participate in various activities will be able to provide professional guidance to other colleagues in the school and make various contributions to their development. According to the findings of the research conducted by the National Foundation for Educational Research (NFER) in 2010, which aimed to determine which factors are motivating in the professional development of teachers, teachers stated that the first-hand support provided by colleagues and school administrators was effective in their development. According to the results of the same study, teachers emphasised that they could not find enough time due to the intensity of their lessons and that this was an obstacle for their development (Çayak, 2022). Both family and close friends, school administrators and other teachers should be aware of the fact that qualified education and training activities can be fulfilled by teachers who constantly develop and renew themselves according to the requirements of the age. Qualified teachers and qualified teaching can only be possible with the existence of continuous support for teachers (Seferoğlu, 2004). Therefore, it should not be forgotten that all stakeholders of education should provide various opportunities and incentives for professional development in order for teachers to improve themselves and become better equipped.

In the light of the findings of this research, it is possible to make various suggestions regarding the professional development of teachers. These suggestions are given below:

- Teachers mostly benefit from distance and face-to-face in-service training activities of the Ministry of National Education in terms of professional development. Therefore, ministry-level trainings should be diversified and made continuous in line with the needs of teachers by asking teachers.
- Due to the widespread use of social media in recent years, social media should be used effectively by the Ministry of National Education in professional development issues and professional development activities should be included more in these channels..
- Teachers constantly need development in their branches/fields and follow the trainings in this field. Therefore, branch-specific trainings should be diversified and made widespread by the ministry.
- Since teachers do not consider their current pre-service training sufficient, professional development activities should be given due importance from the first years of the profession, and face-to-face and distance education opportunities should be continuously made available to teachers based on the

philosophy of lifelong learning.

- In our world of rapid technological developments, all teachers need support in the use of technology. Therefore, teachers should be provided with easy access to trainings on this subject by authorised institutions. In addition, technological equipment in schools should be constantly renewed in accordance with the requirements of the age.
- Considering that the most important priorities of teachers in terms of professional development are to meet student expectations and to teach efficient lessons, trainings on teaching methods and techniques that will increase lesson efficiency should be included.
- For the development of teachers, graduate education should be given due importance and encouraged, and training activities should be organised in cooperation with universities.
- It is necessary to give the necessary importance to the promotion of the Presidential Communication Office Distance Education Gateway and make its use widespread.
- Awareness raising activities should be carried out on the necessity and importance of professional development and teachers' participation in professional development activities should be encouraged with rewards, service points, etc.
- The number of activities that teachers can participate in related to their personal development as well as professional development should be increased and diversified. Personal development courses should be organised for teachers during summer holidays.
- It should not be forgotten that qualified education can be provided by qualified teachers, and the participation of teachers in professional development activities should be supported by administrators, colleagues, friends and family.
- If teachers want to be effective and efficient in their profession, they should be open to professional development and participate in professional development activities frequently.

### **Ethic**

I declare that the research was conducted with the ethical standards of the institutional and national research committee, following the 1964 Helsinki Declaration and its later amendments, or comparable ethical standards.. Informed consent was obtained from all individual participants included in the study.

### **Author Contributions**

This article was jointly written by two authors.

### **Conflict of Interest**

The authors declare that they have no conflicts of interest.

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# Analysis of Misconceptions and Errors Regarding Exponential and Radical Expressions Through the Theory of Reducing Abstraction

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## Abstract

Investigating the reasons for misconceptions and errors is essential and important for making improvements in mathematics teaching. The idea of *reducing abstraction*, utilized as the framework for this research, can essentially be based on students' tendency to work with a lower abstraction level than the concepts they encounter in the course or what experts (mathematicians, teachers, etc.) expect from them. Since the process of reducing abstraction often occurs unconsciously, it can lead to misconceptions and errors. Exponential and radical expressions, which students first encounter in secondary school, are significant topics in mathematics, offering ease of representation and various calculations in many fields of basic sciences and engineering. Research on exponential and radical expressions, perceived by secondary and high school students as a collection of unnecessary formulas unrelated to daily life and difficult to understand, has revealed various misconceptions and errors. In this study, through the theory of reducing abstraction, the possible reasons for the misconceptions and errors revealed by research will be interpreted from an alternative viewpoint. Thus, a new perspective on student approaches regarding these subjects will be provided to teachers and mathematics educators.

## Key Words

Exponential expressions • Misconception • Radical expressions • Reducing abstraction

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## Introduction

Why do students have difficulty in learning mathematics? The nature of mathematics itself holds the key to this question. Mathematics is a discipline known for its abstract structure, and this abstract structure is crucial for the evolution of mathematical concepts and their interrelationships (Sfard, 1991). Mathematical concepts are generally defined in an abstract framework, and the links among these concepts form the basis of mathematical thinking. For example, basic mathematical structures such as the number sets, algebraic operations, and functions play a critical role in building more complex structures and theories (Tall, 2004). This unique abstract structure of mathematics is the biggest reason for the difficulties experienced in learning it. Ferrari (2003) expresses this fact as follows: "Although abstraction is known as the most relevant feature of mathematics from a cognitive point of view, it is one of the main reasons for failure in mathematics learning."

Mathematics is also a discipline in which there are significant connections between distinct concepts, similar to those between elements in the load-bearing structure of a building. The delicate nature of these connections as well as their strength are among the subtleties of mathematics. When you remove any connection in a mathematical structure, the entire structure breaks down, like a building whose load-bearing elements are damaged. Therefore, the critical role of relationships between mathematical concepts in students' development of abstract mathematical thinking, and in the learning process should be considered. Otherwise, as Dreyfus (1991) stated, students learn to apply many standardized methods in mathematics classes in order to answer limited questions that are just exercises. Research also shows that learning mathematical concepts in relation to each other helps students better understand and apply these concepts (Hiebert & Carpenter, 1992).

The abstract nature of mathematical concepts and their complex relationships with each other cause students to have difficulty in learning mathematics, misunderstand the concepts and misconstrue them in their minds. "Misconceptions" and "errors" that emerge as a result of the challenges students face when learning mathematics should also be regarded in this manner (Bingölbali & Özmantar, 2012). Research shows that mathematical misconceptions and errors have significant effects on students' long-term mathematics learning (Nesher, 1987). Therefore, it is vital that educators identify and correct these misconceptions and errors.

Pointing out the role of the term *conception* in making sense of *misconception*, Smith, diSessa and Roschelle (1993) defined misconception as "student understanding that systematically produces errors". This definition also implies that the terms *misconception* and *error* are connected to one another. At this point, the difference between *calculation error*, *misconception* and *error* must be expressed in order to avoid conceptual confusion. *Calculation errors* are errors that can be made carelessly and rarely by both expert and inexperienced people during the solution process of an exercise or problem, and result in wrong answers to the calculations. These types of errors are easily detected and corrected immediately. From this explanation, it is understood that the systematic errors made by students are different from an ordinary calculation error, indicating the presence of a deep understanding, an understanding system (Nesher, 1987), a cognitive structure (Oliver, 1989), or a misconception that reveals and controls itself. In other words, errors done by students are the surface image, and there is a misconception that controls and causes the formation of this image (Nesher, 1987). A *misconception* is not an error or an incorrect

answer owing to lack of knowledge. *Misconception* means an understanding that fits a concept in the mind but is fundamentally distinct from its formal definition. If a student can explain that the mistake he made on a subject is "correct" with reasons based on his own belief and says that he is confident about it, we can conclude that he has a misconception. Given these clarifications, it can be stated that misconceptions may result in errors, but not all errors are misconceptions (Yenilmez & Yaşa, 2008).

Exponential and radical expressions, which students first encounter in middle school, are important mathematical concepts that are closely interrelated, provide ease of representation in many fields of basic sciences and engineering, and are frequently used in calculations. On the contrary, exponential and radical expressions are perceived as a collection of unnecessary formulas that are difficult to understand, have nothing to do with daily life, especially by secondary and high school students. Regarding this situation, Elstak (2007) and Erlandson (2013) state that algebraic operations involving rational exponents and radical expressions are inherently abstract and cause confusion among students. Exponential and radical expressions are among the topics where students have various misconceptions and often make mistakes while working on them. Misconceptions and mistakes regarding these subjects negatively affect students' understanding of advanced mathematics subjects and their problem-solving skills (Stacey, 2006). Research shows that the common misconceptions and mistakes students make regarding exponential and radical expressions generally arise from basic conceptual misunderstandings, failure to establish connections between concepts, and symbolic representation errors (Avçu, 2010; Aydın & Özdemir, 2010; D. Ancheta & Subia, 2020; Denbel, 2019; Elstak, 2007; Erlandson, 2013; Rushton, 2014; Sikora-Press, 2016; Şenay, 2002; Zazkis & Liljedahl, 2004). For example, many students fail to grasp that squaring a number and obtaining its square root are inverses of one another. (Zazkis & Liljedahl, 2004). In addition, important misconceptions are observed about how to handle negative numbers in exponential and radical expressions (Aydın & Özdemir, 2010).

This study seeks to analyze the misconceptions and errors regarding exponential and radical expressions determined by previous research through the *theory of reducing abstraction*. The reason underlying this approach is to offer teachers and mathematics educators a view about student understanding by interpreting the possible causes of misconceptions and errors revealed as a result of research on these subjects from a different perspective.

### **Theory of Reducing Abstraction**

Although *abstraction* is simply known as "the process of transition from concrete to abstract", it is a multifaceted and complex concept, specifically within the context of mathematics education. Consequently, researchers have not reached an agreement on a unique definition of *abstraction*. However, it's thoroughly acknowledged that the concept of *abstraction* can be examined from multiple viewpoints, such as "some concepts are more abstract than others" and "abstraction ability is important for meaningful mathematics learning" (Hazzan, 1999).

Responses to questions such as how a mathematical concept is understood, through what processes it becomes meaningful, or what is effective in the process of structuring mathematical knowledge lie within the concept of mathematical abstraction. Because of the importance of abstraction in mathematics learning, mathematics educators have examined and discussed this issue from many different perspectives and developed various theories about abstraction. One of these is the *theory of reducing abstraction* (*reducing the level of abstraction*) which was first

developed and used by Hazzan (1999) to explain undergraduate students' understanding of concepts of abstract algebra and is generally associated with fields related to advanced mathematical thought (such as computer science) and mathematics subjects at the undergraduate level (Hazzan, 2001, 2003a, 2003b; Raychaudhuri, 2014; Şenay & Özdemir, 2014). Hazzan and Zaskis (2005) and Eraslan (2008) showed that this notion can also be utilized to explain student understandings at the school (primary and secondary school) mathematics level. *Reducing the level of abstraction* (shortly, *reducing abstraction*) idea can be based mainly on students' tendency to work with a lower abstraction level than the concepts they encounter in the course or what experts (mathematicians, teachers, etc.) expect from them. The process of reducing the abstraction level is indicative of the student finding ways to cope with the new concepts he has learned. In this way, students make concepts mentally accessible so they can think and handle with them. *Theory of reducing abstraction* consists of three subthemes developed based on different interpretations of abstraction in the literature. Nonetheless, it must be said that these themes of reducing the abstraction level are neither mutually excluding nor completely inclusive. (Hazzan, 1999, 2001). Below, the subthemes of the *theory of reducing abstraction* will be explained with examples.

#### **Reducing abstraction in terms of the quality of the relationships between the object of thought and the thinking person.**

This point of view of *reducing abstraction* is based on Wilensky 's (1991) claim that "whether something is abstract, or concrete is not a natural feature of that thing, on the contrary, it arises from the characteristics of the relationship between the person and the object." To put it another way, for every *concept* and *person* we can sight a different level of abstraction that reflects the prior relationship between the two. The closer and more connected somebody is to an *object*, the more tangible (and less abstract) he or she feels that *object*. The basis of this perspective lies in the tendency of some students' mental processes to make an unfamiliar thought more familiar or to make the abstract concrete (Hazzan, 1999). For example, the operation  $(1001)_2 + (11)_2$  can be directly calculated in the binary system using the 'carry over' approach we have known since elementary school. However, a student who first converts the given numbers to the decimal system he is used to and then performs addition has reduced the level of abstraction.

#### **Reducing abstraction in terms of reflecting the process-object duality.**

This interpretation of the reduction of abstraction rests on the *process-object duality* proposed in some theories related to the mental construction of concepts in mathematics education. Theories based on this duality (such as APOS theory) distinguish between the understanding of mathematical ideas as *processes* and those as *objects*, and despite their differences, they agree that the understanding of a mathematical concept as a *process* (sequential operations) is prior to and *less abstract* than its understanding as an *object*. Therefore, understanding a mathematical concept as if it were a *process* can be conceived of as a lower level of abstraction (i.e., *reducing the level of abstraction*) than its understanding as an *object* (Hazzan, 1999).

This interpretation of reducing the abstraction level is also related to the subtheme we explained previously, because the more a person deals with a concept that he initially perceives as a *process*, that concept begins to become more *familiar* to him and eventually he can perceive it as an *object*. In addition, we can develop this interpretation of

reducing abstraction from two different perspectives grounded in the understanding of a concept as if it were a *process*:

- (i) Personalizing formal expressions and logical arguments by the student using *first-person language*
- (ii) Student's tendency to use *canonical procedures* when solving problems.

Employing first-person language such as '*I do something*' shows how students perceive the processes related to the concepts they are thinking about in a simplistic manner. The tendency of students to use *first-person language* to make the *unfamiliar* language of mathematics more recognizable and understandable to them is an indication of the reducing the abstraction level.

Employing *first-person language* as an indicator of the understanding of a concept as if it were a *process*, that is, the reducing abstraction, can be illustrated with the following example: Regarding commutativity which is an algebraic property of a set and of an operation defined on the set elements; we can say that someone who uses the expression "If the set of real numbers holds the commutativity property according to the operation  $*$ , this property also valid for every subset of real numbers.", he comprehends the property of commutativity as an *object*. However, a person who tries to explain the commutativity with his own verbs, that is, using first-person language, such as "If *I get* a different result when *I change* the place of the numbers in the multiplication, it is not commutative.", has reduced the level of abstraction.

*Canonical procedures*, on the other hand, are procedures that are automatically triggered by more or less asked questions. This situation may occur due to the problem's nature, or it may arise from the student's association with the method applied to solve a similar problem he has encountered before. *Canonical procedures* are preferred by students because they provide the chance to solve the problem without examining the properties of the mathematical concepts in the problem, that is, without considering the concept as an *object* or even without the need to understand the mathematical ideas behind that method, but they can also cause errors (Hazzan, 1999).

### **Reducing abstraction in terms of the degree of complexity of the concept of thought.**

We can explain this interpretation of reducing abstraction with an example as follows: The real number set is a more *complex* mathematical structure than any element in the set, that is, a real number. This does not, however, imply that thinking with complex objects will always be more difficult. Here, the assumption is that "the more complex a mathematical structure is, the more abstract it is"; because, when a structure is analyzed as a whole, more details should be ignored. In this respect, this interpretation of abstraction focuses on how students tend to work with a simpler object that is related or thought to be related to it instead of a *complex mathematical object* they encounter, thus reducing the abstraction level by working with a *less complex object* (Hazzan, 1999).

To handle the new concepts, they have encountered, to make them mentally accessible and to think with them, students tend to work with less (lower level) of abstraction than experts expect from them, that is, they "reduce abstraction" but this situation should not be understood as a cognitive process that inevitably leads to misconceptions or mathematical errors (Hazzan, 1999). However, since the process of reducing abstraction does not occur consciously most of the time, it can also cause misconceptions and errors. In fact, although the major goal of the

research carried out within the basis of the *theory of reducing abstraction* was not to examine misconceptions and errors, it was observed in these research that students had various misconceptions and made mistakes in most of their answers. In addition, Şenay and Özdemir (2019) revealed that this theoretical framework is a useful tool for analyzing the reasons for misconceptions and errors with their study on misconceptions and errors in number theory. Consequently, based on these considerations, the theory of reduction of abstraction is adopted as the theoretical framework of this study.

## Method

### Research Design

In this research, document analysis, one of the qualitative research methodologies, was used. Document analysis is a systematic process for examining and evaluating documents, which can be in printed or digital formats. Similar to other qualitative research approaches, document analysis involves examining and interpreting data to derive meaning and build a comprehension of the associated subject (Corbin and Strauss, 2008).

### Research Sample

In document analysis, the researcher can decide on the sample size themselves and adjust it as they wish. They may include any documents they desire in their study and impose various restrictions if necessary (Corbetta, 2003). Accordingly, first of all the keywords to be used in the database searches to select the documents to be analyzed within the scope of the study were determined as “misconception”, “error”, “exponential expressions” and “radical expressions”. Searches were conducted in Google Scholar, YÖK National Thesis Center, Web of Science and Scopus databases. The studies whose full texts were obtained in the searches were re-classified according to the demographic characteristics of the sample or study group, grade, school level, etc., data collection tools and the year of the study. Among the classified studies, five studies were selected by purposive sampling method, taking into account the additional criteria that their content is appropriate to the theoretical framework, the sample or study group is different from each other in terms of demographic characteristics, grade, school level, etc., different data collection tools are used and they belong to different years. Below, information about the study groups/samples and data collection tools of the selected articles and theses are given:

(i) Şenay (2002) conducted his research on 729 students studying in the 9th grade of 9 different high schools in Konya, Turkey. In the study, a diagnostic test comprised of 20 multiple-choice questions was preferred as a data collecting tool to identify student misconceptions and errors related to exponential and radical expressions. Additionally, after analysis of the diagnostic test, semi-structured interviews were carried out with the identified students.

(ii) Avcu (2010) conducted his research with 159 students studying in the 8th grade of two different primary schools in Aydın province of Turkey. In the study, an 'Exponential Numbers Achievement Test' consisting of 18 open-ended questions was preferred as a data collecting tool to identify students' misconceptions and errors related to exponential numbers.

(iii) [Sikora-Press \(2016\)](#) conducted his research with 69 students enrolled in a basic mathematics course that met the graduation requirement of students studying in departments not directly related to mathematics at a university in the northeastern region of the USA. In the research, two different tests consisting of 7 isomorphic open-ended exponential and radical expression questions were given to the students at different times, and student opinions were taken on these issues.

(iv) [Denbel \(2019\)](#) conducted his research with 50 students studying in the geography department of a state university in Ethiopia and taking the "Mathematics for Geographers" course during the research process. In the research, a test comprised of three sections and 20 open-ended questions was preferred as a data collecting tool to identify students' misconceptions and errors related to exponential and radical expressions.

[D. Ancheta and Subia \(2020\)](#) conducted a study with 30 civil engineering, 10 electrical engineering and 10 mechanical engineering students studying in the engineering departments of a university in the Philippines in order to examine engineering students' misconceptions about algebra. In the study, a test was administered to the participants, including questions regarding exponential and radical expressions, and semi-structured interviews were carried out with the participants.

### **Data Analysis**

The findings of the articles and theses in the sample of the study, explanations and interpretations of these findings were analyzed using the content analysis method within the framework of the theory of reduction of abstraction, following the systematics of [Hazzan and Zaskis \(2005\)](#). Accordingly, first of all, if there was content in the documents related to concepts that were not directly related to exponential and radical expressions (such as linear equations), these were identified and not included in the analysis. Afterwards, the misconceptions or errors about exponential and radical expressions and the explanations for them, which were identified in the studies included in the sample, were classified and reinterpreted according to their suitability to the subthemes of the theoretical framework by taking the opinions of a mathematics education expert. The questions in the examples used in the study and the student answers to these questions were quoted from the sources without any changes. The views of the researchers on the misconceptions and errors they identified are also stated. The students in the quoted student interviews were coded as  $S_1$ ,  $S_2$ , and  $S_3$  differently from the sources.

### **Findings**

In this section, misconceptions and errors related to exponential and radical expressions will be interpreted based to the subthemes of the *theory of reducing abstraction* through examples selected from research sample.

#### **Findings related to the first subtheme**

**Example 1.** Rewrite  $42^{\frac{1}{2}}$  and  $28^{\frac{1}{2}}$ , if possible, to an equivalent, reduced expression ([Sikora-Press, 2016](#)).

In this question, the researcher expected the students to first write the radical expressions corresponding to the given exponential expressions  $\sqrt{42}$  and  $\sqrt{28}$ , then think about the factors of the numbers as radicands of these expressions and give the answer  $\sqrt{42}$  and  $2\sqrt{7}$ . Consequently, it was noticed that many students had difficulty in

questions involving rational exponents and gave wrong answers such as  $42^{\frac{1}{2}} = 42,5$  and  $28^{\frac{1}{2}} = 28 \div 2 = 14$ . The researcher explained this situation as students having the misconception of thinking of rational exponent as addition or multiplication.

From the above solutions of students who responded to the question wrongly, it appears that the expressions with rational exponents, as a mathematical *object*, are not *familiar* to these students. Students' tendencies to make the *unfamiliar* more *familiar* by associating rational exponents with addition or multiplication operations they are familiar with to overcome this situation, are indicative of reducing the abstraction level in terms of the *quality of the relationships between the object of thought and the thinking person*.

**Example 2.** Which of the following radicals are similar to  $3^3\sqrt{2}$  ?

- A)  $2\sqrt{5}$     B)  $3\sqrt{2}$     C)  $2^3\sqrt{3}$     D)  $-\sqrt[3]{2}$     (D. Ancheta & Subia, 2020)

To this question, only 10 out of 50 participants gave the correct answer of  $-\sqrt[3]{2}$ , while 27 gave the wrong answer of  $2^3\sqrt{3}$ . During an interview with one of the students who chose the wrong answer, the student mentioned that the radical expressions  $3^3\sqrt{2}$  and  $2^3\sqrt{3}$  are similar because the signs and degrees of the roots are the same in these expressions. Researchers have stated that the cause of this misconception is students' failure to remember that for radical expressions to be similar, their root degrees and radicands need to be the same.

It has been noticed that students who choose wrong answers like the above cannot conceive of a radical expression as an *object* with its root degree and radicand, and therefore, they fail to grasp the concept of similarity of radical expressions and have misconceptions. According to the theory of reducing abstraction, in the conceptual context of the question (similarity of radical expressions), it might be asserted that there is no quality relationship between the students and the *objects* they encounter (radical expressions) or that the *objects* are not familiar to them. To overcome this situation, students showed a tendency to make the *unfamiliar familiar* by focusing on the sign and only the root degree of the given radical expressions, and thus they reduce the abstraction level in terms of the *quality of the relationships between the object of thought and the thinking person*.

**Example 3.**  $(\sqrt{a^2}, \sqrt{16}) = ?$

- A)  $(\pm a, \pm 4)$     B)  $(a, 4)$     C)  $(|a|, 4)$     D)  $(\pm a, 4)$     (Şenay, 2002)

For this question, students chose the wrong answer  $(a, 4)$  with a rate of 53%. The researcher noted that these students have the misconception that  $\sqrt{a^2} = a$  for every real number  $a$ . Below is the part of an interview with a student ( $S_1$ ) that relates to this question:

R : Can you solve the question?

$S_1$  : The answer is  $(a, 4)$ .

R : How did you solve it?

$S_1$  : I simplified the root  $\sqrt{a^2}$  with the exponent of  $a$  .



R : Then, are  $\sqrt{(-2)^2}$  and  $\sqrt{2^2}$  equals to each other?

S<sub>1</sub> : (Thinks)... Equal.

In the Turkish education system, students are first introduced to radical expressions in the 8th grade (secondary school), and at this level, only studies on the square root of positive numbers are carried out. Knowledge about square and cubic roots of negative numbers is given in the 9th grade (high school). Students who chose the wrong answer ( $a, 4$ ), tried to use the knowledge they learned in secondary school about the square root of positive numbers for the square root of any real number. In other words, they tried to overcome the problem they encountered by associating the *object*  $\sqrt{a^2}$  that is less familiar (or more abstract) to them with an *object* that they worked on it more in time and is more familiar (or more concrete) to them. Thus, they reduced the abstraction level in terms of the *quality of the relationships between the object of thought and the thinking person*.

### Findings related to the second subtheme

**Example 1.** Compare the expressions  $(0,5)^{21}$  and  $(0,5)^{17}$  (Avcu, 2010).

The researcher stated that students mostly gave wrong answers to these and similar questions. These students made the comparison  $21 > 17$  and answered  $(0,5)^{21} > (0,5)^{17}$  incorrectly. According to the researcher, this misconception occurred as a result of students thinking directly about the general rule (*repeated multiplication*) regarding exponential expressions without paying attention to the base number of exponents.

When examined in terms of theoretical perspective of our study, the students who made this solution ignored the base and did not consider the exponential expression as an *object* to consider the base and exponent together, but they tended to think the most familiar *canonical procedure* namely *repeated multiplication* which is automatically triggered because of the structure of the exponential expression. It might be asserted that students with this tendency reduced the abstraction level in terms of the *process-object duality* because they understood exponential expressions as processes, which is a lower level of understanding than conceiving them as objects.

**Example 2.** If  $a = (2^3)^2$ ,  $b = 2^{(3^2)}$ ,  $c = (2^3)^{-2}$ , what is the correct order between the numbers  $a, b, c$ ?

A)  $a < b < c$     B)  $c < a < b$     C)  $b < c < a$     D)  $c < b < a$     (Şenay, 2002)

34% of the students responded this question wrongly. It has been observed that these students tend to calculate the given expressions separately, that is perform operations instead of using the results  $a = 2^6$ ,  $b = 2^9$ ,  $c = 2^{-6}$  obtained from properties of exponential expressions, and they make various mistakes in these calculations. The following student (S<sub>2</sub>) interview illustrates an example of this approach:

R : Can you solve the question?

S<sub>2</sub> :  $a = 2.2.2 = 8^2 = 64$ ,  $b = 2^2.2^2.2^2 = 4.4.4 = 64$ ,  $c = 2.2.2 = 8^{-2} = -64$ .

R : Are  $(2^3)^2$  and  $2^{(3^2)}$  equals to each other?

S<sub>2</sub> : (Thinks) ... It is not.

R : But you found it equal.

S<sub>2</sub> : I probably did something wrong.

It might be asserted that students who make this and similar solutions tend to use the *canonical procedure*, which is automatically triggered by the nature of the encountered problem and the exponential expression, that is, to perform operations with *repeated multiplication*, without considering the given exponential expressions as an *object* to be considered with their properties. *Canonical procedures* are preferred by students because they enable the problem to be solved without examining the properties of mathematical concepts, that is, without considering the concept as an *object*. In this case, students' tendency to directly perform operations is an indication of the reduced level of abstraction in terms of the *process-object duality*.

### Findings related to the third subtheme

**Example 1.** Simplify the expression  $(-8)^{2/3}$  (Denbel, 2019).

Most of the students answered the question wrongly. Some of the students who answered wrongly solved it as  $(-8)^{2/3} = -8^{2/3} = -(8)^{2/3} = -4$ . The researcher stated that these students did not perceive the role of the grouping specified in parentheses or had the misconception that parentheses did not have any effect.

In regard to theoretical perspective of our study, these students, instead of dealing with an exponential expression with a negative base, which seemed *more complex* to them, made the base of the expression positive and has transformed it into an easier form to calculate. It can be said that these students reduce the abstraction level in terms of *the degree of complexity of the concept of thought*, since they tend to work with a *less complex object*.

**Example 2.**  $\frac{\sqrt{a} \cdot \sqrt{a}}{\sqrt{a} + \sqrt{a}} = ?$ ,  $a \neq 0$

A)  $\frac{1}{2}$       B)  $\frac{\sqrt{2}}{2}$       C)  $\sqrt{a}$       D)  $\frac{\sqrt{a}}{2}$       (Şenay, 2002)

24% of the students answered the question wrongly as  $\frac{1}{2}$ . Some of these students by accepting  $a = 1$  has done the operation  $\frac{\sqrt{1} \cdot \sqrt{1}}{\sqrt{1} + \sqrt{1}} = \frac{1}{2}$ . However, when  $a = -1$ , it is easy to observe that the result will not  $\frac{1}{2}$ .

It might be claimed that the students who made solutions similar to the one above did not consider the expression  $\sqrt{a}$  as an *object* with its properties. In addition, these students tended to avoid the *complexity* of the idea that the number  $a$  could be any negative or positive real number other than 0 (i.e.  $a \neq 0$ ) by using easily calculable numerical values (e.g.  $a = 1$ ) instead of  $a$ . This approach of students is an indication that they reduce the abstraction level in terms of *the degree of complexity of the concept of thought*.

### Miscellaneous Example

Although the interpretation of the examples we have given so far is in accordance with the three subthemes of the *theory of reducing abstraction* separately, in some circumstances, it could be possible to interpret the student's

approach to the same example with multiple subthemes. This also shows that the different subthemes of the *theory* are neither mutually excluding nor completely inclusive of each other. The last example we will give below is interpreted with this approach.

**Example 1.** Given that  $a$ ,  $b$ , and  $c$  are nonzero real numbers, which of the following cannot be made zero as desired?

$$\text{A) } a + b + c \quad \text{B) } a^2 + b^2 + c^3 \quad \text{C) } (a^2 + b + c^2)^4 \quad \text{D) } a^2 + b^2 + c^2 \quad (\text{Senay, 2002})$$

66 percent of the students answered the question wrongly. The majority of these students tried to find the solution by using a numerical value instead of the letters  $a$ ,  $b$ , and  $c$ . Rather than dealing with *objects* (letters  $a$ ,  $b$ ,  $c$ ) that seem *abstract* to them, these students tended to deal with *objects* (numbers) that are *closer* to them by using numerical values instead of letters, that is, they reduced the abstraction level in terms of the *quality of the relationships between the object of thought and the thinking person*. These students also tended to calculate the expressions in the choices by giving numerical values to the letters  $a$ ,  $b$ , and  $c$  without considering the fact that "the even power of any real number other than 0 is always positive", that is, they tried to perform operations (*canonical procedure – process*) without analyzing the exponential expressions they encountered as *objects* which reflects the reduction of the abstraction level in terms of the *process - object duality*. Some students tried to overcome the situation they encountered by using only positive numbers instead of the letters  $a$ ,  $b$ , and  $c$ . These students have reduced the abstraction level in terms of the *degree of complexity of the concept of thought* by using the set of positive integers, which is *easier* to understand, instead of working with real numbers, which are difficult and *complex* to comprehend. Following is a student ( $S_3$ ) interview regarding this point of view of reducing the level of abstraction.

$R$ : Can you solve the question?

$S_3$ : If we take  $a = 1, b = 2, c = 5$ ,  $a + b + c$  cannot be made zero since  $1 + 2 + 5 \neq 0$ .

$R$ : Well, let's try the values you used in other choices. (Trying) As you can see, the other choices could not be made zero also. Actually, if you use all the values as positive numbers, you cannot make any choice of this question zero. For example, if we use  $a = -1, b = -2, c = 3$ , then  $a + b + c = (-1) + (-2) + 3 = 0$ .

$S_3$ : So, we can take negative numbers.

### Discussion, Conclusion & Suggestions

Researchers have employed a variety of approaches to examine students' understanding of mathematical concepts, misconceptions, and errors. Error analyses are crucial in assisting teachers to determine what types of errors a student has made and why. To determine whether a specific error pattern exists, for example, whether the student consistently makes the same type of error or to identify procedural mistakes, a thorough analysis of errors is necessary. In addition, diagnosing errors and determining their causes also allows teachers to meet students' needs more efficiently.

In the studies examined, students' inability to make sense of rational exponents or parenthesized representations (Denbel, 2019; Sikora-Press, 2016) and not knowing the rules completely (Avcu, 2010; D. Ancheta and Subia, 2020; Şenay, 2002) were suggested as the reasons for misconceptions and errors regarding exponential and radical expressions. In this study, it was shown that misconceptions and errors can be attributed to students' tendency to work with a lower level of abstraction than the abstraction required by the concepts they encounter in the lesson or the abstraction expected by the teachers, according to the *theory of reducing abstraction*.

Although the *theory of reducing abstraction* is not a theory developed to examine student errors and misconceptions according to Hazzan (1999), the examples in our study show that unconscious reduction of the level of abstraction can lead students to errors and misconceptions, and therefore this theoretical framework can also be used to examine student errors and misconceptions. Similarly, Şenay and Özdemir (2019) showed that this theory can be used to explain the reasons for student errors and misconceptions.

Presenting the reasons for misconceptions and errors about important concepts of school mathematics such as exponential and radical expressions with a different approach from the previous studies will contribute to the development of teachers' and educators' perspectives on the subject. Conducting similar studies at different student levels and on different subjects would also be useful to identify the causes of possible misconceptions and errors.

#### **Ethic**

This study is in the category that does not require ethical approval.

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## The Method Recommended by Pestalozzi for Mothers to Teach their Children: “Wie Gertrud ihre Kinder lehrt”\*

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### Abstract

Education is one of the areas in which scientists show great interest. Pedagogy plays an important role in this. Johann Heinrich Pestalozzi is one of the most important personalities to think of when it comes to education, and he had a strong influence on his time because he was indeed dedicated to human education. Pestalozzi postulates that people must be educated holistically. He thinks that everything encountered by humans is only meaningful insofar as it contributes to their complete education. The educational form he developed aims to foster the autonomy of children. In this context, Pestalozzi's work “*Wie Gertrud ihre Kinder lehrt*” holds particular significance, where he documents his ideas and experiences regarding elementary education and the upbringing of humanity. This study aims to analyse the work with regard to children's education and to present the method he proposes for educating children through their mothers. Pestalozzi considers the mother to be a child's primary and most effective teacher. The mother's role as a teacher manifests itself in her affective-social relationship with the child. The development of love, trust, gratitude and obedience takes place through the relationship between a child and its mother.

### Key Words

Autonomy of children • Elementary education • Johann Heinrich Pestalozzi

\*This study is based on the dissertation of the first author.

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## Introduction

The concept of education is highly controversial and has also been neglected at times. There is talk of conjunctures of the concept of education, which fluctuate between the controversial motto “we don't need education” and the conservative postulate of “courage to educate” (Faulstich-Wieland & Faulstich, 2006, p. 46). It would be appropriate to argue the variable meaning and definition of the concept of education.

Education encompasses those social actions through which people attempt to develop the structure of the psychological dispositions of other people in the long term. The components deemed to be of significance should be preserved, while the emergence of affections considered undesirable should be prevented. The following sentence provides a concise overview of the term's core content: Education is defined as the actions undertaken by individuals with the intention of influencing the personality of others in some manner (Brezinka, 1990, as cited in Raithe, et al., 2007, p. 22).

Pestalozzi's concept of education can be understood as analogous to the healthy development of a tree. He represents healthy education through a tree planted near fertile waters. First, it is placed in the soil in the form of a small seed, which contains the design of the tree, its shape and its characteristics. The growth of the entire tree is a continuous series of organic components, the configuration of which is reflected in its seed and root. Man is similar to a tree. In a newborn child, those abilities are hidden that are to unfold over the course of life. The individual and separate organs of his being gradually shape into a unity and build humanity in the image of God. The education of man is a purely moral result. It is not the educator who gives man new powers and abilities and gives him breath and life. He only prevents certain unfavourable influences from disturbing the course of nature's development (as cited in Monroe, 1907, p. 315 pp.).

In an environment where the discussion of “public education” encompasses all of Europe, Pestalozzi places particular emphasis on the fact that not only people belonging to the higher milieu have the right to a good education, but those from the lower class should also be offered the same educational opportunities. Consequently, this allows them to fare better in a world where everything continuously evolves and changes. To this end, Pestalozzi carries out various works and projects to make a significant contribution. Pestalozzi's concern for the people is evident firstly in his belief in the right of every individual to education, secondly in the role of society in providing this education, and finally in the importance of the home environment (Bowers & Gehring, 2004, p. 307).

Pestalozzi also acknowledges the significance of a close relationship between the home and educational institutions to ensure the child's success. His writings repeatedly emphasize the importance of the mother in a child's life and the influence of the mother-child relationship on their development (Bowers & Gehring, 2004, p. 308). It is widely accepted that the mother can bring up a child at least until the age of six. Pestalozzi considers this knowledge to be the foundation of all subsequent development. It is therefore evident that if this education is lacking, all future endeavour is lost (cf. Opper, 1845).

Through his newspaper article “*Pestalozzi'yi anımsamak ... [Remembering Pestalozzi ...]*” Sariaslan (2019) makes us think of Pestalozzi's hard life and expresses his enthusiasm: “while Pestalozzi established and

institutionalized educational and humane methods that free the human spirit from its shackles, he placed human love at the centre of education. Simultaneously, he turns towards the European people, overwhelmed by a morality and education based on fear”.

