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Beliefs about Pedophilia and the Attribution of Punishment for Child Sexual Abusers

Gabriela GROZA^{1*} , Codruța Anamaria RÎNDAȘU²

ABSTRACT. Pedophilia is a mental illness which may or may not lead to sexual abuse against children. However, when thinking about people with pedophilic sexual interests, people often consider them abusers (even if they did not act against children and did not commit any offense). This is a pilot study aimed to explore the attitudes and perception of people with pedophilic sexual interests in Romania, based on a questionnaire that was distributed on social media (Facebook), having 1077 respondents. The questions concerned the perception of people who sexually abused children and people with pedophilia who did not abuse children. The majority of participants in the study believe that people with pedophilia do not have control over their actions, even if they are perceived as ill or criminals. The results of this study have shown that chemical castration is the most preferred punishment for persons who sexually abuse children. Regarding the danger of people with pedophilia, all the respondents believed that it did not matter whether they were just suffering from an illness or if they committed an offence, they were all very dangerous. Regarding the recidivism rate, the majority of the respondents believed that the percentage is between 80-100%. Roughly half of the respondents who have children perceived 100% chances for the people with pedophilia to relapse. Further consideration and implications were discussed.

Keywords: pedophilia, sexual abuse against children, stigmatization, sexual offense against children, society's perception of people with pedophilia

¹ Psychology Department, Babeș-Bolyai University, Faculty of Psychology and Education Science, Cluj-Napoca, Romania

² Birmingham City University, Faculty of Law and Social Science, Birmingham, UK

* Corresponding author: gabriela.groza@law.ubbcluj.ro



INTRODUCTION

Pedophilia and sexual abusers

According to the DSM-5, a diagnosis of pedophilic disorder (previously known as pedophilia) requires a prolonged period of sexually arousing fantasies or sexual urges involving prepubescent children that may result in sexually abusive behaviors, significant distress, or sexually abusive acts toward a prepubescent child victim (American Psychiatric Association, 2013).

Stigmatization is a significant problem in society, mainly for people with mental illness or different sexual orientations. These labels diminish opportunities in life and consist of a continuing source of stress. Stigma prevents people with pedophilia to seek help, disclose their sexual interest and seek therapeutic support, but encourages them to be more isolative and to feel loneliness, which are risk factors for committing sexual crimes (Cantor & McPhail, 2016). The media shows (West, 2000) there is a high incidence of sexual abuse and the recidivism rate concerning this offense, but statistics and studies about recidivism fail to confirm the inevitability of recidivism (West, 2000). Moreover, vigilantism, stigmatization, and barriers to employment impair the rehabilitation of sex offenders (West, 2000). With this issue, the public needs education to prevent such labels as 'pedophile', 'predator' and 'incurable' being used indiscriminately, and for the minority of offenders who are dangerously deviant and uncontrolled, hospitalization remains a more constructive response than imprisonment for the protection of children in the future (West, 2000).

Social Perception of pedophilia

One study (Imhoff & Jahnke, 2018) explored society's perception about people labeled as "pedophiles", or people with sexual interest in prepubescent children, finding strong negative and punitive attitudes towards persons with a pedophilic disorder, seen as very dangerous and incapable of changing. People generally sustain and favor punishment and incarceration for people with pedophilia, even if they did not commit unacceptable activities or illegal acts (Imhoff & Jahnke, 2018).

Two surveys conducted in Germany (Jahnke et al., 2014) measured agreement with stereotypes, emotion and social distance concerning people who abused alcohol, sexual sadists, or people with antisocial tendencies, all regarding pedophilia. The results reveal that all reactions to people with pedophilia were more negative than those to other groups, including social distance. Fourteen percent (Study 1) and 28% (Study 2) of the participants admitted that

people with pedophilia should be dead, even if they did not commit any crime. These outcomes showed that persons with a pedophilic disorder are stigmatized and are a target of discrimination (Jahnke et al., 2014).

The prevalence of pedophilia in Romania is not known. A large sample from Germany, found that 4.1% of people had sexual fantasies involving a child, 3.2% sexually offended prepubescent children, and 0.1% had a pedophilic sexual preference (Dombert et al., 2016). Data from Canada ($N= 1040$) suggests that nearly half of the canadian sample (45.6%) expressed interest in at least one paraphilic category (voyeurism, fetishism, frotteurism, masochism), and 33.9% of the respondents have displayed paraphilic fantasies and behaviors in the past (Joyal & Carpentier, 2017). From this sample, 0.4% experienced at least one time sex with a child, and 0.4% wished to have a sexual experience with a child (Joyal & Carpentier, 2017). Moreover, on a sample of sexual offenders from Austria (Eher, Rettenberger, & Turner, 2019), the most frequently found disorders were alcohol misuse (40%), paraphilic disorder (43.3%) and personality disorder (53.6%). From those people who committed a sexual assault against a child, they were most probably diagnosed with pedophilia (67.1%), paraphilic disorder, sexual deviance, and an antisocial disorder (Eher et al., 2019). It can be rightly supposed that the stigma attached to this diagnosis may make some people not want to search for a treatment. Moreover, punitive attitudes against individuals based on their sexually deviant desire also exist.

Of note, it is possible that individuals with sex offenses could differ depending on their age. In a study (Clark & Mezey, 1997), a group of 13 people over the age of 65 ($M=72.5$), who abused children were described, to discover the differences and similarities with younger age groups. They differ in terms of being of higher socioeconomic status, having stable backgrounds, reporting low rates of personal sexual victimization, and yielding an overall picture of socially skilled and well-adjusted offenders. Individuals who committed sex offenses are similar in terms of low levels of psychiatric illness, and in particular of organic disorders, and they also reported sexual abuse in childhood (Clark & Mezey, 1997).

Regarding the punishment people with pedophilia should receive, a greater proportion of respondents agreed with the death penalty (51%), compared with the same punishment for crimes against adults (27%) (Mancini & Mears, 2010).

Perception about the recidivism of a pedophile

Recidivism is another problem that is stigmatized and controversial. On a sample of residents from Florida ($N=193$, 57% females) (Levenson, Brannon, Fortney, & Baker, 2007), 75% of sexual offenders are thought to relapse because they form a homogenous risk group, and the treatment is not effective.

In addition, people consider that persons who commit the sexual offenses are unknown to, and have no connection with their victims. (Levenson et al., 2007). Another study (Katz-Schiavone, Levenson, & Ackerman, 2008) found that people believe that 98% of the people with pedophilia will relapse. In fact, 76% of people who sexually offended did not relapse after 15 years (Harris & Hanson, 2004) (only 5-14% relapse after 3-6 years), 96% of the offenders know their victims (34% are family members and 59% are acquaintances), and there are evidence that cognitive behavioral therapy (CBT) works for rehabilitating this patient (Levenson et al., 2007). Another researcher (Moulden, Firestone, Kingston, & Bradford, 2009) examined the relationship between pedophilia and recidivism on a sample of 206 extra-familial child molesters between 1982 and 1992. The results showed that the overall recidivism rates were 22.8%, 33.9%, and 45.6% for sexual offense, violence, and any re-offense, respectively, but there was no difference regarding recidivism between people with pedophilia and people who do not have pedophilia (Moulden et al., 2009). Five years after release in a sample from Austria (Rettenberger et al., 2015), the recidivism rate was 6% for the total sample, 4% for the rapist subgroup, and 8% for the child molesters' subgroup. In another study (Eher et al., 2019), 68.3% of the sample with pedophilic disorder had an intra-familial child victim, 68.7% had an affiliate victim (acquaintance), and 54.1% did not know their victim.

A qualitative online study, conducted in Australia (Richards, 2018) discovered that people consider pedophilia a sexual orientation which is stable and internal, thus giving a biological explanation for this disease. Participants from this research believed that people with pedophilia do not have control, and that they cannot be cured. Other respondents believed that they are mentally ill, that they need psychological or psychiatric treatment, and they also believe in the efficacy of these treatments (Richards, 2018). Regarding choice, people perceive that people with pedophilic sexual interests do have control over their actions, and they want to show their power and control over their victims. Respondents conceptualized persons with pedophilia as calculated and rational, making deliberate decisions, rather than being driven by a mental illness (Richards, 2018).

It is important for professionals involved in the treatment of sexual offenders to endorse fewer stereotypes and be able to offer the treatment they need, which should be based on review or risk. Sanghara and Wilson (2006) interviewed 60 professionals (psychologists, social assistance, rehabilitation staff etc.) and 71 teachers from schools (UK). The results reveal that professionals involved in the treatment of sexual offenders have fewer negative stereotypes, more positive attitudes, and sustain that the offenders are less guilty if they have a low intelligence level, if they are frustrated because they are alone, or if they have a mental illness (Sanghara & Wilson, 2006).

People with pedophilia appeared to be ambivalent about therapy (52% would seek professional help, even if it meant that they have to talk about their sexual interests to a stranger, but only 36% believed that a health care professional would understand their problems) (Jahnke, Schmidt, Geradt, & Hoyer, 2016). Moreover, perceived social distance and fear of discovery were not linked to self-efficacy, cognitive distortions or treatment motivation (Jahnke et al., 2016).

An analysis of the population's distorted perceptions could reveal the possible areas of intervention to change people's attitude towards pedophilia. A correct public view of pedophilia could help to have a more appropriate attitude that encourages the treatment of people suffering from pedophilia. The general social interest is the prevention of sexual abuse of children. If people suffering from pedophilia were more encouraged to seek treatment, the goal of preventing sexual abuse of children would be indirectly, partially fulfilled.

At present, there are no studies that have measured the public perception of pedophilia in Romania. The main purpose of this exploratory study is to measure Romanian people's belief about people with pedophilia. We want to investigate the inter-individual differences which are associated with certain beliefs. The specific aim is to investigate the attitudes regarding the punishment of the people who suffer from pedophilia, and who committed a sexual abuse, and the perception about the rate of relapse of child sexual abusers.

This study is an exploratory one, therefore no hypothesis was assumed. Variables that were already used in other studies were explored and performed on a sample from Romania.

METHOD

Instrumentation and procedure

Based on other research that measured the public perception of pedophilia (Levenson et al., 2007; Stevenson et al., 2015), we constructed an online questionnaire with 35 items. In the first part we measured different perceptions and beliefs about pedophilia (whether or not pedophilia is a disease, beliefs if pedophilic persons have control over their actions, whether child abuse is spontaneous or premeditated, whether non-offending people with pedophilia are dangerous, about the treatment persons with pedophilia need or deserve etc.), then we measured the punishment chosen by the participants for sexual abuse against children ("What punishment should a person with pedophilia

receive who committed a sexual crime?") and estimates of the recidivism rate of sexual abusers and the history of sexual abuse of persons with pedophilia. In the last part of the questionnaire we measured data on participants.