Pestalozzi's works on education or upbringing may be summarized as emphasizing the standpoint of the developing mind of the child. He believes that human improvement must come from two sources. On the one hand, people should be empowered through education. On the other hand, existing conditions must be improved through legislation (Bowers & Gehring, 2004, p. 309). Pestalozzi also points out that training for a specific profession must always be subordinated to the universal goal of general education (Silber, 1960, p. 35).

An important work in which Pestalozzi recorded his ideas is “*Wie Gertrud ihre Kinder lehrt*” (*How Gertrude teaches her children*) (1801). Tröhler (2015, p. 253) considers it as a type of pedagogical philosophy of education, in which Pestalozzi wrote about his thoughts and experiences. The impact of this work spread magnificently throughout Europe: Johann Gottlieb Fichte, for example, in his “*Reden an die deutsche Nation*” (*Speeches to the German Nation*) of 1807, describes Pestalozzi's method as a suitable model method, because he sees a close connection between the renewal and world mission of Germany and a constitutively renewed education (Tröhler, 2015, p. 253).

In his “*Wie Gertrud ihre Kinder lehrt*”, Pestalozzi tries in fourteen letters to give mothers instructions on how to teach their children themselves, because he is convinced that a child should be educated by its mother at home at least until the age of six. Mothers are expected to be able to find answers to all their questions in this work. He explains in detail how they must bring up and educate their children holistically, morally and naturally so that they can continue their existence as individuals in the world.

This paper aims to analyse Pestalozzi's “*Wie Gertrud ihre Kinder lehrt*” with regard to education and to present the method Pestalozzi proposes for the education of children by their mothers.

### **Johann Heinrich Pestalozzi and his work “*Wie Gertrud ihre lehrt*”**

Johann Heinrich Pestalozzi was born on 12 January 1746 and died on 17 February 1827. He received a strict, protective and moral upbringing from his family, which had a profound impact on his subsequent life. From an early age, Pestalozzi set himself a challenging and ambitious goal, which he pursued throughout his life. His sole objective was to serve the collective good of humanity. In pursuit of this objective, he first began to study theology but subsequently withdrew from the program and decided to study law.

Johann Heinrich Pestalozzi dedicated his life to turning his ideals and dreams into reality. In this context, he established several institutions for the education of children in various locations. These included Neuhof (1769-1780), Stans (1798-1799), Burgdorf (1800-1804/1805) and Yverdon (1804-1855), for which Pestalozzi received financial support. In order to provide further financial support, he began to create literature, writing numerous works on a variety of subjects. Education is a significant theme in his works.

Due to the poor image of schools at the time and his great interest in improving elementary education, one of his most important works, “*Wie Gertrud ihre lehrt*”<sup>1</sup> emerged. This work consists of fourteen letters, which actually appear in the book in chapter form. WGL was the result of Pestalozzi’s educational experiments and experiences between 1799 and 1801 in Burgdorf. The title continues as follows: “*ein Versuch den Müttern Anleitung zu geben, ihre Kinder selbst zu unterrichten, in Briefen*” [An attempt to give mothers instructions on how to teach their children themselves, in letters], which reveals the aim to the reader from the outset. The first edition, published in 1801, is used in this paper.

Pestalozzi’s experimental method contradicts the pedagogical practices of his contemporaries, who continued to rely on rote learning techniques. In his classroom, the focus shifts from teacher to student, from boring memorization to the interests of children, and from the privileged few to the masses. Pestalozzi’s primary motivation for changing the teaching approach is to educate society for its own benefit. Pestalozzi argues that rote learning, or [catechising], is nothing more than parrot-like repetition of incomprehensible sounds (WGL, p. 75). Instead, he suggests proceeding gradually in teaching, corresponding to the developmental stage of the child. According to him, explanations must be clear and adapted to the children’s understanding. The subject must be well comprehended and applied through exercises before introducing new material. Simultaneously, the presentation of new knowledge is based on the sensory experiences of the learners (Laubach & Smith, 2011, p. 343).

Pestalozzi owes the beginning of his influence on the development of pedagogical thinking firstly to his work WGL. Secondly, this influence can also be attributed to the fact that he put his proposals into practice. Pestalozzi wanted to establish a [psychological teaching method] that corresponded to the [laws of human nature]. As a result, he places particular emphasis on spontaneity and self-activity. Children should not be given pre-packaged answers but should arrive at answers themselves. To achieve this, their abilities to observe, judge, and think, as well as their self-activity, should be fostered (Silber, 1960, p. 140). The goal is to educate the child as a whole. Pestalozzi attempts to balance or harmonize three elements - heart, head, and hand.

### Elementary education in „*Wie Gertrud ihre Kinder lehrt*“

In this part of the paper, the method for elementary education in WGL is presented in four parts.

#### 1. Child education

Pestalozzi wanted to educate poor children to their full potential and humanity. He strives for completion and perfection even in the lower classes, because he recognizes the immense gaps that are based on confusion and incompleteness. As a result of the focus on completion, “a general sense of beauty and order” develops in the children. They begin to feel themselves; “sie wollten, —konnten, —harrten aus, —vollendeten und lachten, ...“ (WGL, p. 16 pp.). Pestalozzi is aware of the power of human nature and its peculiarities.

Even if it was acquired out of necessity, Pestalozzi gained a lot from having children teach each other in the classroom. The lack of co-teachers led him to this emergency solution, the consequences of which surprised him in a

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<sup>1</sup> Henceforth, this title will be abbreviated as “WGL”.

positive way. He placed the better children among the weaker ones. They all endeavour to do everything they are instructed to do (WGL, p. 17).

Pestalozzi sees the schools as [artificial stifling machines], where seems to be only talk of responsibility, pedantry, and arrogance. These characteristics are foreign to him (WGL, p. 28). He only wants to set his goal in motion. For this purpose, he tirelessly learns his A. B. C. from morning until evening, seeks ways to simplify the beginning of spelling and arithmetic as much as possible, and to bring them into such forms that gradually lead a child from the first step seamlessly to the second and securely to the next ones (WGL, p. 29).

„Von dem Augenblicke, in dem seine Sinne für die Eindrücke der Natur empfänglich werden, von diesem Augenblicke an unterrichtet es die Natur. Die Neuheit des Lebens selbst, ist nichts anders, als die eben gereifte Fähigkeit, diese Eindrücke zu empfangen; sie ist nicht anders, als das Erwachen der vollendeten physischen Keime, die jetzt mit allen Kräften und mit allen ihren Trieben nach Entwicklung ihrer Selbstbildung haschten: es ist nicht anders, als das Erwachen des jetzt vollendeten Thiers, das Mensch werden will, und Mensch werden soll“ (WGL, p. 33 pp.).

Teaching is then the “art” (*Kunst*)<sup>2</sup> of helping this understanding of nature to develop. By art is meant here the proportionality and harmony of the impressions that are to be imparted to a child according to its developmental capacity (WGL: 34). Nature leads man directly to wisdom and truth. The more Pestalozzi follows its trail and aligns his actions with it, the more successful he is in developing a child's abilities. In this way, even a three-year-old child can achieve a great deal, even if it seems quite difficult to him (WGL, p. 45).

As a result, some basic principles, which must be used as a guide for the development of the minds of the children, emerge from his experience with them (WGL, p. 47):

1. gradually widen the sphere of their sense-impressions
2. firmly impressing upon them those sense-impressions that have been brought to their consciousness.
3. to give sufficient language knowledge that nature and art have brought to their consciousness.

Pestalozzi sees the mother as the main influence on the child and gives her the task of leading her child to the good by leaving it as free as possible in its nature. On the other hand, she has to set limits by the affective-social relationship between them (see WGL, 13th and 14th letter).

## **2. The first elementary means of instruction and gaining knowledge**

Pestalozzi was convinced that man should imitate “the actions of high nature”. Just as a seed grows slowly and imperceptibly day by day into a large tree, so man should develop step by step and education should depend on this. In this direction, principles are needed from which the thread of a broadly psychological method of teaching can be spun. According to Pestalozzi, only mature judgements should be taken into consideration, which are the result of a complete perception of the object under being conscious of all its parts. These principles to which the development of human nature is subject are then (WGL, p. 144 pp.);

- a) One should learn to classify observations and complete the simple before proceeding to the complex.

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<sup>2</sup> Pestalozzi uses the term "Kunst" (art) in three ways: a) in a broader sense as the opposite of “nature”, “culture” and “civilisation”; b) in a narrower sense, all conscious influences of adults on the child for the purpose of education and upbringing; c) initially, Pestalozzi also used this concept to mean craftsmanship, physical ability or professional activity. <https://www.heinrich-pestalozzi.de/biographie/tabellarische-uebersicht/wie-gertrud-ihre-kinder-lehrt-einfuehrung>

- b) All essentially related things should be brought into context in the mind in which they are actually found in nature.
- c) The impressions of important objects should be enhanced and clarified by bringing them us closer by art and through multiple senses.
- d) All effects of a physical nature are to be regarded as necessary, recognising in this necessity the result of their art.
- e) The richness of its charm and the variety of its free play create physical necessity, or natural law, to bear the impress of freedom and independence.

According to Pestalozzi, the laws of nature, to which the above sentences can be traced back, have a threefold source. The first source is Nature itself. Thanks to it, our mind moves from dark sense-impressions to clear ideas. Perfection is the most important law of nature. According to this law, anything unfinished is not true. The second source is the sensuality of our nature, which is generally interwoven with the power of sense-impression. It swings in its actions between the tendency to see and know everything and the desire of enjoying everything that satisfies the urge for knowledge and understanding. One achieves all his knowledge through the immeasurable stimulus. Pestalozzi sees the third source in the relationship between his external situation and his cognitive faculty. Pestalozzi sees the third source in the relationship between a person's external situation and his power of perception. As a mere physical being, man perceives all the truths of the world only to the extent that the objects reaching his sense-impression approach the centre around which his life revolves (WGL, p. 148 pp.).

Man's cognition proceeds step by step from confusion to determination, from determination to clarity, and from clarity to definiteness. The confused sense-impressions are first made present, then represented in various changing conditions, and finally connected with the whole circle of other knowledge (WGL, p. 160).

The WGL is a didactic-methodological design that aims to ensure that the principles of teaching coincide with the sensory-mental constitution of the human being. It places sense-impression as the basis of all instruction. It is part of the task of teaching to convey sense-impression in such a way that the significant structures become visible to the children, so that they arrive at clear concepts. During this learning process, they become familiar with the basic elements of every form of knowledge (Stübiger, 1974, p. 112). According to Pestalozzi, there are three elementary points to be considered in teaching. These are number, form and language (WGL, p. 166).

#### *Language – Sound*

In Pestalozzi's method the art of language is generally linked to the knowledge that nature and art give us. The children thus progress to the point where they are able to express themselves clearly about every step of their knowledge (WGL, p. 125). The ability to speak comes from the power of the sound, which is the first elementary means of instruction.

Teaching speech sounds is very important because it is the basis for the next steps. The child should be aware of speech sounds in their entirety as early as possible. Before the ability to pronounce is formed in him, this awareness

should be perfected. The letter forms should only be placed before a child's eyes after it has mastered simple repeating. Only then it can be begun with reading practice (WGL, p. 171).

According to Pestalozzi, a spelling book must therefore contain the sounds that make up a language in their entirety. It should be repeated daily in every home by the spelling child practising in it, in the presence of the child in the cradle. Thus, from the cradle, through repetition, the child's awareness of tones is deeply ingrained and gradually becomes unforgettable (WGL, p. 171). After spelling, children are introduced to word sequences. For this purpose, mothers should be capable of making their children familiar with the most necessary names of objects in the world, which will prepare them from the earliest age for the study of names (WGL, p. 183). Through his experiences, Pestalozzi observed the children's ability to read matures by learning these sequences of names. This maturity contributes to making later instruction easier (WGL, p. 183).

Pestalozzi applies two criteria for teaching objects that are directly recognized through the child's five senses and about which the child should express himself as early as possible. Firstly, he selects those nouns from the dictionary that are characterised by distinctive and sensually recognisable features and then he adds the adjectives that reflect their characteristics next to them. He then reverses this rule. He selects the adjectives from the dictionary that describe the distinctive and sensually recognisable characteristics of objects. Next to these come the related nouns (WGL, p. 192 pp.).

Pestalozzi calls language an art or the epitome of all the arts to which man has come. Through it he can express the impressions which nature makes on him in its entirety. Language gives us many things (WGL, p. 215). „Man sagt vom elenden Stier, was wäre er, wenn seine Kraft kennte? Und ich sage vom Menschen, was wäre er, wenn er seine Sprachkraft kennt?“ (WGL, p. 216).

### *Form*

The teaching of form must precede by the consciousness of the sense-impression of the formed objects. Their artificial presentation for the purpose of instruction is derived on the one hand from the nature of observing and on the other from the specific aim of the teaching itself (WGL, p. 219).

The consciousness of observing formed objects leads to the art of measurement, which is directly founded on the art of sense-impression. The power of this cultivated sense-impression leads us, through comparing objects to the art of measurement, to the art of drawing, and finally to the art of writing.

If one assumes that the sense-impression is the basis of all knowledge, then one unquestionably accepts the connection between the accuracy of sense-impression and correct judgement. The complete correctness of the sense-impression results from the measurement of the objects to be judged, or from the formed power of the sense of proportion. Drawing is the linear regulation of form. The extent and content of form are correctly determined by excellent measuring skill; meaning practice and proficiency in measuring precede the practice of drawing (WGL, p. 224).

The art of drawing is a skill based on the art of measurement. Through this, one can conceive the outline and features of any object by observing its similar lines and subsequently imitate them accordingly (WGL, p. 236).

The art of writing can be subordinated to the art of drawing and measuring, but drawing in particular should precede writing, as it enables the child to form letters correctly. Pestalozzi divides the learning of writing into two stages (WGL, p. 241 pp.);

- a) the time during which the child should become familiar with the shape of the letters and their combinations independently of the use of the pen; and
- b) the time when the child practises using the actual writing instrument, i.e. the pen, by hand.

All subjects presuppose the organisation and determination of their means and methods according to the age of the children to be taught. This is also true for the art of writing. According to this method, even a bad teacher or a very untrained mother can teach their children to write correctly to a certain extent, without being able to do so themselves (WGL, p. 244).

### *Number*

Besides sound and form, number is the third elementary means of instruction and gaining knowledge. The purpose of number is to make us conscious about the relationship between more and less in all seen objects, and then to define them clearly. Unlike sound and form, number never leads to error or deception, but to unquestionable results (WGL, p. 258).

The art of arithmetic consists of the composition and separation of several units. Number is only an abbreviation of the natural method of calculating. The awareness of numerical relationships is strengthened by the abbreviations of the art of arithmetic, as the forms taught within this art are carefully and deeply imprinted in the human mind. The entire further development of this art is based on the real relationships that underlie all calculations (WGL, p. 260).

Pestalozzi has the children remember the firm impression of numerical relationships as actual real variations of more and less. First, he shows them the basic numbers (1-10) by means of objects, which give a child clear sense-impression, then it is asked to find these objects, designated as a unit, on the boards. After that, the doubled and tripled units are to be found. Then the child should rediscover these relationships on its fingers or with peas, stones or other objects. Pestalozzi makes them repeat this several times a day in order to imprint it deeply. In this way they become fully aware of the numbers in their inner truth (WGL, p. 261 pp.).

The elementary means of instruction, number, form and language, aim to teach children the following (WGL, p. 165);

- to regard every object brought to their consciousness as a unit
- to know the form of every object
- to familiarize them as early as possible with the full range of words and names of all objects they recognize

### **3. The teaching principle of *Anschauung***

The question of sense-impression in relation to teaching is an interesting and noteworthy topic that is being dealt with intensively. „Gedanken ohne Inhalte sind leer, Anschauungen ohne Begriffe sind blind“ says Immanuel Kant in

“*Kritik der reinen Vernunft*“<sup>3</sup> (The Critic of Pure Reason) (1781). Pestalozzi also agrees with Kant's opinion in his work WGL. In the ninth and tenth letters of WGL, he explains in detail the importance of the principle of sense-impression. Pestalozzi's opinion can be summarised quite simply with the statement: “All knowledge must be based on sense impression and be traceable to it” (WGL, p. 282). It is the simple act of standing of external objects before the senses and increasing the awareness about their impressions (WGL, p. 283). Takaya (2003, p. 77) emphasizes that the use of sense-impression in education is one of the most important innovations of modern education. According to her, the term *Anschauung* essentially can be understood as direct knowledge of the object without intermediate processes such as argumentation. In her study she expresses that the context of modern educational philosophy, *Anschauung* means primarily (but not exclusively) the direct knowledge of the object through the five senses (especially through the sense of sight), so this implies first the primacy of the individual's direct experience as opposed to second-hand experience such as reading books or listening to explanations from others. At the same time, it should be noted that *Anschauung* as a methodological principle means more than just experiencing or perceiving objects. Secondly, it implies an orderly or organised method whose aim is to grasp the essential characteristics of an object. Thirdly, it suggests an active force of the individual, as opposed to merely receiving stimuli or impressions from outside (Takaya, 2003, p. 77).

The art of *Anschauung* begins much earlier than we might imagine. In fact, the process begins at the moment a mother takes her child on her lap. She teaches it all that nature scatters and confuses by bringing things closer to its senses (WGL, p. 284). The mother unconsciously teaches her child the act of *Anschauung*.

„Kraftlos, ungebildet, der Natur ohne Leitung und ohne Nachhülfe anhangend, weiß die Mutter in ihrer Unschuld selbst nicht, was sie thut; sie will nicht unterrichten, sie will bloß ihr Kind beruhigen, sie will es beschäftigen; aber demungeachtet geht sie den hohen Gang der Natur in seiner reinsten Einfachheit, ohne daß es ihr bekannt ist, was diese durch sie thut, und die Natur thut doch sehr viel durch sie; sie eröffnet dem Kinde auf diese Weise die Welt, sie bereitet es so zum Gebrauch seiner Sinne, und zur frühen Entwicklung seiner Aufmerksamkeit und seines Anschauungsvermögens vor“ (WGL, p. 284).

Like his predecessors, Pestalozzi accepted the principle of empiricism, which means all knowledge, comes from experience. However, he adds two important insights to this empiricist position. Firstly, the environment does not determine everything, although it is very important and influential, because a child is not entirely passive. A child has its own nature, which is a seed for later development, or we can say that a child has the potential for development. Secondly, the environment is a mixture of good and bad things. Nature may be fundamentally good, but it is negligent in its details or concrete manifestations, and the human mind cannot understand it in its entirety. The human mind needs a means to distinguish the good from the bad, or to perceive a comprehensible pattern from apparent chaos (Takaya, 2003, p. 80 pp.).

Johann Heinrich Pestalozzi, like his predecessors, believes that all knowledge is rooted in a child's experience. Without experience and without education a child is not able to observe objects correctly. He must subordinate the accidental properties of an object to its essential nature (see WGL, 10th letter).

Herbert Spencer is a great admirer of the method of *Anschauung*. After long periods of blindness, people should have finally realised that the spontaneous activity of children's observation skills has a meaning and a use. This method is good, but not without deficiencies. Although Spencer appreciates Pestalozzi's principles and method, he

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<sup>3</sup> [https://www.auer-erlag.de/media/ntx/auer/sample/03617\\_Musterseite.pdf](https://www.auer-erlag.de/media/ntx/auer/sample/03617_Musterseite.pdf)



does not like the state of development of the education of pupils who have been educated according to the method of Anschauung. If the method were correct, the children would be very happy and eager for their daily lessons. Quite the contrary, they were bored. Pestalozzi's system seems to have hardly fulfilled the promise of his theory. According to Spencer, the failure of this concept has two main reasons. The first problem lies largely not with the principles or the method itself, but with the teachers, as they were not adequately trained to implement the teaching according to this method. Secondly, the concrete application of his principles in formulating current methods is problematic. Spencer criticizes Pestalozzi's method, particularly focusing on this second issue. The pleasure or happiness that a child experiences in the learning process is a very important criterion for him in evaluating the adequacy of the method, because a child's intellectual instincts are more trustworthy than the arguments of adults (Spencer, 1966 cited in Takaya, 2003, p. 89).

Pestalozzi also emphasized that an object should be exemplary, representative, and in its elemental form of its kind. If one wants to lead a child by the shortest route to the ultimate goal of education, that is, to clear concepts, then in all fields of knowledge, firstly those objects must be carefully placed before a child's senses which clearly and distinctly carry the most important characteristics of their subject (WGL, p. 316).

Mainly, the principle of perception is still mostly associated with Pestalozzi. He does not consider it merely as a simple perception of objects, but as the guiding activity of mothers and teachers, presenting them to children in a specific order (Osterwalder & Reusser, 1997, p. 327).

#### **4. Religion**

The keystone of Pestalozzi's entire system is the connection between the essence of divine worship and the principles he accepts as true regarding human development. He thinks about questions such as “How does the concept of God grow in my soul?” or “How is it that I believe in a God, that I throw myself into his arms and feel blessed when I love him, when I trust him, when I thank him and when I follow him?”. Before one has the feelings of love, trust, gratitude and the skills of obedience in this context, they must be developed in the person (WGL, p. 351). We should first develop these feelings for one another within ourselves in order to truly worship God through true feelings.

Love for humanity, which has been known in German literature since the 12th century (Öztürk, 1999, p. 61), trust in people, gratitude towards people, and the ability to obey arise in human nature through the relationship between the immature child and its mother (WGL, p. 352-355):

- a) Through the power of a purely sensual instinct, the mother feels obliged to care for the child and satisfy its needs. Through the mother's care, the seed of love develops in the child over time.
- b) If the child is distressed by something and cries, its mother presses it to her breast, comforts it or tries to distract it. She protects it, so it develops trust in the child.
- c) The mother diligently satisfies her child when it, for example, is hungry or thirsty. Just her presence is enough to make it feel at peace. It reaches out its hands and its eyes shine with joy towards her. This awakens gratitude in it.

- d) Love, trust, and gratitude towards the mother develop into love for humanity in the child, so it loves its mother and every creature that resembles her.
- e) In order to be obedient, a child first needs to be patient. Patience develops in it before obedience. It learns to be patient when it has to wait for the mother to fulfil its needs. In the course of time, active obedience develops. Human development stems from the desire to satisfy the needs and these must be bent as required. The mother is inflexibly opposed to the child's stormy and disorderly desires, as nature shows itself.
- f) The seed of conscience arises from all these feelings. The child realizes that it is not right to oppose the loving mother.

These feelings listed above are the initial outlines of self-development that unfold between the infant and its mother in a natural relationship. In these basic features, the germ of connection to God is also found, which generates the child's attachment to its mother. The developing self-power allows the child to no longer feel the need for its mother and to leave her hand. Over time, she tells him about God: „Kind! es ist ein Gott, dessen du bedarfst, wenn du meiner nicht mehr bedarfst, es ist ein Gott der dich in seine Arme nimmt, wenn ich dich nicht mehr zu schützen vermag; es ist ein Gott der dir Glück und Freuden bereitet, wenn ich dir nicht mehr Glück und Freuden zu bereiten vermag, ...“ (WGL, p. 357).

Thus, it begins in the child a tendency towards faith that places it above itself. It delights in hearing the name of God spoken by its mother. The feelings that unfolded at its mother's breast now include God, and the child does everything right for the sake of God, just as it has done so far for the sake of its mother (WGL: 358). Moral life depends on these feelings towards the mother and towards God; therefore, everything must be presented to a child in connection with them (WGL, p. 362).

### **Conclusion**

Pestalozzi is a figure who must immediately be recognized for his value in the field of education. It is hardly possible to have not heard Pestalozzi's name, especially if one is interested in the field of pedagogy. His biography alone shows that he is one of the most important educational reformers in this field, because he dedicated himself to human education.

According to Pestalozzi, the human mind must be educated holistically; therefore, everything is meaningful to him only insofar as it contributes to the complete education of humanity. His educational approach aims to support the independence of children. They should be capable workers and morally upright, as well as acquire correct knowledge.

Pestalozzi crowns his work with countless writings. Some of them contribute to spread his influence in the field of education. His work WGL, in which he set forth his ideas and experiences on elementary education and the upbringing of children, is particularly important in this context.

Pestalozzi sees the mother as the first and most effective teacher of a child, which he explains in detail in the WGL. The mother fulfils this role of teacher through the affective-social relationship with her child. It is through the

relationship between the immature child and its mother that love of mankind, trust in mankind, gratitude and the ability to obey arise in human nature.

Pestalozzi places great importance on the educational principle of Anschauung, considering it the foundation of all knowledge. It states preparing educational content and materials in a way that allows students to gain precise ideas and accurate knowledge through sensory impressions. According to him, we should understand Anschauung as a correspondence between the human soul and the ideal world. One should clarify the objects, be conscious of them, and ultimately determine them as clear concepts.

Through the WGL, Pestalozzi wanted to help mothers and teachers to teach their children themselves, because he considered it unnecessary or even harmful to send children to school before a certain age. Therefore, children should be brought up and educated by their mothers at least until the age of six.

### **Ethic**

There is no need for ethic approval for this study.

### **Author Contributions**

Both authors have the same contributions in this study.

### **Conflict of Interest**

There is no conflict of interest between the authors.

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## A Perspective on Parenting Attitudes in the Context of Acceptance and Commitment Therapy: Examination of Two Works from the Field

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### Abstract

Since the dawn of the humanity, individuals have endeavored to pursue happy and avoid suffering. Despite exploring various paths to achieve these aims, they often find themselves back where they started. The aim of this study was to investigate parental attitudes based on the book “The Joy of Parenting: An Acceptance and Commitment Therapy Guide to Effective Parenting in the Early Years”, written within the framework of acceptance and commitment. The research employed the document analysis method, a qualitative research technique. It is stated that parental attitudes profoundly influence children and that such attitudes, learned within the family context, mold individuals throughout their lives. Although acceptance-commitment therapy, which is based on many schools of thought, attracts attention among current therapies, there remains a notable dearth of literature on its application to parenting, with limited studies dedicated to this intersection. The study reviewed parenting insights drawn from various sources and theoretical frameworks within the acceptance and commitment paradigm. Findings from literature and the book were synthesized, and subsequent discussions incorporated data from related studies. In the light of the data obtained, it was observed that undesirable parental attitudes were associated with psychological rigidity and desired parental attitudes were associated with psychological flexibility.

### Key Words

Acceptance and commitment • Attitude • Parent

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## Introduction

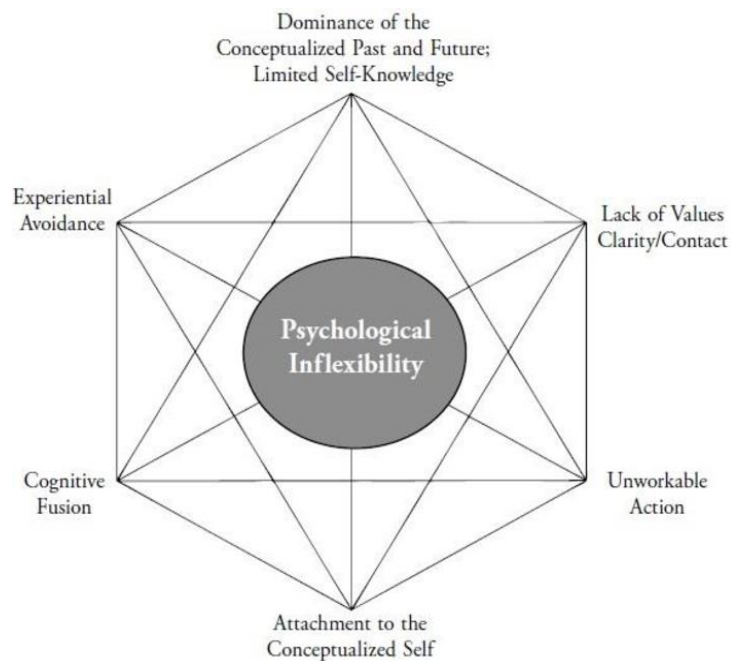
Human beings have sought happiness and sought to avoid suffering since their existence (Hayes, Strosahl & Wilson, 2003). Experts in the field endeavor to assist individuals in steering clear of pain (Bach & Moran, 2008). Debates persist today regarding which theories are most effective in this endeavor (Yavuz, 2015). This evolution, which originated with Skinner's behaviorism theory (Skinner, 1950), is roughly categorized into three waves by Hayes (2004). Interest in traditional behaviorism, which included many factors such as exposure (Ciarrochi, & Bailey, 2008) when it was first introduced, waned over time (Pinker, 2002). In addition to its decline in popularity due to the lack of adequate explanations for slips of the tongue and internal observations (Pinker, 1994), the fact that people are turning to topics such as reasoning and problem solving marked the onset of the cognitive revolution called the second wave. (Ciarrochi, & Bailey, 2008). Although research has enabled the development of new techniques (Balow, 2002), behavioral therapy methods such as exposure and shaping continued to be used (Ciarrochi, & Bailey, 2008). Cognitive therapies in the second wave assumed that individuals receive certain information from their environment, process it and produce outputs (Osherson & Lasnik, 1990). Over time, third wave therapies have emerged that incorporate new concepts such as mindfulness activities, receiving support from cognitive therapies and behavioral therapies (Ciarrochi, & Bailey, 2008).

Acceptance and commitment therapy, which receives empirical support from cognitive behavioral therapies and is one of the third wave therapies, appears to have perhaps the most advanced theory philosophy (Hayes et al., 2004). The theory, created by Steven Hayes in the mid-1980s, also receives support from language theory and relational framework theory (Hayes, Barnes-Holmes & Roche, 2001). Acceptance and Commitment Therapy and the Relational Turbulence Model, which takes behavioral techniques and processes as a step and blends them with cognitive processes, excel other theories. The Relational Turbulence Model evolved from fundamental learning principles like reinforcement and the cognitive impacts of language, viewed through a behavioral lens (Ciarrochi, & Bailey, 2008). These distinctions are the features that put acceptance and commitment therapy ahead of other theories (Hayes, Barnes Holmes & Roche, 2001). Given the significant role of language in human behavior, distinct from its role in animals, relational turbulence also explores the influence of language use on behavior (Ciarrochi, & Bailey, 2008). The language that helps shape our worlds can be useful but also problematic (Hayes & Strosahl, 2005). Language, which has a tremendous degree of control (Bennet & Oliver, 2019), has a bidirectional structure according to relational turbulence, but it cannot control behavior alone, so the determining factor here is the context (Ciarrochi, & Bailey, 2008).

Acceptance-commitment therapy defines humans as unique in the world in finding something to make them suffer (Flaxman, Blackledge, & Bond, 2011; Hayes, Strosahl & Wilson, 2003) even if they have optimal living conditions and there are no physical dangers around them (Ciarrochi, & Bailey, 2008). The reason for this is the way humans use language (Hayes & Strosahl, 2005) and the fact that their mind has evolved to create suffering (Harris, 2019). Homo sapiens has successfully continued its generation since the day it came to the planet, and today the mind wants to actively fulfill this task of creating suffering, even if there is no problem (Harris, 2018). At this point, acceptance and commitment aims to reduce unnecessary suffering of individuals and help individuals build the life

they value (Batten, 2011). Acceptance and Commitment Therapy acknowledges that pain and suffering are inherent parts of human life, emphasizing that attempting to pursue happiness by avoiding them is ultimately futile (Harris, 2018). For this purpose, acceptance and commitment tries to help individuals determine their values and live with them in a consistent and open way (Jackson & Gillard, 2016; Morris, Johns & Oliver, 2013) and to change the function, not the form, of relational networks (Hayes & Strosahl, 2005). Acceptance and Commitment Therapy (Flaxman, Blackledge & Bond, 2011), which primarily emphasizes reducing intensity and is presented as an alternative to traditional psychotherapies, has been studied in many areas such as anxiety disorders (Vøllestad, Nielsen, & Nielsen, 2011), psychosis (Bach & Hayes, 2002), chronic pain (Vowles & McCracken, 2008), emotion regulation (Blackledge & Hayes, 2001), values (Wilson & Murrell, 2004), chronic diseases (Prevedini et al., 2011), eating disorders (Manlick, Cochran, & Koon, 2013), post-trauma stress disorder (Walser and Hayes, 2006), and depression (Bohlmeijer et al., 2011; Zettle, 2007).

The theory does not have a goal based on symptom reduction (Bennet & Oliver, 2019). Instead, it focuses on the ability to act carefully in accordance with values, technically known as psychological flexibility (Harris, 2019). Flexibility, defined as a person's sensitivity to changing environmental demands (Ciarrochi, & Bailey, 2008), can also be called hexaflex and consists of six basic headings (Morris, Johns & Oliver, 2013).



**Figure 1.** Acceptance and commitment therapy psychological flexibility model (Hayes et al., 2006).

Acceptance: The concept, which etymologically means receiving what is offered, does not include passivity but rather embracing the emotions, thoughts and physical sensations that arise with awareness (Harris, 2019; Hayes & Strosahl, 2005). The concept involves making contact with emotions without attempting to suppress, resist, or avoid them (Morris, Johns, & Oliver, 2013; Stoddard & Afari, 2014). In essence, the theory highlights the importance of accepting things as they are (Harris, 2018). In her book "Any Woman's Blues" (1973), Erica Mann Jong articulates,



"I didn't stop being afraid, but I stopped letting fear control me. I accepted fear as a part of my life and moved forward despite all the noise in my heart," thus sharing her personal approach to acceptance with her readers.

**Contextual Spontaneity:** It can be defined as the dominance of the observing aspect of the mind, which is divided into thinking and noticing in everyday language. (Harris, 2019). The theory focuses here on whether the individual pays attention to his mind or what he is experiencing at the moment (Coyne & Murrell, 2021). Contextual self, also called pure awareness (Harris, 2019), is defined as people having an ego that observes their emotions just as the sky that witnesses all weather events does not change (Zettle, 2007).

**Cognitive Dissociation:** It emphasizes that to avoid being affected by challenging events, individuals need to focus on the context surrounding their thoughts when evaluating them (Hayes & Strosahl, 2005), rather than making judgments based on those thoughts (Strosahl et al., 2012). In simpler terms, cognitive dissociation can be understood as "pay attention to your thoughts" (Harris, 2019). This approach allows for understanding how thoughts influence behavior without necessarily altering their content or frequency (Yavuz, 2015).

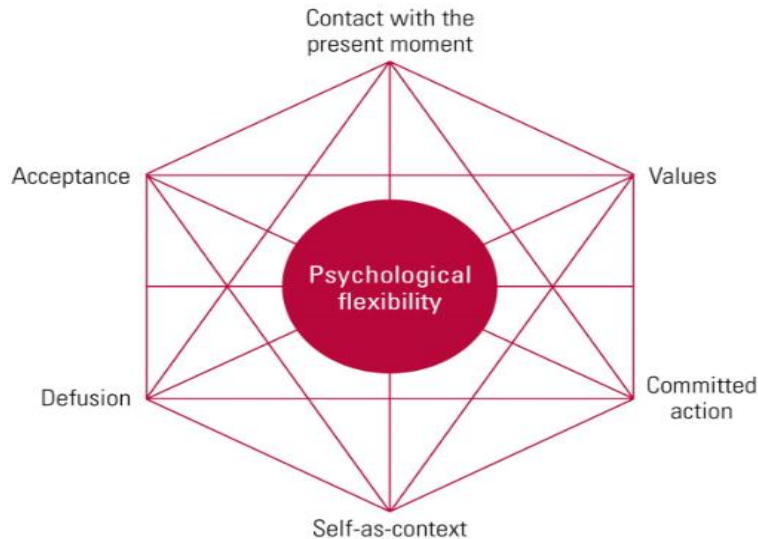
**Being in the Moment/Contacting with the Present Moment:** It is defined as establishing a non-judgmental connection with the present moment (Kabat-Zinn, 1994) by being effective, open and vulnerable (Hayes & Strosahl, 2005). Although the concept *here and now* is used in many theories, the purpose of acceptance and commitment therapy is to enhance vitality and psychological flexibility (Harris, 2019; Hayes & Strosahl, 2005). In this way, individuals are expected to disengage from autopilot mode, engage in a process oriented towards the present, and respond flexibly in alignment with their values (Stoddard & Afari, 2014).

**Value:** Values are defined as the actions an individual chooses to express and solidify in pursuit of what they want to achieve in life (Ciarrochi & Bailey, 2008; Hayes & Strosahl, 2005). However, values should not be confused with goals, as goals may be achieved and completed, but values endure throughout one's life (Harris, 2018). With these features, values are motivating and can function as a source of motivation (Harris, 2020). In other words, values act as a compass in creating effective life patterns (Hayes & Strosahl, 2005).

**Determination in Value-Oriented Behaviors:** It pertains to the actions oriented toward values that individuals take in their lives (Simoes et al., 2022). It represents the active, behavioral, and transformative aspect of the model. (Bennet & Oliver, 2019). The slogan "Do whatever it takes" used here represents a psychological as well as behavioral action (Harris, 2019). It is important that the actions displayed are functional. Because the place of the action in the context increases the individual's quality of life (Robb, 2007).

When individuals detach from the painful and distressing actions in their lives and accept the actions, they can establish contact with the present moment and increase their psychological flexibility (Bolderson, 2013). People may move away from psychological flexibility dimensions for various reasons (Bolonna, 2011). Psychological rigidity, which is called the opposite of psychological flexibility, is also valid for all people (Hayes & Strosahl, 2005). In case of psychological rigidity, problems such as communication, decrease in quality of life, rumination, anxiety, future anxiety, and avoidance can negatively affect the quality of life of people (Dousti, Ghotrati & Elibrahimi, 2019). As factors influencing this, it is stated that various areas such as cyberbullying, family income level, and social media

usage time play a role (Kabakçı & Traş, 2024). Psychological rigidity consists of six headings, similar to psychological flexibility. These are loss of contact with the moment, cognitive unification, experiential avoidance, attachment to the conceptualized self, avoidance/impulsivity, and moving away from values (Bennet & Oliver, 2019).



**Figure 2.** Acceptance and commitment therapy psychological rigidity model (Hayes et al., 2006).

**Experiential Avoidance:** The concept of experiential avoidance is accepted directly or indirectly in multiple therapy systems (Hayes, Strosahl & Wilson, 2003). It represents the escape from emotions, thoughts and behaviors, as the opposite of the concept of acceptance (Harris, 2019). While avoiding traffic is a practical necessity when a vehicle approaches, extending this behavior to every situation can complicate life (Bennet & Oliver, 2019). In essence, relying excessively on experiential avoidance, which is somewhat natural, becomes problematic for individuals in the long run (Harris, 2019). As a matter of fact, avoidance efforts serve as negative reinforcers, causing the individual to resort to the same or different experiential avoidance reactions over and over again (Chawla and Ostafin, 2007).

**Cognitive Fusion/Fusion:** It is the situation in which thoughts dominate physical actions and awareness (Harris, 2019) and this dominance gradually increases (Yavuz, 2015). In other words, the individual integrates with these thoughts without questioning (Bennett-Levy, 2003). An example of this can be seen in individuals experiencing depression, where they become deeply entangled with their own negative thoughts (Harris, 2019). In this way, the individual can become so intertwined with their thoughts that they can even forget the existence of their own thoughts (Hayes and Smith, 2021).

**Loss of Contact with the Moment:** This strategy, introduced to protect the individual from an undesirable situation, hinders the individual's functionality over time (Bolderson, 2013). The situation can also be defined as the situation in which the individual moves away from the moment and focuses on the thoughts in his mind (Harris,

2019). Experiential avoidance and fusion may weaken the individual's bond with the tangible, causing him to carry out mental activities in the past and future (Yavuz, 2015).

Attachment to the Conceptualized Self: Individuals can interpret the events and situations they observe in various ways, influencing their self-assessment (Yavuz, 2015). This highlights the tendency to overlook that what remains unchanged is their own essence, while what can change depending on circumstances is simply a part of life (Harris, 2017). As a result, the person may perceive that he is the story itself, rather than an individual present in the story (Bilgen, 2021).

Moving Away from Values: It refers to when individuals cease making choices aligned with their values to avoid feelings such as anxiety, seek social approval, or fear criticism (Hayes, 1989). Adopting a lifestyle distant from one's values leads individuals to disconnect from the present moment and miss its significance (Harris, 2019). This concept should not be conflated with shifts in values that individuals may naturally undergo over time (Coyne & Murrell, 2021).

Escape-Avoidance and Impulsivity: It is the individuals who want to get rid of negative internal experiences exhibiting escape-avoidance behaviors from some environments (Yavuz, 2015). In strict and inflexible parenting strategies, avoiding rather than confronting the problem, inconsistent behavior, and focusing on the mind instead of the child are encountered (Coyne & Murrell, 2021). It is common for individuals who use escape-avoidance and impulsivity strategies to use some relaxative products to divert their attention (Yavuz, 2015) or to think in an all-or-nothing way (Akkaya and Yılmaz, 2022).

Although acceptance and commitment therapy, which has been shown to be effective in a wide range of behavioral and psychiatric areas, is still a new field, it has an intensely increasing literature (Coyne, McHugh & Martinez, 2011). Despite this intense increase, the literature is still young (Ost, 2008). It can even be stated that studies on children, adolescents, and families are only in their infancy (Coyne et al., 2011). Realizing this deficiency in the literature, Coyne and Murrell (2021) conducted studies with young age groups and families. The novelty and limited number of studies in this field indicate a need for further research from diverse perspectives. In this study, the parenting styles in *Toxic Parents: Overcoming Their Hurtful Legacy and Reclaiming Your Life* and the concept of parenting in the book *The Joy of Parenting: An Acceptance and Commitment Therapy Guide to Effective Parenting in the Early Years* will be examined within the framework of acceptance-determination theory. This study will provide an opportunity to look at future studies from a different perspective. From this viewpoint, the main purpose of the research is to reveal the psychological rigidity or flexibility that can be observed in children and families as a result of parental attitudes.

## Method

### Research Model

This is a descriptive study in which *Toxic Parents: Overcoming Their Hurtful Legacy and Reclaiming Your Life* (Forward & Buck 2015) and *The Joy of Parenting: An Acceptance and Commitment Therapy Guide to Effective Parenting in the Early Years* (Coyne & Murrell, 2021) are analyzed based on acceptance and commitment therapy

(psychological flexibility-psychological rigidity). The document analysis technique used in this study is used in qualitative research methods (Sönmez & Alacapınar, 2019). Document analysis technique is a method that allows researchers to scan written texts that provide information about facts and events in detail and aims to create integrity with the information obtained as a result of scanning (Creswell, 2002). The document analysis method can include the analysis of written and visual materials (Yıldırım & Şimşek, 2011). Written sources encompass books, articles, edicts, and inscriptions, while visual sources encompass pictures, pennants, and stamps (Sönmez & Alacapınar, 2019). Document analysis stages include selecting the appropriate document to be analyzed, creating categories, determining and evaluating the unit of analysis (Bowen, 2009). The key aspect of employing document analysis technique lies in understanding what to use, why, and where to apply it (Sönmez & Alacapınar, 2019).

The book “Toxic Parents: Overcoming Their Hurtful Legacy and Reclaiming Your Life” discusses parents who criticize, view their children as inadequate, seek to control them, and their parenting attitudes. In the book *The Joy of Parenting: An Acceptance and Commitment Therapy Guide to Effective Parenting in the Early Years*, techniques and methods that can be applied in accordance with developmental periods to remain psychologically flexible against the difficulties that may be encountered in parenting are mentioned.

#### **Data Collection Tool and Data Analysis**

The works *The Joy of Parenting: An Acceptance and Commitment Therapy Guide to Effective Parenting in the Early Years* (Coyne & Murrel, 2021) and *Toxic Parents: Overcoming Their Hurtful Legacy and Reclaiming Your Life* (Forward & Buck, 2015) were used as data collection tools. The works can be grouped as the expectations of parents from their children, the types of these expectations, the attitudes of parents, what should be included in parenting attitudes, and what can be done to achieve these attitudes. The analysis of the data was tried to be presented with what is included in the book in line with the literature information on acceptance-commitment therapy and parental attitudes. In this context, the extent to which negative parental attitudes represent psychological rigidity and the factors affecting psychological flexibility were examined. The data obtained from the books were grouped according to the identified topics and sample sentences from the work were included in the findings section.

#### **Results**

Every family strives to raise their child in its own unique way, believing they are doing their best. However, there are parents who, despite professing love, harm their children through neglect or abuse (Harris, 2017). Some individuals may consider beating their children as a disciplinary measure to be normal and attempt to justify it to their children (Forward & Buck, 2015). Because the family is a child's first world, they often internalize and accept many of the things they witness there as unquestionable truths (Coyne & Murrel, 2021). A study conducted with individuals who experienced abuse in childhood revealed that abuse and behavioral avoidance mediate psychological rigidity (Marx and Sloan, 2002). Parents may also use the attitudes they adopt within the family irregularly or incorrectly (Coyne & Murrel, 2021). It is thought that these attitudes of families towards their children may lead to the formation and reinforcement of psychological rigidity in children.

Forward & Buck (2015) compare parents who progress within the framework of perfection to Greek gods. According to mythology, gods punish people for uncertain reasons and at unspecified times. This inconsistency can potentially increase children's reliance on their parents to avoid divine wrath. Thus, children will not be able to create their own values and will move away from their values. They will live their lives in a constantly alert manner. Because they do not want to be scolded by their parents, they will not be able to stay in the moment, and because they live in their own mind, they will not be able to notice what is happening around them. In such families, even the noise or mischief made by the child can be perceived as a fault (Coyne & Murrell, 2021). In a study conducted with families with inconsistent understanding of discipline, it was found that parents were less involved in interacting with their children. This situation predicted that children in the family would exhibit more problematic behavior (Berlin et al., 2006). Children living with family members with the above mentioned attitudes will constantly try to escape from situations in which they fear or think they will infuriate them. In this way, all stages of psychological rigidity will be represented in the individual, perhaps in different order and over time. Eventually, the child may believe that the problematic life he lives with experiential avoidance is normal and may spend money to maintain this avoidance (alcohol, cigarette, substance, game addiction, etc.). However, even if this situation is uncomfortable for him, unless he takes steps to change it throughout his life, it will relieve him in the short term, but will give him difficult times in the long term (Forward & Buck, 2015). This is valid not only for addictions but also for realistic-consistent limits and reactions that are not set for the child (Coyne & Murrell, 2021). In a study conducted with parents with relatively higher experiential avoidance scores, it was found that they wanted to control their children more, but they had less sense of control, internalized the situations more, and were more prone to depression (Coyne & Thompson, 2009).

Parents, in their desire for the best for their children, may criticize them, leading them to feel inadequate. However, criticism intended for their well-being remains criticism, even when it is motivated by genuine concern (Forward & Buck, 2015). Constant feelings of inadequacy may drive individuals to avoid facing reality by striving for greater success in academics, business, or other endeavors, seeking to escape the harsh judgments of their parents. Living in a culture where failure is unacceptable can exacerbate this dynamic (Coyne & Murrell, 2021). Although there are no inherently right or wrong values (Harris, 2017), individuals who live according to their own values may face criticism and feelings of inadequacy, prompting them to stray from their values and adopt those deemed appropriate by their parents. The individual remains on guard to avoid constant criticism and because they perceive themselves as inadequate. Consequently, they lose connection with the present moment, their mind becomes cognitively fused, and they resort to experiential avoidance by avoiding environments where criticism might occur. Labeling a fearful child with terms like 'baby' increases tension and fosters a negative view of anxiety within a social context. The child then strives to avoid anxiety and environments that provoke worry, thereby restricting their behavior (Coyne et al., 2011). Although short-term relief from unpleasant physiological reactions can be achieved by avoiding anxiety triggers (Borkovec et al., 1998), this approach may hinder long-term emotional processing (Borkovec & Hu, 1990). Research by Armelie, Delahanty, and Boarts (2010) indicates that experiential avoidance is associated with anxiety in children, particularly when children avoid thoughts and feelings in interactions with their parents, leading to psychological vulnerability (Barret et al., 1996). In a different study conducted with mothers in the neonatal unit, it was determined that mothers with experiential avoidance experienced more problems in terms of

stress and adaptation (Greco et al., 2005). Lower empathic awareness scores of mothers may lead to a higher likelihood of depression in mothers and more behavioral problems in children (Coyne et al., 2007). The attitudes adopted by parents towards their children can influence the behaviors they exhibit in school environments (Sarı & Çiftçi, 2023), and can even affect many of the choices they make throughout their lives (Keleş, Ak & Kesici 2023). Based on the research, it can be said that the attitudes of the parents, starting from the birth process of the baby, have an impact on the attitudes that children will choose.

Different studies have been carried out showing that addictions are affected by the impulsivity factor (Nordstrom, et al., 1994). Behaviors such as timidity and fear of making new friends can be observed in children of families with alcohol or any other addiction (Forward & Buck, 2015). The child may show avoidance behavior caused by family members. Considering that impulsivity is also affected by genetic factors (Ak, Gülsün & Nahit Özmenler, 2009), it may be possible for children to develop similar addictions. According to the studies, one fourth of addicted families' children are also addicted, and even take the first step towards addiction together with a family member (Forward & Buck, 2015). Since children first learn about truth within their families, they may struggle to recognize wrong in such circumstances. The child who loses contact with the moment may blame himself and make an effort contrary to his values to save the addicted individual. Studies have also revealed that addicted adults are more likely to experience childhood abuse and experiential avoidance (Simons et al., 2003). Or, to avoid encountering the addicted individual, he may plan his life in a way to spend the least amount of time with him by exhibiting escape and avoidance. However, for psychological flexibility, families need to care about their children, and this is not only necessary for the children, but also parents need to care about each other (Harris, 2018).

According to the literature findings, it can be observed that the psychological rigidity of children growing up in families displaying such attitudes is more dominant than their psychological flexibility. Based on the findings, although there are different factors, individuals tend to maintain the behaviors learned from their families. It is aimed for families to achieve psychological flexibility, as it will affect their children and their future. As a first step towards psychological flexibility, families need to accept that they have made a mistake (Forward & Buck, 2015). Pain, difficulty and distress are already a part of life and it is impossible to escape or ignore them (Harris, 2018). We have a mind that works like a computer to evoke pain more than anything else (Bolonna, 2011; Harris, 2019). In fact, it was previously referred to as a machine that was believed to be able to think due to its continuous operation (Schultz & Schultz, 2020). People who are sure that man is a thinking machine have also created works in the field of literature. Hans Christian Andersen (2020) talks about a mechanical bird in his work *The Nightingale*. Frank Baum (2019) tells a story centered around robot men in his work *The Wizard of Oz*. A different example was written by Mary Shelley (2012) in her book *Frankenstein*, about a mechanical monster that destroys the person who created it. Even though all of the writers grew up in different cultures, similar thoughts occupied their minds.

Acceptance and commitment therapy, which believes that observable behavior compatible with values should be activated, uses many techniques such as metaphors, stories, paradoxes, and exercises (Ciarrochi & Bailey, 2008). All acceptance-commitment interventions have the goal of providing more flexibility and greater sensitivity to the feasibility of actions (Hayes & Strosahl, 2005). Metaphors used for this can be listed as Chinese finger trap, being

aware of the language used, and working with values (Hayes, et al., 2006). Coyne & Murrell (2021), in order for parents to achieve flexibility while parenting their children, recommends planned ignoring to extinguish the undesirable behavior, using concrete and clear sentences appropriate to the developmental period to reinforce the desired behaviors, and reinforcing the desired behaviors with emphatic appreciation. Thus, the way is paved for individuals to be psychologically healthy in line with their values when they enter different areas of life (Adcock, Murrell & Woods, 2007). Blackledge and Hayes (2006), who worked with parents of children with autism with a focus on acceptance and commitment, revealed that experiential avoidance and cognitive fusion symptoms decreased in parents. Otherwise, no matter what situation the children are in, the mind will continue to whisper negative things to individuals (Coyne & Murrell, 2021).

### Discussion and Conclusion

Most people think that all people except themselves are living their best lives (Harris, 2018). Parents can do many beneficial things, yet their minds may continue to judge themselves just as others' minds do (Coyne & Murrell, 2021). The theory suggests that what is important for people is to live a life in accordance with our own values, making room for pain in our lives, but without delving into it (Harris, 2018). However, when experiencing unwanted emotions and feelings, the individual's mind focuses only on criticism (Coyne & Murrell, 2021). Being able to fully accept our minds in this way is one of the main goals of therapy. Because there is no such concept as partial acceptance in acceptance and commitment (Hayes, Stroahl & Wilson, 1999). With acceptance in parenting, the doors to the process of learning new things are opened (Coyne & Murrell, 2021). Supporting the statement in the previous sentence, it has been found that parents who do not have the tolerance to accept negative behavior of their children have a lower capacity to produce positive parenting terms (Murrell, Wilson, & LaBorde, 2009). If parents set high standards for their child, the child may feel obligated to meet them without questioning their validity. When unable to fulfill these expectations, the child might attribute fault to themselves, linking it to their self-concept of inadequacy rather than considering developmental appropriateness. However, acknowledging the child's developmental stage when setting expectations and providing genuine appreciation when tasks are completed can foster psychological flexibility and support their growth (Coyne & Murrell, 2021). Vocabulary development and use in children begins to take shape around the age of two and is called the coordination relationship. Coordination development also supports the development of relationship patterns such as discrimination, opposition and comparison (Whelan and Barnes, 2004). In other words, the current developmental period is important for the child's vocabulary and language development. Expressions of appreciation to be chosen during this period should be appropriate to the developmental period.

In child education, within the framework of acceptance and commitment, it is stated that in order to increase psychological flexibility, short and concrete tasks should be given in accordance with the child's developmental period before rewarding (Coyne & Murrell, 2021). Contrary to these techniques, it has been found that parents who prefer more strict and punitive methods in their parenting have lower spontaneity scores and have more difficulty dealing with multiple problems (Shea & Coyne, 2009). In a different study conducted with individuals who preferred similar parental attitudes, it was concluded that they preferred experiential avoidance as a coping style (Shea, Sims &

Coyne, 2007). Studies conducted with individuals who prefer experiential avoidance have revealed that individuals are affected by different challenging factors such as financial difficulties, stress and depression (Shea, Sims & Coyne, 2007; Silvia & Coyne, 2009; Coyne & Thompspon, 2009). It has also been determined that attachment problems are higher in parents who prefer avoidance (Sümer, et al., 2009). In addition to these findings, in the observations made after the acceptance and commitment therapy training was given to the parents, Tümlü (2021) worked with families with autism spectrum disorder and concluded that the psychological adjustment, psychological resilience and marital satisfaction of the parents increased as a result of the training. In their study, Blackledge and Hayes (2006) stated that experiential avoidance and cognitive fusion decreased in parents.

Parenting by trying to suppress unwanted emotions and thoughts is considered ineffective (Coyne & Murrel, 2021). Studies have shown that families' awareness of their emotions, thoughts and feelings about parenting has an important place in raising their children effectively and drawing realistic boundaries (Sinhg et al., 2007). For example, it has been concluded that parents who experience intense emotions such as anger are less in harmony with their children (Dix, et al., 2004). It is stated that as a result of increasing intense emotions, individuals' ability to express their emotions decreases (Harris, 2017). As a result of studies conducted with children with anger problems and their parents, a decrease in children's aggression and disobedience behaviors and an increase in parents' behavior of choosing appropriate methods and performing valuable activities were observed (Coyne et al., 2011). A similar study finding was found with a six-year-old student with anger and aggression problems (Coyne & Wilson, 2004). From a different perspective, due to cultural factors, men are asked to suppress their emotions and be stoic (Harris, 2018). This reinforcement allows us to conclude that men tend to hide their emotions at all stages of their lives. It has been concluded that parenting stress scores are high in individuals who try to suppress or avoid unwanted emotions and thoughts, regardless of gender (Blackledge & Hayes, 2006). On the contrary, a study conducted with parents with empathic awareness revealed that both they and their children were happier and had fewer behavioral problems (Coyne et al., 2006). Similarly, children who exhibited fewer problems were encountered in families that accepted their parenting skills as they were (Oppenheim, Goldsmith & Koren-Karie, 2004). It has been found that children who exhibit fewer problems are more successful in social interactions and their parents' awareness skills are higher (Singh & Sabaawi, 2006).

Acquiring a skill can be likened to learning a new language. No matter how well and quickly a person learns a new language, he does not forget his native language (Harris, 2017). Demonstrating a newly learned skill is of course difficult for all parents, and this difficulty can increase especially during stressful times and transition periods (Coyne & Murrel, 2021). Even though new, the formed relational networks cannot be easily deleted (Bennet & Oliver, 2019). It was concluded that people who have just started to experience the spontaneity technique have lower unconditional acceptance scores than experienced meditators (Baer et al., 2006). Therefore, the development of intervention programs for parents is considered valuable (Söğüt & Köse, 2023). When a person begins to live in an accepting way, his connection with the moment is strengthened (Hayes & Wilson, 2003). In fact, accepting adolescent individuals have lower chronic pain scores than non-accepting adolescents (McCracken, Gauntlett-Gilbert, & Eccleston, 2010). In other words, the individual is expected to take step(s) in line with the values he targets with determined action, no matter how difficult it is. After these steps, individuals are expected to



congratulate themselves for success, just as they do when they criticize themselves when they fail (Coyne & Murrel, 2021). Otherwise, the frequency of observing such behavior will diminish over time, akin to how non-praiseworthy behaviors decrease in a child (Pincus, Eyberg & Choate, 2005). For this reason, it is important for families to provide encouraging reinforcement for their children to develop behavior (Coyne & Murrel, 2021). In addition, indirect reinforcements from the environment are also meaningful for children and parents (Ciarrochi, & Bailey, 2008). This can serve as evidence that parents and children are affected by the social environment.

### **Recommendations**

The book *The Joy of Parenting: An Acceptance and Commitment Therapy Guide to Effective Parenting in the Early Years*, can be cited as an example to similar works as it is one of the first parenting works within the framework of acceptance and commitment introduced into the literature. Similarly, *Toxic Parents: Overcoming Their Hurtful Legacy and Reclaiming Your Life* can be included in as an aid in studies on parental attitudes. As a result, it is thought that the works put forward are important in creating the right messages about mental health and it will be useful to examine different works in this context.

### **Ethic**

Research data does not require ethics committee approval. For this reason, ethical approval was not obtained.

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This article was written with the joint contributions of three authors.

### **Conflict of Interest**

The authors declare that they have no conflict of interest.

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# Development of the Psychological Flexibility in Romantic Relationships Scale (PFRRS): A Validity and Reliability Study

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## Abstract

This research aimed to investigate the psychometric properties of the Psychological Flexibility in Romantic Relationships Scale. Data were collected from two separate study groups in 2024 to assess the validity and reliability of the developed measurement tool. Exploratory and confirmatory factor analyses were conducted to assess the construct validity of the scale. The results supported the single-factor structure of the six-item scale. To provide evidence for the convergent validity of the Psychological Flexibility in Romantic Relationships Scale, its scores were correlated with the Psychological Flexibility Scale and the convergent validity was supported by a significant correlation coefficient of .72 between the scales. Cronbach Alpha coefficients examined for the reliability of the scale are above acceptable limits in both exploratory (.77) and confirmatory (.71) factor analyses and support internal consistency. Item-total correlations indicated that the scale items were highly correlated with the general factor representing the scale. Independent samples t-tests conducted on the top and bottom 27% of the sample revealed significant differences, indicating that the scale could discriminate between individuals with high and low levels of psychological flexibility in romantic relationships. In conclusion, the developed scale was found to be a valid and reliable measurement tool.

## Key Words

Psychological flexibility • Romantic relationships • Validity and reliability

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## Introduction

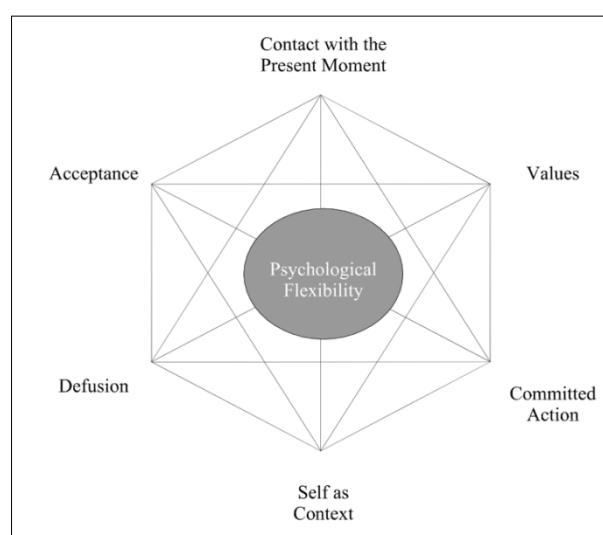
Intimate relationships are considered an indispensable element of human life, which is characterized as a social being. While the types of intimate relationships vary, each type has its unique characteristics (Türküler Aka, 2022). Romantic relationships, a type of intimate relationship, are a significant interpersonal relationship type that encompasses long-term commitments such as courtship, cohabitation, and marriage (Hendrick & Hendrick, 2006). Romantic relationships, which serve as a means for individuals to meet their needs for attachment and belonging, are also essential for meeting a variety of needs. The bond formed with a romantic partner enables the fulfillment of physical, emotional, and sexual needs, making this relationship more special and unique compared to all other relationships (Akçabozan Kayabol, 2022; Baumeister & Leary, 1995; Hendrick, 2016; Mills & Clark, 2001). Therefore, romantic relationships have a privileged meaning in an individual's life.

Romantic relationships play a significant role in many aspects of an individual's life, particularly their physical and mental health (Braithwaite & Holt-Lunstad, 2017; Ross et al., 1990; Schone & Weinick, 1998). Research has found that individuals in romantic relationships experience fewer mental health problems, feel less lonely, are less likely to be obese, engage in fewer risky behaviors, and report higher life satisfaction task (Beckmeyer & Cromwell, 2019; Braithwaite et al., 2010; Bucher et al., 2019; Gómez-López et al., 2019). These outcomes may be attributed to the social support and companionship provided by a partner or the fulfillment of a life task (Beckmeyer & Cromwell, 2019; Braithwaite et al., 2010). Studies demonstrating that having a satisfying romantic relationship is linked to stress buffering, mental health, physical health, subjective well-being, happiness, and prosperity further support the positive effects of romantic relationships (Diener et al., 2000; Dush & Amato, 2005; Pepping et al., 2024; Perelli-Harris et al., 2019; Purol et al., 2021; Siegel et al., 2024; Waite & Gallagher, 2000; Whisman & Baucom, 2012). Therefore, being in a romantic relationship has numerous functional implications, both individually and socially, including meeting various basic needs and leading a healthy life. Given the aforementioned significance of romantic relationships in both individual and social life, it is crucial to examine the psychological factors necessary for maintaining healthy relationships. In this context, psychological flexibility emerges as another critical factor contributing to overall well-being.

To better comprehend how psychological flexibility contributes to overall well-being, and specifically to the quality of romantic relationships, it is essential to grasp the fundamental structure of this concept. The concept of psychological flexibility is a fundamental building block and the overarching goal of acceptance and commitment therapy, representing a healthy structure (Bennett & Oliver, 2023; Bilgen, 2021; Hayes et al., 2008; Hayes & Lillis, 2021; Stoddard & Afari, 2023; K. Strosahl et al., 2017). According to this approach, individuals can cope with the cognitive, emotional, and behavioral challenges they encounter in life by possessing psychological flexibility (Fuchs, 2022). This concept, composed of six dimensions that enable individuals to maintain a healthy life and cope with difficulties on an individual level, is defined as a whole.

Understanding each of the six dimensions that constitute psychological flexibility is crucial for grasping the integrated structure as a whole. Therefore, it is essential to address the specific aspects emphasized by each dimension individually. The acceptance dimension of psychological flexibility refers to an individual's ability to connect with their internal experiences without trying to avoid, alter, or control them (Bennett & Oliver, 2023; Hayes et al., 1996, 2006; Luoma & Platt, 2015; Stoddard & Afari, 2023; K. D. Strosahl et al., 1998). The core

principle emphasized in this dimension is that efforts to avoid pain are ineffective, and attempting to suppress, control, or ignore a thought only makes it more prominent. Hence, the focus is on individuals' ability to accept their experiences (Begotka et al., 2004; Bennett & Oliver, 2023; Bilgen, 2021; Eifert & Heffner, 2003; Feldner et al., 2003; Hayes et al., 2004, 2006, 2013; Hayes & Lillis, 2021; Jäger et al., 2021; Luoma et al., 2019; Moskowitz et al., 2022; Stoddard & Afari, 2023; K. Strosahl, 2002; K. D. Strosahl et al., 1998). Another dimension, cognitive defusion, refers to the process of stepping back from thoughts and observing them from an objective perspective (Harris, 2022a; Hayes & Smith, 2022; Stoddard & Afari, 2023). The primary aim of cognitive defusion is to view distressing memories and thoughts from a detached standpoint without disrupting psychological adaptation (Demirci Seyrek & Ersanlı, 2017; Harris, 2022b; Hayes & Smith, 2022; Karakuş & Akbay, 2020; Nalbant & Yavuz, 2019). The third dimension, self-as-context, involves the flexible noticing of present experiences and the ability to narrow, widen, sustain, and direct attention as desired (Harris, 2022a; Luoma et al., 2019; Ong et al., 2023). The dimension of self-as-context is described as the part of the self that observes all experiences (Ciarrochi et al., 2010; Godbee & Kangas, 2020; Harris, 2022a; Petersen et al., 2022). In other words, this dimension reflects an individual's ability to observe their internal and external worlds independently of thoughts, feelings, physical sensations, and roles. Through this perspective, the individual is not seen as identical to their thoughts and emotions but rather as the context or stage on which these experiences unfold (Bilgen, 2021; Boone et al., 2015; Stoddard & Afari, 2023; K. Strosahl, 2002). Of the last two dimensions of the psychological flexibility model, one is values, which represent the individual's deepest desires regarding what they stand for in life or how they wish to spend their time in the world (Harris, 2022a, 2023; Lev & McKay, 2022; K. Strosahl, 2002). The final dimension, committed action, refers to an individual's ability to take action in alignment with their values, thus living a life in line with what they deem meaningful (Harris, 2022a; Hayes et al., 2013; K. D. Strosahl et al., 1998). When these six dimensions are collectively considered, they form the core structure referred to as psychological flexibility. This structure is illustrated in Figure 1.



**Figure 1.** Psychological Flexibility Model (Hayes et al., 2008)

Psychological flexibility is defined as the ability to consciously remain in the present moment, experience the cognitive and emotional consequences of one's experiences, and behave consistently in a manner that serves one's self-defined values (Hayes et al., 2008, 2013; Hayes & Lillis, 2021; Rolffs et al., 2018). In other words,

psychological flexibility is the willingness of individuals to experience the present moment, to persist in or change their actions in accordance with their values (Bond et al., 2006; Ciarrochi et al., 2010; Maor et al., 2014). Possessing this skill allows individuals to directly engage with their experiences, free from the negative effects of their thoughts and emotions, thereby enabling them to exhibit value-driven behaviors (Hayes et al., 2004; Masuda et al., 2011; Scott & McCracken, 2015). Here, the emphasis is on an individual's relationship with all their thoughts and feelings, regardless of whether they are pleasant or unpleasant. The focus is not on the presence or absence of thoughts and emotions, but rather on their impact on actions in relation to values (Luoma et al., 2011; O'Donohue, 2023). In general terms, psychological flexibility means being willing to experience thoughts and feelings that arise in the present moment without trying to control, reduce, judge, or suppress them. By accepting experiences in this way, individuals can reduce their sense of pressure and engage in value-driven actions (Bennett & Oliver, 2023; Holman et al., 2021; Kul & Türk, 2020; Sağar, 2022; K. Strosahl et al., 2017).

The integrated structure of psychological flexibility, consisting of six dimensions, is associated with individuals' leading a higher quality of life and the positive development of their psychological skills (Ciarrochi et al., 2010; Cyniak-Cieciura, 2021; Guerrini Usubini et al., 2021; Hayes et al., 2006; Long & Hayes, 2014; Toprak et al., 2020). Research has shown that increased psychological flexibility, along with its six dimensions, positively impacts physical and mental health, as well as social adaptation (Cyniak-Cieciura, 2021; Foote et al., 2016; Fuchs, 2022; Hsu et al., 2023; Kashdan & Rottenberg, 2010; Kroska et al., 2020; Leahy et al., 2012; Malo et al., 2022; Maor et al., 2014; Masuda et al., 2011; McCracken et al., 2013; McCracken & Velleman, 2010; Mousavi, 2023; Nikrah et al., 2023; Pakenham et al., 2023; Ruan et al., 2022; Savruk, 2023; Thompson et al., 2021; Twohig et al., 2015; Ulubay & Güven, 2022; Villatte et al., 2016; Wang et al., 2023; Yadavaia et al., 2014; Yu et al., 2017). Therefore, psychological flexibility is an integral part of individuals' mental health and life satisfaction.

As the explanations suggest, the concept of psychological flexibility is not limited to solving a single problem or situation an individual encounters; rather, it focuses on acquiring skills that can impact all areas of life. Given its comprehensive nature, encompassing skills to cope with challenges across various life domains, this concept extends beyond individual problems to encompass social interactions, such as relationships. In this context, one of the areas where approaches that support the development of psychological flexibility are effective is in relationships, which are critically important in an individual's life, and in the problems experienced in relationships (Daks & Rogge, 2020; Dimidjian et al., 2016; Harris, 2023; Hayes et al., 2023; Twiselton, 2021). Given the negative impacts of relationship problems on couples, families, and various life domains, individuals often seek therapeutic interventions. A variety of therapeutic approaches offer distinct perspectives on relationship issues. Emotion-focused therapy (Greenberg & Goldman, 2008) focuses on emotions within relationships, cognitive behavioral therapy (Fischer et al., 2016; Yazar & Tolan, 2021) targets cognitions, and systemic therapy (Dallos & Draper, 2016) concentrates on relational patterns. Acceptance and Commitment Therapy (ACT) offers a unique approach, emphasizing the acceptance of difficult emotions, alignment with personal values, and the development of psychological flexibility. ACT interventions encourage partners to work towards shared values rather than trying to change each other (Harris, 2023; Lev & McKay, 2022; K. Strosahl et al., 2017). Despite a scarcity of research examining the outcomes of Acceptance and Commitment Therapy (ACT) interventions targeting psychological flexibility on romantic relationships in Turkey (Karaaziz et al., 2023; Özcan & Karagöz, 2023; Ulubay & Güven, 2022), international studies provide encouraging evidence for

their potential in fostering healthy relationships (Amani & Yari, 2022; Fani Sobhani et al., 2021; Ghahari et al., 2021; Imani et al., 2023; Khanjani Veshki et al., 2016; Mohammadian et al., 2021; Mousavi Haghighi et al., 2022; Naderi Moghaddam et al., 2023; Nemati et al., 2020; Peterson et al., 2009; Yaghoobi et al., 2020). Based on these findings, it is seen that the skill of psychological flexibility makes positive contributions to an individual's life as a general life skill (Avcı, 2023; Berger et al., 2021; Cyniak-Cieciura, 2021; Dahl et al., 2004; Dimidjian et al., 2016; Fluja-Contreras et al., 2023; Genç, 2022; Gur & Reich, 2023; Kangas & McDonald, 2011; Köksal, 2023; Konstantinou et al., 2023; Li et al., 2023; Nikrah et al., 2023; Pakenham et al., 2023; Towey-Swift et al., 2023; Villatte et al., 2016; Wang et al., 2023). Considering the undeniable importance of romantic relationships for individuals, it is seen that the activation of the skill set called psychological flexibility in this area of life provides benefits. While psychological flexibility plays a significant role in various aspects of individuals' lives, there is a notable lack of research on measuring and evaluating this skill specifically within the context of romantic relationships. This gap in the literature hinders our understanding of exactly what it means to possess psychological flexibility in romantic relationships, the mechanisms through which it operates, and, consequently, its significance for relationship outcomes. When the literature is examined, no measurement tool has been found to measure the psychological flexibility skill specifically in romantic relationships. To fill this void in the existing literature and enable more targeted research on romantic relationships, the development of a measurement tool specifically designed to assess psychological flexibility in romantic contexts was deemed crucial. Starting from this point, the aim of the measurement tool developed is to address psychological flexibility in romantic relationships. The measurement tool developed will enable data collection in studies based on the use of psychological flexibility skills in romantic relationships. The findings obtained from the measurement tool will allow a contemporary approach to be examined from the perspective of individuals experiencing romantic relationships. It is thought that the use of the developed measurement tool will open doors to many studies to be conducted in the field of close relationships, providing rich contributions both theoretically and practically in a current field.