Similar to Levenson et al. (2007), in most items the answers had to be chosen from a list of choices (for example, " You consider that people who suffer from pedophilia: a) They are sick; b) They are criminals; c) They are sick criminals; d) Other: ", "Pedophiles: a) have control over their behavior; b) they have no control over their behavior; c) I do not know" or "Do all persons with pedophilia commit sexual crimes at any given time?: a) yes; b) no; c) I don't know"). For items that estimated the recidivism rate and the history of sexual abuse of pedophiles, we proceeded as Stevenson et al. (2015) formulating responses at intervals. We took over the questions formulated by Stevenson et al. (2015) to which we added some regarding the criminal policy that the participants would consider effective.

The questionnaire was distributed on social media, in different Facebook groups (e.g. groups of different students from Romania). This method was chosen because it gave access to a large number of people and keep them anonymous.

Participants

There were no exclusion criteria, and the total number of participants was 1131. After incomplete, duplicated and invalid responses were excluded, 1077 responses were taken into consideration. The age of the participants ranged between 18 and 77 years of age ($M=27.43$, $SD=10.020$), 71.9% of the respondents were female, and 28.1% were male. About half of the sample responded that they are students, and the rest had diverse careers. The majority of the sample, 93.6%, declared being heterosexual, 5.4% declared that they are bisexual, and 1% declared being homosexual. From the total sample, 83.4% of the respondents declared that they have never met an individual with pedophilia, and 10.8% of the sample declared that they have been a victim of sexual abuse. The majority of the sample is from the urban area (93.3%).

Analysis of the data and results

The data were analyzed in the program SPSS Statistics 24., using the Chi-square test or the Kruskal-Wallis test, depending on the variables (nominal or ordinal).

Results regarding punishment attribution

The punishment set by the respondents for the people who committed sexual abuse against a child was: 1% chose imprisonment for up to 1 year, 5% imprisonment between 1-5 years, 8% imprisonment between 5-10 years, 9% imprisonment between 10-15 years, 5% imprisonment between 15-20 years, 9% imprisonment between 20-25 years, 6% death penalty, 15% life imprisonment, 34% chemical castration, and 9% chose “other” (see Figure 1).

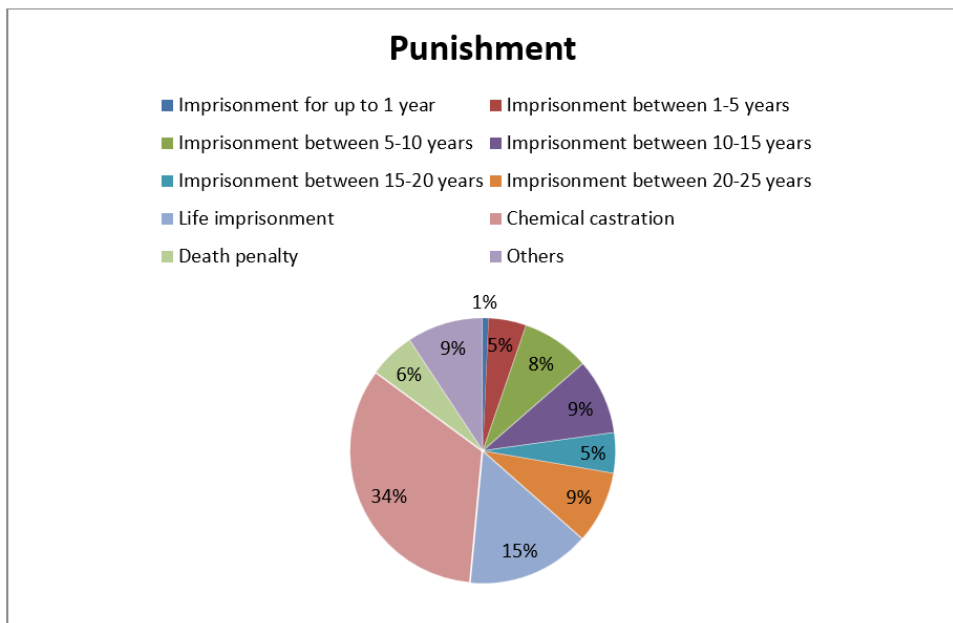


Figure 1. Punishment attribution

There was a significant association between people’s knowledge and the perceived punishment, $\chi^2(21) = 43.060, p < .001$. Phi coefficient indicated a small association of .21 ($p < .001$). Most of the respondents with no legal/psychological training, (23.3% from the total 65.8%), most of the respondents with legal training (2.3% from the total 8.2%), most of the respondents with psychological training (7.1% from the total 23.6%), and most of the respondents with both psychological and legal training (0.9% from the total of 2.4%) perceived chemical castration as the most appropriate punishment.

Table 1. Results regarding punishment attribution

	X ²	df	p
Perceived punishment			
Legal/psychological knowledge	43,060	21	.003
Individuals with pedophilia do /r have control of their actions	55,608	28	.001
Participants who don't/have children	25,881	7	.001
Individuals with pedophilia forced/convinced their victim	140,454	14	.001
Individuals with pedophilia do /not have a mental disorder	71,892	28	.001
Individuals with pedophilia have a mental illness / criminals	67,556	28	.001
Individuals with pedophilia abused in the past	152,759	63	.001
Individuals with pedophilia's environment	37,373	14	.001
Danger of individuals with pedophilia	121,178	14	.001

There was a significant association between the belief that persons with pedophilia do or do not have control over their actions, and the perceived punishment, $\chi^2(28) = 55.608, p = .001$. Phi coefficient indicated a small association of .25 ($p < .001$). The majority of the respondents who considered that persons with pedophilia do not have control over their sexual actions (16.4% from the total of 51%) considered that the appropriate punishment was chemical castration. The majority of the respondents who considered that individuals with pedophilia have control over their sexual actions, (12% from the total of 33.5%) considered that the appropriate punishment was chemical castration.

There was a significant association between people who have / do not have children and the perceived punishment, $\chi^2(7) = 25.881, p = .001$. Phi coefficient indicated a small association of .20 ($p < .001$). A big part of the respondents who do not have children (23.3% from the total of 75.3%), and most of the respondents who have children (10.2% from the total of 24.7%) considered that the most appropriate punishment was chemical castration.

There was a significant association between the belief that persons with pedophilia forced/convicted their victim, and the perceived punishment, $\chi^2(14) = 140.454, p < .001$. Phi coefficient indicated a moderate association of .41 ($p < .001$). The majority of the respondents who believed that the victim was convicted (0.6% from the total of 1%) considered that the most appropriate punishment was imprisonment to up to one year (0.3%), and chemical castration (0.3%). The majority of the respondents who believed that the victim was forced (4.4% from the total of 12%) of them considered that the most appropriate punishment was chemical castration.

There was a significant association between the belief that individuals with pedophilia do or do not have a mental disorder, and the perceived punishment, $\chi^2(28) = 71.892, p < .001$. Phi coefficient indicated a moderate association of .31 ($p < .001$). From the total number of respondents, 89.5% considered that people with pedophilia have a mental disorder, 4.9% considered that they do not have a mental disorder, and the rest (5.6%) answered that they do not know if people with pedophilia have or have not a mental disorder. From the respondents who believed that people with pedophilia have a disorder, a considerable percentage (32%) considered that the most appropriate punishment was chemical castration (16%) and imprisonment between 10-15 years (16%).

There was a significant association between the belief that people with pedophilia are criminals / ill, and the perceived punishment, $\chi^2(28) = 67.556, p < .001$. Phi coefficient indicated a small association of .25 ($p = .027$). The majority of the respondents who believed that people with pedophilia have an illness (23.3% from the total of 68.7%) and the majority of the respondents who considered that people with pedophilia are criminals (5.3% from the total of 15.2%) considered that the most appropriate punishment was chemical castration.

There was a significant association between the belief that individuals with pedophilia became sexual abusers because they have been abused in the past, and the perceived punishment, $\chi^2(49) = 86.285$, $p = .001$. Phi coefficient indicated a small association of .28 ($p < .001$). A significant part of the respondents who believed that individuals with pedophilia have not been abused in the past (3.2% from the total of 11.7%) and the majority of the respondents who considered that individuals with pedophilia have been sexually abused in the past (15.4% from the total of 49%) considered that the most appropriate punishment was chemical castration.

There was a significant association between the belief about the pedophile's environment, and the perceived punishment, $\chi^2(14) = 37.373$, $p = .001$. Phi indicated a small association of .20 ($p < .001$). 19.4% from respondents considered that individuals with pedophilia come from urban area. The majority of the respondents who considered that individuals with pedophilia come from the urban area (7.4% from the total of 19.4%) perceived that the most appropriate punishment was chemical castration. The majority of the respondents who considered that individuals with pedophilia come from the rural area (3.1% from the total of 11%) perceived that the most appropriate punishment was chemical castration.

There was a significant association between the perceived danger of individuals with pedophilia, and the perceived punishment, $\chi^2(14) = 121.178$, $p < .001$. Phi coefficient indicated a moderate association of .36 ($p < .001$). A part of the respondents who believed that individuals with pedophilia are not dangerous (0.7% from the total of 4%), the majority of the respondents who perceived individuals with pedophilia as a little dangerous (14.4% from the total of 41.9%), and a big proportion of the respondents who considered that individuals with pedophilia are very dangerous (18.5% from the total of 54.2%), perceived chemical castration as the most appropriate punishment.

Results regarding perceived recidivism rate

There was a significant association between people's training and the perceived recidivism rate, $\chi^2(3) = 11.689$, $p = .009$. Phi coefficient indicated a small association of .16 ($p < .017$). Most of the respondents with no legal or psychological training (25% from the total 65.8%), most of the respondents with legal training (3.9% from the total 8.2%), and most of the respondents with both legal and psychological training (0.8% from the total 2.4%) considered that there was a probability of 80-100% that individuals with pedophilia would commit a crime again. Most of the respondents with psychological training (8.6% from the total 23.6%) considered that there was a probability of 50-80% that individuals with pedophilia would relapse.