## **Method**

### **Research Design**

This research was conducted using a general survey model, one of the quantitative research methods. The scale developed within the scope of the research was applied to the individuals included in the study group, in line with the survey model. Survey studies, which are common in general survey models, are applied to a group of samples or a sample taken from the entire population or a part of the population in order to reach a general conclusion about a population with a large number of elements (Büyüköztürk et al., 2017; Karasar, 2012).

### **Scale Development Study**

Measurement is the process of determining the degree to which an object or individual possesses a specified attribute or characteristic. Psychological tests used for measurement purposes are developed to enable individuals to realistically reveal the desired attribute or characteristic to be measured (Seçer, 2021). With this aim, a detailed review of the relevant literature was conducted to appropriately transform the characteristic to be measured in individuals into items. The concept of psychological flexibility, which is the subject of the scale, and the theoretical framework underlying this concept were examined in detail. In addition to these studies, the processes of developing and adapting measurement instruments related to psychological flexibility in Turkey and

abroad, and the items they contain, were examined (Burke & Moore, 2015; Francis et al., 2016; Gloster et al., 2021; Karakuş & Akbay, 2020; McCracken & Gauntlett-Gilbert, 2011; Trindade et al., 2022). As a result of all these reviews, a 30-item pool was created for the purpose of scaling the concept of psychological flexibility in romantic relationships. To ensure that the items prepared for the item pool were appropriate in terms of language usage and were clear to the reader, an expert in Turkish education was consulted. To evaluate the content and face validity of the 30 items prepared in this way, an "Expert Evaluation Form" was prepared. The expert evaluation form included evaluation scores for each item's suitability for the scale based on the criteria of suitable, partially suitable, and not suitable at all. Explanation and adjustment suggestion columns were also included for the suitability of each item. The expert evaluation form prepared for the item pool of the scale was shared with five experts in the field. Two of the experts were specialized in acceptance and commitment therapy, which forms the basis of the concept of psychological flexibility, while the other three were faculty members specializing in close relationships. By contacting the field experts via email and sending the prepared form, opinions were sought on the evaluation of the items in terms of both theory and comprehensibility. Based on the feedback received from the field experts, some items were corrected to increase their comprehensibility, and items that were considered insufficient to reflect the concept, difficult to understand, created confusion, or were considered to be asked repeatedly were removed from the pool. As a result of the adjustments made based on the feedback, a new item pool consisting of 25 items was created. The items were prepared in a 5-point Likert-type scale format. A pilot study was conducted to examine the comprehensibility of the items for the group to which the application would be made. For this pilot study, it was required that individuals have been in a romantic relationship for at least 6 months. As a result of the information obtained from this application, items that were unclear and interpreted differently from the intended purpose were removed from the pool. As a result of this process, the structure consisting of 19 items created for the scale was finalized and made ready for application.

### **Participants**

The scale development study was conducted with two different study groups after the procedures for creating the item pool were applied. The first study group consisted of 80 individuals (82.5% female, 17.5% male) who had been in a romantic relationship for at least six months. The age range of the first study group was between 21 and 55, and it consisted of individuals who were married (72.5%), engaged (9%), and in a relationship (16.3%). Exploratory factor analysis was conducted with this study group to analyze the construct validity of the scale. The second study group of the research consisted of 218 individuals (73.9% female, 26.1% male) who had been in a romantic relationship for at least six months. The age range of the second study group was between 20 and 64, and it consisted of individuals who were married (71.1%), engaged (8.3%), and in a relationship (20.6%). Confirmatory factor analysis was conducted with the second study group to test the construct validity of the scale. The demographic information of the research group is presented in Table 1.

Table 1

*Demographic data of the research group*

<i>Variables</i>	First working group		Second working group	
	f	%	f	%
<i>Gender</i>				
Female	66	%82,5	161	%73,9
Male	14	%17,5	57	%26,1
<i>Age</i>				
20-34	64	%80	167	%76,6
35-44	13	%16,3	31	%14,2
45-54	2	%2,5	14	%6,4
55-64	1	%1,2	6	%2,8
<i>Education Level</i>				
Primary and Secondary School	1	%1,3	7	%3,2
High School	4	%5	22	%10,1
University	49	%61,3	120	%55,0
Master's Degree	20	%25	56	%25,7
Doctorate	6	%7,5	13	%6
<i>Relationship Status</i>				
Marriage	58	%72,5	155	%71,1
Engagement	9	%83,8	18	%8,3
Loverhood	13	%16,3	45	%20,6
<i>Length of Relationship</i>				
6 months - 11 months	11	%13,8	18	%8,3
1 year-5 years	41	%51,2	82	%37,6
6 years -10 years	21	%26,3	57	%26,1
11 years - 15 years	4	%5	31	%14,2
16 years - 20 years	1	%1,2	10	%4,6
21 years and over	2	%2,5	20	%9,2
TOTAL	80	100	218	100

**Data Collection Tools*****Personal Information Form***

A personal information form was created to collect data from the participants. The form included questions about gender, education level, age, current relationship status, and relationship duration.

***Psychological Flexibility in Romantic Relationships Scale (PFRRS)***

The Psychological Flexibility in Romantic Relationships Scale (PFRRS) is a 6-item, 5-point Likert-type scale. The highest possible score on the scale is 30, and the lowest is 6. There are no reverse-scored items on the scale. A higher score on the scale indicates a higher level of psychological flexibility in romantic relationships. The Cronbach's alpha coefficient for the scale was .77 in the exploratory factor analysis and .71 in the confirmatory factor analysis. The results of the exploratory and confirmatory factor analyses are presented in the results section.

***Psychological Flexibility Scale***

The Psychological Flexibility Scale was used as a criterion to assess the convergent validity of the newly developed Psychological Flexibility in Romantic Relationships Scale. This scale was developed by [Uygur and Karaca \(2020\)](#). It is a 5-point Likert-type scale consisting of 16 items. The maximum possible score on the scale is 80, and the minimum is 16. Two of the items are reverse-scored. The scale includes five subdimensions and



can yield a total score. A higher total score indicates a higher level of psychological flexibility. The Cronbach's alpha coefficient for the scale was found to be .83. In the present study, the Cronbach's alpha coefficient was calculated as .85.

### **Data Collection**

After the pilot application of the Psychological Flexibility in Romantic Relationships Scale, data collection was carried out in two stages. First, data was collected to conduct exploratory factor analysis and reliability analysis on the 19-item structure. For data collection, it was a requirement that individuals had at least a 6-month history of a romantic relationship. Data was collected through Google Forms and was sent to participants who volunteered to participate in the study via a link. At the beginning of the form, participants were informed about the study and an informative text was presented stating that the data obtained would not be shared with anyone. After the informative text, participants were asked to give their consent stating that they had read the text and voluntarily agreed to participate in the study. In the second stage of data collection conducted for the confirmatory factor analysis of the scale structure, the same criteria were sought in the participants. Participants were reached through Google Forms and the same information was provided and the consent process was carried out.

### **Data Analysis**

In order to conduct validity and reliability analyses for the research, data collected from two distinct study groups were organized and analyzed using SPSS 29.00 and AMOS 24.00. To reveal the factor structure of the scale, an exploratory factor analysis (EFA) was performed on data obtained from the initial study group. Before proceeding with the EFA, the dataset was examined for any missing values. Subsequently, outliers within the dataset were assessed through Z-scores and Mahalanobis distance values, with a Z-score range of -3 to +3 established as the criterion. Analysis results indicated that no extreme values that could negatively impact the analyses were present in the dataset. Skewness and kurtosis coefficients were examined within the range of +2 to -2, indicating that the data largely conformed to a normal distribution. To assess the suitability of the dataset for exploratory factor analysis, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were utilized as measures of sampling adequacy. Analysis results confirmed the sample's suitability for exploratory factor analysis. In examining the scale's factor structure, principal component analysis (PCA) was employed as the factorization technique. Factor analysis was used to identify the number of factors within the structure and the nature of the relationships between them. PCA was preferred to group the data and reduce the number of variables, aiming to achieve more accurate information with fewer measurements. This process also allowed the scale to be refined by removing redundant items that measure the same construct (Can, 2016).

To test the accuracy of the obtained structure, a confirmatory factor analysis (CFA) was conducted. In preparation for CFA, data collected from the second study group were first checked for any missing values. Outliers in the dataset were then assessed using Z-scores and Mahalanobis distance values, with Z-scores between -3 and +3 set as the criterion. Skewness and kurtosis coefficients were examined within the range of +2 to -2, indicating that the data largely conformed to a normal distribution. To assess the dataset's suitability for confirmatory factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were used as indicators of sampling adequacy. Analysis results confirmed that the sample was suitable for the analysis, validating the dataset's readiness. For the confirmatory factor analysis, goodness-of-fit indices,

including  $\chi^2/df$ , GFI, CFI, AGFI, IFI, and RMSEA, were examined. The data obtained from this analysis are presented in the findings section.

To further support the validity of the scale, a convergent validity analysis was conducted. A pre-existing, well-established measure of psychological flexibility was used as a criterion. The correlation between the scores of the new scale and the criterion scale was calculated to assess the degree to which the two measures converge on the same construct.

The reliability of the scale was evaluated using Cronbach's alpha coefficient, item-total correlations, and independent samples t-tests to compare the scores of the top and bottom 27% of the sample. The results of all these analyses are presented in the findings section.

## Results

### Results of Exploratory Factor Analysis (EFA)

Exploratory factor analysis was conducted to determine the construct validity of the Psychological Flexibility in Romantic Relationships Scale. In factor analysis, it is important that the sample size is sufficient for reliable estimation of correlations (Tabachnick & Fidell, 2020). For this reason, Kaiser Mayer Olkin (KMO) and Bartlett sphericity test findings were examined to test the sample size and suitability of the data obtained for factor analysis before proceeding to exploratory factor analysis. The results of KMO and Bartlett Sphericity Test are given in Table 2.

Table 2

*Kaiser- Mayer- Olkin (KMO) and Bartlett Test results*

KMO Measurement Value Adequacy		.743
Bartlett's Test of Sphericity	$\chi^2$	592,857
	df	171
	Sig.	.000

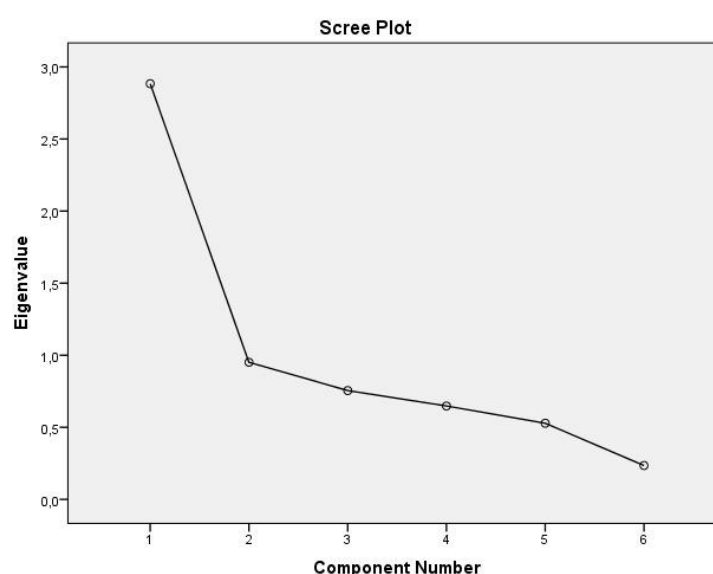
As a result of the tests performed, the KMO value was determined as .74 and the result of Bartlett's Test of Sphericity was determined as  $\chi^2= 592.857$   $p < 0.001$ . KMO sampling adequacy value is a statistical data showing the ratio of variance in variables that can be caused by basic factors. When the value increases and approaches 1.0, it generally indicates that a factor analysis is sufficient for the data. Significant Bartlett's Sphericity test results also indicate the adequacy of the sample size for the data. As a result of the KMO value being above .70 and the Barlett Sphericity Test findings being significant, it was decided that the data set was suitable for exploratory factor analysis (Karagöz, 2019; Seçer, 2021; Şencan, 2005).

After it was determined that the data set to be used to test the construct validity of the Psychological Flexibility in Romantic Relationships Scale was suitable for exploratory factor analysis, the analyses continued in order to reveal the structure. While determining the items to be included in the measurement tool with exploratory factor analysis, the eigenvalue must be above 1 (Can, 2016; Eşici & Karaman, 2022; Karagöz, 2019; Seçer, 2021; Şencan, 2005; Tabachnick & Fidell, 2020). In factor analysis, in the process of revealing a factor from items measuring similar characteristics, items with a high level of relationship between them are tried to be brought together. In order for the item measuring a certain construct to remain in the scale, the factor loading

value is required to be above a certain value. A factor loading value of .45 and above is accepted as good (Can, 2016). Based on this information, the factor loading value criterion for the scale items to be included in the scale was preferred as .60 (Tabachnick & Fidell, 2020).

In the resulting structure, it was paid attention that an item should not be included in more than one factor with a difference below .10 (Seçer, 2021). In addition to the factor loadings and overlap criteria of the items, pure measurement items that were thought to best reflect the concept of psychological flexibility in romantic relationships were preferred among the items that were thought to have similar expressions in the item pool (Tabachnick & Fidell, 2020). Accordingly, it was concluded that the scale provided a unidimensional 6-item structure.

Figure 2 presents the scree plot illustrating the factor structure of the Psychological Flexibility in Romantic Relationships Scale, and the factor loadings obtained are displayed in Table 3.



**Figure 2.** Scree Plot demonstrating the factor structure of the Psychological Flexibility in Romantic Relationships Scale

Table 3

*Factor loadings of the Psychological Flexibility in Romantic Relationships Scale*

Items No	Factor Load
<b>Item 1:</b> When I spend time with my partner, I can focus my attention on them	.639
<b>Item 2:</b> I accept the existence of many different emotions and thoughts in my relationship.	.668
<b>Item 3:</b> When I face a challenging situation in my relationship, I can recognize that my thoughts are just thoughts.	.639
<b>Item 4:</b> I evaluate problems in our relationship based on the specific situation.	.636
<b>Item 5:</b> My partner and I plan our lives in accordance with our values.	.730
<b>Item 6:</b> It is important for us to act in accordance with our values in our relationship.	.828

The factor loadings of the items in the resulting structure ranged from .64 to .83, indicating a high level of association between the items and the factor. Factor loadings above 0.45 are generally considered a good criterion for item selection (Büyüköztürk, 2019; Can, 2016). Therefore, the item factor loadings in the scale exceeded the required values. The Psychological Flexibility in Romantic Relationships Scale was found to be unidimensional, with a single factor explaining approximately 48% of the total variance. An explained variance of 30% or higher is generally considered an acceptable threshold for single-factor scales used in the humanities (Büyüköztürk, 2019; Tinsley & Tinsley, 1987; Williams et al., 2010). These results suggest that the scale is unidimensional and consistent.

The findings regarding the variance explained of the scale are presented in Table 4.

Table 4

*Total variance explained*

Factors	Initial Eigenvalues			Sums of Square Root Charges		
	Total	Variance Percentage	Percentage of Total Variance	Total	Variance Percentage	Percentage of Total Variance
1	2.884	48.060	48.060	2.884	48.060	48.060
2	.951	15.848	63.908			
3	.755	12.580	76.488			
4	.648	10.798	87.287			
5	.528	8.801	96.088			
6	.235	3.912	100.000			

**Results of Confirmatory Factor Analysis (CFA)**

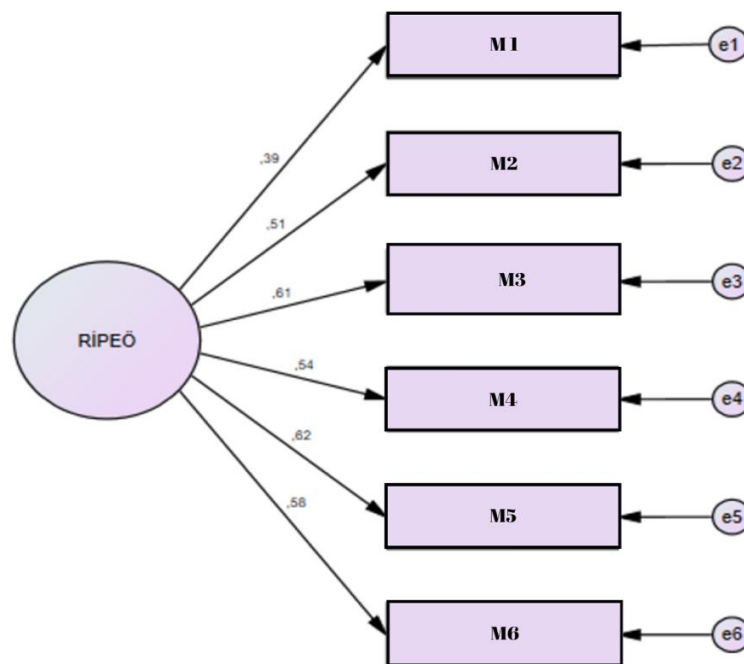
Exploratory factor analysis was performed to determine the factor structure of the scale with the data collected from the first group of the research. Confirmatory factor analysis was performed to determine whether this factor structure was a good fit or not. The fit values obtained as a result of the analysis are given in Table 5. The obtained data were analysed by taking acceptable fit and perfect fit values as criteria (Bayar, 2022; Eşici & Karaman, 2022; Karagöz, 2019; Manuoğlu, 2022; Seçer, 2021; Tabachnick & Fidell, 2020).

Table 5

*Confirmatory factor analysis fit indices and acceptable values*

Model Fit Indices	Model Fit Values	Acceptable Fit Values	Perfect Fit Values
$\chi^2/df$	2.71	$\leq 5$	$\leq 3$
GFI	.96	$\geq .85$	$\geq .90$
CFI	.92	$\geq .90$	$\geq .95$
AGFI	.92	$\geq .85$	$\geq .90$
IFI	.92	$\geq .90$	$\geq .95$
SRMR	.06	$\leq .08$	$\leq .06$
RMSEA	.08	$\leq .08$	$\leq .05$

As seen in Table 5, the scale meets acceptable and excellent fit index values. The model that emerged after the confirmatory factor analysis is given in Figure 3.



**Figure 3.** The model that emerged after the confirmatory factor analysis

When Table 5 and Figure 3 are evaluated together, it is seen that the structure obtained as a result of confirmatory factor analysis is confirmed by the analyses.

A convergent validity analysis was also conducted to assess the validity of the scale. To evaluate convergent validity, the correlation coefficients between the scores of the newly developed scale and a pre-existing measure of the same construct were examined. The Psychological Flexibility Scale was used as the criterion measure in this study. The criterion scale assesses psychological flexibility at a broader level, while the newly developed scale provides a more specific measure of psychological flexibility within the context of romantic relationships. The correlation coefficients between the scales are presented in Table 6.

Table 6

*The correlation coefficient between the Psychological Flexibility Scale and the Psychological Flexibility in Romantic Relationships Scale*

	Psychological Flexibility in Romantic Relationships Scale
Psychological Flexibility Scale	.723**

p\*\* < .001

The correlation coefficient from the convergent validity analysis is presented in Table 6. A correlation of .72 was found between the Psychological Flexibility in Romantic Relationships Scale and the Psychological Flexibility Scale. This finding indicates that the two scales measure similar constructs.

### Results of Reliability Analyses

For the reliability analysis of the scale, Cronbach Alpha internal consistency coefficient was examined. The findings obtained from the scale for the first and second applications are given in Table 7.

Table 7

*Cronbach Alpha Coefficients of the scale applications*

Scale Applications	Cronbach Alpha Coefficient
Exploratory Factor Analysis Application	.77
Confirmatory Factor Analysis Application	.71

The Cronbach Alpha values obtained from the scale applications for both analyses were determined as .77 and .71. A Cronbach Alpha coefficient of .70 and above indicates that the scale is reliable (Büyükoztürk, 2019; Can, 2016; Karagöz, 2019; Seçer, 2021). The findings show that the scale is a reliable measurement tool for measuring psychological flexibility in romantic relationships.

In order to determine the discrimination of the items in the scale, the item-total correlation coefficients of the scale and the item total score averages of the data in the lower-upper 27% obtained from the total scores were compared with the independent samples t test (Can, 2016). The findings obtained from the data collected for exploratory factor analysis are given in Table 8 and the findings obtained from the data collected for confirmatory factor analysis are given in Table 9.

Table 8

*Item total correlation results of the Psychological Flexibility in Romantic Relationships Scale and Independent Groups T Test value of the difference between the lower and upper 27 groups*

	Item Total Correlation Coefficients	T Values of the Difference between Lower and Upper Groups
Item 1	.47	7.40**
Item 2	.51	4.95**
Item 3	.47	8.12**
Item 4	.48	5.02**
Item 5	.54	5.26**
Item 6	.67	7.67**

p\*\* < .001

Table 9

*Item total correlation results of the Psychological Flexibility in Romantic Relationships Scale and Independent Groups T Test Value of the difference between the lower-upper 27 groups*

	Item Total Correlation Coefficients	T Values of the Difference between Lower and Upper Groups
Item 1	.32	7.79**
Item 2	.42	8.90**
Item 3	.51	14.19**
Item 4	.42	11.84**
Item 5	.51	11.43**
Item 6	.45	13.14**

p\*\* < .001

When the findings of the exploratory factor analysis given in Table 8 are considered, it is seen that the item total score correlation coefficients vary between .47 and .67. When the findings of the confirmatory factor analysis given in Table 9 are considered, it is seen that the item total score correlation coefficients vary between .32 and .51. It is known that items with item total score correlation coefficients of .30 and above discriminate individuals well. Therefore, it was determined that the items in the scale were well discriminative and showed a high internal consistency by exemplifying similar behaviors (Büyüköztürk, 2019; Can, 2016; Karagöz, 2019). Another way used for item analysis is to compare the differences between the item score averages of the lower 27% and upper 27% groups formed in line with the total scores obtained from the scale using an unrelated samples t-test. Significant differences between the groups in the desired direction are accepted as an indicator of the internal consistency of the test. The results obtained from the analysis are interpreted as showing the discrimination of the items in terms of behavior when measuring individuals (Büyüköztürk, 2019; Karagöz, 2019). When the total scores of the lower and upper 27% groups were subjected to independent samples t-test analysis, it was seen that the difference between the item mean scores was statistically significant ( $p < .001$ ). As a result of the findings, it can be stated that the scale items are well discriminative and reliable.

### Discussion, Conclusion & Suggestions

In this study, the Psychological Flexibility in Romantic Relationships Scale (PFRRS) was developed. The construct validity of the scale was examined using exploratory factor analysis (EFA). As a result of the analysis, a unidimensional structure explaining 48.060% of the total variance was obtained for the PFRRS. The structure identified through EFA was then tested by conducting a confirmatory factor analysis (CFA) using a new data set. The goodness-of-fit indices for the model derived from the CFA were found to meet both acceptable and excellent fit criteria. A correlation coefficient of .72 was obtained from the convergent validity analysis, indicating a strong convergent validity between the Psychological Flexibility in Romantic Relationships Scale and the well-established Psychological Flexibility Scale. This finding provides evidence that the newly developed scale measures the same construct as the criterion measure. For the reliability analysis of the PFRRS, Cronbach's Alpha internal consistency coefficient, item-total correlation coefficients, independent samples t-test results for the differences between the upper and lower 27% groups analysis were utilized. Given that the

Cronbach's Alpha coefficient was above .70, the scale was deemed to meet the reliability criterion (Büyüköztürk, 2019; Can, 2016; Karagöz, 2019; Seçer, 2021). Furthermore, the item-total correlation coefficients for each item exceeding .30 indicated that the items in the scale possess high internal consistency (Büyüköztürk, 2019; Can, 2016; Karagöz, 2019). Another method used for item analysis involved comparing the mean scores between the upper and lower 27% groups using an independent samples t-test. The significant differences observed in the desired direction further supported the internal consistency of the test. (Büyüköztürk, 2019; Karagöz, 2019). Based on all validity and reliability analyses conducted, the scale was found to have satisfactory validity and reliability.

As a result of the research, the scale developed to measure psychological flexibility in individuals' romantic relationships consists of 6 items in a unidimensional structure. A 5-point Likert scale was used for rating the items. The minimum score that can be obtained from the scale is 6, while the maximum score is 30. There are no reverse-coded items on the scale. Higher scores indicate greater psychological flexibility in romantic relationships.

Psychological flexibility, the foundation of the developed scale, has emerged as a widely used concept and a frequent subject of research in recent years. Psychological flexibility is central to psychological health and healthy emotional functioning in the context of Acceptance and Commitment Therapy (ACT (Alrefi, 2019; Doorley et al., 2020; Kashdan & Rottenberg, 2010; Stoddard & Afari, 2023)). This approach focuses not on solving a single issue or situation in an individual's life, but rather on acquiring skills that affect all areas of life. Therefore, ACT has a broad scope, addressing a wide range of both clinical and non-clinical conditions. One of the areas where this approach has been shown to be effective is relationships, particularly issues that arise within them, which hold great significance in an individual's life (Daks & Rogge, 2020; Dimidjian et al., 2016; Harris, 2023; Hayes et al., 2023; Twiselton, 2021). Research has demonstrated that Acceptance and Commitment Therapy (ACT) interventions, which focus on enhancing psychological flexibility, lead to improvements in couples' marital adjustment, satisfaction, relationship quality, and overall quality of life (Çetinkaya, 2022; Daks & Rogge, 2020; Hosseini et al., 2019; Hosseinpanahi et al., 2020; Kuşcu, 2019; Omid & Talighi, 2017; Sabouri et al., 2020; Shahbazfar et al., 2021; Twiselton, 2021; Twiselton et al., 2020; Ziapour et al., 2017). Based on this evidence, the development of a scale designed to assess psychological flexibility within the context of romantic relationships—a domain of significant importance in individuals' lives—was deemed essential. A review of the literature revealed an absence of measurement tools specifically addressing this need within romantic relationships. While existing tools assess psychological flexibility as a broader skill, the newly developed scale conceptualizes psychological flexibility as a more specialized skill applicable specifically within the context of romantic relationships. This tool aims to measure individuals' adaptation of psychological flexibility skills in the dynamics of romantic relationships, providing a more nuanced dataset specific to this relational context. Therefore, the scale is expected to pave the way for novel research findings in the area of romantic relationships. The information obtained through the use of this scale is anticipated to offer a fresh perspective on romantic relationship processes. Additionally, the availability of measurements in this area will enable the collection of concrete evidence demonstrating the efficacy of psychological flexibility-based intervention approaches within romantic relationships. By facilitating assessments of intervention approaches that incorporate psychological flexibility, the scale is expected to support the demonstration of their effectiveness and contribute to the development of targeted interventions in this field.



The wide applicability of the scale developed within this study is considered an advantage in terms of its practical use. The scale can be administered to all individuals involved in romantic relationships, including marriage, engagement, or dating. The unidimensional structure of the scale, consisting of six items, is expected to facilitate both the administration and evaluation processes for researchers. Despite its advantages, the scale also has certain limitations. One of the main limitations is that, as a self-report measure, it may yield misleading results if individuals do not respond sincerely. Additionally, the sample group from which data were collected in this study was formed using a convenience sampling method. Therefore, it is recommended that future research utilizing the scale be conducted with different sample groups to further enhance the scale's measurement power.

### **Ethic**

This study was conducted as a part of the doctoral thesis study conducted at Necmettin Erbakan University. For the conduct of the research, Necmettin Erbakan University Social and Human Sciences Scientific Research Ethics Committee decided that there was no ethical objection to the conduct of the research according to the decision given by the decision numbered 38, meeting number 38, decision number 11 on 01.08.2023. The study was carried out as a result of the document obtained from the research ethics committee.

### **Author Contributions**

This article was written with the joint contributions of two authors.

### **Conflict of Interest**

The authors declare that they have no conflict of interest.

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Appendix 1: The English version of Psychological Flexibility in Romantic Relationships Scale

Items No	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
<b>Item 1:</b> When I spend time with my partner, I can focus my attention on them	1	2	3	4	5
<b>Item 2:</b> I accept the existence of many different emotions and thoughts in my relationship.	1	2	3	4	5
<b>Item 3:</b> When I face a challenging situation in my relationship, I can recognize that my thoughts are just thoughts.	1	2	3	4	5
<b>Item 4:</b> I evaluate problems in our relationship based on the specific situation.	1	2	3	4	5
<b>Item 5:</b> My partner and I plan our lives in accordance with our values.	1	2	3	4	5
<b>Item 6:</b> It is important for us to act in accordance with our values in our relationship.	1	2	3	4	5

Appendix 2: The Turkish version of Psychological Flexibility in Romantic Relationships Scale

Ölçek Maddeleri	Hiç katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
Madde 1: Eşime/sevgilime ayırdığım vakitlerde dikkatimi ona verebilirim.	1	2	3	4	5
Madde 2: İlişkimdeki pek çok duygu ve düşüncenin varlığını kabul ederim.	1	2	3	4	5
Madde 3: İlişkimde zorlayıcı bir durumla karşılaştığımda düşüncelerimin neler olduğunu fark edebilirim.	1	2	3	4	5
Madde 4: İlişkimizdeki bir sorunu içinde bulunduğumuz duruma göre değerlendiririm.	1	2	3	4	5
Madde 5: Eşimle/sevgilimle hayatımızı değerlerimize uygun planlarız.	1	2	3	4	5
Madde 6: İlişkimizde değerlerimiz yönünde hareket etmek bizim için önemlidir.	1	2	3	4	5

Note: The English version of the scale is provided in Appendix 1, while the Turkish version is presented in Appendix 2. The scale is unidimensional, consisting of six items. No reverse-coded items were included in the scale. The total score, calculated by summing the responses to all items, ranges from 6 to 30. Higher scores on the scale indicate higher levels of psychological flexibility in romantic relationships. Researchers are permitted to use the Turkish version of the scale in their scientific research, provided that they cite it appropriately and adhere to ethical principles. No additional permission is required to use the scale in scientific research.

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## Digital Skills in the 21st Century: Understanding the Impact of Digital Literacy on Nurses

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### Abstract

The aim of this research is to draw attention to the importance of digital literacy in nursing services. Technological advances have driven global development in an unprecedented manner over the last two decades, leading to significant growth in access and connectivity for billions of people worldwide. Approximately 2.5 billion people own smartphones, and four billion people use social media. Digital literacy now requires not only the ability to use technology on a social level, but also the capacity to analyze and integrate digital information. The increasing demand from the labor market for individuals to be digitally literate has spurred targeted interventions and innovations aimed at equipping the future workforce with necessary digital skills. However, despite these efforts, the digital skills gap remains a global challenge. A digitally enabled profession ensures citizens receive the highest quality healthcare. Health-related infrastructures are rapidly digitalizing, leading to significant improvements in healthcare quality. Digital literacy is crucial for accessing and interpreting data, analyzing medical images, and using technology to enhance patient care. Assessing digital literacy levels within healthcare is an issue that should not be overlooked, as technology plays an increasingly important role in both clinical work and research. It is noted that the digital literacy levels of nursing students vary globally, and there is limited research on the factors that influence these levels. Therefore, academics should prioritize this concept and invest in further research and educational initiatives to improve digital literacy.

### Key Words

Digital literacy • Management • Nursing

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## Introduction

Technological advances have driven global development in an unprecedented manner over the past two decades, leading to significant growth in access and connectivity for billions of people (ITU, 2020). Worldwide, 2.5 billion people own smartphones, and four billion people use social media (Taylor, 2019; Smart Insights, 2024). A study conducted in Japan found that despite 100% smartphone and personal computer ownership among university students, these devices are not being used to their full potential (Cote & Milliner, 2016). Digital literacy requires not only the ability to use technology at a social level, but also the capacity to analyze and integrate digital information (Margaryan, 2011). Buckingham (2015) argues that “digital literacy is not a simple concept, and the ability to use computers and digital tools at a basic level is not sufficient to achieve digital literacy.” Although digital technologies, particularly social media, are now ubiquitous, linking their ubiquity to effective usage remains a challenge (Cohen & Hewitt, 2019). It has been emphasized that exposure to digital technologies does not automatically equate to digital literacy (Reid et al., 2023).

Digital literacy was defined by Paul Gilster in 1997 as “the ability to understand and use information in a variety of formats from a wide range of sources when presented through computers” (Gilster, 1997). The World Health Organization’s “eHealth Strategy and Action Plan 2012-2017” emphasizes digital literacy as a key element in ensuring quality care, promoting health, and preventing disease, as it guarantees better access to education and information in an equitable manner (Alonso Galbán, 2019). Widespread internet access, and in particular, the availability of smartphones and other mobile devices since around 2009, have significantly contributed to the digitalization of health (Taj et al., 2019). The concept of digital literacy is becoming increasingly prevalent in the 21st century. Growing demands from the labor market for digitally literate individuals have prompted targeted interventions and innovations to equip the future workforce with digital skills. However, despite these efforts, the digital skills gap remains a global challenge (Reddy, 2023).

Adoption of digital tools and technologies in healthcare has not been widespread in many countries, including Australia, Europe, and the US (Honeyman, 2020; Islam, 2019; Health, 2021; Lomazzi, 2014). Poor digital health literacy has been identified as the most common barrier to the implementation of digital health services (Health, 2021). While interdisciplinary capabilities in digital innovation are being actively developed in other professions, nursing education has largely remained at the exploratory stage in cultivating expertise in digital technology (Cheng, 2024). A digitally enabled profession ensures citizens receive the highest quality of healthcare. The UK Department for Business, Innovation and Skills, along with the Department for Culture, Media and Sport, asserts that maximizing the benefits of digital tools in patient care will improve not only patient outcomes but also staff experiences, thereby “achieving better outcomes for patients” according to 2016 data (Booth et al., 2021). In 2016, the Royal College of Nursing (RCN) Congress emphasized that nurses should become ‘e-nurses’ who can effectively utilize technology to benefit patients (RCN, 2018). According to Pravikoff (2006), digital literacy is as crucial as evidence-based practice, and the development and maintenance of digital literacy is a lifelong professional responsibility (Stombaugh et al., 2013; Pravikoff, 2006). Assessing digital literacy levels within healthcare is an issue that should not be overlooked, as digital literacy and technologies are playing an increasingly vital role in clinical practice and research (Aydımlar & Mavi, 2024).

### **The Concept of Digital Literacy**

The term digital literacy was first defined by Paul Gilster in 1997 (Gilster, 1997). In 2011, the American Library Association (ALA) further refined the definition, describing it as "the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills" (Techataweewan, 2018). Digital literacy encompasses the management of information, digital skills, ethical awareness, and the effective and efficient use of technology for learning. It involves not only knowledge and technical skills but also the attitudes towards using digital technology and devices—such as smartphones, tablets, laptops, and PCs—intelligently for collaboration, communication, support, and expression (Polizzi, 2020; Tejedor, 2020).

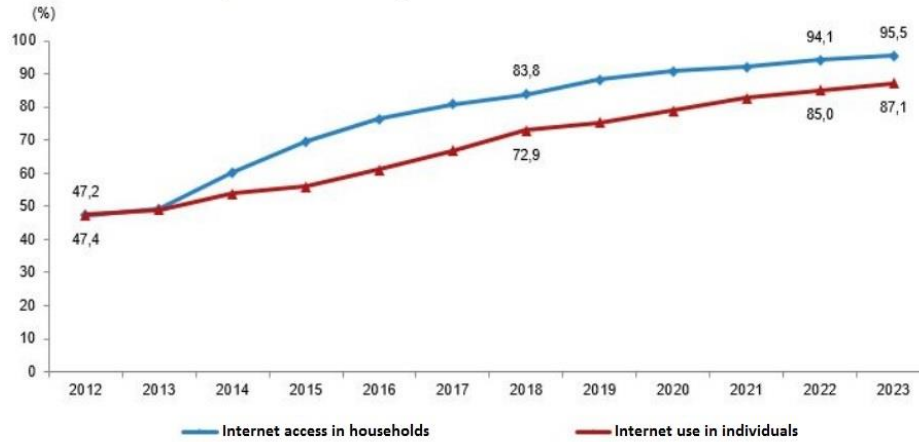
In the Cambridge Dictionary (2004), literacy is defined as the ability to read and write. Digital literacy, however, is a concept that has gained prominence in the digital age. The Joint Information Systems Committee (JISC, 2014) defines it as the acquisition of foundational digital skills that enable individuals to live, learn, and work in a digital society. The committee emphasizes the importance of practical digital competencies and behaviors developed through digital literacy skills. Similarly, the American Library Association (ALAIR, 2011) describes digital literacy as the capacity to use technology to access information.

The London School of Economics offers another perspective, defining digital literacy as the opportunity for individuals to engage with digital platforms and interact within them. This definition introduces a social dimension to digital literacy, outlining it as a set of skills that involves using digital devices, communication tools, and networks to access, manage, and evaluate information (Nascimbeni & Vosloo, 2019). The Digital Literacy Across the Curriculum handbook by British Futurelab (Hague & Payton, 2010) describes it as having access to a wide range of practices and cultural resources that one can apply to digital tools.

A similarly expansive definition is provided by the European Information Society (Martin, 2005), which describes digital literacy as the awareness, attitude, and ability of individuals to use digital tools and facilities appropriately. This includes the ability to identify, access, manage, integrate, evaluate, analyze, and synthesize digital resources, create new knowledge, produce media expressions, and communicate with others. Both definitions highlight the importance of creating meaning and communicating effectively with digital tools, with the latter definition placing additional emphasis on the processes of searching, evaluating, and synthesizing information from digital sources. The Organization for Economic Cooperation and Development (OECD, 2018) predicts that as society progresses, the importance of digital literacy will continue to grow, as future conditions will be markedly different from those of today.

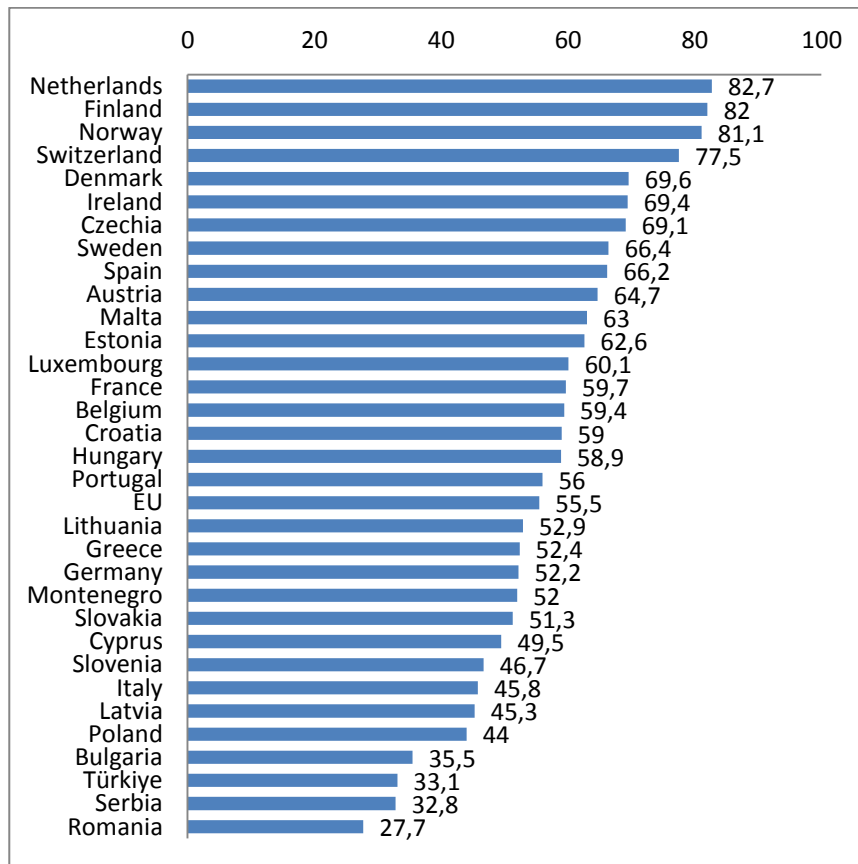
### **Digital Literacy in Türkiye**

The use of information technologies in Türkiye has been steadily increasing. According to data from Turkstat (2023), internet access and usage rates in Turkey have risen significantly over the past decade. Specifically, household internet access has increased from 47% to 95.5%, while individual internet usage has grown from 47% to 87.1% in 2023 (Figure 1).



**Figure 1.** Internet access and usage rate 2012-2023 (Turkstat, 2023)

Although internet access and usage rates in Turkey have increased significantly over the past decade, the fact that the level of digital literacy has not experienced a similar rise poses significant risks. According to the European Statistical Office (Eurostat, 2023), Turkey ranked 30th out of 32 countries in terms of information and data literacy, as well as basic digital skills (including communication and collaboration, security, and problem-solving skills) (Figure 2).



**Figure 2.** Digital skills level of individuals (Eurostat, 2023)

Statistical findings highlight the significance of digital skills and digital literacy in Turkey. An analysis of postgraduate studies on digital literacy in Turkey reveals that the first study was conducted in 2015, with a total of 149 studies completed to date (Table 1). Among these studies, four theses were conducted in the field of nursing and eight in the field of health. Over the years, the number of theses focused on digital literacy has shown a notable increase. Furthermore, there are currently 105 ongoing studies, including two in nursing and four in health (Thesis Center, 2024).

**Table 1.** Graduate theses on digital literacy

Completed Theses	Nursing	Health	Other	Total
Master's Degree	4	5	128	137
PhD	0	3	9	12
2015 year	-	-	1	1
2016 year	-	-	-	0
2017 year	-	-	1	1
2018 year	-	1	2	3
2019 year	-	-	16	16
2020 year	-	-	9	9
2021 year	-	-	20	20
2022 year	-	3	40	43
2023 year	4	3	34	41
2024 year	-	1	14	15
Total	4	8	137	149
Thesis in Progress	Nursing	Health	Other	Total
Master's Degree	1	3	78	82
PhD	1	1	21	23
Total	2	4	99	105

Source: Thesis Center (2024)

In Turkey, various measurement tools have been developed or adapted to assess the digital literacy levels of individuals. Some of these tools are designed for specific age groups or occupational categories, while others are applicable to the general population. The names of these measurement tools include the 21st Century Digital Literacy Skills Scale (Kalaycı, 2023), the Digital Literacy Scale (Hamutoğlu et al., 2017), the Digital Literacy Scale (Bayrakcı & Narmanlıoğlu, 2021), the Adult Digital Literacy Scale (Nabiyeve et al., 2022), and the Digital Literacy Scale (Üstündağ et al., 2017).

### The Importance of Digital Literacy in Nursing

In the era of the fifth industrial revolution, possessing digital literacy and continually improving with each technological advancement has become essential (Polizzi, 2020; Tejedor, 2020). Technological innovations have influenced the work life of employees across all sectors, including the healthcare sector (Eden et al., 2019). Given the digital advancements in healthcare, the importance of integrating digital literacy into education has been emphasized (Behrends & Paulmann, 2021). Workplace requirements now demand applicable technological knowledge, and employees must continuously use relevant technologies while updating their digital skills (Peromingo & Pierson, 2018). The infrastructures in healthcare are rapidly digitalizing, resulting in a significant

improvement in the quality of healthcare services. Digital literacy is essential for accessing and interpreting data, analyzing medical images, and utilizing technology to enhance patient care (Krupinski, 2015). However, nurses' informatics competencies are reported to be below "average" (Hwang & Park, 2011).

Globally, there is a growing call for nurses to be trained in digital competence in order to work effectively in technology-mediated healthcare settings (Cummings et al., 2016; Harerimana et al., 2022a; Honey et al., 2020; Veikkolainen et al., 2023). Digital literacy skills should be incorporated into the undergraduate nursing curriculum, and National Nursing Digital Literacy competencies for entry into practice as registered nurses should be developed and tailored to individual jurisdictions (Reid et al., 2023). Digital literacy plays a critical role in understanding the ethical implications and potential risks of using technology in healthcare (McBride, 2018). Employees with high digital literacy are more aware of online privacy issues, such as data protection, security breaches, information security, and the ability to search and interpret information (Park, 2013; Weinberger et al., 2017). Additionally, it is predicted that digital technologies will play a crucial role in the future in facilitating disease prevention and health promotion (De Santis et al., 2021). Evidence suggests that the nursing workforce will struggle to keep pace with these developments, and substantial investments are needed to enhance digital capabilities (Peltonen et al., 2019). Poor digital skills and limited digital literacy are critical factors contributing to this issue (Terry et al., 2019).

Healthcare services in the third millennium are predominantly delivered through systems that incorporate technological devices and services. However, to ensure the effective delivery of digital healthcare services, users must be digitally literate, meaning they need to be capable of using technology purposefully (Campanozzi, 2023). The infrastructure in healthcare is rapidly becoming digitalized, leading to significant improvements in the quality of health services. Digital literacy is essential for accessing and interpreting data, analyzing medical images, and leveraging technology to enhance patient care (Krupinski, 2015). According to Kleib and Nagle (2018), digital skills in technology increase with the level of education among nurses. Additionally, nursing experience, alongside age and qualifications, influences IT competence. Increased clinical experience is linked to a higher likelihood of utilizing technology at the point of care, and is predicted to have a positive impact on digital literacy (Hwang and Park, 2011; Wei-Lan et al., 2013).

### **Research on Digital Literacy in Nursing**

Digital literacy is a concept that has been increasingly studied in relation to nursing students in the literature. Jeon and Kim (2022) explored the relationship between learning attitudes, E-health literacy, digital literacy, and self-efficacy among Korean nursing students. The study found a positive correlation between digital literacy and self-efficacy.

Kuek and Hakkennes (2019) investigated the digital literacy levels and attitudes towards information systems among healthcare personnel in Australia. The study revealed that participants were generally confident and exhibited positive attitudes toward information systems. Additionally, the study identified that the digital literacy levels of staff aged 50 and older were lower, and suggested improvements in this area.

Harerimana et al. (2022b) conducted a cross-sectional study on the digital literacy of nursing students. The authors noted that sufficient digital literacy among nursing students positively influences their ability to perform electronic documentation, engage in communication and collaboration, and search for evidence that supports the quality of patient care.

Erbir (2021) investigated the digital literacy levels of nurses in relation to demographic characteristics. The study found that digital literacy levels were significantly higher among younger nurses, single nurses, those with postgraduate education, and those who had recently started their careers compared to other groups.

Kars-Fertelli and Kücükballı (2023) examined the relationship between digital literacy levels and counseling skills among nursing students in Turkey. The study revealed that nursing students had high levels of digital literacy. Furthermore, a positive, moderate correlation was found between students' digital literacy levels and their counseling skill scores.

Erdar et al. (2023) examined the impact of technical, cognitive, and socio-emotional factors on digital literacy among nursing students. The study identified that internet self-efficacy, online information search strategies, and online privacy concerns were positive predictors of digital literacy, while social media use was found to be a negative predictor.

### **Conclusion and Recommendations**

The COVID-19 pandemic has significantly contributed to the global development of new technologies and has accelerated the digitalization of various aspects of daily life (Zeeb and Pigeot, 2020). Digital technologies have demonstrated considerable potential for innovation, particularly in the areas of individual health promotion, the use of health apps for prevention and early disease diagnosis, as well as health education (Dadaczynski, 2018). As a result, it is anticipated that digital technologies will increasingly influence health-related decisions in the future (Odone, 2019).

The incorporation of technology into nursing practice requires a solid foundation in digital literacy (Reid et al., 2023). The National Nursing and Midwifery Digital Health Capability Framework emphasizes the integration of digital literacy across nursing and other healthcare disciplines through five key domains: digital professionalism, leadership and advocacy, data and information quality, information-supported care, and technology. This approach will empower future healthcare professionals to provide safe, high-quality, and person-centered care that is well-connected and supported by technology (Williamson et al., 2020).

Holt et al. (2020) emphasized that nursing students worldwide exhibit varying levels of digital literacy, and there is limited understanding of the factors influencing these levels. Consequently, it is crucial for academics to be adequately trained and upskilled in educating nursing students, equipping them with the essential knowledge and digital literacy skills necessary to work in a digitally advanced clinical environment. It is equally important for education providers to support nursing students in becoming proficient in nursing informatics, thus preparing them for the rapidly digitizing healthcare landscape (Cummings et al., 2016).

The ongoing expansion of technology use in patient care will persist, necessitating that nurses are prepared to effectively embrace the digital health environment. To make this expectation realistic, nurses must be actively involved in the development of systems, platforms, and devices used at the point of care, and provided with sufficient time and resources to implement them effectively. Building digital capability in nurses will require the adoption of a wide array of strategies and the involvement of all relevant stakeholders, including nurses, employers, managers, and policymakers. Drawing upon the synthesis of literature on the integration of digital capability in nurses' workplaces, we propose practice, policy, and educational programs aimed at enhancing nurses' ability to utilize both existing and emerging clinical care technologies. It is recommended that further research be conducted to explore nurses' knowledge and attitudes toward next-generation technology in the workplace.

In line with the aforementioned information, the following recommendations are proposed:

- Assign trainers and mentors to support the development of digital literacy among nurses.
- Encourage continuous professional development programs aimed at enhancing digital literacy in nurses.
- Ensure the provision of the necessary infrastructure to allow nurses to explore and practice digital platforms in care delivery.
- Develop a comprehensive implementation strategy, including stakeholder engagement and a well-defined timeline for the adoption of new technologies.
- Establish clear guidelines on the confidentiality and privacy of patient information.
- Provide digital services, including help and support, to assist nurses in troubleshooting and resolving usability, technical, and reliability issues promptly.
- Promote the widespread use of electronic medical records as a means of enhancing the quality and safety of care.
- Increase awareness of the importance of digital literacy within the profession to foster its development and contribute to the ongoing progress of nursing practice.

### **Ethical Approval**

All scientific and ethical guidelines were strictly adhered to throughout the study. All data and information utilized in the study were properly cited, and the study complied with the standards set by the Committee on Publication Ethics (COPE).

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# Predictive Relationships between Self-Recovery Power at Birth, Psychological Resilience and Religious Coping

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## Abstract

This study is a field study that aims to examine the relationship between recovery strength, psychological resilience and religious coping among women in labor. The study is based on data collected in November-January 2020-2021. The sample consists of 921 women residing in different cities of Türkiye as a result of the announcement made using social media. In the study, demographic information form and self-recovery power, psychological resilience and religious coping scales were used. AMOS Structural Equation modeling was used to analyze the data. According to the study, it was seen that religious coping positively affected the power of self-recovery in women. In addition, it was found that the power of self-recovery also positively affected psychological resilience.

## Key Words

Self-recovery power • Psychological resilience • Religious coping

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## Introduction

One of the things that adds meaning to a person's life is embracing a religion and beginning to live it according to their values. This decision effectively contributes to gaining a positive outlook, increasing optimism, and fostering hope (Frankl, 2017; Göcen, 2014). In studies conducted in other fields, it has been noted that due to the multidimensional nature of religion, it is difficult to examine its impact on mental health. Instead, the effect of one's morality while practicing religion, rather than the practice of religion itself, has been observed (Payne et al., 1991).

"Religions have been observed to have positive effects on mental health through their worldview or approaches to problems (Payne et al., 1991). The protective aspect of religion on psychological well-being has also been observed in studies. Among African American girls with low income, religious activities have been found to help tolerate conditions such as intense anxiety and depression (Grant et al., 2000). Additionally, religion can help in coping with the psychological crises brought on by severe illnesses during childhood, as well as in maintaining family and social support (Spilka et al., 1991).

When a person feels that Allah is by their side during difficult times, it provides them with strength, hope, and the ability to realize their potential. This, in turn, helps them find the resilience to cope with their problems and maintain psychological well-being (Türker, 2018). When a person seeks refuge in Allah, they can better make sense of events, understand their emotions and thoughts, and feel at peace when expressing them. Seeing God as the first source to turn to during times of distress helps them endure challenges more patiently and find the strength needed to fight, even contributing to their personal growth. It is evident that using religion as a coping mechanism strengthens inner peace and empowers the individual (Ayten et al., 2012). Many have expressed that when individuals seek a refuge that can provide strength during difficult times, they often find it in religion (Ayten, 2012). Religion plays a significant role in making sense of life by offering guidance, hope, and support in the face of life's events (Pargament & Brant, 1988). For each person, spiritual life is a story of understanding and accepting themselves, their place in society, and life itself (Çetinkaya et al., 2007).

In ancient times, psychological disorders were believed to be caused by the influence of malevolent spirits. Civilizations such as the Sumerians, Egyptians, and Akkadians integrated medicine with religious beliefs. While Christianity associates illness with sin, Islam examines the human being as a whole, considering both the spirit and the body in medical practice. However, after the 17th century, the focus shifted to studying humans solely through the lens of science, moving away from religion. Yet, after the 19th century, the field of psychology began to emerge as a crucial factor in explaining the relationship between religion, health, and psychology (Düzgüner, 2013). When individuals face processes such as death and birth, where they may struggle to find adequate explanations, religion can provide convincing answers, playing a significant role in their recovery process (Kula, 2005). Religion serves as a foundation for individuals to make sense of their problems during coping (Ekşi, 2001). The belief that Allah is with them and the confidence derived from that thought help individuals experience less stress and maintain anxiety at a normal level in the face of events (Kula, 2002).

Throughout their lives, individuals may go through difficult processes, and what is essential during these times is the desire to maintain important aspects at a high level. These aspects vary for each person; for some, they may be material, while for others, they could be spiritual, physical, or psychological. What matters is that when faced with a problem, there is a desire for these aspects to continue, which can only be achieved through

coping behaviors. Studies have observed the positive effects of religion among coping behaviors (Pargament & Brant, 1988).

In a stressful situation, a person can use different methods, which may be mental, emotional, or even spiritual in nature (Topuz, 2003). Human beings have needs in terms of physical health, social roles, and psychological well-being, along with the fears and anxieties they experience in relation to these needs. To make sense of these situations and alleviate their concerns, individuals may need to seek support from various sources, with religion often serving as a primary source (Turhan, 1959).

It has been observed that in order to be more resilient in the face of stress, a person's ability to assess the situation realistically and to recognize their own self-structure is effective. Recognizing and respecting one's self, accepting that there are actions that can be taken by acknowledging one's realistic capabilities, and utilizing existing resources or finding new ones are pathways to resilience against stress (Tuğrul, 2000). In the face of difficult life conditions, it is observed that individuals turn to Allah and seek help. Such a turn is expected when sudden difficulties bring feelings of helplessness and powerlessness (Aydm, 2011).

In their 2016 study on religious coping and life satisfaction, Ayten and Yıldız found a positive relationship between positive religious coping, religiosity, and life satisfaction, while no significant relationship was found with negative religious coping. It was observed that religious coping methods such as turning to God, reading the Qur'an, and praying increased life satisfaction. It was understood that behaviors like interpreting events positively, showing patience, and engaging in worship were effective in reducing stress levels in individuals experiencing stress. Another study found that positive beliefs had beneficial effects on mental health. Individuals with a positive perception of God were found to use positive religious coping styles, experience fewer depressive states, have fewer thoughts of death, and exhibit a greater desire to live. Believing in a loving and protective God helps individuals stay attached to life and maintain psychological health during difficulties (Aydm, 2011). On the other hand, it was observed that individuals with a perception of God as punitive and unloving experienced a deterioration in their health (Pargament et al., 2001).

Coping refers to a state in which an individual can enter a process of recovery without experiencing severe psychological distress or, if they are experiencing psychological difficulties, without showing intense symptoms (Perişan, 2018). Throughout their lives, people use religion and their values to cope with the problems they face. It is a path they turn to for resolving these difficulties (Hood et al., 1996). One of the coping strategies people use when faced with challenges is 'religious coping,' a concept proposed by American Clinical Psychologist Kenneth I. Pargament (Pargament et al., 1988).

Before defining religious coping, coping itself can be described as the cognitive and behavioral efforts an individual makes to physically and mentally deal with the difficulties they face (Lazarus & Folkman, 1984). Religious coping is defined as the use of religion-based cognitive and behavioral methods. Studies on stress reduction using religious coping methods have shown more concrete results compared to general measures like religiosity (Pargament et al., 1998). Research has found that religious coping is positively related to variables such as physical health, mental health, and spiritual maturity (Pargament & Park, 1997). It has been found that individuals who interpret the stressful situations in their lives as evil or negative experience more stress compared to those who evaluate these situations as good or positive (Ayten, 2012).

We come to understand the role of religion in coping when we recognize human limitations. Even when a person utilizes their talents and resources to their fullest, they may find they cannot surpass certain boundaries. At this point, religion can offer supplementary spiritual support, providing meaning and a sense of control in situations that are unexplained or beyond human control. Religion plays a role in coping, especially when individuals struggle to confront challenges on their own (Pargament & Brant, 1988). Research has defined the influence of religious coping in three ways: a) providing a new cognitive framework to interpret events through faith, b) offering social support through religious community, and c) fostering a sense of control during stressful situations (Tix & Frazier, 1988).

Haque (2012) stated that in the face of major problems, religious coping strategies are more beneficial than non-religious ones. Prayer is one of the religious coping methods, and it has effects on feelings of loneliness, mental health, and even physical health (Albayrak, 2013; Gashi, 2016). It is not only expected to provide explanations in traumatic situations. Religion stands out as one of the coping methods people use in life (Ayten, 2012). Approaches in different religions also vary in terms of how individuals cope with negative psychological experiences such as depression, anxiety, and stress through religion (Alferi et al., 1999; Chang, Noonan, & Tennstedt, 1998).

When examining the literature on religious coping methods, we observe negative religious coping strategies such as procrastination, denial, and avoidance; however, these do not align well with life adaptation. In contrast, when discussing religious coping, positive religious coping strategies are being referenced (Eryücel, 2013). Negative religious coping has been found to be more related to ineffective coping methods, often seen as involving alcohol or drug use. Positive religious coping, on the other hand, is associated with interpreting events positively, providing emotional support, understanding and accepting emotions (Ekşi, 2001). Another study has shown that positive religious coping has a positive effect on health, while negative religious coping strategies can negatively affect health (Pargament, Koenig, & Perez, 2000; Ross, Handal, Clark, & Wal, 2009; Pargament, Tarakeshwar, Ellison, & Wulff, 2001). Research has demonstrated that religious coping methods yield more successful results compared to non-religious methods, with noticeable effects on well-being and health (Pargament & Brant, 1988). Furthermore, religious coping has been found to be associated not only with physical health but also with psychological well-being and a sense of usefulness (Hunsberger et al., 2001). Effective results have been observed between positive religious coping and managing stress (Topuz, 2003).

Two important practices of positive religious coping, as identified in research findings, are reading the Quran and praying (Kesikbaş, 2022). The concept of patience, as a religious coping method, is seen as the first step in crisis management when it is perceived as accepting the situation (Özdoğan, 2009).

An individual's resilience is an important variable in the process of overcoming psychological challenges and adapting to them (Oshio et al., 2003). Resilience is defined as the ability to survive (Rak & Patterson, 1996); the ability to develop skills to cope with difficulties and risky situations (Mangham, McGrath, Reid & Stewart, cited in Işık, Özünlü, & Atalay, 2019); and the effort to recover despite facing greater risks (Masten, 2001).

Studies on resilience have shown a positive relationship between individuals' well-being and physical health and their resilience (Doherty & Clayton, 2011; Losoi et al., 2013; Park & Slattery, 2014; Zakour, 2012); and a negative relationship between resilience and anxiety and depressive states (Oliveira, Matos, Pinheiro, & Oliveira, 2015; Nishi, Uehara, Kondo, & Matsuoka, 2010; Skrove, Romundstad, & Indredavik, 2013).



Allen and Hurtes (1999) described resilience as the effective methods individuals use to cope with the problems they face (cited in Kaya & Demir, 2017). Walsh (2006) refers to resilience as an active process that enables individuals to stand strong in the face of adversity and show growth during crises (cited in Işık, 2016). It is believed that an individual's ability to cope with stressful situations will enhance their level of happiness and psychological health (Kaya & Demir, 2017).

Psychological resilience has been defined as an individual's capacity to recover and return to well-being after facing difficulties (Garmezy, 1993). Religion serves as a resource that supports psychological resilience by helping individuals cope with risky psychological situations in their social environments (Masten, 2001). Studies indicate a relationship between spirituality and psychological resilience, showing that individuals draw strength from spirituality in challenging times (Greene & Conrad, 2002). In a study conducted with Muslim soldiers, it was observed that the coping behaviors they employed were based on religion/spirituality, providing them strength in difficult circumstances (Wahiba & Shareda, 2015). Additionally, it has been observed that negative religious coping methods decrease the level of psychological resilience in individuals (Uysal et al., 2017). According to the results of 130 studies on this subject, religious coping methods have been found to have a positive effect in alleviating negative psychological conditions such as anxiety, stress, and depression (Argyle, 1999).

It has been found that individuals with high levels of coping and protective behaviors in the face of challenging situations demonstrate psychological resilience (Rutten et al., 2013). Accordingly, pregnant women with high psychological resilience are more likely to cope more easily with difficult situations they encounter (Mautner E, et al., 2013; Cited in: Üzar-Özçetin & Erkan, 2019).

Pregnancy and childbirth, as natural processes for a woman's body and societal norms, offer women an extraordinary experience (Şahin & Erbil, 2019). However, pregnancy is also a risky condition that lies within the boundaries of life and death for both the mother and the baby. Despite this, pregnancy has a spiritual and miraculous aspect for women, akin to the experience of childbirth for the newborn (Trudelle, 2001). Furthermore, a woman who enters a transformative process with pregnancy anticipates the mental adaptation to caregiving, driven by the responsibility that comes with her societal role as a mother (Stern et al., 2013). While the meanings society attaches to motherhood may lead to experiences like depression, it has been observed that Islam's approach to the concept of motherhood provides supportive and positive perceptions (Kesikbaş, 2022).

"We have enjoined upon man [care] for his parents. His mother carried him, [increasing her] in weakness upon weakness, and his weaning is in two years. Be grateful to Me and to your parents; to Me is the [final] destination." (Quran, Luqman 31:14).

Religion serves as a refuge for both ensuring the health of babies and helping mothers cope with stress (Merey, 2019); religious coping involves utilizing sources related to religion as a means of support (Ekşi, 2001). It is thought that women who are able to compare and discuss their childbirth experiences with their religious beliefs may have a more positive birth experience (Schneider, 2012).

Studies examining stress levels during pregnancy have found that women who adopt a spiritual lifestyle experience lower level of pregnancy-related stress. It has been reported that 86% of pregnant women utilize religious coping methods (Yali & Lobel, 1999; Pakzad, Dolatian, Jahangiri, Nasiri, & Dargah, 2018). Another

study examining women's spiritual domain during childbirth, the moment of birth, and postpartum found that religious life positively impacts individuals' sense of reliability, determination, and psychological resilience (Mutmainnah & Afianti, 2019). Consequently, if a woman undergoing pregnancy does not receive support in the spiritual aspect along with physiological, psychological, and biological approaches, this would represent a deficiency in a holistic approach (Gügen, 2019).

During childbirth, women demonstrate performance that exceeds typical coping processes. Studies have identified religious coping as the most beneficial method for managing control during this time (Hood et al., 2009). When individuals face the limits of their control during challenging times, they are expected to turn to an omnipotent force, a source of boundless strength (Buldur & Göcen, 2021).

In religious coping methods during childbirth, it has been observed that women recite prayers to divert attention during contractions (Yıldırım & Şahin, 2014), and use water that has been prayed over to ease childbirth (Coşkun, 2011). Respecting women's desire to draw on spirituality during childbirth and providing a calm and peaceful environment can help the birthing woman feel more at ease and empowered. Engaging in practices like reading or listening to holy scriptures, praying, or using spiritual chants are seen as helpful rituals. Ensuring that these practices align with cultural values is crucial in helping women manage intense contractions. When health professionals respect and support culturally relevant coping methods for contractions, women may feel more encouraged during the birthing process. With comfort in her spirituality and beliefs, a woman's active participation in childbirth can make the experience more meaningful, bringing peace to both mother and baby (Bing, 2002; Morton & Hsu, 2007; Duran & Atan, 2011; Malata & Chirwa, 2011; Unutkan, 2018; Köksal & Duran, 2013).

The relationship between a woman's resilience during childbirth, psychological resilience, and religious coping is illustrated in the Quran through the story of Mary (Maryam) during labor. In her intense pain, she expressed, "I wish I had died before this and had been forgotten, utterly forgotten!" (Quran, Maryam 19:24). This highlights the profound psychological and physiological state women undergo during childbirth. While in this state, Maryam was comforted by God through the provision of fresh dates from a dry tree and a flowing stream.

Spanish midwives, known as *Comadronas*, aim to create a sacred atmosphere during childbirth by using candles, incense, and other religious symbols for women experiencing contractions. They mention using special candles, which they light at each birth, sometimes surrounding revered images with candles while praying fervently to God for a safe delivery and protection from danger. According to *Comadronas*, childbirth is not merely a physical function but a spiritual process (V. Walsh, 2016).

It has been found that mothers who receive spiritual support during childbirth maintain a strong sense of faith in later life, which is highly associated with psychological resilience (Das et al., 2017). According to attachment theory, the child's primary caregiver—often the mother—is the closest person to whom they turn in dangerous situations. In this sense, Islam reflects a similar relationship in a person's closeness and attachment to Allah. Allah created the first human with His own hands, breathed into them from His spirit, and befriended humanity. He encompasses them with love and mercy; His mercy precedes His wrath, His patience precedes His punishment, and His forgiveness precedes His harshness. His mercy encompasses everything (Cevziyye, 1990). In this relationship, the only duty of humans is to attach to and seek refuge in Him (Gazali, 1973). Accordingly,

in Islamic tradition, the Qur'an, as the holy book, plays a role in reducing human anxieties and finding peace. Like the warmth, security, and comfort one finds in a mother's presence, reading, understanding, and loving the Qur'an enables direct connection with Allah, as if He is speaking to the person (al-Muhasibi, 2003).

The Qur'an states:

"To those who believe in Allah and hold fast to Him, He will admit them to His mercy and grace and guide them to Himself on a straight path." (Qur'an, An-Nisa 4:175)

"And whoever holds firmly to Allah has certainly been guided to a straight path." (Qur'an, Al-Imran 3:101)

"Unquestionably, for the allies of Allah there will be no fear concerning them, nor will they grieve. Those who believed and were conscious of Allah, for them are good tidings in this worldly life and in the Hereafter. There is no change in the words of Allah. That is the great attainment." (Qur'an, Yunus 10:62–64)

## Method

### Research Design

In this study, the quantitative research method was chosen to examine the predictive relationship between mothers' psychological resilience and recovery capacities during childbirth and their religious coping processes. The AMOS structural equation model was used for analysis. Structural equation modeling (SEM) is a multivariate statistical method that allows us to measure latent structures using observed variables. One notable aspect of this method is that it enables the inclusion of unobserved variables in the model, as well as the incorporation of measurement errors in all observed variables. SEM software, such as AMOS, EQS, LISREL, SEPATH, RAMONA, SAS, and CALIS, which have become increasingly popular for their efficiency and broad application, has enhanced the practical applicability of this complex method in research fields. In this study, commonly preferred SEM software, including AMOS, EQS, and LISREL, were compared within the framework of model assumptions (Yılmaz & Varol, 2015).

### Study Group of the Research

The sample of the study consists of women residing in various regions of Türkiye who have given birth within the past five years. The research was conducted with a total of 921 participants. The age range of the sample is between 20 and 48 years, with an average age of 30. Among the women in the sample, 45% have one child, while 1.6% have five or more children. Additionally, 55.4% of the participants gave birth through normal delivery, while 44.7% delivered via cesarean section.

### Measurement Tools

In this study, scales were used to measure the levels of religious coping, psychological resilience, and recovery ability among the participants. Additionally, the first part of the questionnaire included a personal information form with questions to collect demographic details (such as age, number of children, and type of birth).

### *The Religious Coping Scale*

Developed by Abu-Raiya, Pargament, Mahoney, and Stein (2008), was adapted into Turkish by Ekşi and Sayın (Cited in: Ekşi & Sayın, 2016). Psychometric analyses of the Turkish version showed that it retained a

structure similar to the original scale. Confirmatory variable analysis was conducted to validate the scale's desired structural results. The confirmatory factor analysis yielded acceptable fit index values for the 10-item, 2-factor model ( $\chi^2/df = 2.58$ ; RMSEA = .049; SRMR = .20; GFI = .94; CFI = .95; NFI = .98; NNFI = .93), as reported by [Hu and Bentler \(1999\)](#), [Kline \(2015\)](#), and [Schermelleh-Engel, Moosbrugger, and Müller \(2003\)](#). Cronbach's alpha internal consistency coefficients for the scale were calculated as 0.91 for positive religious coping and 0.86 for negative religious coping.

#### ***The Psychological Resilience Scale***

Developed by [Friborg et al. \(2003\)](#) for adults, includes dimensions of 'personal competence,' 'structured style,' 'social competence,' 'family cohesion,' and 'social resources.' A later study by [Friborg et al. \(2005\)](#) showed that the six-dimensional form better defined the model of psychological resilience. In this study, Friborg and colleagues' 'personal competence' dimension was divided into 'self-perception' and 'future perception,' resulting in a six-dimensional structure. The items are structured as follows: 'structured style' (items 3, 9, 15, 21) and 'future perception' (items 2, 8, 14, 20) with four items each; 'family cohesion' (items 5, 11, 17, 23, 26, 32), 'self-perception' (items 1, 7, 13, 19, 28, 31), and 'social competence' (items 4, 10, 16, 22, 25, 29) with six items each; and 'social resources' (items 6, 12, 18, 24, 27, 30, 33) with seven items. A format was used in the scale to avoid biased evaluations, with positive and negative features on different sides and responses organized in five separate columns. The scoring system allows flexibility in evaluating whether psychological resilience is high or low ([Basım & Çetin, 2011](#)).

#### ***The Recovery Ability Scale***

Originally created by [Wagnild and Young \(1993\)](#) and adapted to the Turkish cultural context by [Terzi \(2006\)](#), was administered to a sample of 155 university students (84 females and 71 males)(Cited in: [Terzi, 2006](#)). Principal Component Analysis was used to obtain data on construct validity. Factor analysis revealed a 24-item final version, where each factor explained shared variance between 0.469 and 0.740 with seven factors having eigenvalues greater than one. As a result, the Recovery Ability Scale was found to be a valid and reliable tool for determining university students' recovery ability levels ([Işık et al., 2019](#)).

### **Findings**

The final model ( $X^2 = 189.35$ ,  $df = 50$ ,  $p < .001$ ) includes one exogenous variable (religious coping) and two endogenous variables (recovery and resilience). Each path in the model was found to be statistically significant. Upon examining the goodness-of-fit values in Table 1, it was observed that the model's SRMR, NFI, CFI, GFI, AGFI, and TLI values indicated a good fit, while the other values showed an acceptable fit. All relationships in the model are statistically significant and exhibit high values.

Table 1

Goodness-of-Fit Statistics for the Structural Equation Model

Measure	Good Fit	Acceptable Fit	Model Fit Values
(X <sup>2</sup> /sd)	≤ 3	≤ 4-5	3.79
RMSEA	≤ 0.05	0.06-0.08	0.06
SRMR	≤ 0.05	0.06-0.08	0.05
NFI	≥ 0.95	0.94-0.90	0.96
CFI	≥ 0.97	≥ 0.95	0.97
GFI	≥ 0.90	0.89-0.85	0.97
AGFI	≥ 0.90	0.89-0.85	0.95
TLI	≥ 0.95	0.94-0.90	0.96

(p < .001).

Upon reviewing the goodness-of-fit values in Table 1, the results show X<sup>2</sup>/df = 3.79, RMSEA = 0.06, SRMR = 0.05, NFI = 0.96, CFI = 0.97, GFI = 0.97, AGFI = 0.95, and TLI = 0.96. Based on these values, the model is considered to have acceptable levels of goodness-of-fit (Bollen, 1989; Browne & Cudeck, 1993; Byrne, 2010; Hu & Bentler, 1999; Kline, 2011; Tanaka & Huba, 1985). The tested single-factor model is shown in Figure 1. All paths indicated in the model are statistically significant at the p < .001 level.