Table 2. *Results regarding perceived recidivism rate*

	X ²	df	p
Perceived recidivism rate			
Legal/psychological knowledge	11,689	3	.009
Individuals with pedophilia abused in the past	19,524	5	.002
Participants who don't/have children	44,900	1	.001
Individuals with pedophilia do /not have a mental disorder	8,738	1	.003

There was a significant association between people who have been abused and the perceived recidivism rate, $\chi^2(20) = 40.517, p = .004$. Phi coefficient indicated a small association of .11 ($p < .010$). A significant part of the respondents who have not been sexually abused (35.4% from the total 93%) and most of the respondents who have been sexually abused (2.4% from the total 6.9%) considered that there was a chance of 80-100% that an individual with pedophilia would reoffend again.

There was a significant association between people who have children or not and the recidivism rate, $\chi^2(5) = 55.980, p < .001$. Phi coefficient indicated a small association of .28 ($p < .001$). A significant proportion of the respondents who do not have children (27.2% of the total of 75.2%) consider that there is a chance of 80-100% that individuals with pedophilia would commit again. Most of the respondents who have children (10.8% from the total of 24.8%) consider that there is a chance of 100% that individuals with pedophilia would commit again a sexual offence.

There was a significant association between the belief that individuals with pedophilia do or do not have a mental disorder, and the perceived recidivism rate, $\chi^2(10) = 100.237, p < .001$. Phi coefficient indicated a small

association of .21 ($p=.001$). Most of the respondents who believed that individuals with pedophilia do not have a mental disorder (1.8% from the total of 4.9%) considered that the recidivism rate was between 50-80% chances that the individuals with pedophilia would commit again. Most of the respondents who considered that individuals with pedophilia have a mental disorder (34% from the total of 89.5%) considered that the recidivism rate was between 80-100% chances that people with pedophilia would commit again.

Results regarding perceived control

Table 3. Results regarding perceived control

	χ^2	df	p
Perceived control			
Individuals with pedophilia have a mental illness/ criminals	82,914	16	.001

There was a significant association between the belief that individuals with pedophilia do or do not have control over their actions, and the perception that they are criminals / ill, $\chi^2(16) = 82.914$, $p < .001$. Phi coefficient indicated a large association of .52 ($p < .001$). Most of the respondents who considered that individuals with pedophilia are having an illness (19.6% from the total of 30.2%), and most of the respondents who considered that individuals with pedophilia are ill criminals (27.7% from the total of 53.8%) considered that they do not have control over their actions. Most of the respondents who considered that individuals with pedophilia are criminals (7.9% from the total of 11.7%) considered that they do have control over their actions.

Results regarding danger perception

There was a significant association between the belief about the danger a persons with pedophilia poses, and the belief about the help they need, $\chi^2(8) = 90.949$, $p < .001$. Phi coefficient indicated a moderate association of .36 ($p < .001$). Most of the respondents who considered that individuals with pedophilia were not dangerous (2% from the total of 4%), and most of the respondents who

considered that individuals with pedophilia were a little dangerous (23.4% from the total of 41.9%) considered that the most appropriate help for them was treatment. Most of the respondents who considered that individuals with pedophilia were very dangerous (36.8% from the total of 54.1%) considered that the most appropriate help for them was treatment and imprisonment.

Table 4. Results regarding danger perception

	X ²	df	p
Danger perception			
Help they need	90,949	8	.001
Participants who have children	15,369	2	.001

There was a significant association between people who have children or not and the perceived dangerousness of individuals with pedophilia, $\chi^2(2) = 15.369$, $p < .001$. Phi coefficient indicated a small association of .17 ($p < .001$). Both most of the respondents who do not have children (36.7 from the total of 75.2%), and most of the respondents who have children (17% from the total of 24.8) considered that an individual with pedophilia who never committed a crime is very dangerous.

DISCUSSION

The main purpose of the study was to explore the Romanian people's attitudes and beliefs concerning individuals with pedophilia. The specific aim was to investigate the attitudes regarding the punishment of people who suffer from pedophilia, and the perception about the rate of relapse of child sexual abusers.

Discussion regarding punishment attribution.

This hypothesis targeted the punishment assigned to individuals with pedophilia that committed sexual offense. Respondents considered that the most appropriate punishment for individuals with pedophilia is chemical castration. This answer was the majority, even if the following variables about

the answer were controlled: do or do not have legal/psychological training; consider that individuals with pedophilia do or do not have control over their actions; do or do not have children; consider that the victims were forced or convinced; consider or not that individuals with pedophilia have a mental disorder; consider that individuals with pedophilia are having an illness or not; consider that individuals with pedophilia were or were not sexually abused in the past; consider that individuals with pedophilia come from urban/rural area; consider that individuals with pedophilia are a little dangerous, dangerous or very dangerous.

This information may show that the first instinct people have when they think about an individual with pedophilia is the defense instinct (for their children). The criminal punishment has a punitive role but also to remove the immediate danger. In conformity with Imhoff (2015), there are situations when people prefer to think about a just punishment for what individuals with pedophilia have done, and to restore justice. Moreover, 54.2% of the respondents consider that individuals with pedophilia are very dangerous.

Discussions about perceived recidivism rate.

The probability of perceived recidivism rate for the majority of the respondents is between 80-100%. This could be a possible explanation why the majority of the respondents prefer chemical castration as a punishment for individuals with pedophilia. Individuals who have psychological training are more optimistic regarding the recidivism rate, or they may just be more aware of the current state of research. The majority of them estimated the probability of recidivism rate between 50-80%, however, estimating the rate to be much higher than the real one, 38% in 2017 (The National Administration of Penitentiaries, 2017). In Romania there are no official data specific for pedophilia related offenses, but only in general, for sex offenses. However, the judgments made by respondents regarding recidivism rate could be distorted, reflecting the stigmatization of people with pedophilia, considering the fact that studies showed that 76% of people convicted in the past for sexual offenses against children do not recidivate (Harris & Hanson, 2004). The results of this study are consonant with other studies regarding perception about people with pedophilia, where the relapse rate was also overestimated (Levenson et al., 2007; Moulden et al., 2009; Richards, 2018).

Whether individuals with pedophilia were sexually abused or not, the respondents perceived the recidivism rate as being very high. Considering the repulsion/negative emotions that society has for pedophiles (Richards, 2018), one of the explanation for this result could be attribution substitution. Research

(Kahneman & Frederick, 2005) has shown that when people should evaluate frequency, they are influenced by emotions (affective heuristic).

The respondents who have children yield another interesting result, regarding the perceived recidivism rate. Almost half of the respondents perceived the recidivism rate as being 100%. It is considered that this result is sustaining the hypothesis that emotional processes are also involved in the evaluative judgments regarding recidivism rate. However, this presumption needs to be further investigated in the future.

Discussions regarding the perceived control.

Regardless of whether the respondents believe that individuals with pedophilia are mentally ill or criminals, those who perceive the disease to be associated with the behavior, assigned external control. There is strong association between the perception of pedophilia as a disease, and the perception of the lack of control. On the flip side, respondents who perceived individuals with pedophilia as criminals, assigned internal control for the behavior, indicating they consider that these individuals have control over their actions. This is in accordance with other studies that investigated the perception of people with pedophilia (Richards, 2018).

Discussions regarding danger perception.

The high danger perception of individuals with pedophilia is associated with the perceived need to give them treatment but also with incarceration. As discovered before, cognitive behavioral treatment could have beneficial outcomes and reduce the rate of recidivism (Babchishin et al., 2013).

The majority of the respondents with or without children (53.7%) consider that individuals with pedophilia are very dangerous, regardless of whether they committed a sexual crime in the past or not. The results are explainable because people associate the mental illness with the lack of control. Thereby, respondents considered people with pedophilia very dangerous because they perceived them unable to control their desires regarding children. This is in accordance with other studies that found strong negative and punitive attitudes towards persons with a pedophilic disorder, seen as very dangerous and incapable of changing (Imhoff & Jahnke, 2018). In a study from 2014, Janke and colleagues, discovered that 28% of the respondents considered that people with pedophilia should be dead, even if they did not abuse any child. Also, 53.7% of the respondents of this study considered that individuals with pedophilia who never committed a sexual offense were very dangerous. Regarding punishment,

5% of the respondents considered the death penalty the most appropriate punishment for individuals with pedophilia who committed a sexual offense. This percentage (5%) found in this study it is smaller than in previous researches (28%- Jahnke et al., 2014). This difference could be due to the fact that the current sample has a high level of education (32% graduated university, 17% master degree).

The present paper confirms what has already been found by previous research (Levenson et al., 2007; Stevenson et al., 2015). In Table 5. the results from previous studies will be summarized and the findings from the present study completed.

Table 5. *Perception and reality about sex offenders*

People's perception	Reality	Present study
67% of the molesters were sexually abused in childhood (Stevenson et al., 2015).	28% of the molesters were sexually abused in childhood (Stevenson et al., 2015).	49% of the respondents consider that individuals with pedophilia were abused in childhood.
75% of sex offenders have high rates of recidivism (Hanson et al., 2004;	After a period of 15 years, 76% of the sex offenders did not relapse (Levensonet al., 2007).	Respondents consider that the recidivism rate is between 80-100%.
People consider that sex offenders did not know their victims (Levenson et al., 2007).	93% of the sex offenders know their victims (59% are acquaintances, 34% are members of the family) (Levenson et al., 2007).	-
People consider that treatment does not have beneficial outcomes and do not reduce the rate of recidivism (Babchishin et al., 2013).	Cognitive behavioral treatment could have beneficial outcomes and reduce the rate of recidivism (Babchishin et al., 2013).	53.8% of the respondents consider that individuals with pedophilia are ill criminals and they need both treatment and imprisonment.

The results of this study showed a high stigmatization of individuals with pedophilia who did not commit a sexual abuse. It is important to delimit the two terms "pedophile" and "child sexual abuser". Society should be more careful with the individuals with pedophilia who did not commit a sexual offense, because if they are not seen with empathy, and if there is no wish to help them through professional programs, the chances that they will commit a sexual offense against children could increase. People should fight against

stigmatization to reduce child sexual abuse in society. A first step could be to differentiate people with pedophilia who did not commit any offense against a child and people with pedophilia who sexually abused children.

Limitations and future directions

This study is, as we have assumed, an exploratory one. One of the main limitations is that in the measurement, we used only one item for each public perception/belief. Moreover, because it is an exploratory study, and because Romania does not have a validated questionnaire for this matter, a not validated questionnaire was used. The answers were only self-report, which could lead to a socially desirable answering style. However, anonymity could also offer freedom in expressing their thoughts regarding a taboo subject. The used sample is quite highly educated, thus the generalizability of the results is limited. In the same direction, our sample is heavily skewed towards females (71.9%), which may limit the generalizability of the results, particularly regarding gendered perceptions of pedophilia. There is a need to explore more the gender differences on the perception of pedophilia. In future research it is necessary to use more complex instruments, with more items for each perception / belief studied.