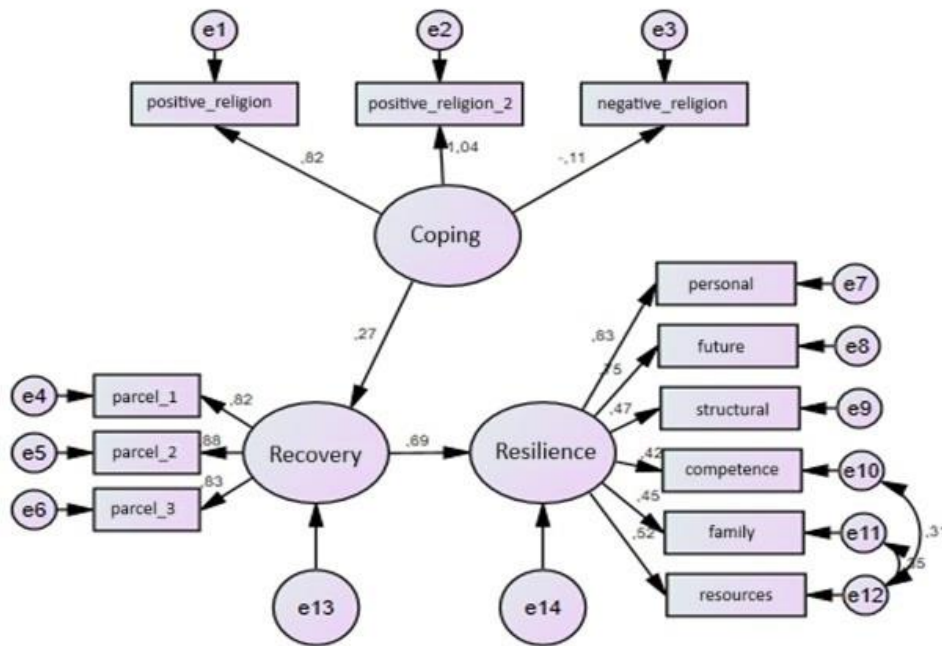


Figure 1. Path analysis for the model

Table 2

Model for Predictive Relationships Among Religious Coping, Recovery, and Resilience

Predictor Variable	Dependent Variable	Total Effect	Direct Effect	Indirect Effect	Standard Error	Critical Value
Religious Coping	Recovery	0.46	.27	.19	0.45	7.99*
Recovery	Resilience	0.69	.69	0	0.41	18.25*

\*a Total Effect = Direct Effect + Indirect Effect, p < 0.001

Upon examining the model in Figure 1, it is observed that individuals' level of religious coping is a significant factor affecting their recovery ability ( $t = 7.99$ ,  $p < .001$ ). The path coefficient for this factor was found to be  $\beta = 0.27$ . When the predictive relationships between religious coping and recovery are examined, a positive and significant relationship emerges. In other words, as individuals' level of religious coping increases, so does their recovery ability.

In the model, individuals' recovery ability is observed to be a variable that impacts their psychological resilience ( $t = 18.25$ ,  $p < 0.001$ ). The path coefficient for this variable is  $\beta = 0.69$ . Upon examining the predictive relationships between individuals' recovery ability and psychological resilience, a positive linear relationship is evident. Accordingly, it is understood that individuals' recovery ability positively affects their psychological resilience.

### Discussion and Conclusion

Childbirth is the process by which a living being transitions from the mother's womb to the world. Women demonstrate a high level of performance during childbirth. In past times in our country, women in villages often gave birth alone in fields or at home. With high birth rates and practical experience, these women sometimes served as midwives, assisting many others.

A woman giving birth needs to cope with the intense physical and psychological symptoms she experiences. During childbirth, she may wish for a hand on her shoulder, or the support of someone who understands her, reassuring her that everything is going well. It is known that such social support facilitates the childbirth process. Beyond this support, spiritual support also plays a crucial role for women. In recent times, the importance of religious coping methods in the face of inadequate conventional coping methods has been emphasized (Anderson et al., 2005). Women who use religious coping strategies during childbirth are often psychologically stronger and find it easier to recover from stressful situations they encounter.

Our study shows a strong relationship between the religious coping methods used by pregnant women during childbirth, their psychological resilience, and their ability to recover. The research variables demonstrate good compatibility with each other. This suggests that our study yielded positive results. According to the findings, women who use religious coping methods have higher levels of recovery. Additionally, as recovery ability increases, psychological resilience also rises. An important aspect of this study is that although coping has been a longstanding research topic, studies on religious coping methods have only emerged internationally over the past 20 years and in our country over the past 10 years. Despite its recent introduction, religious coping has become one of the leading methods of coping. For this reason, this research is especially significant for pregnant women (Eryücel, 2013).

Recently, studies on religion and psychology have garnered attention in our country as a new area of research. When examining the human being as a whole, ignoring religion and focusing solely on science creates an incomplete understanding. During the miraculous process of childbirth, we observed that the source of strength and support for a woman often lies in spiritual processes that alleviate her sense of helplessness. Embracing spirituality, allowing her to practice what is significant for her, such as reading prayers, is essential for pregnant women (Adams & Bianchi, 2008). A woman's spirituality or faith during childbirth provides an inner strength and sense of relief (Breen, Price, & Lake, 2006; qtd. in Adams & Bianchi, 2008). Additionally, a

woman in labor requires the hormone oxytocin, which is a natural preference for both the baby and the mother. Oxytocin is released in calm and private environments. Considering that spirituality may create such an atmosphere, it could influence oxytocin levels and make childbirth easier for the mother.

The spiritual aspect has undeniable effects on human beings. The recent focus on this area is noteworthy. According to the research results, it is hoped that by developing religious coping strategies, women can show greater patience, recover more easily from each difficulty they face during childbirth, and maintain their psychological resilience even in later stages, particularly during the postpartum period. In future studies, experimental research on religious coping methods may be conducted, with this study serving as a foundation.

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## Adaptation of the Self-Control Strategies Scale to Turkish and Evaluation of Psychometric Properties

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### Abstract

Self-control was initially defined as behavioral inhibition. However, researchers have since recognized that strategies beyond behavioral inhibition are also required. This study aims to adapt the Self-Control Strategies Scale, developed to measure the broader theoretical structure of self-control beyond behavioral inhibition, into Turkish and to examine its psychometric properties. The study was conducted with 477 university students aged between 18 and 31. The confirmatory factor analysis indicates that the 33-item version of the scale shows good fit. Convergent validity analysis involved using the Multidimensional Self-Control Scale and the General Procrastination Scale. It was found that behavioral inhibition remains the strongest predictor of self-control, followed by Pre-Commitment, Reward, and Cognitive Change. General Procrastination is only predicted by Behavioral Inhibition and Pre-Commitment. Reliability analyses of the scale were conducted using McDonald's Omega, test-retest reliability, and item-total correlations. All subscales, except for the Pre-Commitment subscale, have a reliability level above .70. In conclusion, the scale is valid and reliable for use in research conducted in Türkiye. However, the reliability level of the Pre-Commitment subscale should be considered when interpreting the results. This study also provides insights into the skills that should be acquired in self-control enhancement interventions.

### Key Words

Behavioral inhibition • Self-control • Self-control strategies • Self-regulation • Willpower

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## Introduction

Self-control is essential for success and well-being in many areas of life. Individuals with strong self-control tend to be more successful in various domains such as health, education, financial conditions, and relationships (Baumeister et al., 1998; Cobb-Clark et al., 2022; Duckworth & Seligman, 2005; Hoffman et al., 2014; Moffitt et al., 2010; Tangney et al., 2004). In contrast, weak self-control is associated with several problems, including obesity and unhealthy eating (Elfhag et al., 2008; Jasinka, 2012), procrastination (Ramzi & Saed, 2019), alcohol and substance use (Ford & Blumentstein, 2013), and criminal behavior (Gottfredson, 2017). The importance of self-control has led to increased research in this area.

Initially, self-control was defined as the delay of short-term gratification for long-term goals. According to this perspective, self-control is an attempt to inhibit undesirable impulses (Ainslie, 1975; Mischel et al., 1989). In other words, an internal or external temptation triggers an impulse, and when an individual resists these impulses by considering long-term consequences, they demonstrate successful self-control (Fujita, 2011). Defining self-control as effortful inhibition has led to the neglect of different strategies people use to achieve long-term goals (Fujita, 2011). As research on self-control has increased, it has become evident that individuals with strong self-control often prefer behaviors aligned with their long-term goals automatically, without engaging in effortful inhibition (Adriaanse et al., 2014; de Ridder et al., 2012). They are also known to take preventive measures before impulses arise (Duckworth et al., 2016) For instance, their daily habits and routines are already consistent with their life goals (Galla & Duckworth, 2015), and they avoid engaging in willpower battles that would lead to fatigue (Hofmann, 2012). These studies indicate that self-control extends beyond effortful inhibition.

People often use various strategies beyond impulse inhibition to avoid self-control failure. For instance, according to Duckworth et al.'s (2016) process model, individuals can achieve long-term goals more successfully by taking preventive measures before impulses emerge. According to the situation selection/modification strategies described by the author, a person who spends excessive time playing computer games might place the computer in a closed cabinet during the week or completely remove gaming programs from their computer. Similarly, someone on a diet might store sweets on the top shelves of the cabinet or avoid bringing sweets into the house. By doing so, the person reduces the likelihood of encountering temptations, thereby moving towards their goals without engaging in a self-control conflict (Duckworth et al., 2016).

Rewards and punishments are also strategies that help in exercising self-control towards our goals. Imposing a punishment on oneself for not performing a desired behavior or rewarding oneself upon achieving goals can reduce undesirable behaviors and increase desirable ones. Rewards and punishments provide commitment to behavior (Trope & Fishback, 2000). Additionally, individuals can maintain commitment to long-term goals through various pre-commitment devices (Hofmann & Kotabe, 2012). For example, someone wanting to diet might make a prepayment for a meal preparation service, which can help them adhere more closely to their diet. Alternatively, setting a deadline for a task can reduce procrastination (Ariely & Wertenbroch, 2002).

When faced with temptations that challenge our progress towards goals, strategies such as behavioral inhibition, distraction, cognitive change (Magen & Gross, 2007), and acceptance can also be used. For instance, in Mischel's famous marshmallow experiment, children used cognitive change by imagining the marshmallow as a cloud to resist the urge to eat it (Mischel, 2014). Duckworth et al. (2016) suggest that changing our thinking about the current situation can help manage impulses. For example, if staying at home is viewed as leading to health issues associated with a sedentary lifestyle, the preferred behavior might be to go for a walk.



Another useful strategy for resisting temptations is acceptance (Alberts et al., 2013; Forman, 2007). Acceptance involves engaging with internal experiences such as unpleasant feelings, thoughts, and bodily sensations without attempting to change or reduce them (Luoma et al., 2017; Strosahl et al., 2004). This helps in reducing the dominance of internal experiences that challenge our behavior, thus facilitating actions aligned with our goals.

When these strategies are combined, it becomes evident that self-control is a comprehensive concept. Katzir et al. (2021) developed the Self-Control Strategies Scale to assess self-control in its broad context. This scale evaluates self-control across two dimensions: anticipatory control and down-regulation of temptation. Anticipatory control includes Situation Selection/Stimulus Control, Punishment, Reward, and Pre-Commitment, while Down Regulation of Temptation comprises Cognitive Change, Acceptance, Distraction, and Behavioral Inhibition.

In Türkiye, self-control is assessed using various measurement tools such as the Brief Self-Control Scale-SCS, the Multidimensional Self-Control Scale-MSCS, and the Self-Control and Self-Management Scale-SCMS (Ercoskun, 2016; Nebioğlu et al., 2012; Gülüm & Tığrak, 2022). The Brief Self-Control Scale (Tangney et al., 2004), adapted by Nebioğlu et al. (2012), is related to inhibitory control. The SCMS, developed by Mezo (2009) and adapted to Turkish by Ercoskun (2016), includes a self-reinforcement subscale related to reward. The most comprehensive self-control scale used in this study for convergent validity is the Multidimensional Self-Control Scale (Gülüm & Tığrak, 2022). The MSCS features two dimensions: inhibitory and initiatory control, with six subscales each: Procrastination, Attention Control, Impulse Control (inhibitory control); Emotion Control, Goal Orientation, and Self-Control Strategies (initiatory control). As observed, these dimensions differ from those of the scale to be adapted. Unlike the SCSS, none of these scales comprehensively evaluate self-control strategies.

### **The Present Study**

This study aims to examine the psychometric properties of the SCSS (Self-Control Strategies Scale) in Turkish. Validity and reliability analyses have been conducted as part of the adaptation of the scale. To assess convergent validity, the Multidimensional Self-Control Scale and the General Procrastination Scale were utilized. As mentioned, self-control is predominantly addressed through inhibitory control. The original study also identified behavioral inhibition as the strongest predictor of self-control, followed by Pre-commitment and Punishment, with other strategies not being significant predictors (Katzir et al., 2021). To explore whether the strategies explaining self-control differ in Turkish culture, this study also aims to examine the extent to which self-control strategies predict self-control itself as a second objective. Additionally, procrastination, used for assessing convergent validity, is described as a failure of self-regulation (Steel, 2007). Therefore, a negative relationship between self-control and procrastination, as indicated in the literature (Karademir, 2023; Kim et al., 2017; Przepiórka et al., 2019), is expected. Furthermore, the study will investigate which strategies predict general procrastination within the framework of predictive validity.

Strong self-control, or the ability to resist immediate impulses, is an essential characteristic that contributes to success in various aspects of life. Consequently, strategies that help direct our behavior towards long-term goals and overcome immediate impulses are necessary. Understanding which strategies contribute to strong self-control is important for improving quality of life. Thus, this study, by adapting the mentioned scale to a Turkish sample, will contribute to a more comprehensive assessment in future self-control research and provide guidance for practitioners in the field.

## Method

### Participants

477 university students, 366 women (76.7%) and 111 (23.3%) men, aged between 18-31, recruited to study. The average age of the participants is 21.19 (SD = 1.898).

### Measurement Tools

#### *Self Control Strategies Scale (SCSS)*

It was developed by [Katzir et al \(2021\)](#) to determine self-control strategies. The original scale is a five-point Likert type scale consisting of 38 items (1=not at all., 5 very much). It consists of 8 sub-dimensions: Situation Selection, Reward, Punishment, Pre-Commitment, Distraction, Cognitive Change, Acceptance and Behavioral Inhibition. The first four subscales are associated with anticipatory control, while the next four are associated with down regulation of temptations. Each subscale is scored separately. Higher scores from the scales indicate that strategy is used more.

#### *Multidimensional Self-Control Scale (MSCS)*

It is a 5-point Likert type scale (1 strongly disagree - 5 strongly agree) developed by [Nilsen et al., \(2020\)](#). The original form of the scale consists of 29 items. In this study, a 25-item form adapted by [Gülüm and Tığrak \(2022\)](#) was used. The scale has 6 subscales: Procrastination, attentional control, impulse control, emotional control, goal orientation, and self-control strategies. These subdimensions are grouped under factors inhibition and initiation. The total score obtained from the scale shows high self-control. Cronbach's Alpha coefficient was calculated as .88 for this study

#### *General Procrastination Scale*

It was developed by [Çakıcı \(2003\)](#) to measure the procrastination behavior of high school and university students. The scale is a five-point Likert type scale consisting of 18 items (1 does not reflect me at all - 5 reflects me completely). Total scores obtained from the scale indicate that procrastination behavior has increased. In this study, Cronbach's Alpha coefficient was calculated as .94.

### Procedure

Before starting the study, permission was obtained from the authors to adapt the scales. Ethics committee approval for the research was received from Hasan Kalyoncu University (approval number E-97105791-050.04-62515). The original scale was translated into Turkish by the authors, and then back-translated by one psychologist who is a native English speaker and resides abroad. Items 7 and 16, which were originally designated as reverse-coded items in the scale, have been adapted in the Turkish translation to ensure they align with the intended meaning, and therefore, they are not treated as reverse-coded items. After finalizing the scale, feedback was gathered from ten individuals to ensure the clarity of the items. Based on the feedback received, any unclear items were revised by the authors. Following these revisions, the scale was again reviewed by the same ten individuals to confirm the clarity of all items. The necessary adjustments were made by the authors, and the scales were given their final form.

The study data were collected from university students via Google Forms in November and December, 2023. Informed consent was obtained from all participants, confirming their voluntary participation in the study.

### Data Analysis

Confirmatory Factor Analysis (CFA) was used to test the construct validity. Pearson Correlation and Multiple Regression Analysis were used to test convergent validity. For the reliability analysis, McDonald

Omega reliability coefficient and item-total correlations were calculated, and the test-retest method was employed. Analyses were carried out using the Statistical Program for Social Sciences (SPSS 28) and AMOS 23 software.

## Results

### Validity Analysis

We conducted confirmatory factor analysis (CFA) with using maximum likelihood estimation method (See Figure 1). Model Fit is analyzed chi-square statistic ( $\chi^2/df < 5$ ), Comparative Fit Index (CFI > 0.90), Root Mean Square Error of Approximation (RMSEA < 0.1), Standardized Root Mean Square Residual (SRMR < 0.1), Tucker-Lewis index (TLI > .90) (Hu ve Bentler, 1999; Schumacker ve Lomax, 1996; Kline, 2005).

Table 1

*CFA Fit Indices for The Self-Control Strategies Scale After Modifications*

Modifications	$\chi^2/df$	CFI	TLI	RMSEA	SRMR
Original Model	3,076	.83	.81	.066	.081
e6-e38 (s4-s5)	2,8	.85	.83	.062	.085
e13- e14	2,7	.86	.84	.060	.085
D23 moved CC	2,6	.87	.85	.58	.082
D23 Deleted	2,5	.88	.86	.057	.082
e39-e40 (BI36-BI38)	2,4	.88	.87	.056	.085
BI38 Deleted	2,4	.89	.88	.055	.078
BI36 Deleted	2,3	.90	.89	.052	.071
S5 Deleted	2,2	.91	.90	.052	.065
e27-e28 (A31-A32)	2,1	.92	.91	.049	.064
<b>SS1 Deleted (Final Version)</b>	<b>2,1</b>	<b>.92</b>	<b>.91</b>	<b>.050</b>	<b>.064</b>

All changes in CFA are listed in Table 1. The CFA results of the scale in its original form were determined as 3,076 for the  $\chi^2/df$ , 0.66 for the RMSEA, .83 for the CFI, .81 for the TLI and .081 for the SRMR values. In order to achieve model fit, modification indices were examined and modifications were made respectively for the items showing the highest covariance. Accordingly, D23 was deleted because of loadings in Cognitive Change Subscale and modifications were made for B36 and B38. However, it was observed that the CFI and TLI values were below .90 and the SRMR value was above .80, and the Standardized Residual Covariance Matrix was examined.

Accordingly, Residual Covariance values that above 2 are defined as poor items (Awang, 2012). When the matrix was examined, it was seen that the highest values (above 3 and 4) were in items B36, B38 and SS5, and these items were deleted from the measurement tool respectively. Later, modifications were made between items e27-e28; the SS1 was deleted because of low factor loading and the scale provided the good fit values seen in Table 1. These values are similar to the CFA values of the original scale (Katzir et al., 2021). Factor loadings is indicated also Table 2.

Table 2

*Confirmatory Factor Analysis Factor Loadings for Self-Control Strategies Scale*

Subscale	Item	Factor Loadings	Subscale	Item	Factor Loadings
Situation Selection/Stimulus Control	SS2	.75	Distraction	D19	.82
	SS3	.76		D20	.93
	SS4	.79		D21	.82
	SS6	.53		D22	.71
Punishment	P7	.72	Cognitive Change	CC24	.68
	P8	.39		CC25	.77
	P9	.86		CC26	.73
	P10	.70		CC27	.64
Reward	R11	.90	Acceptance	CC28	.71
	R12	.94		A29	.74
	R13	.80		A30	.87
	R14	.83		A31	.61
Pre-Commitment	PC15	.57	Behavioral Inhibition	A32	.63
	PC16	.30		BI33	.36
	PC17	.32		BI34	.83
	PC18	.60		BI35	.73
				BI37	.58

### Convergent Validity

Analyzes regarding the relationship between the subscales are included in Table 3. Within the scope of convergent validity analyses, the relationships of the scales with the Multidimensional Self-Control Scale and the General Procrastination Scale were examined (See Table 4). Situation Selection/Stimulus Control has weakly associated with MSCS-Initiatory Self-Control ( $r$  ranges from .180 and .209). In addition MSCS-Procrastination, one of the inhibitory strategies, has a weak but statistically significant relationship with Situation Selection ( $r = .119$ ). Punishment has a weak and positive relationship with MSCS-Initiatory Self-Control ( $r$  ranges from .136 and .179) whereas has no significance relationship with MSCS-inhibitory Self Control. The Reward had a weak significant relationship with MSCS-inhibitory Self-Control ( $r$  ranges from .196 to .171) and a moderate, significant relationship with MSCS-Initiatory Self Control ( $r$  ranges from .222 to .365). Pre-commitment had moderate significant relationship only MSCS-Procrastination and had weak to moderate relationship with MSCS Initiatory Self-Control ( $r$  ranged from .174 and .340). Distraction had a weak to moderate significant relationship with both MSCS inhibition and initiation strategies ( $r$  ranged from .098 and .257). Cognitive change had weak and significance relationship with MSCS-Inhibitory Self Control, MSCS-Procrastination and MSCS-Attention Control and MSCS Goal Orientation ( $r$  ranged from .113 and .239) and moderate relationship MSCS-Initiation, Emotion Control and Self Control Strategies ( $r$  ranged from .370 and .425). Acceptance had moderate and negatively significant relationship only MSCS-Impulse Control ( $r = -.227$ ). Behavioral Inhibition had

moderate relationship both MSCS Inhibitory and Initiatory Self Control (r ranged from .213 and .488). As expected, r values for inhibition strategies were higher than for initiation strategies.

MSCS Total Score had significantly correlated moderately or weakly with all self control strategies except Acceptance (r ranged from .471 and .097). Except Punishment and Acceptance; all strategies had weak and negative associations with general Procrastination Scale (r ranged from -.128 and -.287).

Table 3

*Pearson Correlation Analysis for Self-Control Strategies Subscale*

	1	2	3	4	5	6	7
1 Situation							
Selection/Stimulus Control	1						
2 Punishment	.220**	1					
3. Reward	.105*	.250**	1				
4. Pre-Commitment	.244**	.321**	.236**	1			
5. Distraction	.467**	.113*	.099*	.248**	1		
6. Cognitive Change	.421**	.241**	.256**	.346**	.472**	1	
7. Acceptance	-.036	-.032	.091*	.134**	-.024	.095*	1
8. Behavioral Inhibition	.131*	-.104*	.046	-.041	.208**	.205**	-.148**
n	477	477	477	477	477	477	477
M	13.23	10.09	15.47	13.92	12.9706	17.40	13.46
SD	3.47	3.532	4.058	2.826	3.57618	3.97	3.467

\*p< .05, \*\*p< .01

Table 4

*Pearson Correlation Analysis for SCSS, MSCS and GPS*

	MSCS									
	MSCS Procrast.	MSCS Attent. Control	MSCS Impulse Control	MSCS Inhibit.	MSCS Emot. Control	MSCS Goal Orientat.	MSCS Self- Control Strat.	MSCS Initiat.	MSCS Total	GPS
Situation Selection	.119*	.039	.050	.088	.180**	.140**	.209**	.225**	.184**	-.154**
Punishment	.083	-.020	-.083	-.011	.136**	.141**	.148**	.179**	.097*	-.041
Reward	.196**	.167**	.047	.171**	.222**	.365**	.293**	.366**	.317**	-.150**
Pre-Commitment	.254**	.085	.031	.155**	.174**	.340**	.263**	.322**	.281**	-.269**
Distraction	.098*	.089	.146**	.144**	.255**	.127**	.216**	.257**	.237**	-.128**
Cognitive Change	.148**	.113*	.068	.139**	.370**	.239**	.387**	.425**	.331**	-.175**
Acceptance	-.044	.050	-.227**	-.102*	-.022	.066	.108*	.062	-.027	.006
Behavioral Inhibition	.307**	.355**	.474**	.488**	.213**	.221**	.267**	.296**	.471**	-.287**
n	477	477	477	477	477	477	477	477	477	477
M	11.80	12.36	11.83	36.00	13.39	14.64	18.70	46.75	82.74	46.24
SS	3.358	3.23	3.65	8.02	3.41	2.90	3.21	7.53	13.04	15.65

MSCS Multidimensional Self-Control Scale; Procrast: Procrastination; Attent: Attention; it: Inhibition; Orientat: Orientation; Strat: Strategies; Initiat: Initiation; GPS: General Procrastination Scale

\* $p < .05$ , \*\* $p < .01$

### Predictive Validity

We also conducted regression analysis to test which self-control strategies predicted self-control and general procrastination.

As seen Table 5, Behavioral Inhibition ( $\beta = .440$ ,  $t = 11.293$ ,  $p = .000$ , CI [1.457, 2.070]), Pre-commitment ( $\beta = .022$ ,  $t = 5.105$ ,  $p = .000$ , CI [.600, 1.351]), Reward ( $\beta = .211$ ,  $t = 5.680$ ,  $p = .000$ , CI [.466-.959]) and Cognitive Change ( $\beta = .105$ ,  $t = 2.286$ ,  $p = .023$ , CI [.048, .642]). The model explains a variance in the dependent variable, with an  $R^2$  of 0.365, indicating that 36.5% of the variance is accounted for by the predictors.

As seen Table 6, only Behavioral Inhibition ( $\beta = -.286$ ,  $t = -6.369$ ,  $p = .000$ , CI [-1.800, -.951]) and Pre-Commitment ( $\beta = -.269$ ,  $t = -5.641$ ,  $p = .000$ , CI [-2.010, -.972]), predicted General Procrastination Scale. The model explains a variance in the dependent variable, with an  $R^2$  of 0.156, indicating that 15.6% of the variance is accounted for by the predictors.

Table 5

*Multiple Regression Analysis Predicting Multidimensional Self Control Scale Scores from Specific Self-Control Strategies*

	B	Beta	SE	t	p	95.0% CI
(Constant)	29.568		4.00	7.392	.000	[21.709, 37.428]
Situation Selection	-.008	-.002	.163	-.050	.960	[-.328, .311]
Punishment	-.033	.222	.150	-.220	.826	[-.327, .261]
<b>Reward</b>	<b>.712</b>	<b>.211</b>	<b>.125</b>	<b>5.681</b>	<b>.000</b>	<b>[.466, .959]</b>
<b>Pre-Commitment</b>	<b>.976</b>	<b>.022</b>	<b>.191</b>	<b>5.105</b>	<b>.000</b>	<b>[.600, 1.351]</b>
Distraction	.083	-.023	.156	.508	.612	[-.237, .402]
<b>Cognitive Change</b>	<b>.345</b>	<b>.105</b>	<b>.151</b>	<b>2.286</b>	<b>.023</b>	<b>[.048, .642]</b>
Acceptance	-.076	-.020	.143	-.530	.598	[-.356, .205]
<b>Behavioral Inhibition</b>	<b>1.763</b>	<b>.440</b>	<b>.156</b>	<b>11.293</b>	<b>.000</b>	<b>[1.457, 2.070]</b>

F=35.267; R<sup>2</sup>=.365

Table 6

*Multiple Regression Analysis Predicting General Procrastination Scale Scores from Specific Self-Control Strategies*

	B	Beta	SE	t	p	95.0% CI
(Constant)	89.448		5.5531	16.171	.000	[78.578, 100.317]
Situation Selection	-.305	-.068	.225	-1.358	.175	[-.747 .137]
Punishment	.213	.048	.207	1.029	.304	[-.194, .620]
Reward	-.314	-.081	.173	-1.808	.071	[-.654, .027]
<b>Pre-Commitment</b>	<b>-1.494</b>	<b>-.269</b>	<b>.264</b>	<b>-5.641</b>	<b>.000</b>	<b>[-2.010, -.972]</b>
Distraction	.148	.034	.225	.660	.509	[-.293, .590]
Cognitive Change	-.009	-.002	.209	-.044	.965	[-.419, .401]
Acceptance	.031	.007	.197	.158	.874	[-.356, .419]
<b>Behavioral Inhibition</b>	<b>-1.375</b>	<b>-.286</b>	<b>.216</b>	<b>-6.369</b>	<b>.000</b>	<b>[-1.800, -.951]</b>

F=12.080; R<sup>2</sup>=.157

#### Reliability Analysis

Reliability of the subscales was also above .70 except pre-commitment ( $\omega$ =.80 for Stimulus Selection;  $\omega$ =.76 for Punishment;  $\omega$ =.93 for Reward;  $\omega$ =.52 for Pre-Commitment;  $\omega$ =.89 for Distractions;  $\omega$ =.83 for Cognitive Change;  $\omega$ =.81 for Acceptance and  $\omega$ =.71 for Behavioral Inhibition) as seen Table 7.

Table 7

*McDonald Omega Values of SCSS Subscales*

	Number of Items	McDonald's Omega
Situation Selection/Stimulus Control	4	.80
Punishment	4	.76
Reward	4	.93
Pre-Commitment	4	.52
Distraction	4	.89
Cognitive Change	5	.83
Acceptance	4	.81
Behavioral Inhibition	4	.73

Table 8

*Item-Total Correlations of SCSS Subscales*

Subscale	Item	Item-Total Correlations	Subscale	Item	Item-Total Correlations
Situation Selection/Stimulus Control	SS2	.629	Distraction	D19	.733
	SS3	.647		D20	.837
	SS4	.702		D21	.776
	SS6	.450		D22	.677
Punishment	P7	.555	Cognitive Change	CC24	.574
	P8	.330		CC25	.682
	P9	.708		CC26	.676
	P10	.589		CC27	.583
Reward	R11	.829	Acceptance	CC28	.644
	R12	.865		A29	.596
	R13	.817		A30	.697
	R14	.850		A31	.636
Pre-Commitment	PC15	.264	Behavioral Inhibition	A32	.660
	PC16	.271		BI33	.324
	PC17	.251		BI34	.635
	PC18	.425		BI35	.562
				BI37	.509

As Seen Table 8, Item total correlations had the values above .30 (Büyüköztürk, 2016) except Pre-Commitment Subscale (Item PC 15, 16 and 17). These results indicate that the items are distinguishable in terms of the traits they measure and that the scale exhibits high internal consistency except Pre-Commitment Subscale.



Test-Retest reliability analysis was recruited with 30 sample. Analysis show that Distraction, Cognitive Change sub scales T1 and T2 scores had high association ( $r = .729$  and  $.827$ , respectively) whereas Situation Selection, Punishment, Reward, Pre Commitment, Distraction, Cognitive Change, Acceptance, Behavioral Inhibition sub scales T1 and T2 scores had moderate association ( $r$  ranged from  $.462$  and  $.674$ ) (See Table 9).

Table 9

*Pearson Correlation Analysis for Test-Retest Reliabilty*

	T1			T2		r
	n	M	SS	M	SS	
Situation Selection	30	12.83	2.705	13.57	2.596	.633**
Punishment	30	10.03	2.953	10.33	3.377	.462*
Reward	30	14.60	3.719	14.63	3.222	.672**
Pre-Commitment	30	14.03	2.341	14.23	1.775	.405*
Distraction	30	13.23	2.885	13.60	3.180	.729**
Cognitive Change	30	17.73	3.591	17.17	4.128	.827**
Acceptance	30	13.30	4.203	13.30	4.364	.674**
Behavioral Inhibition	30	13.33	2.510	13.07	2.753	.526**

\* $p < .05$ , \*\* $p < .01$

### Discussion

This study aims to adapt the Self-Control Strategies Scale (SCSS), developed to measure a broader theoretical construct of self-control, into Turkish and to examine its psychometric properties. The original scale, consisting of 38 items, was validated in its Turkish version with 33 items. Due to the initial version of the scale showing unacceptable fit indices, modifications and item deletions were performed. Initially, the items 5 and 6 with the highest covariance were associated. It was observed that these items are semantically similar and measure the same construct. Subsequently, item 23, which was originally part of the Distraction was moved to the Cognitive Change. Changing the item's subscale did not improve the fit indices to the desired level, leading to the decision to remove the item from the scale.

Despite modifications to error variances and the deletion of item 23, the fit indices did not improve. Therefore, the covariance matrix was examined. Awang (2012), notes that items with values above 2 are problematic. Based on this, items 38, 36, and 5, starting from those showing the highest covariance, were sequentially removed from the measurement tool. After the removal of the final item, the fit indices reached acceptable ranges, and since the number of items in the subscales was low, item deletion procedures were concluded. One modification was applied between items 31 and 32, which are correlated. When these items were examined, they appeared conceptually similar and measured the same construct. Finally item SS 1 is deleted because of the factor loading is below  $.30$  (Çokluk et al., 2012 ) and final version of the scale was presented.

As a result, it was found that the  $\chi^2 / df$  CFI, TLI, RMSEA and SRMR values of the scale showed acceptable fit (Hu ve Bentler, 1999; Kline, 2005; Schumacker ve Lomax, 1996). These values are similar to the fit indices of the original scale. When examining the fit indices of the original scale, analyses conducted with different

samples revealed CFI values ranging from 0.86 to 0.91, TLI values between 0.85 and 0.90, RMSEA values from 0.055 to 0.061, and SRMR values between 0.063 and 0.075 (Katzir et al., 2021).

For convergent validity, the relationship between the SCSS and the MSCS as well as the GPS was examined. The highest correlation between SCSS and the MSCS was found to be with Behavioral Inhibition, showing a positive association. This was followed, in order, by Cognitive Change, Reward, Pre-Commitment, Distraction, Situation Selection, and Punishment. Self-Control was not found to be associated with Acceptance.

These findings indicate that self-control, as initially defined, remains associated with inhibitory control. Indeed, in the Multiple Regression analysis conducted to test predictive validity, Behavioral Inhibition was the strongest predictor of self-control, followed sequentially by Pre-Commitment, Reward, and Cognitive Change. Similarly, in the original study, Behavioral Inhibition was also the strongest predictor followed by Pre-Commitment, Punishment, and Acceptance (Katzir et al., 2021). These results provide clues that self-control strategies may vary culturally. Pre-Commitment appears to be the second strongest predictor of self-control in both studies. However, in our culture, the association between self-control and reward strategies rather than punishment suggests that incorporating rewards related to specific tasks could be beneficial in self-control research. Conversely, Acceptance was not found to be related to self-control in Turkish culture. Instead, Cognitive Change strategies were found to be more relevant to self-control.

General procrastination is most strongly negatively correlated with Behavioral Inhibition. It also shows negative but weakly significant correlations with Pre-Commitment, Cognitive Change, Reward, Situation Selection, and Distraction. This supports the known negative relationships between procrastination and self-control and self-regulation strategies (Karademir, 2023; Kim et al., 2017; Przepiórka et al., 2019; Steel, 2007). However, while these relationships are significant, they are very weak. The Acceptance and Punishment subscales were not found to be related to general procrastination. For predictive validity, procrastination scores were only predicted by Behavioral Inhibition and Pre-Commitment. These findings suggest that the ability to inhibit impulses and the use of commitment devices may be associated with reduced procrastination. Given that procrastination is considered a failure of self-regulation (Steel, 2007), it is expected that impulse inhibition would predict procrastination. Pre-commitments, such as setting deadlines, are also known to help reduce procrastination (Ariely, 2002). These studies support our findings. Other subscales, as mentioned, have low levels of correlation and are therefore considered not to predict procrastination.

Regarding reliability analysis results, it was observed that all values were above 0.70, except for Pre-Commitment. The McDonald Omega reliability coefficient and item-total correlations (PC15, PC16, PC17) for the Pre-Commitment subscale were found to be weak. According to George and Mallery, (2003)  $>.50$  Cronbach's Alpha values are poor but acceptable range. They classified values of  $.50$  and below as unacceptable. On the other hand Seçer (2015) suggests that a  $.20$  item-total correlation is an acceptable threshold, and items with values below this threshold can be removed. The item-total correlation values of all items in the scale are above the threshold. However Although these values fall within the acceptable range results indicates that the items are not strongly related to each other for Pre-Commitment subscale. When examining the items in this subscale, it is thought that they may not have been understood as measuring the same construct. For example, the statement "When I want to achieve a goal, I take actions or impose restrictions on myself that make it almost impossible to fail." might have been interpreted more as a form of punishment rather than a commitment tool. The statement "I tell people about my long-term goals so that they can hold me accountable " might have

different implications related to meeting deadlines in Turkish culture. Items in a measurement tool may be interpreted differently across cultures.

When examining the results of the test-retest analyses, it was observed that the correlation coefficients ranged from .405 to .827. These results indicate that the subscales Pre-Commitment, Reward, and Behavioral Inhibition demonstrated moderate consistency over time, while other subscales showed higher consistency.

This study has some limitations. Firstly, due to the low Cronbach's alpha reliability coefficient and the item-total correlations being below .30 for the Pre-Commitment subscale, caution should be exercised when interpreting the results for this subscale. Future studies could develop a measurement tool consisting of items more suitable for our culture to assess pre-commitment. Secondly, to achieve good fit indices, four items were removed from the measurement tool. Thirdly, this study is limited to young adults and predominantly consists of a female sample. A more homogeneous group in terms of gender could be used, allowing for validity analyses such as measurement invariance to be conducted.

In conclusion, this scale, in its 33-item form, is a valid and reliable tool and can be used in research aimed at evaluating self-control strategies, taking its limitations into account. This study also provides some insights for researchers aiming to enhance self-control and reduce procrastination within the Turkish cultural context. Firstly, self-control still appears to be largely associated with behavioral inhibition. Therefore, it is essential to identify factors that facilitate and hinder individuals' ability to suppress their impulses and unwanted desires. Identifying these factors can lead to the development of practical recommendations and interventions. Additionally, establishing deadlines, which ties individuals to their tasks, seems to be related both to enhancing self-control and reducing procrastination. However, this result should be interpreted considering the reliability level of the Pre-Commitment subscale. Given that rewards rather than punishments are more predictive of self-control within the Turkish cultural context, it may be beneficial for individuals to reward themselves for accomplishing desired tasks. Furthermore, teaching cognitive change skills could also be valuable in interventions aimed at increasing self-control. The findings of this study should not be interpreted in terms of cause-and-effect relationships. Experimental studies are needed to understand the impact of these strategies on self-control and procrastination reduction.

#### **Ethic**

The present study was approved by the Hasan Kalyoncu University Graduate Education Institute Ethics Committee (Ethics approval number: E-97105791-050.04-62515)

#### **Author Contributions**

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [Saadet Öztürk, Mehmet Dinç]. The first draft of the manuscript was written by [Saadet Öztürk and Mehmet Dinç], and all authors commented on previous versions of the manuscript.

#### **Conflict of Interest**

The authors declare that they have no conflict of interests

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## Appendix

**Öz-Kontrol (İrade) Stratejileri Ölçeği (ÖKSÖ)**

Hepimiz sevdiğimiz bir tatlı ya da en sevdiğimiz mağazadaki indirimler gibi bizi baştan çıkaran bir şey/kontrol etmemiz gereken arzuyla karşılaştığımızda ya da sağlıklı yaşamak, para biriktirmek, okulda/işte başarılı olmak gibi uzun vadeli hedeflerimizin peşinde koşarken öz-kontrol (irade) çatışmaları yaşayabiliriz. Bu ölçek böyle durumlara karşılaştığınızda nasıl davrandığınızı anlamak için geliştirilmiştir. İnsanlar irade gerektiren durumlarda farklı davranabilirler. Bazı durumlarda kendilerini çok fazla kontrol edebilirken bazı durumlarda o kadar kontrol edemezler. Bu nedenle, bu ölçekteki bazı maddelerde kendinizi güçlü iradeye sahip olarak değerlendirmeniz, bazı maddelerde ise orta veya düşük iradeli olarak değerlendirmeniz mümkündür. Bununla birlikte, sorulara içtenlikle yanıt vermeniz bizim için son derece önemlidir.

	Hiçbir Zaman		Çoğu Zaman		
1. Kontrol etmem gereken arzularımı uyandıracak durumlardan kendimi uzaklaştırırım.	1	2	3	4	5
2. Hayatımı, kontrol etmem gereken arzularımı uyandıracak şeylerden daha kolay kaçınabileceğim şekilde düzenlerim.	1	2	3	4	5
3. Kontrol etmem gereken arzularımı uyandıracak şeylerle karşılaşmamak için ortamımı değiştiririm.	1	2	3	4	5
4. Ortamımı beni baştan çıkaran şeylerle karşılaşmayacağım şekilde düzenlerim.	1	2	3	4	5
5. Kontrol etmem gereken arzularıma karşı koyamadığım durumlarda genellikle kendimi cezalandırırım.	1	2	3	4	5
6. Planlarımı ve hedeflerimi başarıyla gerçekleştirmek için kendime yaptırımlar uygularım.	1	2	3	4	5
7. Kendime verdiğim sözlere uymadığımda kendimi cezalandırırım.	1	2	3	4	5
8. Uzun vadeli hedeflerim için kendime başarı için ödül, başarısızlık için ise ceza içeren sözler vermeyi severim.	1	2	3	4	5
9. Uzun vadeli hedeflerimi başarıyla tamamladığımda genellikle kendimi ödüllendiririm.	1	2	3	4	5
10. Uzun vadeli bir hedefe ulaştığımda kendimi ödüllendiririm.	1	2	3	4	5
11. Hedeflerim ile ilgili ilerleme kaydettiğimde kendimi ödüllendiririm.	1	2	3	4	5
12. Uzun vadeli önemli bir hedef belirlediğimde, hedefimi başarısam kendimi ödüllendirmeye karar veririm.	1	2	3	4	5
13. Bir hedefe ulaşmak istediğimde, başarısız olmamı engelleyecek eylemlerde bulunurum veya kendime kısıtlamalar getiririm.	1	2	3	4	5
14. Son teslim tarihlerine uyarım.	1	2	3	4	5
15. Sorumlu hissetmek için insanlarla uzun vadeli hedeflerimi paylaşıyorum	1	2	3	4	5

16. Ulaşmak istediğim hedeflere kendimi bağlayacak adımlar atarım (örneğin, son tarihlere bağlı kalarak, katılmak istediğim faaliyetlere önceden para ödeyerek)	1	2	3	4	5
17. Kontrol etmem gereken bir arzum olduğunda odağımı ondan uzaklaştırırım.	1	2	3	4	5
18. Kontrol etmem gereken bir arzuyla karşılaştığımda dikkatimi ondan uzaklaştırırım.	1	2	3	4	5
19. Kontrol etmem gereken bir arzum olduğunda düşüncelerimi ondan uzaklaştırırım.	1	2	3	4	5
20. Direnmek istediğim bir arzum olduğunda dikkatimi ondan uzaklaştırırım.	1	2	3	4	5
21. İstemediğim bir arzuyla karşılaştığımda, ona bakış açımı değiştirerek kendimi kontrol ederim.	1	2	3	4	5
22. Baştan çıkarıcı bir şeye karşı daha az arzu duymak istediğimde, ona ilişkin düşünce şeklimi değiştiririm.	1	2	3	4	5
23. Kontrol etmem gereken bir arzuyla karşılaştığımda, kendimi onun beni daha az cezbedebileceği şekilde düşünmeye zorlarım.	1	2	3	4	5
24. İstenmeyen bir arzuyla karşılaştığımda onu soğuk, uzak ve etkisiz bir şeymiş gibi düşünürüm.	1	2	3	4	5
25. Kontrol etmem gereken bir arzum olduğunda onu farklı bir açıdan düşünürüm.	1	2	3	4	5
26. Baştan çıkarıcı bir şeye karşı daha az arzu hissetmek istediğimde, arzularımı kabul ederim.	1	2	3	4	5
27. Baştan çıkarıcı bir şeyle karşılaştığımda ona karşı arzumu kabul ederim.	1	2	3	4	5
28. Ne zaman yasak bir şeye istek duysam, bu arzuyu taşıdığımı kabul ederim.	1	2	3	4	5
29. Düşünmemeyi tercih ettiğim baştan çıkarıcı şeyler olsa da, bunlarla ilgili düşüncelerimin varlığını kabul ederim.	1	2	3	4	5
30. İstenmeyen arzulara göre hareket etmekten kendimi alıkoymam kolaydır.	1	2	3	4	5
31. Benim için iyi olmayan bir şeyi arzuladığımda ona direnmekte zorluk çekerim. * (Ters Madde)	1	2	3	4	5
32. Benim için kötü olsalar bile bazı şeyleri yapmaktan kaçınmak bana zor gelir. * (Ters Madde)	1	2	3	4	5
33. İstenmeyen arzular hissettiğimde davranışlarımı kontrol etmekte zorlanırım. * (Ters Madde)	1	2	3	4	5



## Bibliometric Analysis of Studies on Philosophy for Children In the Field of Education

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### Abstract

The purpose of this study was to present a bibliometric analysis of scientific articles published in internationally indexed Web of Science (WoS) journals on the topic of philosophy for children in the field of education. This study of articles in the field of education focused on several key fields, including the number of studies, the journals in which they were published, an analysis of authors, the distribution of institutions and countries, the use of keywords, and the identification of general trends. The Bibliometrix program in the R library was employed for the analysis of the research. As a consequence of this analysis, 1120 articles published between 1977 and 2024 were identified as meeting the requisite criteria. In the field of education, the journal in which articles on “philosophy for children” were published most frequently was “Childhood and Philosophy”. The author with the highest number of studies, citations, and index value in this field was K. Murris. The country in which the most studies were conducted was the United States of America, and the institution where the most studies were conducted was Montclair State University. The most significant keyword in this field was “philosophy for children”. It is hypothesized that this comprehensive presentation of research findings will serve as a valuable reference point for future research endeavors and inform the direction of future research.

### Key Words

Bibliometric analysis • Educational research • Philosophy for children

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## Introduction

The period of childhood is of great significance with regard to the acquisition of knowledge, during which the individual experiences rapid and pronounced growth and development (Senemoğlu, 2009). It can be posited that the sentiments of innocence, curiosity, and discovery that emerge during this process exert a significant influence on the child's cognitive and emotional development. During this period, the mind attempts to make sense of the world over time, resulting in the development of cognitive processes and abilities that facilitate comprehension of life, individuals, and occurrences. Philosophy for children can be defined as an approach that facilitates the development of critical thinking, communication, and self-expression in children. The primary objectives of education, encompassing the child's ability to understand and interpret life, acquire essential life skills, and develop into a critical, inquisitive, and democratic citizen, have provided direction to philosophical studies conducted in the field of children's education.

The Philosophy for Children (P4C) approach is grounded in the universal nature of philosophy and the human cognitive process. Philosophy, as articulated by Aristotle in Ancient Greece, begins with curiosity and thus its origins trace back to the very existence of humanity. The curiosity and questioning of children and adults about life challenges the assumption that philosophy is not a relevant aspect of everyday life. We all engage in inquiries and hold philosophical beliefs, whether we are aware of it or not (Law, 2010; White, 2009).

In their initial interactions with the world, children typically begin their inquiries with questions such as "Why?", "What is this?" and "How?" which reflect their fundamental curiosity and desire to understand their surroundings. This approach is exemplified in dialogues such as those of Socrates, who believed that knowledge was not acquired through writing alone, but through dialogue and the asking of questions. Socrates views this approach as a means of acquiring knowledge and engaging in critical inquiry (Noddings, 2017). These dialogues with children are sometimes based on old questions that have been around for a long time, or new questions that have arisen depending on the time and context, or questions about everyday life.

Thinking is a natural function of the mind, whereas questioning is a skill that can be developed. One of the most crucial objectives of contemporary educational institutions is to enhance the cognitive abilities of their learners (Güneş, 2012). Furthermore, educators should integrate additional strategies to reinforce students' comprehension and abilities, as well as to comprehend the internal workings of their cognitive processes (Tekerci & Kılınc, 2023). The fostering of questioning as an important goal in environments that employ a philosophy of education that is conducive to dialogue and critical thinking is also regarded as a significant factor in the development of children's cognitive abilities (Kökten, 2023). Furthermore, the educational perspectives and philosophies of parents also influence the educational trajectory of their children (Yılmaz et al., 2023).

It is therefore surmised that the activities undertaken with the P4C approach will prove beneficial to children in a number of ways, particularly in relation to their emotional and mental development. First and foremost, despite the evolving roles of teachers and students, the most crucial skill to be cultivated is the capacity for critical thinking (Kurt et al., 2023). Philosophy encompasses a range of skills, including imagination, critical thinking, and logical reasoning.

The study of philosophy for children in education, as well as the Philosophy for Children (P4C) movement, may be traced back to the 1970s work of philosophers such as Matthew Lipman and Ann Sharp (Lipman & Sharp,

1978). Process-oriented approaches such as P4C facilitate the development of these skills through questioning and dialogue, while also imparting knowledge about reasoning (Fisher, 2001; Pardeles & Girod, 2006; Daniel & Auriac, 2011). Communication and empathy skills are essential for individuals to possess throughout their lifespan. These skills form an integral component of emotional intelligence, necessitating the ability to view events and situations from diverse perspectives, comprehend the sentiments, thoughts, and actions of others, and integrate these insights into one's own actions (Katz & Hadani, 2023). In accordance with the advancement of these competencies, the philosophy for children approach enables children to comprehend the world and the multifarious experiences within and beyond the academic setting. It facilitates their development into articulate and reasonable individuals, enables them to investigate their own ideas in relation to the ideas of others, and, on occasion, provides them with the reassurance that their peers share their sentiments and thoughts (Shaw, 2007). Philosophy also cultivates in children the capacity to understand their own feelings, thoughts, and beliefs; to embrace freedom and independence; to engage in creative thinking; and to question knowledge (Fisher, 2001; Lipman, 1995; Shaw, 2007; Trickey & Topping, 2004). This approach engages children's natural inclination towards curiosity and wonder, facilitating the development of their reasoning abilities, comprehension, and pursuit of meaning. Such activities facilitate the development of self-confidence and self-esteem (Shaw, 2007). Given the significance of philosophical inquiry for children, researchers engage in a range of studies employing diverse research methodologies. One such methodology is bibliometric analysis.

Bibliometric analysis is a method that provides information about the development, impact, and structure of the literature by evaluating the scientific literature of the relevant subject from various perspectives (Aria & Cuccurullo, 2017; Oliveira et al., 2019; Van Eck & Waltman, 2010). This analysis assesses trends and activity in a specific research area through a comprehensive review of scientific articles, authors, journals, keywords, and citations (Mongeon & Paul-Hus, 2015; Zupic & Čater, 2015). The most commonly employed techniques include citation analysis, co-author analysis, common word analysis, and scientific mapping. In particular, citation analysis examines the interconnections between academic papers to identify which studies have had a significant influence on the field. Co-author and vocabulary analysis, on the other hand, map out research areas and themes (Donthu et al., 2021; Garfield, 2009; Small, 1973). Moreover, scientific mapping and clustering techniques are instrumental in elucidating pivotal research domains and trends within the field, as they facilitate the visualization of the structure of publications (Cobo et al., 2011; Waltman et al., 2010). Researchers who intend to engage in international collaboration may utilize the findings of the present study to contact authors, countries, and organizations that are more amenable to such endeavors, thereby facilitating the production of joint publications. In this context, bibliometric data provides the potential for identifying collaborative opportunities and sources of support for research projects with an interest in the relevant subject area (Yıldızhan & Atmaca Aksoy, 2023).

In recent years, there has been a notable increase in the number of studies conducted in the field of philosophy for children in Türkiye. These studies are primarily based on the practical application of philosophical principles with children, particularly through the analysis of children's literature. Additionally, studies have been conducted to examine the existing literature and gain insight into the various research orientations that have emerged within this field. The research conducted by Durmuş and Çalıřkan (2022) revealed that there has been a notable increase in studies conducted in the field of philosophy for children in Türkiye, including graduate theses and articles published in Turkish journals, over the past five years. Additionally, there has been a significant rise in the number of theoretical and review studies carried out in this area. In the comprehensive literature analysis conducted by

Lafcı Tor (2023), 14 master's theses, 7 doctoral dissertations, and 10 academic articles published between 2008 and 2023 were examined. According to the research findings, the reviewed studies primarily focused on the effects on participants' thinking skills, social competencies, philosophical thinking capacities, cognitive achievements, and creativity levels. Moreover, Lafcı Tor emphasized the absence of standardization in the terminology employed, particularly concerning the approaches, methods, and techniques utilized in these studies. Furthermore, Dirican (2024) conducted a bibliometric study encompassing all forms of publications across all domains of philosophical inquiry pertaining to children.

Apart from the above studies, no research examining Philosophy for Children (P4C) conducted in our country has been identified. One of these studies is a content analysis (Durmuş & Çalışkan, 2022), and another is a systematic review (Lafcı Tor, 2023). The study conducted by Dirican (2024) is a bibliometric analysis. What distinguishes the current research, which examines Philosophy for Children bibliometrically, from other studies is its exclusive focus on articles conducted in the field of education. In bibliometric studies, the commonalities and differences of prior research in the field are identified through bibliometric analysis. Therefore, the research questions guiding this study are presented below.

In the field of education, related to philosophy for children;

- How is the analysis of the publications?
- How is the analysis of authors in publications?
- How is institutional analysis in publications?
- How is country analysis in publications?
- How is the structure of the keywords in the publications?

## Method

### Research Model

The research was carried out using the method of bibliometric analysis to examine scientific studies on philosophy for children in the field of education published in internationally indexed journals (Web of Science: SSCI, SCI-Expanded and AHCI). Bibliometrics is the quantitative measurement of the characteristics of documents related to publications in a field of research. Bibliometrics makes scholarly activity visible by examining the productivity, impact, and information flow of scholarly publications (Broadus, 1987; Pritchard, 1969). Bibliometric analysis is a method of analysis based on the systematic examination of various characteristics of scientific publications. These analyses aim to reveal the overall profile of a research field by evaluating scientific output, citation data, keywords, co-citation networks and author productivity (Ellegaard & Wallin, 2015; Thelwall, 2008; Zupic & Čater, 2015). Bibliometric analyses are used to determine the evolution of research over time, leading authors, institutions, and impact levels of publications (Cobo et al., 2011; Perianes-Rodriguez et al., 2016). In this context, the bibliometric analysis procedure highlighted in the literature and commonly used was applied. This procedure is as follows (Aria & Cuccurullo, 2017; Cobo et al., 2011; Ellegaard & Wallin, 2015; Van Eck & Waltman, 2014; Waltman, 2016):

1. **Identifying the Study Question:** Before conducting a bibliometric analysis, it is necessary to define a clear research question or objective. This defines the topic, time period and types of publications to be analyzed.

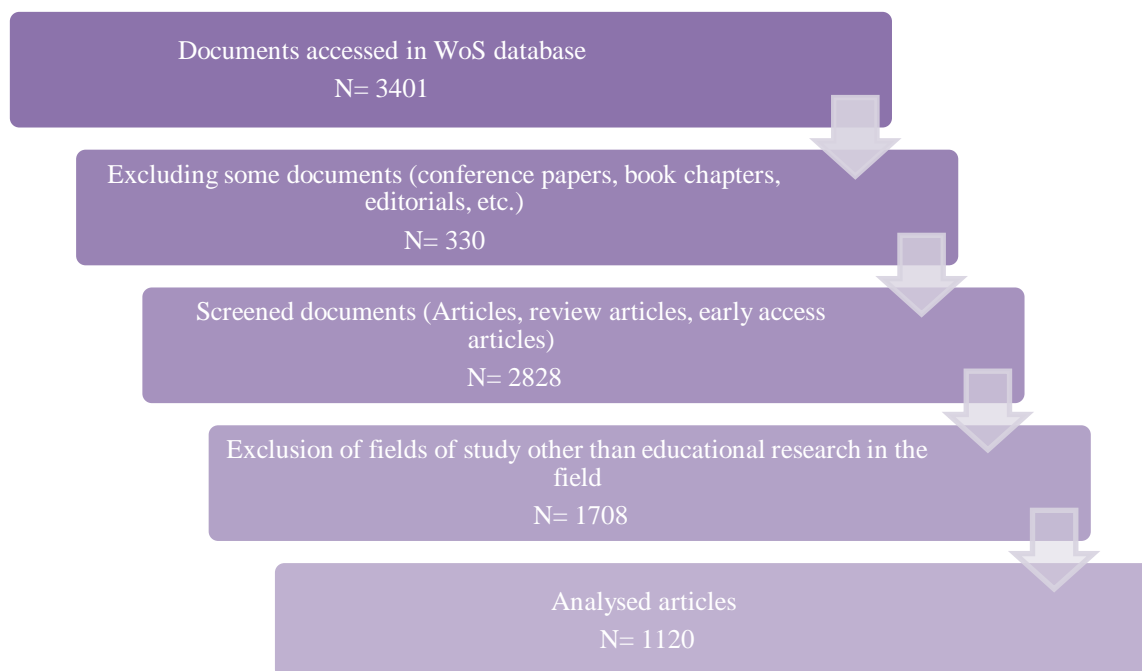
2. **Data Collection:** Various databases (e.g. Web of Science, Scopus, PubMed) are used to collect data relevant to the research question. At this stage, relevant publications are searched and downloaded using criteria such as keywords, authors, year of publication and journals.
3. **Data Cleansing and Preparation:** Data collected can often be disorganised and incomplete. Data cleaning involves removing duplicate records, completing missing data and making the dataset suitable for analysis.
4. **Analysis and Processing:** Bibliometric analysis involves various statistical and visualisation techniques. These include co-authorship analysis, citation analysis, co-term analysis and network analysis. These analyses reveal key trends in the research field, the most influential works and authors, and cross-cutting connections.
5. **Visualisation:** Some analyses are presented using different visualisation methods such as maps, network diagrams, word clouds and time series charts.
6. **Interpreting and Reporting Findings:** The findings of the analysis are interpreted in a way that helps to answer the research question. The findings are organised into a written report or article to be shared with the scientific community. The report should identify knowledge gaps, trends and future research directions in the research field.

The purpose of the bibliometric analysis method was to examine and summarise the scientific studies in the literature on philosophy for children in the field of education according to the defined criteria. In this way, it aims to provide a different perspective on the literature by better understanding and evaluating the literature on the research topic.

### **Data Set**

The study analysed relevant publications scanned in the Web of Science (WoS) database produced by Clarivate Analytics. The researchers preferred WoS because it contains scientific publications (journals, proceedings, online books, editorial materials) with a high impact value scanned in indexes such as SCI, SSCI, AHCI worldwide, because of the accessibility of the database and the possibility to download data from the scanned journals suitable for bibliometric analysis programs and to filter the desired data. In comparison to the Web of Science (WoS), Scopus, Dimensions, and Google Scholar, WoS is the most preferred database for bibliometric studies due to its rigorous indexing standards and reliable citation analysis tools. The selectivity of WoS enables it to concentrate on basic science studies, particularly in high-quality journals (Birkle et al., 2020; Singh et al., 2021). While Scopus and Dimensions offer broader coverage in the field of applied sciences, they are less precise in data accuracy and less consistent in citation standardization (Stahlschmidt & Stephen, 2021; Visser et al., 2020). While Google Scholar offers a comprehensive scope, it is less reliable than selective databases such as WoS in bibliometric analyses due to concerns regarding data accuracy, transparency, and high self-citation rates (Gusenbauer & Haddaway, 2020; Levine-Clark & Gil, 2021). In this context, a search was carried out in the WoS database on 19.10.2024 to access scientific publications on philosophy for children in the field of education. In this search, the subject field option was preferred for each concept, and the concept “philosophy” was entered first, and then the concept “children” was entered by combining it with AND. The result of the search was a total of 3401 scientific publications. Some operations were then carried out according to the purpose of the study (see Table 1).

Table 1

*Roadmap for Obtaining Research Data*

As can be seen from Table 1, only articles related to the research topic were selected from the WoS database. Among these articles, preference was given to articles in the field of Educational Research, and the research was based on the analysis of these articles. It was assumed that the 1120 articles obtained as a result of these screening and filtering processes were suitable for the purpose of the study.

### **Data Analysis**

The output (.bib) of the bibliographic data in the study consists of data such as author name, title, author institution and country, keywords, abstract. The data obtained in the research were analysed using descriptive analysis and mapping techniques. For these analyses, the program Bibliometrix in the R library was used (Aria & Cuccurullo, 2017). Bibliometrix was developed by Massimo Ariaa and Corrado Cuccurullo from Italian universities as a software tool for scientific mapping analysis. In comparison to other programs, Bibliometrix's comprehensive features, encompassing data preprocessing, performance analysis, science mapping, and visualization, are particularly noteworthy (Moral-Muñoz et al., 2020). To illustrate, the Biblioshiny interface offers a user-friendly experience that does not require technical expertise, while simultaneously supporting sophisticated analyses such as co-citation, trend analysis, and thematic mapping (Darvish, 2018). Furthermore, its compatibility with multiple databases, including Web of Science, Scopus, and PubMed, makes it an optimal choice for integrated analysis of data from disparate sources. As a result of the analysis performed with this tool, results such as distribution of studies by years, author rankings, journal distributions, institution distributions, citation rankings, co-author citation network and common word analysis are reported.

### **Validity and Reliability**

For the validity of the study, the process of obtaining the data and the date when the dataset was collected were explained in detail. The steps involved in the data analysis process and the reasons for choosing the bibliometric

analysis method were included. To ensure the reliability of the study, the findings were presented directly and discussed in accordance with the study.

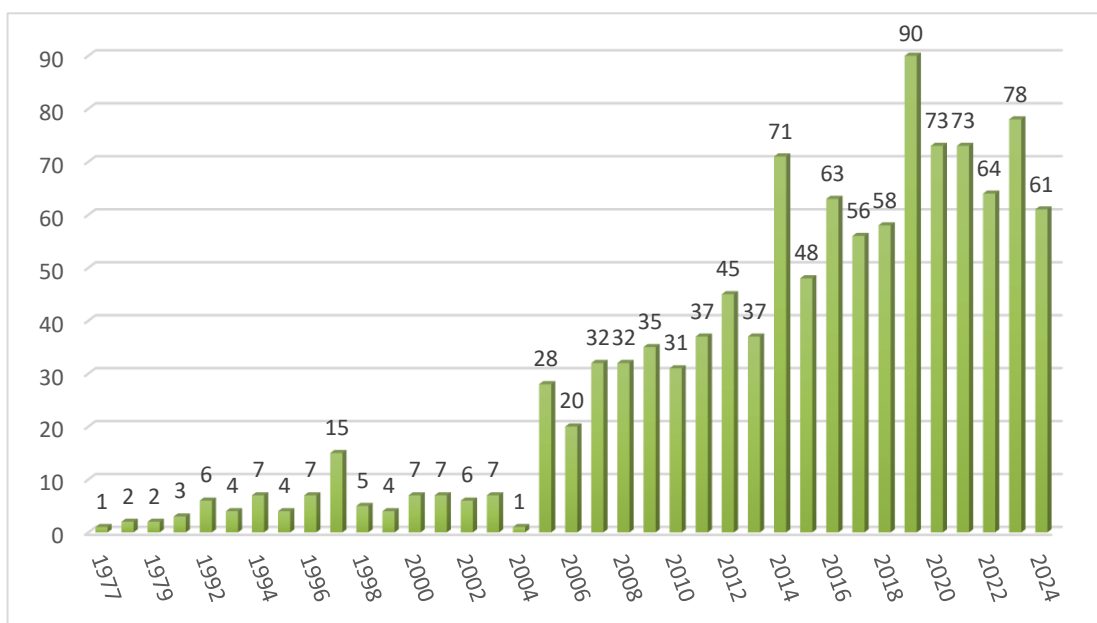
### Findings

The results of the study were analysed according to the research questions. In this context, the bibliometric and descriptive findings of the data analysed in relation to the research questions are presented below.

#### Analysis of Publications on Philosophy for Children in the Field of Education

##### *Distribution of Publications by Year*

In the field of education, there were 1120 articles on philosophy for children. Figure 1 shows the distribution of articles in this field by year.



**Figure 1.** Distribution of publications in the field of education by years

Figure 1 shows that research publications started in 1977. The highest number of publications was in 2019 (90 publications), while the lowest number was in 1977 and 2004 (one publication each). In the field of education, publications on philosophy for children started to increase from 2005 onwards. In 2023, 78 publications were identified and in 2024, 61 publications were identified at the time of the review.

##### *Journal Analysis of Publications*

In the field of education, 309 journals published on philosophy for children. Figure 2 shows the top 10 journals with the highest number of publications in this field.

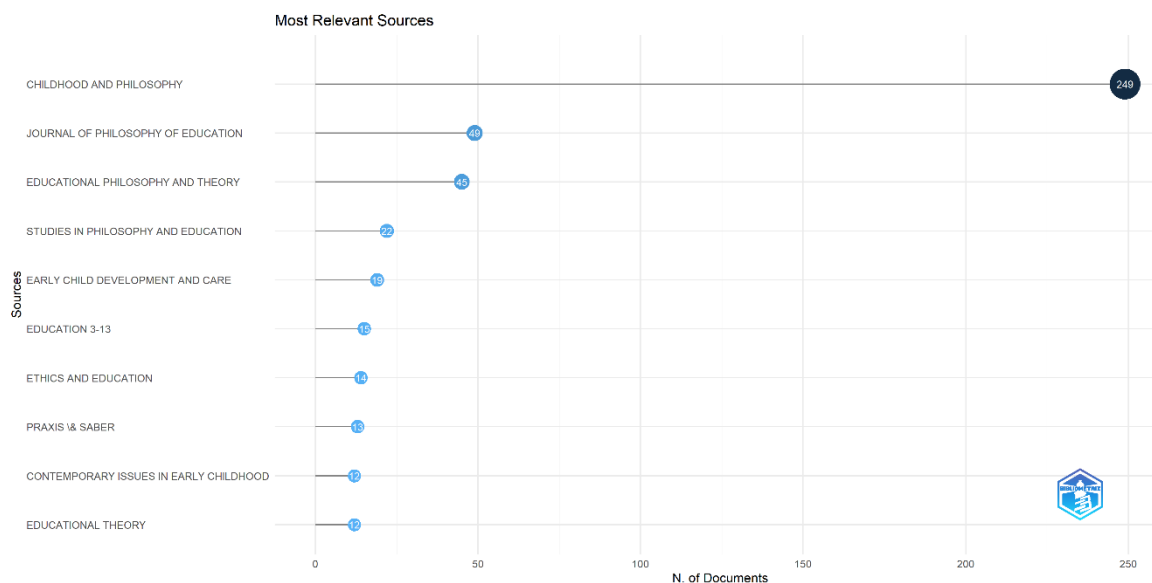


Figure 2. Distribution of publications in the field of education by journals

Table 2

*The Effectiveness of Philosophy-Related Journals for Children in the Field of Education*

Nº	Journal	h_index	g_index	m_index	Total Citations	Total Articles	Publication Start
1	Journal of Philosophy Of Education	14	24	0,56	633	49	2000
2	Educational Philosophy and Theory	13	18	0,813	424	45	2009
3	Childhood and Philosophy	8	13	0,4	371	249	2005
4	Studies in Philosophy and Education	8	15	0,471	243	22	2008
5	Early Child Development and Care	7	12	0,368	162	19	2006
6	Contemporary Issues in Early Childhood	6	12	0,3	144	12	2005
7	Thinking Skills and Creativity	6	8	0,375	106	8	2009
8	American Annals of The Deaf	5	9	0,152	93	9	1992
9	Australasian Journal of Early Childhood	5	6	0,313	44	8	2009
10	Ethics and Education	5	11	0,263	121	14	2006



Upon examination of Table 2, it becomes evident that the Journal of Philosophy of Education has the highest number of publications related to philosophy for children in the field of education, with an h-index value of 14 and a g-index value of 24. This indicates that the journal has a high citation impact, with a notable number of articles receiving significant attention from the academic community. It is noteworthy that the journal Educational Philosophy and Theory has a high h-index (13) and g-index (18), as well as the highest m-index (0.813). This indicates that, despite being a relatively new publication, the journal has been able to make a significant impact in a relatively short time. Furthermore, Childhood and Philosophy and Studies in Philosophy and Education also merit mention, with an h-index of 8. Of these, Childhood and Philosophy has received over 300 citations in total and is the most prolific journal, with 249 articles published. Studies in Philosophy and Education has a g-index of 15 and an m-index of 0.471. It should be noted that other journals have lower index values, yet they contribute to the advancement of the research field. Furthermore, the publication years of the journals included in the table span a period between 1992 and 2009, with the majority of them commencing publication in the 2000s.

### Analysis of Authors Related to Philosophy for Children in the Field of Education

#### Authors' Publication Distribution

In the field of education, 200 authors have published on the subject of philosophy for children. Figure 3 illustrates the 10 most prolific authors in this field, ranked according to the number of publications.

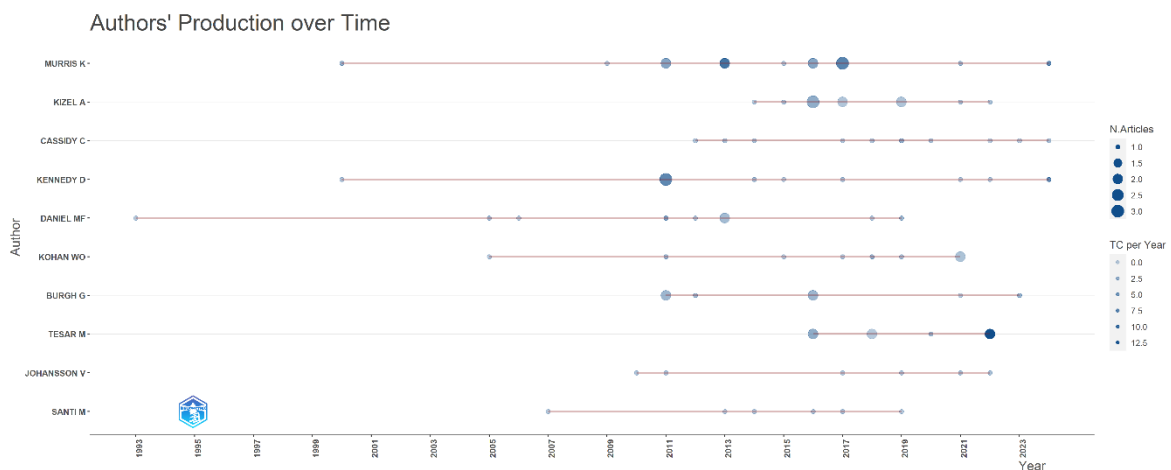


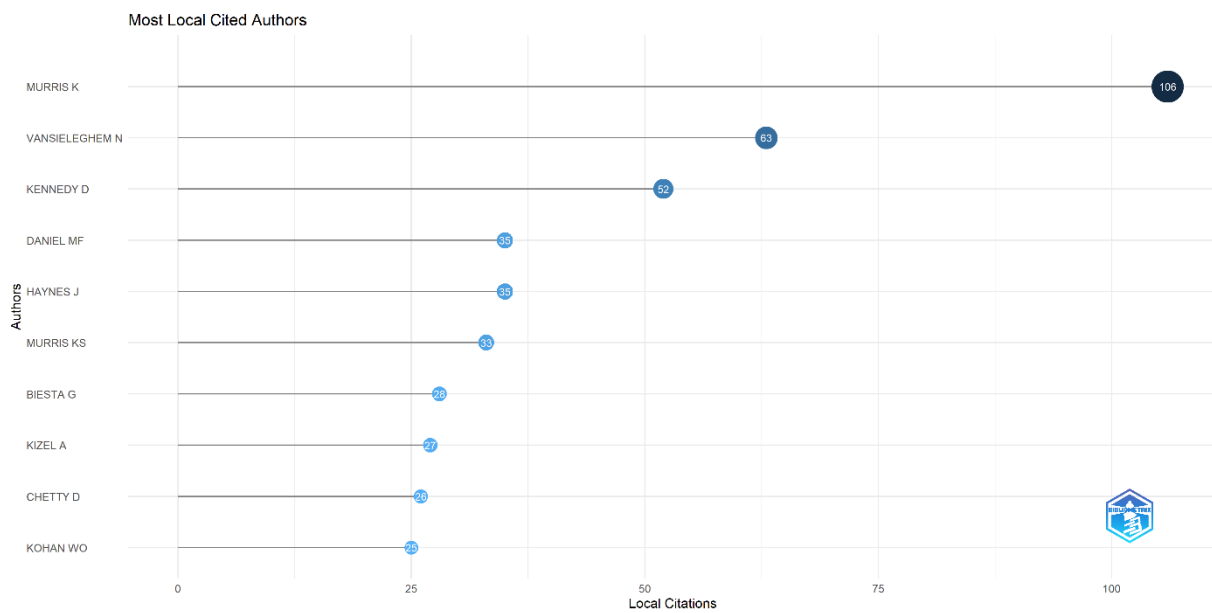
Figure 3. Authors' production

The data presented in Figure 3 encompasses the 30-year interval between 1993 and 2023 and illustrates the number of publications and annual citation impact (TC per Year) of the contributing authors. The size of the dots represents the number of articles published by each author (N. Articles), while the shades of colour indicate the number of citations received by each article per year. In the field of education, K. Murriss had the highest number of publications on the subject of philosophy for children, with a total of 14 articles. The next most prolific author is A. Kizel, with 11 articles, followed by C. Cassidy and D. Kennedy with 10 articles each, and M. F. Daniel with nine articles. The next most prolific authors are W. O. Kohan with eight articles, G. Burgh and M. Tesar with seven articles, and V. Johansson and M. Santi with six articles. Furthermore, the figure demonstrates that K. Murriss is one of the authors with the most extensive academic publication history and has produced a significant number of highly cited works, particularly in recent years. Despite having a relatively shorter publication history, M. Tesar

has demonstrated a noteworthy citation impact with his recent works. It is evident that the majority of authors have been active in the field since the 2000s, demonstrating a notable surge in academic productivity, particularly after 2010. M. F. Daniel’s academic output, commencing in 1993, represents the earliest publication history depicted in the graph. The rise in research output and the citations received by these publications indicate that the research topic is attracting increasing attention, and that significant contributions are being made in this field.