As I have shown above, from the total sample, 83.4% of the respondents declared that they have never met an individual with pedophilia. So, a majority of respondents formed their beliefs about people suffering from pedophilia indirectly. It would be interesting for the future to investigate more the way in which respondents form their perceptions of people who suffer from pedophilia and if direct contact with these people changes their beliefs about them.

Lasher and Stinson (2017) suggested that to "challenge myths and misunderstandings about child sexual abuse" is one of the important recommendations in the process of preventing sexual abuse behaviors of individuals with pedophilia. Stigma prevents people with pedophilia to seek help, disclose their sexual interest and seek therapeutic support, but stimulate them to be more isolated and to feel loneliness, which are risk factors for committing sexual crimes (Cantor & McPhail, 2016). The present research is only a first step in measuring the beliefs about pedophilia and child sexual abuse in Romanian population. In the future, information campaigns and challenge myths and misunderstandings about child sexual abusers can be promoted, so that people with pedophile interests who do not act will be encouraged to consult with mental health specialists.

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Civic Engagement in Times of Crisis: How did Romanian Emerging Adults Engage?

Bianca V. MARINICA^{1*}, Oana NEGRU-SUBTIRICA²

ABSTRACT. The COVID-19 pandemic created a unique context in which community engagement was necessary for handling the crisis and emerging adults had a reduced risk in the face of the virus. Therefore, this paper aimed to take an in-depth look at the ways in which emerging adults engaged in their communities. Inductive thematic analyses conducted on a sample of 86 Romanian emerging adults ($M_{age}= 23.38, SD_{age}= 2.71$) revealed two main themes: *General engagement* (subthemes *Passing on knowledge, Helping disadvantaged groups, Organizing events, and Political engagement*), and *Pandemic-related engagement* (subthemes *Initiatives directly related to the COVID-19 virus, and Initiatives related to the wider impact of the COVID-19 pandemic*). Results show that most Romanian emerging adults engaged in activities not directly related to handling the crisis and identify one worryingly unpopular form of engagement: political engagement.

Keywords: community engagement, civic engagement, Eastern Europe, emerging adulthood, COVID-19

Despite a lack of consensus regarding the definition of civic engagement, Eastern European countries consistently show lower engagement than Western countries (Ekman et al., 2016; Kostelka, 2014). However, social crises can make people more willing to help others (e.g., Yum & Schenck-Hamlin, 2005), with

¹ Self and Identity Development Lab, Department of Psychology, Babes-Bolyai University, Str. Republicii 37, 400015, Cluj-Napoca, Cluj, Romania; E-mail: biancamarinica@psychology.ro

² Self and Identity Development Lab, Department of Psychology, Babes-Bolyai University, Str. Republicii 37, 400015 Cluj-Napoca, Romania, e-mail: oananegru@psychology.ro

* Corresponding author: biancamarinica@psychology.ro



the number of willing volunteers sometimes higher than the actual need for them (e.g., Simsa et al., 2019). Past research highlights the valuable role of the civil society in handling crises during which authorities are overwhelmed (e.g., Simsa et al., 2019) or dependent on the compliancy of the public for reducing disease contamination (Ekzayez et al., 2020; Laverack & Manoncourt, 2016). This likely occurred during the COVID-19 pandemic as well, with people engaging in different civic behaviors as they felt an increased need to help handle the pandemic (Mao et al., 2021).

In their review of volunteering during the COVID-19 pandemic in the United Kingdom, Mao et al. (2021) go as far as suggesting that the civic engagement of regular citizens had a life-saving role while public services were having issues responding to the pandemic. Such valuable types of engagement included the delivery of food and medication to vulnerable categories in the beginning of the pandemic. As the pandemic prolonged, other types of activities became increasingly popular, such as those geared towards reducing social isolation (e.g., providing emotional support thorough phone calls) and handling the broader consequences of the pandemic on important life domains, such as employment and mental health.

Similar to non-crisis times, Eastern Europeans' civic engagement in times of crises is understudied. However, research has shown an increase in solidarity (Voicu et al., 2021) and Eastern Europeans' motivation to get engaged during social crises has been observed during the more recent societal crisis generated by the war in Ukraine (Marinica & Negru-Subtirica, 2023). When faced with war on their doorstep, Romanians expressed several motivations for helping their neighbors, mostly related to the need to express their personal values. Considering that people generally have a higher propensity to help in-group members (Levine et al., 2005), we could expect even higher civic engagement among Romanians in the context of COVID-19, a societal crisis directly affecting those close to them and with whom they share even more similarities than with their neighbors from Ukraine.

Educated young people could be the group most likely to engage in non-crisis times in Romania (e.g., Dragan & Popa, 2017), especially after they reach the voting age of 18, which expands their range of possible civic engagement activities. This age overlaps with the beginning of emerging adulthood, a period lasting from 18 to 29 years old (Arnett, 2011) during which youth ponder their role in society (Lannegrand-Willems et al., 2018) and civic engagement is generally increasing (Wray-Lake et al., 2020). As youth were least likely to be seriously harmed by the COVID-19 virus, their engagement may have been particularly important during this crisis, potentially providing unique insight into emerging adults' engagement and capturing implications for the social well-being and stability of the already weakened Eastern European democracy (Koc-Michalska et al., 2024).

To our best knowledge, only one previous study researched how emerging adults engaged during the COVID-19 pandemic, highlighting their preference for getting engaged online through distributing information about COVID-19 on their social media platforms or by volunteering remotely to help those affected by the pandemic (Yazdani et al., 2022). However, like most studies on the topic, this study focused on a Western sample and gave respondents a predetermined list of civic behaviors to choose from, potentially missing types of engagement not already included in the questionnaire. Therefore, more research is required to understand how emerging adults engaged in times of COVID-19, especially those from Eastern European contexts, who might display higher engagement than in non-crisis times and have a crucial role in the future of democracy in this part of the world.

CURRENT STUDY

Despite concerns about the low levels of civic engagement from Eastern Europe (Kostelka, 2014), research on the topic is scarce (Zaff et al., 2011), especially in times of crisis during which it can be particularly important and youth are at low risk. Therefore, this paper aimed to investigate the ways in which emerging adults engaged in their communities during the COVID-19 pandemic, using thematic analysis as recommended by Braun and Clarke's (2006) paper. As several of the ways in which people engaged during the COVID-19 pandemic were adapted to the universal particularities of the crisis (e.g., delivering essentials to those forced to stay inside due to the virus), we expect Romanians' civic engagement to be similar to that from other countries (Mao et al., 2021). However, as most of the previous research has been conducted on Western cultures using self-reported questionnaires (e.g., Zaff et al., 2011), answers to our open-ended question could reveal other specific ways in which Romanian emerging adults engage in their communities, possibly capturing important cultural differences.

METHODS

Participants and Procedure

Our sample included 86 Caucasian Romanians aged between 18 and 29 years old ($M_{\text{age}} = 23.38$, $SD_{\text{age}} = 2.71$). The majority of them were females (74.4%) and had community engagement experiences before the COVID-19 pandemic

(82.6%). Data collection was conducted as part of the larger project titled “Offline and online civic engagement during emerging adulthood” after the research ethics approval number 1664/19.02.2021 was granted to the first author by the Scientific Council of the Babes-Bolyai University of Cluj-Napoca. Respondents filled in a questionnaire who was distributed online as part of a partnership with ProVobis - The National Centre for Volunteering Resources from Romania. A study description and a link to the questionnaire were posted on their website. The link was also shared on different Facebook pages and groups, in addition to being directly shared with ProVobis’ network of partner organizations. Respondents were rewarded with participation to a free webinar delivered by the first author and had the chance to win one of the three raffle prizes.

MEASURES

Types of community engagement. How emerging adults engaged in their communities was measured using the following prompt “Please take 5-7 minutes to write in as much detail as possible about an event which happened during the pandemic (taking place online or offline) where you felt that you were getting involved in the community or that you were contributing to a cause that was important to you. This event must be relevant to community involvement from your point of view, specifying: what exactly did you do in that activity, whether it took place online or offline.”

DATA ANALYSIS

Inductive (i.e., data driven) thematic analysis was conducted in line with Braun and Clarke’s (2006) recommendations for conducting this analysis in psychology: (a) initial patterns were identified after the entire data set was read many times by each author, (b) the initial patterns identified were used to propose initial codes, (c) each author independently matched the initial codes with respondents’ responses using both excel documents and printouts, (d) matching disagreements were solved through discussion, (e) broader themes were created by organizing the codes from the previous steps, (f) a thematic map including codes and themes was generated and reviewed by both authors (Figure 1).

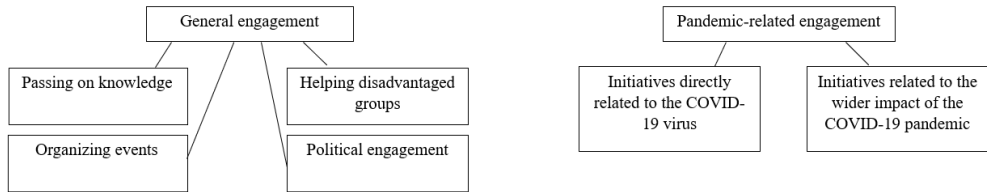


Figure 1. Final thematic map showing the two main themes and their subthemes

RESULTS

Two main themes were identified: *General engagement in the community* and *Pandemic-related engagement in the community*. In other words, whereas some participants engaged in activities which could also be carried out in non-crisis times, possibly with the need for adaption to the pandemic context, others chose to engage in activities which were specific to handling the unique crisis created by the pandemic. Titles, definitions, and sample items for each subtheme can be found in Table 1.

Theme 1. General engagement

This theme refers to community engagement which is not directly related to the pandemic, including 4 types of activities which could also be conducted in non-crisis times (e.g., workshops). However, despite not being as directly linked to the pandemic conditions as other possible activities (e.g., delivering groceries to the elderly who could not leave their house due to the higher risk associated with a possible COVID-19 infection), these activities could also be impacted by the wide-reaching effects of the pandemic. Notably, many of these activities could only be conducted online due to social distancing regulations and/or safety concerns. In other words, this theme includes activities which could be carried out in non-crisis times, but we must acknowledge the possible differences regarding *how* exactly they were carried out during the COVID-19 pandemic.

Table 1. Themes and Subthemes of how Emerging Adults Engaged in their Communities during The Pandemic

	Title	Definition	Sample Item
General engagement (61.6%)	Passing on knowledge	This subtheme includes activities conducted with the aim of passing on knowledge on different topics (e.g., discrimination, mental health).	<i>"I contributed to creating and delivering online sessions within a mental health campaign from XXX. I felt that I was sharing relevant and useful information for students regarding mental health."</i> (Respondent 248, Female, 23 years old)
	Helping disadvantaged groups	This subtheme includes activities conducted with the aim of helping specific disadvantaged groups, such a people with mental and physical health problems.	<i>"I organized volunteer campaigns, together with my colleagues, to help different social categories, especially children with health problems. We have created campaigns, sales exhibitions, fundraising activities. We donated toys and various other products to families with many children."</i> (Respondent 60, Female, 28 years old)
	Organizing events	This subtheme includes varied tasks conducted with the final aim of organizing events other people can benefit from.	<i>"An event from the pandemic period, in which I was deeply involved, was the project XXX. I took care of organizing the courses, sending emails to the participants, organizing the XXX (i.e., specific activity) facilitating some activities during XXX (i.e., specific activity) and communicating with the teachers"</i> (Respondent 35, Female, 20 years old).
	Political engagement	This subtheme includes engagement in political activities, such as voting and protesting.	<i>"I voted. I wasn't home, I was in a different country. It was hard and inconvenient for me to do this, but I believe it is my duty to thick this off (i.e., do it)."</i> (Respondent 168, Male, 27 years old)

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Pandemic-related engagement (38.4%)	Initiatives directly related to the COVID-19 virus	This subtheme includes activities conducted to mitigate the risks linked to the COVID-19 virus and the restrictions imposed to contain its spread, such as helping vulnerable categories self-isolate and adhering to the official recommendations.	<i>“During the pandemic, I signed up as a volunteer to do shopping for the elderly who stay at home. I would talk to them on the phone, take the shopping list and leave their bags in front of the house.” (Respondent 73, Female, 26 years old)</i>
	Initiatives related to the wider impact of the COVID-19 pandemic	This subtheme includes activities conducted to mitigate the wider impact of the COVID-19 pandemic and of the associated restrictions, such as loneliness and enhanced financial struggles.	<i>“As we all know, this pandemic led to the beginning of an economic crisis whose presence will be felt even after the pandemic. Each person had to organize himself from an economic point of view; but those who had this problem before the pandemic felt the presence of this problem much more. In the association I belong to, we know that those who have had a hard time will have it even more during the pandemic. That’s why we decided to act before Christmas, offering different clothes, food, toys and personal hygiene products. The activity took place offline, going to the homes of needy people in the commune (i.e., rural area) with bags full of the previously mentioned objects; with the aim of helping and offering a smile to people before the holidays. I did nothing but help to distribute the bags; but I consider that even so it was a brave involvement, with a positive impact on my conscience and the whole community.” (Respondent 79, Male, 19 years old).</i>

Passing on knowledge

This subtheme showed up in almost half of the responses from this theme (47.16%) and it includes varied activities through which emerging adults wanted to share their knowledge about specific topics. Whereas in some instances these topics were specifically related to sharing their experiences with other members of student organizations: *“During the pandemic, I took part and still take part in the meetings of the volunteer association on behalf of the university to develop and improve projects that will be carried out in the online environment. In this activity, I came up with ideas and arguments and took on various tasks to help the process.”* (Respondent 8, Female, 20 years old), *“Well, first of all, the activity in which I was involved consisted in establishing a working strategy of a student organization for the current academic year. My role in this activity was to guide the new people who will deal with the implementation of this strategy and to give them advice.”* (Respondent 153, Male, 26 years old), many responses also included a focus on raising awareness about specific topics, such as discrimination, bullying and mental health. Raising awareness was often done in the formal setting provided by non-governmental organizations: *“I contributed to creating and delivering online sessions within a mental health campaign from XXX. I felt that I was sharing relevant and useful information for students regarding mental health.”* (Respondent 248, Female, 23 years old), *“I started volunteering for XXX, and during the pandemic I went through a series of modules through which I gained more knowledge about drugs, addictions and how to convey this information to teenagers. I was actively involved in the meetings, which took place exclusively online. It is important for me because this field attracts me, I would like to do addiction counseling someday. Also, many teenagers are at risk of consuming drugs, so I would like to be able to make a positive contribution when I get involved in prevention campaigns.”* (Respondent 210, Female, 22 years old), *“I was involved in an anti-bullying campaign that I coordinated and still coordinate. This aims to bring together specialists related to the decrease of bullying in schools, in order to provide them with information, but more than that, to help them create relationships at national level and collaborate on effective projects”* (Respondent 156, Female, 24 years old), *“With the end of the summer and the processing (to a certain extent) of the events that took place worldwide, I felt (more than before) the need for active involvement. Thus, I resumed my online volunteer activity that I had abandoned because it seemed too demanding and chaotic. I started to be active again within the association I belong to and had the initiative to coordinate an event for the first time. The latter (i.e., the event) consists in organizing and delivering workshops on discrimination (racial, gender, bullying, religious, etc.) to some high school students. The campaign was initiated by XXX. This is still ongoing*

as we wait for the right moment to hold the workshops in a physical format without exposing participants and facilitators to high risk. However, in addition to this activity, together with the team we are looking for alternative ways to promote inclusiveness and acceptance.” (Respondent 19, Female, 20 years old).

Some answers focused on narrow topics that did not repeat much, but the desire of passing on knowledge remained. For example, participants mentioned initiatives related to pollution: *“During the pandemic, I participated in an action in which I presented some of the aspects of pollution to secondary school students and asked them what they thought would be useful to do from that moment on to contribute to reducing pollution. The meeting took place online, the students were very interested, and their ideas were very good. Each of them made a promise at the end of the meeting. Some of them promised not to throw waste on the ground, for example. I think this is an important step, the awareness of bad habits. Their enthusiasm inspired me and I still believe that young people can change society. If for those past middle age change comes more difficult, young people can be shaped much more easily.”* (Respondent 240, Female, 26 years old) and traffic education: *“I was and still am a trainer/facilitator for traffic education classes dedicated to children between the ages of 9-12, the modules being delivered both online and in the physical environment. One of the moments when I realize that my activities really have an impact is when I see the children get involved and not only put into practice the information received, but also pass it on to their parents or friends”* (Respondent 165, Female, 22 years old), sometimes also highlighting their hope that the knowledge they shared will have a long-term impact (e.g., by “shaping” a generation more concerned about pollution in the first example or by knowing that participants sometimes share their learning with others in the second example). Similarly, other participants gave specific and sometimes very detailed examples of knowledge they passed on to others, such as information about the experience of being a medical student: *“During the pandemic, I had the opportunity to participate in 3 online projects to inform future medical students. 1 event was on a platform with former fellow volunteers from XXX. I talked to them for about 2 hours about the advantages and disadvantages of XXX (i.e., specific medical school in Romania). (...) and 1 is a video (...) in which, together with 2 other older colleagues from XXX (i.e., specific medical school in Romania), we respond to a set of approx. 50 questions about medicine”* (Respondent 184, Female, 19 years old) or teaching French: *“Starting from September last year and until February this year, as part of my XXX volunteer internship, I was a French teacher for an emigrant community in the north of France and through weekly French language classes, I helped a group of seven young women to integrate into the local community. The courses were held on site and as a result, the students declared that they have a*

more autonomous life, more self-confidence and increased chances of employment as well as improved interpersonal relationships. Specifically, thanks to the skills developed during the courses, they were able to go shopping, help children with their homework and complete administrative procedures.” (Respondent 76, Female, 27 years old).

Summing up, despite the wide range of topics approached, this subtheme captured emerging adults’ engagement in activities which allowed them to pass on their knowledge to other people, often motivated by the desire to raise awareness about social issues, such as discrimination and mental health.

Helping disadvantaged groups

Responses from this subtheme included activities aimed at helping people from disadvantaged groups: *“I participated in volunteering activities within school activities, within the institution where I carry out my activity. I organized volunteer campaigns, together with my colleagues, to help different social categories, especially children with health problems. We have created campaigns, sales exhibitions, fundraising activities. We donated toys and various other products to families with many children.”* (Respondent 60, Female, 28 years old), *“I help people with disabilities (autism, down syndrome, epilepsy, etc...) to live a better life. This is my job and I believe that by helping these people I am helping the community. By doing this, it shows me that I care about the people in the community I live with.* (Respondent 201, Male, 26 years old), *“I answered calls as part of a volunteering program that focuses on people at risk of suicide. It took place online/by phone. It is significant because I was able to help actively psychologically guide the distressed caller.”* (Respondent 160, female, 25 years old). Some of the answers from this theme also referred to providing financial help: *“I donated around 300 lei (i.e., Romanian currency) for planting trees, building hospitals, feeding children and adults in the Middle East, especially for those who are at war. I donated to support websites that offer free books and materials for knowledge and evolution of the IT field.”* (Respondent 20, Female, 22 years old), *“The only real support that I can say that I brought to the community was the money donations (via bank transfer) made to associations/foundations that helped people (especially children) with more serious health problems.”* (Respondent 164, Female, 27 years old).

Many of the responses from this subtheme also include mentions of other subthemes, such as *Passing on knowledge*: *“I have been a volunteer at XXX for 2 years and since the pandemic, I have been doing online activities with children from placement centers (i.e., places which provide housing and other social services to children separated from their parents). Even if it is online, I feel*

that I help the children a lot through the activities I do (online safety or math)” (Respondent 83, Female, 20 years old), “Starting from September last year and until February this year, as part of my XXX volunteer internship, I was a French teacher for an emigrant community in the north of France and through weekly French language classes, I helped a group of seven young women to integrate into the local community. The courses were held on site and as a result, the students declared that they have a more autonomous life, more self-confidence and increased chances of employment as well as improved interpersonal relationships. Specifically, thanks to the skills developed during the courses, they were able to go shopping, help children with their homework and complete administrative procedures.” (Respondent 76, Female, 27 years old).

Summing up, responses from this subtheme highlighted that some emerging adults engaged in activities which allowed them to use their resources and skills to help disadvantaged groups, such as people with health problems and children from poor backgrounds.