**Citation Analysis of Authors**

In the field of education, 240 authors were cited in publications on philosophy for children. The top 10 authors, as determined by ranking, are presented in Figure 4.



**Figure 4.** Most local cited authors in the field of education

As illustrated in Figure 4, K. Murriss is the most frequently cited author, with 106 local citations. This is followed by N. Vansielegheem with 63 citations and D. Kennedy with 52 citations. These three authors may be considered to be among the most prominent in the field of research on this topic. Furthermore, the first three ranked authors receive a significantly greater number of citations than the others. This distribution demonstrates that there are notable differences between the authors in terms of scientific impact and recognition. M. F. Daniel and J. Haynes, with 35 citations, and K. S. Murriss, with 33 citations, are also of importance in terms of local citations. This illustrates that the works of these authors in the ranking have made a substantial contribution to the relevant literature.

**Index Values of Authors**

The productivity of authors is not only evaluated according to the number of publications they produce. Furthermore, the total number of citations is not considered an isolated indicator. In addition to this, other metrics such as the h-index, g-index and m-index are employed to assess the productivity and impact of authors within their respective fields. Table 3 presents a ranking of authors publishing on philosophy for children in the field of education, based on their h-index.

Table 3

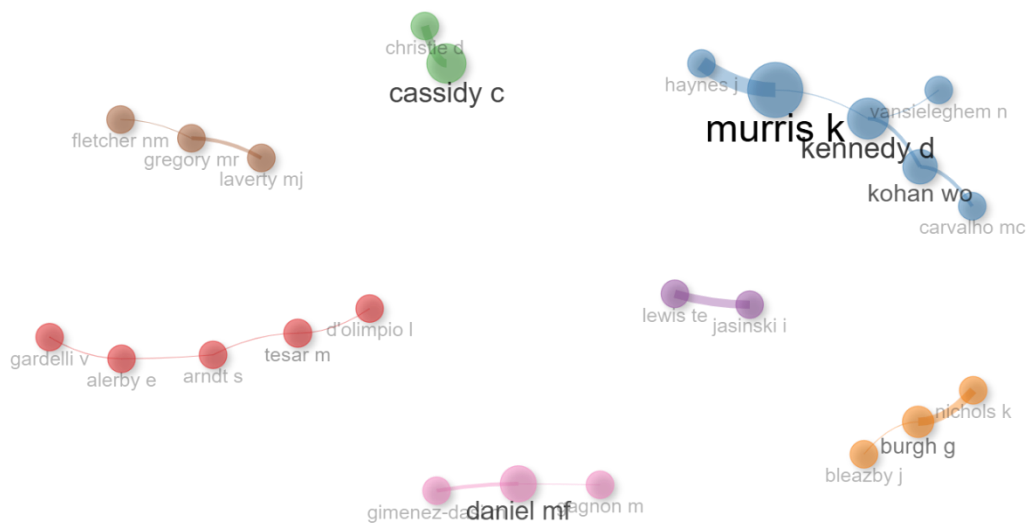
*Productivity and Effectiveness of Authors Publishing on the Research Topic*

No	Author	h_index	g_index	m_index	Total Citations	Total Article	Career Start
1	K. Murriss	9	14	0,36	354	14	2000
2	D. Kennedy	7	10	0,28	139	10	2000
3	G. Burgh	5	7	0,357	80	7	2011
4	C. Cassidy	5	7	0,385	62	10	2012
5	M. F. Daniel	5	9	0,156	130	9	1993
6	M. Tesar	5	7	0,556	80	7	2016
7	L. D'olimpio	4	5	0,4	37	5	2015
8	J. Haynes	4	5	0,2	100	5	2005
9	A. Kizel	4	6	0,364	52	11	2014
10	S. Lyle	4	4	0,235	186	4	2008

As indicated in Table 3, K. Murriss, who commenced his academic career in 2000 and is one of the most frequently cited authors (354 citations) in the field of study under consideration, has an h-index value of 9 and a g-index value of 14. This suggests that the author's scientific output is well-balanced. Nevertheless, the m-index value of 0.360 may suggest that the author's citation rate is relatively low despite a lengthy academic career. The discrepancy between the h-index (7) and g-index (10) values of D. Kennedy, the second-ranked author, suggests that some of his publications are cited more frequently than others. Nevertheless, the author's annual productivity remains relatively low, with an m-index value of 0.280. G. Burgh and C. Cassidy are notable for their 5 h-index and 7 g-index, while their m-index values are 0.357 and 0.385, respectively. Despite having been active since 1993, M. F. Daniel has a relatively low m-index value (0.156), which suggests that his academic impact per year is limited. However, M. Tesar, who has been active since 2016, has the highest m-index value (0.556), indicating a high citation impact in a relatively short period of time. A. Kizel, who ranks highly in terms of the number of publications (11 articles), has a medium h-index (4) and g-index (6) value. S. Lyle, who ranks second in terms of total number of citations, has a g-index value (4) equal to the h-index value (4), indicating a more homogeneous distribution of citations among publications.

***Co-authorship Network***

A co-authorship structure was established among 24 researchers specialising in the field of education and related to the subject field of philosophy for children. Figure 5 illustrates this structure.

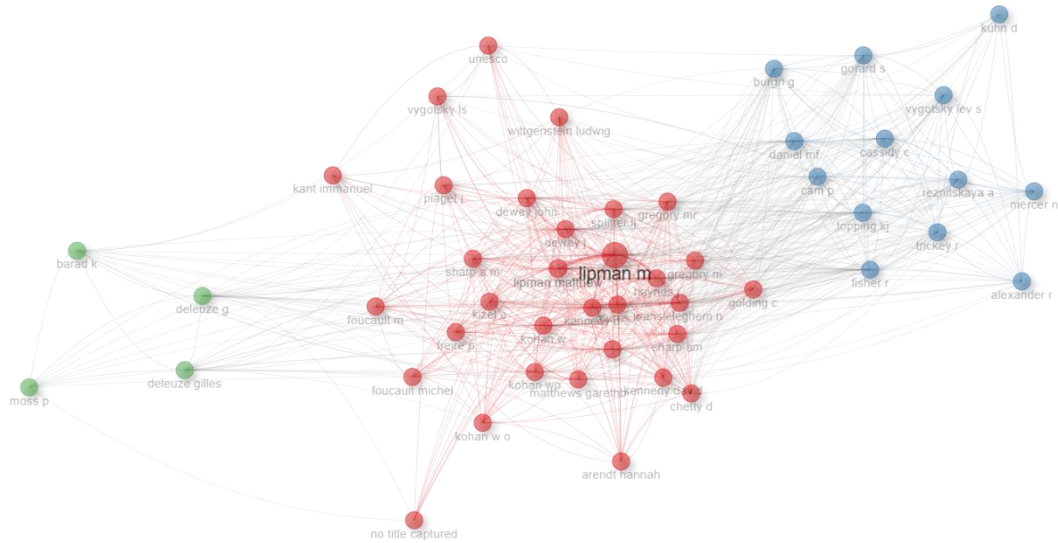


**Figure 5.** Co-authorship network

The analysis of author co-occurrences within the context of the research reveals the emergence of seven predominant network structures. The authors with the highest link strength are indicated by a darker tone. The thickness of the links between authors is indicative of the extent of research conducted among those authors. The cluster exhibiting the greatest degree of collaboration among authors (comprising six authors) is represented by the dark blue cluster network. In this structure, which exhibits the greatest number of instances of co-authorship, the names K. Murris and J. Haynes are particularly prominent, appearing in the central position. In addition to these two individuals, others such as D. Kennedy, W. O. Kohan and M. C. Carvalho also demonstrate robust connections within the network. With regard to the number of co-authors, there is evidence of collaboration between five authors within the red cluster. In terms of the strength of the connection between authors, the collaboration between C. Cassidy and D. Christie in the green cluster, I. Jasinski and T. E. Lewis in the purple cluster, and G. Burgh and K. Nichols in the orange cluster is particularly noteworthy. The structure of the networks demonstrates that some researchers are more isolated than others, while others are engaged in intense collaboration.

#### *Co-citation Network Analysis*

In the field of education, there are instances of co-citations in publications pertaining to the philosophy of children's literature. The results of the analysis of 50 co-citations in these publications are presented in Figure 6.



**Figure 6.** Co-citation network analysis

Upon analysis of the co-citations, the intellectual structure of the publications within the scope of the research is revealed, resulting in the identification of three co-citation clusters. The term ‘co-citation’ is used to describe the phenomenon of an article being referenced in the bibliography of at least two other articles. This method allows the identification of the most prominent intellectual contributions within a given subject field. As illustrated in Figure 6, Matthew Lipman’s (2003) *Thinking in Education* and the 1980 publication *Philosophy in the Classroom*, also by the same author, occupy a central position within the network, with numerous citations from other publications. This illustrates that these two publications have made a significant contribution to the development of literature on philosophy for children in the field of education. In 1916, John Dewey published *Democracy and Education: An Introduction to the Philosophy of Education* represents a historical node and an early work that provides a historical foundation for the field of education. Earlier studies within the network provide the basis for subsequent research. The dense connections in the red cluster indicate that the work of the researchers in this group is frequently co-cited, indicating that they are conceptually close. The blue cluster represents a different subgroup of research by a small group of authors. The green cluster reflects a smaller group of authors. However, there is no centralised and prominent name in these clusters.

### **Institutional Analysis of Related Publications for Children in the Field of Education**

#### ***Distribution of Publications by Institutions***

In the field of education, researchers in 921 institutions produced publications on philosophy for children. Table 4 presents the ten institutions with the highest number of publications in this subject within the field of education.

Table 4

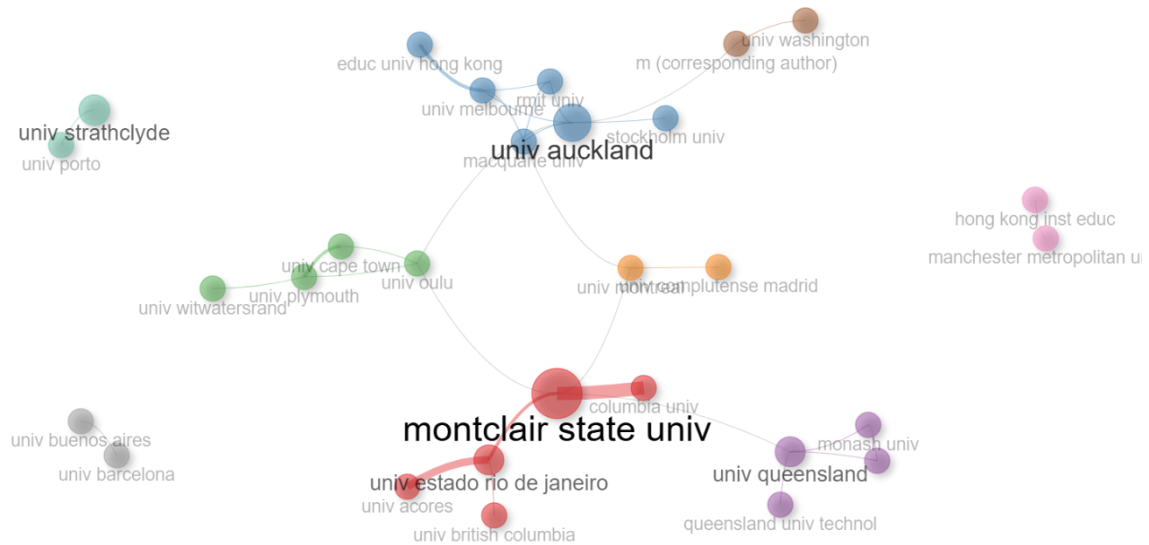
*Institutions Publishing on Philosophy for Children in the Field of Education*

<b>Institutions</b>	<b>Total Article</b>
Montclair State University	40
The University of Auckland	36
University of Strathclyde Glasgow	33
The University of Queensland	30
Rio de Janeiro State University	24
University of Haifa	24
Monash University	23
Université de Montréal	21
University of Cape Town	19
Columbia University in the City of New York	18

Table 4 reveals that Montclair State University is the most prolific institution in the field of education publishing on philosophy for children, with 40 articles. The next most prolific institutions are the University of Auckland (36 articles), the University of Strathclyde Glasgow (33 articles), and the University of Queensland (30 articles). The institutions with 24 articles are Rio de Janeiro State University and the University of Haifa. The lowest-ranking institutions in the table are Monash University (23 articles), Université de Montréal (19 articles), University of Cape Town (19 articles), and Columbia University in the City of New York (11 articles).

***Collaboration Network of Institutions***

A number of publications on the subject of philosophy for children in the field of education were produced as a result of collaborative efforts between various institutions. A total of 28 collaborative publications have been produced by these institutions within the scope of co-authorship. This structure is illustrated in Figure 7.



**Figure 7.** Collaboration network of institutions

When the coexistence of the institutions within the scope of the research is analyzed, it is seen that 9 common structures are formed. The structures are formed in accordance with the degree of similarity in the subject matter covered by the authors of the institutions. The structures exhibiting the highest degree of connection are indicated by a darker coloration. The cluster exhibiting the most intense collaboration is the red cluster. Montclair State University, situated within the red cluster, exhibits the highest degree of co-authorship. Furthermore, the university engages in collaborative efforts with three other clusters with regard to co-publication. The thickness of the links between Montclair State University and Columbia University and Rio de Janeiro State University and Universidade dos Açores in this cluster indicates a high level of collaboration between these institutions.

### **Country Analysis of Publications on Philosophy for Children in the Field of Education**

#### ***Distribution of Publications by Country***

In the field of education, research on philosophy for children has been conducted in 66 countries. Table 5 presents the 15 institutions with the highest number of publications in this subject field.

Table 5

*Countries with the Most Publications on Philosophy for Children in Education*

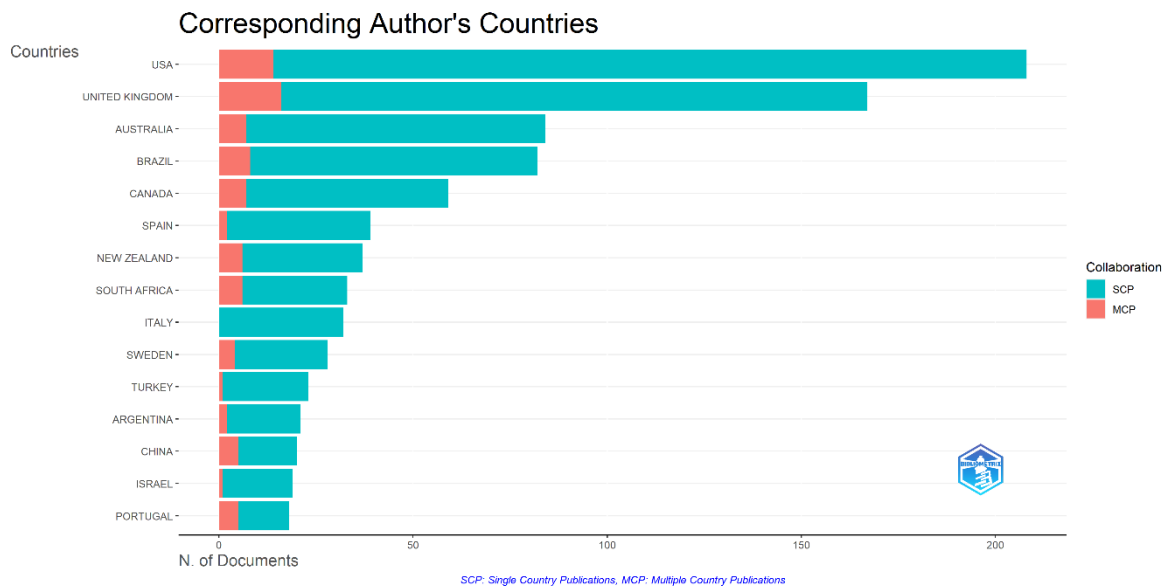
<b>Countries</b>	<b>Total Article</b>
United State of America	543
United Kingdom	382
Brazil	220
Australia	207
Canada	152
Spain	103
New Zealand	99
South Africa	77
Italy	73
Sweden	64
Türkiye	57
China	56
Portugal	51
Ireland	47
Argentina	45

A review of Table 5 reveals that the United States is the most prolific nation in terms of publishing on philosophy for children in the field of education, with a total of 543 articles. Subsequently, the United Kingdom ranks second with 382 articles, followed by Brazil (220 articles), Australia (207 articles), Canada (152 articles), and Spain (103 articles). With fewer than 100 articles, New Zealand (99 articles), South Africa (77 articles), Italy (73 articles), and Sweden (64 articles) are among the top 10 countries in terms of publishing on philosophy for children in the field of education. It is noteworthy that Türkiye, China, Portugal, Ireland, and Argentina have made a significant contribution to the literature with 57, 56, 51, 47, and 45 articles, respectively.

#### ***Distribution of Corresponding Authors by Country***

In the field of education, researchers from 67 countries have produced publications on philosophy for children. Figure 8 shows the top 15 countries with the highest number of publications in this subject field.





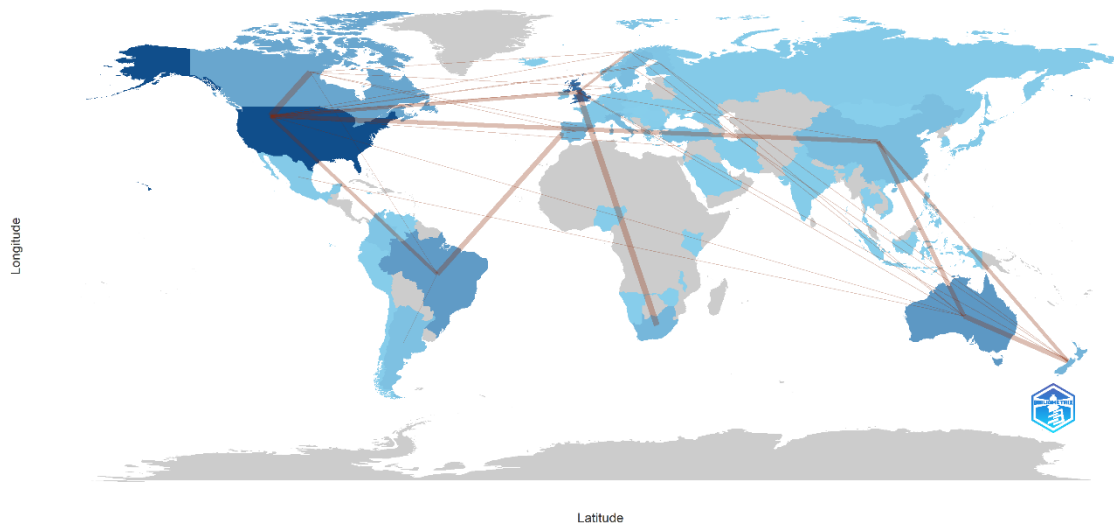
**Figure 8.** Distribution of publications by country

Figure 8 illustrates the number of publications and the types of collaborations by country of the lead authors engaged in publishing on philosophy for children in the field of education. The data are presented in two categories, distinguished by color, corresponding to single country publications (Single Country Publications) and multiple country publications (Multiple Country Publications). The former category encompasses works originating from a single country, whereas the latter category includes those resulting from collaborations with multiple countries. The United States of America (USA) is the foremost contributor in terms of both the total number of articles (208) and in-country collaboration (SCP=194 articles). The United Kingdom occupies the second position in terms of the total number of articles (167) and the first position in terms of international collaboration (MCP=16 articles). Subsequently, Australia (84 articles), Brazil (82 articles), and Canada (59 articles) are the next most prolific countries. Additionally, it is notable that countries such as Spain (39 articles), Türkiye (22 articles), and Argentina (19 articles) have produced relatively few articles, which are typically based on studies conducted through in-country collaborations. In Italy, all 32 articles were based on in-country collaborations. The majority of countries demonstrate a higher SCP rate than their MCP rate, indicating a tendency towards national-level research activities.

#### *Countries' Collaboration World Map*

In the field of education, collaborative publications on philosophy for children have been produced between countries. A total of 94 distinct collaborative efforts were identified between these countries. These collaborative efforts are illustrated in Figure 9.

## Country Collaboration Map



**Figure 9.** Collaboration of countries in publications

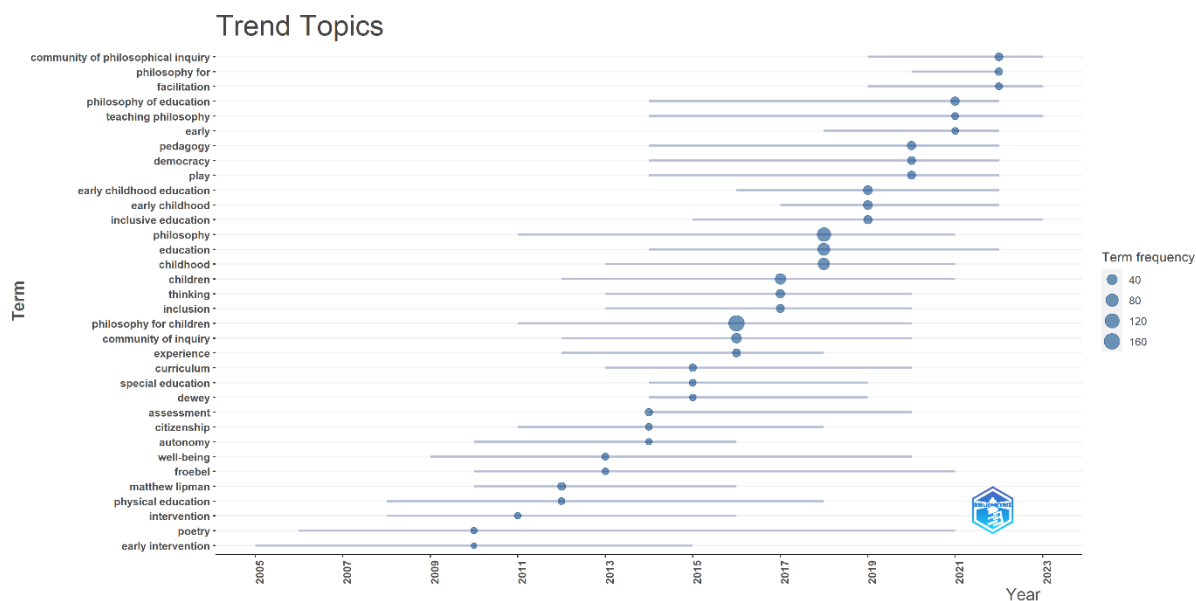
The map illustrating the extent of international collaboration in the field of philosophy for children in education depicts the intensity of cross-country collaboration as reflected in the darker blue tones, while the number of lines signifies the volume of research collaborations between countries. As illustrated in the map, the United States occupies a central position, indicated by its dark blue color and extensive network of connections, with 45 collaborations spanning 22 countries. The United Kingdom is the next most active participant, with 27 collaborations involving 14 different countries. Additionally, Australia (19 collaborations with 7 different countries), Canada (15 collaborations with 11 different countries), and Brazil (15 collaborations with 8 different countries) also demonstrate notable global engagement. Notably, the United Kingdom and South Africa (eight times) and the USA and Canada (eight times) have established the most cooperation. These countries are followed by Australia and New Zealand and Brazil and Portugal with six collaborations each. Additionally, some regions (e.g., much of Africa and parts of Asia) have relatively fewer links, indicating potential fields for improvement in global academic collaboration.

### **Keyword Structure of Publications on Philosophy for Children in the Field of Education**

#### ***Keyword Analysis***

In the field of education, a total of 2,728 distinct keywords were identified based on their appearance in publications on philosophy for children, with each keyword representing a minimum of one occurrence. The top 50 keywords are presented in a word cloud format in Figure 10.





**Figure 11.** Trend topics analysis of articles

Figure 11 illustrates the prevailing trend in terms of the keywords favored by authors in publications on philosophy for children in the field of education as of 2005. The frequency of each term is represented by the size of the balloon, with larger balloons indicating a higher frequency of use. The initial trend in research appears to commence with *early intervention*. As illustrated in the figure, the core concepts of philosophy for children and philosophy became a prominent and frequently utilized element in research from 2011 onwards. The concepts of *early childhood education*, *critical thinking*, *democracy*, and *pedagogy* were frequently discussed and employed in the context of philosophical education of children and educational pedagogy. The concepts of *children*, *thinking*, and *inclusion* which are employed with moderate frequency, reflect the fundamental tenets of philosophical education, including the promotion of critical thinking and an inclusive approach towards the child as the primary beneficiary of philosophical education. Moreover, the concepts of *curriculum*, *special education*, and *assessment* underscore the structural aspects of integrating philosophical education into the broader educational system. A notable observation in the graph is the prominence of the names *Dewey*, *Matthew Lipman*, and *Froebel* among the prominent educational theorists. This illustrates that the practice of philosophy for children is grounded in a robust theoretical framework and is informed by philosophical and pedagogical foundations, particularly pragmatic and democratic educational approaches. In recent years, there has been a notable increase in the use of terms such as *community of philosophical inquiry*, *facilitation*, and *inclusive education*. These concepts indicate that collaborative learning environments and inclusive practices have gained importance in children's philosophical education. In particular, the *community of philosophical inquiry* stands out as an important method that supports children's participation in philosophical dialogue and collective thinking processes. This situation reveals that philosophical education for children is a tool that strengthens the culture of social participation and dialogue as well as individual thinking skills.

### Discussion, Conclusion and Suggestions

This study presents a bibliometric analysis of articles published in Web of Science on philosophy for children in the field of education. Its purpose is to provide a comprehensive perspective on the subject field. The results

demonstrate the historical development of the field, as well as its current status and trends. In this context, 1120 articles were obtained and the results of the analysis of these articles were discussed in relation to other studies in the related literature.

The publication timeline of work on philosophy for children in education begins in 1977. During these years, philosophers such as Matthew Lipman and Ann Sharp laid the groundwork for the Philosophy for Children (P4C) movement. This movement is an innovative approach to teaching children critical thinking, questioning, and philosophical dialogue skills (Lipman & Sharp, 1978). The trend of change in the number of publications shows a significant acceleration since 2005. Among the reasons for this increase, besides the changes in educational paradigms, is the prominence of approaches such as critical thinking and inquiry learning. This is because P4C adapts to postmodern approaches in education and increasingly emphasizes the importance of philosophical dialogues in education (Välitalo et al., 2016). In fact, keyword analyses show that the concept of “critical thinking” is frequently used. The P4C method has been shown to develop children’s reading, reasoning, critical thinking, argumentation, and cognitive skills, and thus this field is growing as a broad field of interest in education (Daniel & Auriac, 2011; Trickey & Topping, 2004). This growth, which peaked with 90 studies published in 2019, shows that the field has broad interest in academic circles and is constantly evolving. This trend may indicate that educators and researchers increasingly recognize the importance and potential of philosophical thinking for children, and feel the need to conduct more research on the topic.

The fact that the studies on philosophy for children were published in 309 different journals shows the diversity of this research field within academic publications and the wide audience it reaches. As Basourakos (2000) notes, this situation shows that philosophy for children intersects with different disciplines such as education, psychology and sociology. Analyzing the distribution of journals, the journal *Childhood and Philosophy* has by far the highest number of publications. However, when the effectiveness indicators of journals such as h-index, g-index and m-index are taken into account, well-established journals such as *Journal of Philosophy of Education* and *Educational Philosophy and Theory* stand out in terms of h-index values. This situation emphasizes the importance of not only the number of publications but also the quality of publications and shows that the h-index can be used as an effective measure in this context (Pagel & Hudetz, 2011). It is stated that measures such as the h-index are a reliable method for evaluating the academic effectiveness of journals; this method reflects the long-term performance and effectiveness of articles (Hodge & Lacasse, 2011). However, instead of relying solely on the h-index, a multiple evaluation method supported by additional indicators such as the m-index and g-index should be adopted, which provides a more comprehensive assessment of impact and performance (Khan et al., 2013). In addition, the effectiveness of the h-index values of journals is a measure of the impact and value of studies in the field of philosophy for children in education on the academic world.

The contribution of 200 authors working on philosophy for children in education shows that research efforts in this field are supported by a large and diverse community. In terms of author productivity, names such as K. Murriss, M. F. Daniel, and A. Kizel stand out quantitatively. In terms of the most cited authors, names such as K. Murriss, N. Vansielegem and D. Kennedy are at the top of the list. However, when evaluated according to citation-based metrics such as the h-index, it is clear that K. Murriss, D. Kennedy and G. Burgh are the leading authors in the field. The top authors and their impact indicators (h-index, g-index, m-index) reveal the prominent figures of philosophy for children in the academic literature and the quality of the work done in this field. This indicates the

interdisciplinary nature of the field and its support by a broad research community. In the co-authorship network analysis, K. Murriss and J. Haynes were identified as the authors with the most robust collaboration network. In addition to these authors, other notable figures such as D. Kennedy, W. O. Kohan, and M. C. Carvalho have also demonstrated a high level of connectivity within the network. A co-citation analysis has demonstrated that Matthew Lipman's work is regarded as the foundational text of the field and has significantly influenced subsequent research. Lipman's contributions to the field, including "Thinking in Education" (2003) and "Philosophy in the Classroom" (1980), established the theoretical and practical foundations of the philosophy for children approach and significantly influenced the development of the literature. John Dewey's 1916 seminal work, "Democracy and Education: An Introduction to the Philosophy of Education" also merits recognition as a historical reference point.

From an institutional standpoint, it is notable that Montclair State University plays a pivotal role in the field of research under consideration. Its central position within the co-authorship network serves to confirm the university's productivity and interactivity. The Institute for the Advancement of Philosophy for Children (IAPC), which was established by Matthew Lipman and Ann Sharp, has exerted a significant global influence, with numerous educators and researchers from around the world having contributed to this model (Cam, 2017; Gregory, 2011). In contrast, academic institutions such as the University of Auckland, the University of Strathclyde in Glasgow, and the University of Queensland have also made notable contributions to the advancement of this field. The role of the University of Strathclyde in Glasgow became apparent with the research conducted by Cassidy and Christie in 2013 on thinking skills and philosophical inquiry. The influence of the University of Queensland is evident in Burgh and Thornton's (2016) examination of the evolution of the philosophy for children movement in Australia. This illustrates the significance of philosophy for children in academic settings and the breadth and intricacy of research in this domain. Additionally, there is a close collaborative relationship between Montclair State University and Columbia University, as well as between Rio de Janeiro State University and Universidade dos Açores. This collaboration was further reinforced by Kohan's (2014) research on the philosophy of childhood in Latin America.

A review of published research in the field of philosophy for children reveals that scholars from 66 countries have contributed to this field of study, indicating a global interest and impact. The country analysis demonstrates that the United States is the leading nation in philosophy for children research. The historical process that commenced with Lipman's establishment of the IAPC in the USA is a key point of reference. However, it is important to acknowledge the significant contributions made by countries such as the United Kingdom, Brazil, Australia, and Canada to the field. These countries have integrated philosophical thinking into their educational policies, thereby contributing to the development of the field (Scholl et al., 2016). The preponderance of European and North American countries may be attributable to the historical and philosophical underpinnings of the subject matter in these regions. It was determined that the United Kingdom and South Africa exhibited the greatest degree of collaboration in the subject field. This indicates that historical and cultural ties can reinforce cooperation networks and the global influence of the United Kingdom (Chinchilla Rodríguez et al., 2019). The structures of collaboration and co-authorship across countries demonstrate that the research has a global perspective. However, the observation that some regions (e.g., most of Africa and parts of Asia) have relatively fewer links indicates potential fields for improvement in global academic collaboration. Furthermore, the inclusion of Türkiye on the list with 57 publications indicates that interest in this field is growing in Türkiye. Indeed, recent years have seen a

number of studies by researchers from Türkiye, including [Akkocaoğlu Çayır and Akkoyunlu \(2016\)](#), [Karadağ and Demirtaş \(2018\)](#), [Budak Çalışkan \(2022\)](#), and [Dirican \(2024\)](#), which have been published in the literature. A review of the distribution of philosophy studies for children across countries reveals a global proliferation of such initiatives, with some countries demonstrating a particularly robust approach.

The use of 2728 different keywords demonstrates the extensive scope of research in the field of philosophy for children. Upon analysis of the keyword clouds, it becomes evident that the concepts of “philosophy for children”, “community of inquiry”, “dialogue”, “ethics” and “critical thinking” emerge as prominent themes within the research landscape. These concepts confirm that the P4C approach, as developed by Matthew Lipman and Ann Sharp, is designed to foster critical thinking, ethical inquiry, and philosophical dialogical abilities in children. The emphasis on these concepts, which constitute the fundamental tenets of the field, reflects the philosophical and pedagogical roots of research in the field ([Cam, 2017](#); [Daniel & Auriac, 2011](#); [Vansielegheem & Kennedy, 2011](#)). A review of trend topic analyses reveals a clear trend in research in the field since 2005. Topics such as “early childhood education”, “facilitation”, “inclusive education” and “community of philosophical inquiry” have emerged as prominent fields of interest in recent years. This situation indicates that P4C is not only applicable to middle or high school children, but it has also begun to be implemented in preschool education. It is therefore important to initiate philosophical inquiry processes from an early age ([Karadağ et al., 2017](#)). These results, in conjunction with the evolution of P4C’s agenda, also indicate a heightened emphasis on the principles of inclusion and facilitation in education. In particular, the increased prominence of themes such as “inclusive education” is indicative of an effort to expand the applicability of philosophy in all fields of education ([Haynes, 2021](#)). This shift demonstrates that P4C is a dynamic field, with research continually re-evaluating philosophical approaches to children’s education.

As the findings of this study were limited to publications in the Web of Science database, the inclusion of studies in different databases (e.g., Scopus, Google Scholar) did not encompass the entirety of research in the field. Furthermore, the analyses were based on quantitative data in terms of citations and publication numbers, and the impact of qualitative research in pedagogical and cultural contexts was not sufficiently examined. The limited geographical distribution of P4C studies in parts of Africa and Asia indicates a need for further investigation into the applicability and challenges of philosophical education in these regions. Future studies should address the implications of P4C in different socio-cultural contexts, its role in teacher education, and its impact on long-term learning outcomes in greater depth.

It can be stated that the subject of philosophy for children in the field of education has attracted increasing attention in recent years, resulting in a notable accumulation of scientific knowledge in this domain. The findings of the study offer valuable insights into the historical evolution, current state, and potential future trajectories of the field. The trends and key points in the development of the field offer researchers new perspectives and research topics. Furthermore, this study reiterates the importance of interdisciplinary collaborations and the necessity of integrating diverse perspectives. In light of these considerations, the following recommendations can be put forth for consideration by those responsible for developing and implementing educational policies and practices.

- It is imperative that children's critical thinking and communication skills be developed by including philosophical inquiry and dialogue-based activities in curricula from the earliest stages of education.

- It is recommended that professional development programs be organized and supported with pedagogical tools for teachers to utilize P4C methods effectively in their classrooms.
- Inclusive education practices that facilitate the participation of all children in philosophical discourse, acknowledging socio-economic and cultural differences, should be implemented.
- Pilot projects based on P4C should be initiated in schools to facilitate the collection of long-term data on learning outcomes. Furthermore, successful practices should be disseminated.
- Philosophical education should be integrated with other academic disciplines, such as mathematics, science, and the arts, in order to ensure an interdisciplinary approach.
- It is recommended that collaboration between educational institutions, policymakers, and other relevant stakeholders be strengthened in order to facilitate the implementation of P4C as a systematic education policy.

### **Ethic**

This study is in the category that does not require ethical approval.

### **Author Contributions**

The authorship contribution is equally distributed, with the first author and the second author each contributing 50% to the study.

### **Conflict of Interest**

There is no potential conflict of interest related to the research, authorship and/or publication of this study.

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