Organizing events

Responses from this subtheme were centered around organizing events for other people: *“I organized the first online public event of the organization. I was involved in its coordinating and promotion. We started by actively collaborating with the team and setting a strategy, then we started to implement the strategy and develop the event.” (Respondent 15, Male, 21 years old), “An event from the pandemic period, in which I was deeply involved, was the project XXX. I took care of organizing the courses, sending emails to the participants, organizing the XXX (i.e., specific activity) facilitating some activities during XXX (i.e., specific activity) and communicating with the teachers” (Respondent 35, Female, 20 years old).*

Some of the respondents from this subtheme overlapped with the subtheme *Passing on knowledge*: *“I am involved in a community where I carry out activities together with other people which involve different ways of expression through art, where I coordinated, participated, helped support this place and continue to do so, with the vision of creating something special in our city in terms of cultural life.*

These cultural events (local festivals, fairs, outdoor film screenings, organizing events with live music) help me to feel that I belong to a group of people, with whom I do these things, in whom I trust more and more and I continue to invest time and energy with a common goal that we have together, namely the creation of a playground for young adults who want to deepen their creative and artistic side through music, dance, painting, culinary arts, didactic arts and many others.” (Respondent 113, Male, 26 years old), “I was involved in an anti-bullying

campaign that I coordinated and still coordinate. This aims to bring together specialists related to the reduction of bullying in schools, in order to provide them with information, but more than that, to help them create relationships at the national level and collaborate on effective projects.” (Respondent 156, Female, 24 years old).

Summing up, this subtheme highlighted that some emerging adults got engaged in their communities by organizing events which could help other people. Besides conducting administrative tasks (e.g., sending emails), several of these emerging adults also facilitated specific activities with the goal of passing on knowledge.

Political engagement

Very few respondents mentioned getting involved through political channels, such as voting and protesting: *“I voted. I wasn’t home, I was in a different country. It was hard and inconvenient for me to do this, but I believe it is my duty to thick this off (i.e., do it).”* (Respondent 168, Male, 27 years old), *“I believe that such an incident would be the participation in the protests held by XXX regarding the cutting of free railway transportation for students. My involvement consisted in participating in various meetings in the online environment, about how to organize it, what steps to take, what slogans to have, how to respect the protection rules (i.e., related to COVID-19) and so on. It ended with the physical participation in the respective protest, in XXX. But until the protest, I also had discussions with my colleagues from XXX, and then I tried to convey the importance of involvement in this effort to the volunteers as well. At the same time, I shared the XXX posts on personal accounts, so that the message reaches as many people as possible, who feel like getting involved in their turn. I got involved in the protest by conveying, at the end, my point of view and the reasons why we as students deserve to fight for this right.”* (Respondent 180, Female, 22 years old). Few of the respondents also mentioned singing petitions supporting different causes: *“I signed petitions for Greenpeace for the various events that they voice. It was the online signature for forests/animals on the brink of extinction, etc., it depends on the context and topic. I have always been for the natural environment and the importance of nature in a human context.”* (Respondent 179, Female, 26 years old), *“I filled out the petitions from XXX, I contributed to research by filling in questionnaires - I think that every person who does this helps to make a big change, so every vote given and every completed questionnaire helps someone - both took place online.”* (Respondent 236, Female, 23 years old)

Summing up, this subtheme captured that some emerging adults engaged in activities which aimed to influence political decision-making, such as protesting and voting. However, their number is very low.

Theme 2. Pandemic-related engagement in the community

This theme captures activities in which emerging adults engaged in order to help their communities through the difficult circumstances cause by the COVID-19 pandemic. Whereas the first subtheme (i.e., *Initiatives directly related to the COVID-19 virus*) focuses on activities related to the dangers of the virus, the second one (i.e., *Initiatives related to the wider impact of the COVID-19 pandemic*) includes activities related to the wider impact of the pandemic and of the restrictions on other life domains, such as mental health problems and financial struggles.

Subtheme 1. Initiatives directly related to the COVID-19 virus

This subtheme focuses on the activities conducted in order to help mitigate the unique risks associated with the COVID-19 virus and the measures imposed to handle it. Many of the activities from this subtheme aimed to provide help to the categories most vulnerable in the face of the virus: *“It was about helping the most vulnerable people and with an increased risk of having serious consequences after being infected with sars-cov2 by doing their shopping or providing them with the necessary things without having to leave the house.”* (Respondent 189, Female, 25 years old). As the elderly were one of the most vulnerable categories in the face of the virus, they were often mentioned in this subtheme: *“I helped the elderly in the block (i.e., of flats) with the supply of essential products/medicines, basic foods, paying the bills.”* (Respondent 16, Male, 28 years old), *“During the pandemic, I signed up as a volunteer to do shopping for the elderly who stay at home. I would talk to them on the phone, take the shopping list and leave their bags in front of the house.”* (Respondent 73, Female, 26 years old), *“I contributed to very important causes to save lives. Even if sometimes the cases we go to with the ambulance are not necessarily medical emergencies, a kind word and a handshake can do more than anything. In addition to the actual shifts on the SMURD (i.e., Romanian Mobile Emergency, Resuscitation and Discharge Service) special vehicle, during the state of alert I was also a volunteer at the DSP (i.e., Directorate of Public Health) where I helped enter data into the computer.”*

One of the incidents in which I felt a special contribution, was when I went to see a very nice grandmother, who had an altered general condition and had many health problems. She appreciated every single word and thanked me countless times for every intervention. She told me that I have a very light hand for a nurse and wished me all the best in the world and to succeed in life, learn and be a good person with patients. These words make you understand that what you do is very important for the community, and people in suffering need helpers with a good heart, who will understand their suffering and then solve their problems.” (Respondent 119, Female, 21 years old).

Getting engaged in order to help vulnerable categories protect their health was also mentioned by a respondent who volunteered in an oncology hospital: *“At the beginning of the pandemic, I was a volunteer at an oncology clinic in XXX County, where young volunteers without comorbidities were needed to help triage patients. I went every day from morning to evening and filled in the triage sheets of the patients, dressed them appropriately with disposable materials (because many of the patients were unable to dress themselves due to oncological problems) and directed them to the office/salon where they were expected. I really liked this type of volunteering because I felt that those people needed me and I was there to help them. I felt appreciated by both the patients and the doctors in that clinic for the courage I have. At the beginning of the pandemic, the world was much more scared than it is now, and I think that few people would have done what I did.” (Respondent 274, Female, 25 years old).*

A few of the respondents mentioned helping to mitigate the dangers of the virus by getting vaccinated and following the official recommendations of the national authorities: *“Honestly, all I can say I did was follow the social distancing rules etc. It seems to me that I helped stop the spread of COVID-19 and the moment I got infected, I locked myself in the house:)). And now I can say that I am trying to help by getting vaccinated and supporting it, promoting it among the people around me and not only.” (Respondent 235, Female, 21 years old), “For me, the involvement in the community that had increased personal significance was represented by making the decision about vaccination against COVID. Although I was not afraid of this virus, I considered that by vaccinating, I can contribute to getting things back to 'normal' as much as possible, and as far as it is in my control. For me, vaccination primarily denotes respect for other people and responsibility for the needs of those around me. I don't know if the fact that I live with my grandmother had some influence on this or not. I think it's possible because I considered her to be in the category of people who are vulnerable.” (Respondent 245, Female, 23 years old).*

Summing up, this subtheme captured the varied ways in which emerging adults got engaged to help mitigate the unique risks of the COVID-19 virus. While some of them took a more general approach by getting vaccinated and respecting the official recommendations, others engaged to specifically help the categories most vulnerable to the virus, especially the elderly.

Subtheme 2. Initiatives related to the wider impact of the pandemic and the restrictions

This subtheme included activities aimed at addressing the wider impact of the pandemic and of the restrictions imposed to stop its spread, especially self-isolation. For instance, some respondents got engaged in activities aimed at helping people handle the consequences of self-isolation, such as the lack of physical exercise and loneliness: *“together with the XXX association, we organized an online training in which we brought a speaker from XXX (i.e., foreign country), who is a fitness trainer, and we held an event about how to do sports safely at home, what movements and exercises to do, and it was significant because, especially during the pandemic, many people remained sedentary and I think this event helped them”* (Respondent 9, Female, 19 years old), *“In the faculty, I participated in several online social activities (game night, movie evenings, socializing evenings). I tried to gather more people together (in some cases I also organized the events) to have fun together, to get to know each other better, to create a better atmosphere related to online activities (not just the stress of projects). I think that during the pandemic, relations cooled down, the number of interactions with colleagues and other people decreased, and in some cases a need for human contact and a feeling of loneliness began to develop. The events were aimed at creating bonds of friendship between people, reducing feelings of loneliness and increasing the quality of life during the Corona period, when social relations began to suffer.”* (Respondent 96, Male, 26 years old). Loneliness was also mentioned by other respondents, some of which also referred to the need to address mental health problems: *“I volunteered in 2 support telephone lines for people who feel lonely and a telephone line for anxiety and depression. At the beginning of the pandemic, all the activity of these lines moved online, so I was able to become a volunteer.”* (Respondent 243, Female, 22 years old), *“Together with my colleagues, I created a free psychological support page for all interested people. Being at the beginning of the pandemic, things were uncertain, panic set in and people became very anxious. I also created a platform where I wrote articles in a non-academic language, an Instagram page where I post things, precisely to have access to as many age groups as possible.”* (Respondent 192, Female, 28 years old)

Some of the respondents mentioned getting engaged to help tackle the impact of the pandemic on those struggling financially and the deepening of already existing social inequalities: *“As we all know, this pandemic led to the beginning of an economic crisis whose presence will be felt even after the pandemic. Each person had to organize himself from an economic point of view; but those who had this problem before the pandemic felt the presence of this problem much more. In the association I belong to, we know that those who have had a hard time will have it even more during the pandemic. That's why we decided to act before Christmas, offering different clothes, food, toys and personal hygiene products. The activity took place offline, going to the homes of needy people in the commune (i.e., rural area) with bags full of the previously mentioned objects; with the aim of helping and offering a smile to people before the holidays. I did nothing but help to distribute the bags; but I consider that even so it was a brave involvement, with a positive impact on my conscience and the whole community.”* (Respondent 79, Male, 19 years old).

Several respondents mentioned getting engaged to address the impact of the pandemic on education: *“At the moment I am part of the XXX team, as a mentor. My activity involves a weekly meeting with a group of first-year freshmen from the Faculty of XXX. In these meetings, I, as a mentor, have the duty to be a support for freshmen in any difficulty/question/situation they have. In the 2 meetings I've had so far, I've answered students' questions about note-taking, how to study effectively, classes, teachers, organizational aspects, and I've held get-to-know-you activities with freshmen. Meetings take place online. These meetings are valuable to me because I want to help those with less experience during this difficult time, especially since college is online. (...) I think my involvement in this activity is of great benefit to freshmen, as I hope to contribute to the prevention of college dropout and to be able to be a support for those who are starting this new stage in their lives.”* (Respondent 1, Female, 22 years old), *“An event from the pandemic period is related to the moment when we resumed doing activities with children from families that do not have a favorable situation. After a period when they were locked up and had no one to guide them, we were able to get involved in their education. For me it was meaningful because I was able to help develop a child in terms of education. My responsibilities were to help them solve their homework, do recreational activities and prepare with them in the subjects they were not able to cope with.”* (Respondent 53, Female, 22 years old).

Summing up, this subtheme captures that some emerging adults got engaged in tackling the wider impact of the pandemic on varied domains, such as mental and physical health, education and financial struggles.

DISCUSSION

There have been growing concerns about the declining rates of civic engagement, especially in the understudied region of Eastern Europe (Ekman et al., 2016; Zaff et al., 2011). However, the COVID-19 pandemic created a societal crisis during which community engagement may have been unusually high, especially among emerging adults. Therefore, our study aimed to take an in-depth look at how Eastern European emerging adults engaged during the COVID-19 pandemic.

Types of civic engagement: General engagement

Two broad categories of community engagement were identified: *General engagement* (61.6%), and *Pandemic-related engagement* (38.4%). Interestingly, the majority of respondents reported involving in activities not directly related to handling the COVID-19 pandemic, although they were detailing activities which took place during it and were sometimes influenced by the pandemic conditions (e.g., conducting a workshop online instead of offline due to safety concerns and/or regulations). This is particularly interesting because the previous literature on community engagement during the pandemic had a strong focus on actions directly linked with the pandemic or its broader consequences on important life domains (e.g., Mao et al., 2021). Therefore, our results shed light on the understudied forms of engagement conducted during the pandemic, without being directly linked to it, and possibly suggest ways of engagement emerging adults also prefer in non-crisis times. Interestingly, several of these subthemes could be related to generativity, a concept broadly defined as “*the human experience of contributing to and promoting lives of others and oneself.*” (Kim et al, 2017, p.7).

The most popular subtheme was *Passing on Knowledge* (47.16% from the responses from this theme), which was often linked to emerging adults’ desire to raise awareness about social issues: “*I contributed to creating and delivering online sessions within a mental health campaign from XXX. I felt that I was sharing relevant and useful information for students regarding mental health.*” (Respondent 248, Female, 23 years old)”. This subtheme resembles one of the facets of generativity included in the Loyola Generativity Scale (McAdams & St. Aubin, 1992), namely passing on knowledge, skills, and so on, to others, especially those from future generations. Our responses do not necessarily suggest a focus on the next generations, which aligns with the more recent perspective that generativity is not only relevant for older adults and limited to concern for future generations (e.g., Kim et al., 2017).

The subtheme *Helping disadvantaged groups* referred to activities conducted mainly to help specific disadvantaged categories, such as children with health problems: *“I participated in volunteering activities within school activities, within the institution where I carry out my activity. I organized volunteer campaigns, together with my colleagues, to help different social categories, especially children with health problems. We have created campaigns, sales exhibitions, fundraising activities. We donated toys and various other products to families with many children.”* (Respondent 60, Female, 28 years old). This subtheme also resembles a facet of generativity from the Loyola Generativity Scale (McAdams & St. Aubin, 1992), namely caring for and taking responsibility for other people.

The subtheme *Organizing events* centered around playing a role in the organization of events for other people, sometimes overlapping with the respondents’ desire to pass on their knowledge: *“I was involved in an anti-bullying campaign that I coordinated and still coordinate. This aims to bring together specialists related to the reduction of bullying in schools, in order to provide them with information, but more than that, to help them create relationships at the national level and collaborate on effective projects.”* (Respondent 156, Female, 24 years old). This subtheme could also be related to facets of generativity, such as making valuable contributions to the betterment of one’s community (if respondents are organizing these events in hopes of improving their community) or caring for and taking responsibility for other persons, as other people will be benefiting from them (McAdams & St. Aubin, 1992). However, the similarity is less clear than in the case of the previously mentioned subthemes.

The last subtheme refers to *Political engagement*, with very few respondents mentioning political forms of engagement, such as voting: *“I voted. I wasn’t home, I was in a different country. It was hard and inconvenient for me to do this, but I believe it is my duty to thicken this off (i.e., do it).”* (Respondent 168, Male, 27 years old) and signing petitions which could potentially influence decision-making: *“I signed petitions for Greenpeace for the various events that they voice. It was the online signature for forests/animals on the brink of extinction, etc., it depends on the context and topic. I have always been for the natural environment and the importance of nature in a human context.”* (Respondent 179, Female, 26 years old). What makes these results particularly worrying is that data collection was conducted shortly after the Romanian Parliamentary Elections from December of 2020. According to the official statistics released by the Romanian Permanent Electoral Authority (2020) only 31.84% of the eligible population voted in these elections. Taking a closer look at youth, The Romanian National Youth Council (2020) points out that, despite an increase from the attendance rate from the last parliamentary elections, as

much as 74.61% of the Romanians aged between 18 and 24 years old did not attend the elections. This percentage could be partially explained by the fact that the pandemic context prevented some youth from voting. However, the low prevalence of political engagement is worrying, as it could suggest a strong political apathy among Romanian emerging adults that might also be reflected in the results of the several important elections from 2024.

Although the types of engagement from this theme are not directly related to handling the pandemic, these emerging adults may have been motivated to get engaged by the uncertainty and challenges of the pandemic. Previous research suggests that, when faced with the crisis generated by the war in Ukraine, Romanians' motivations for engagement were related to the desire to express their personal values (Marinica & Negru-Subtirica, 2023). However, this study did not assess whether respondents also got engaged in activities not directly related to the war in Ukraine. Therefore, it is possible that crisis situations, like the war in Ukraine and the COVID-19 pandemic, could make emerging adults more willing to engage civically in diverse activities which allow them to act upon their values, not just in activities directly related to the crisis that enhances their motivation. However, for some respondents, engagement unrelated to the crisis could simply be a continuation of their previous activities, as is the case for the volunteers who decided to pass their knowledge to the younger generation from their student organization: *“Well, first of all, the activity in which I was involved consisted in establishing a working strategy of a student organization for the current academic year. My role in this activity was to guide the new people who will deal with the implementation of this strategy and to give them advice.”* (Respondent 153, Male, 26 years old).

While it is possible that these students would have carried out these activities in non-crisis times as well, without the pandemic playing a crucial role in their decision to remain engaged, it is notable they did not stop their engagement during the pandemic. In line with research suggesting that those who stopped their engagement during the pandemic might be particularly hard to re-engage (Gray et al., 2024), organizations and institutions working with volunteers should prioritize helping their volunteers to remain engaged during crises. Although the help of new volunteers can be crucial in times of crisis, those with more experience could have an easier time adapting to the challenges, as they are already familiar with the procedures and tasks from the organization. Therefore, organizations should ideally welcome new volunteers, while also helping the old ones adapt to the new circumstances. In line with the activities identified in this theme, it is possible that one way to attract Eastern European emerging adult volunteers is by creating opportunities which allow them to pass on their knowledge, help disadvantaged groups, and organize events.

Types of civic engagement: Pandemic-related engagement

In line with the previous literature on community engagement during the COVID-19 pandemic (e.g., Mao et al., 2021), several respondents (38.7%) got involved in activities related to the pandemic context. Thematic analysis revealed two subthemes: *Initiatives directly related to the COVID-19 virus*, and *Initiatives related to the wider impact of the COVID-19 pandemic*.

The first subtheme included activities which were aimed at mitigating the risks of the COVID-19 virus, such as delivering food and medicine to the elderly who needed to self-isolate: *“I help the elderly in the block (i.e., of flats) with the supply of essential products/medicines, basic food, paying the bills.”* (Respondent 16, Male, 28 years old). This aligns with the results of a rapid review about COVID-19 volunteering in the United Kingdom, which found that food shopping was one of the most prevalent activities, especially at the beginning of the pandemic (Mao et al., 2021), with people self-isolating and the elderly being perceived as the most vulnerable categories (Jones et al., 2020). Besides providing help to the most vulnerable categories, a few of the respondents also mentioned following the official recommendations as a way of contributing to their community by limiting the spread of the virus and protecting their loved ones, despite not perceiving themselves at risk: *“For me, the involvement in the community that had increased personal significance was represented by making the decision about vaccination against COVID. Although I was not afraid of this virus, I considered that by vaccinating, I can contribute to getting things back to 'normal' as much as possible, and as far as it is in my control. For me, vaccination primarily denotes respect for other people and responsibility for the needs of those around me. I don't know if the fact that I live with my grandmother had some influence on this or not. I think it's possible because I considered her to be in the category of people who are vulnerable.”* (Respondent 245, Female, 23 years old). This aligns with research showing that some Romanians' decision to get vaccinated was not always driven by medical concerns, but sometimes by the desire to protect those around them and a perceived civic duty to do so (Mărcău et al., 2022).

The second subtheme was *Initiatives related to the wider impact of the COVID-19 pandemic*, which differentiates itself from the first subtheme because it can include activities which are not so specific to the challenges of the pandemic, but which address its wider impact on different life domains, such as feeling lonely or being sedentary as a result of quarantines. Respondents from this subtheme often emphasized how the wider impact of the pandemic motivated them to get engaged in these activities: *“we held an event about how to do sports safely at home, what movements and exercises to do, and it was significant because,*

especially during the pandemic, many people remained sedentary and I think this event helped them” (Respondent 9, Female, 19 years old), *“I think that during the pandemic, relations cooled down, the number of interactions with colleagues and other people decreased, and in some cases a need for human contact and a feeling of loneliness began to develop. The events were aimed at creating bonds of friendship between people, reducing feelings of loneliness and increasing the quality of life during the Corona period, when social relations began to suffer.”* (Respondent 96, Male, 26 years old). This aligns with the results of the review about COVID-19 volunteering in the United Kingdom which found that, as the pandemic prolonged, more and more people got engaged in addressing the wider influence of the pandemic on other domains, such as employment and mental health (Mao et al., 2021). Choosing to engage in this way could also be related to the limited number of necessary volunteers for the activities directly related to the pandemic (e.g., Simsa et al., 2019). Therefore, it is possible that some emerging adults got engaged in ways less directly related to the pandemic simply because these actions were more accessible to them. Considering the low level of engagement in Eastern Europe (Kostelka, 2014), the crisis created by the COVID-19 pandemic could have been an opportunity to engage a population otherwise unengaged. In our sample, this seems to be the case for 17.4% of the respondents. Keeping these volunteers engaged in the long run could be an important first step towards slightly increasing civic engagement among emerging adults in Eastern Europe, in line with research suggesting that the majority of COVID-19 volunteers planned to continue volunteering (Gray et al., 2024). Therefore, non-governmental organizations and other institutions working with volunteers during crisis situations could focus on trying to maintain new volunteers engaged in the long run, possibly including them in new types of activities after the crisis is over. Keeping these new volunteers engaged could enhance the benefits of volunteering not only on the individual level (e.g., by providing emerging adults with additional opportunities), but also on the social level by addressing community’s problems and supporting democracy in Eastern Europe by increasing community engagement (Koc-Michalska et al., 2024).

CONCLUSION

Our paper contributes to the scarce literature on community engagement among Eastern European youth by researching how Romanian emerging adults get engaged in times of crisis. Two main themes were identified regarding their community engagement during the COVID-19 pandemic: *General engagement* (subthemes *Passing on knowledge, Helping disadvantaged groups, Organizing*

events, and Political engagement), and Pandemic-related engagement (subthemes Initiatives directly related to the COVID-19 virus, and Initiatives related to the wider impact of the COVID-19 pandemic), suggesting that many emerging adults got engaged in activities which were not directly related to the pandemic and very few got engaged through political channels. Future research should focus on taking a comprehensive approach of community engagement, while investigating ways to engage youth in diverse activities, including those related to political channels.

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The authors have equally contributed to the manuscript.

Declaration of interests

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Implicit and Explicit False Memories conditioned by lapse of time

Andreea HOROIȚĂ¹, Adrian OPRE^{2*} 

ABSTRACT. False memories represent distorted memories which are remembered incorrectly or didn't happen at all in reality. In the present study, the period of time between encoding and testing has been manipulated, in order to explore the effects of delay on implicit and explicit false memories. Two groups of subjects were tested, using the DRM paradigm, for false implicit and explicit memories. One group had no delay period between encoding and test phases, the other group was tested at one week delay after the encoding phase. Results showed no significant differences between implicit and explicit false memories. The delay had significant effect only for true memories, which were significantly lower after one-week delay. Conclusions and future directions of research are discussed.

Keywords: False memories, implicit false memories, explicit false memories, true memories, delay.

ABSTRAKT. Falsche Erinnerungen sind verzerrte Erinnerungen, an die man sich falsch erinnert oder die in der Realität überhaupt nicht stattgefunden haben. In der vorliegenden Studie wurde der Zeitraum zwischen Kodierung und Test manipuliert, um die Auswirkungen der Verzögerung auf implizite und explizite falsche Erinnerungen zu untersuchen. Zwei Gruppen von Probanden wurden mithilfe des DRM-Paradigmas auf falsche implizite und explizite Erinnerungen getestet. Eine Gruppe hatte keine Verzögerungszeit zwischen der Kodierungs- und der Testphase, die andere Gruppe wurde mit einer Woche Verzögerung nach

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- ¹ PhD student, Doctoral School of Applied Cognitive Psychology, Department of Psychology, Faculty of Psychology and Educational Sciences, Babes-Bolyai University. E-mail address: andreeahoroita@psychology.ro
 - ² Professor PhD, Dean, Faculty of Psychology and Educational Sciences, Babes-Bolyai University. E-mail address: adrianopre@psychology.ro
- * Corresponding author: adrianopre@psychology.ro



der Kodierungsphase getestet. Die Ergebnisse zeigten keine signifikanten Unterschiede zwischen impliziten und expliziten falschen Erinnerungen. Die Verzögerung hatte nur bei echten Erinnerungen signifikante Auswirkungen, die nach einer einwöchigen Verzögerung deutlich geringer waren. Schlussfolgerungen und zukünftige Forschungsrichtungen werden diskutiert.

Schlüsselwörter: Falsche Erinnerungen, implizite falsche Erinnerungen, explizite falsche Erinnerungen, wahre Erinnerungen, Verzögerung.

INTRODUCTION

False memories refers to certain events that are misremembered or are remembered, but never happened (Roediger & McDermott, 1995). During the last 20 years, researchers investigated both explicit and implicit false memories. Attention grew for implicit false memories when both perceptual and conceptual implicit tests revealed false memories in participants answers (McKone & Murphy, 2000). The difference between explicit and implicit false memories resides in the testing phase, where if an explicit test is used, then it has been measured as an explicit false memory, and if an implicit test is used, it has been measured as an implicit false memory. Either it's explicit or implicit, false memories appear to be robust, as they appear in participants answers throughout all scientific studies.

Explicit memory refers to the post-event stimulation that is remembered consciously and at the demand of the experimenter. Implicit memory, on the other hand, refers to post-event stimulations that are remembered unconsciously, where the participant is asked by the experimenter to say the first thing that comes to mind (Graf & Schacter, 1985; as cited in Opre, 2012).

False memories have been studied in laboratory settings using the misinformation paradigm (Loftus, 1979) or the Deese-Roediger-McDermott paradigm (DRM) (Deese, 1965; Roediger & McDermott, 1995). The present study will use the former investigation paradigm, DRM. In this paradigm, the participants are presented with lists of words semantically associated between them and strongly associated with a word that is not presented, called the Critical Lure. After a certain amount of delay, participants memory is submitted to the test and participants are asked to recall or recognise the words presented earlier. About half of them usually will remember the Critical Lure also (Roediger & McDermott, 1995), which was never presented, and is called in the scientific literature *false memory*. The memory tests used for this paradigm are usually explicit memory tests and are part of the concept of *remembering*.

In the last years, false memories have been also investigated, using the DRM paradigm, at the implicit level, and research shows that both perceptual and conceptual implicit memory tests reveal false memories (McKone & Murphy, 2000; Garfinkel, Dienes & Duka, 2006; Van Damme & d'Ydewalle, 2009; McBride, Coane & Raulerson III, 2006; Schacter, Gallo & Kensinger, 2007; Cabeza & Lennartson, 2005; Marini, Agosta, Mazzoni, Barba & Sartori, 2012; McKone, 2004; Kawasaki & Yama, 2006; Tajika & Neumann, Hamajima & Iwahara, 2005; Van Damme & d'Ydewalle, 2010; Lovden & Johansson, 2003; Hicks & Starns, 2005; McDermott, 1997).

In the Deese-Roediger-McDermott paradigm (Deese, 1959; Roediger & McDermott, 1995), researchers have found that the delay between the encoding and testing phases have an effect on the memory tests. There have been found effects of 2 days delay on recall test (McDermott, 1996), which increased false recall over veridical recall. Those results were in line with previous prose literature (Sulin & Dooling, 1974; Bartlett, 1932; Spiro, 1980; as cited in McDermott, 1996). The delay between encoding and testing phase has had an effect on an EMDR task also, where false recall and false recognition were higher than veridical recall and recognition after 2 days delay, even though EMDR has proven to reduce false memories when there is no delay involved (Houben et al., 2020). Moreover, new research show that delay doesn't make fade the differences between true and false memories (Neuschatz et al., 2010), contrary to theories as source monitoring framework or fuzzy-trace theory. In the source monitoring theory, it has been interpreted that true and false memories distinguish less as the time period between study and test increases (Belli & Loftus, 1994; as cited in Neuschatz et al, 2010). In the fuzzy-trace theory it has been stipulated that verbatim traces disintegrate into parts that may adhere to gist traces, which will make seem the gist traces very similar to verbatim traces (Reyna & Titcomb, 1996). However, new research indicate that although characteristics of both true and false memories decrease over time, they still remain present after 2 days delay (Neuschatz et al., 2010).

It has been well known in the scientific literature that the longer the delay is, the harder the accurate recall is, the more the false memories increase (Brainerd & Reyna, 1996). The longest delay between the encoding and the test phases was 2 weeks (Brainerd & Reyna, 1996). In the short and immediate memory testing, researchers have used math exercises to distract the subjects from the encoding phase, in order to accurately test what participants truly remembered after the word lists exposure. For the longer delays, participants will lead their daily activities, so there is no need to distract them from the encoding phase. Given that memory resides on the concept of time, the objective of the present study is to investigate the effects of one week delay on implicit and explicit false memories.

MATERIALS AND METHODS

Participants

A total of 113 university students in their first academic year participated in this study. They were divided into two groups, the *Delay group* and the *No Delay group*. Their participation was voluntary and they were randomly assigned in the two groups. At the end of the study, each 30st participant received a self-help book as a reward.

The two groups, Delay and No Delay, were created according to the assignment of the academic class. In the end we had two groups of students for each group of participants. We couldn't control for their second participation in the delay group, and we have excluded participants based on their answers at a specific questionnaire: Awareness Questionnaire. Therefore the groups don't have an equal number of participants. Out of the 113 participants, 78 were assigned to the No Delay group (42 females, 4 men, 1 nonbinary, 3 undeclared, 27 with no gender and age specification; $M_{age}= 19.4$, $SD_{age}=1.20$) and 35 to the Delay group (6 females, 2 males, 27 with no gender and age specification, $M_{age}=19.5$), according to the class assignment. After the exclusion criteria based on the Awareness Questionnaire, the No Delay group had 56 participants for Implicit False Memory test and 75 participants for Explicit False Memory test. The Delay group had 24 participants for Implicit false memory test and 34 participants for Explicit False Memory test.

Instruments

A total of 12 lists of DRM words were used. Each list had 1 critical lures and 15 associated words. The DRM lists of words were created according to McKone (2000), Van Damme & d'Ydewalle (2009), and Stadler et al (1999). Both created in Romanian language and translated from English to Romanian lists of words were used for this study, as there are no statistical differences between them (Horoitã & Opre, 2020).

It was necessary to respect the standards for word stem completion test (Graf & Schacter, 1985; as cited in Opre, 2012; as cited in Van Damme & d'Ydewalle, 2009). Therefore all words had a minimum of 4 letters long, their 3-letter stem had a minimum of 7 different word completion, and all lures and presented items had 3 different letters in their stem. In addition, it was necessary to ensure that their baseline completion rate is not too high, in order to avoid ceiling effects on priming scores. In order to accomplish all criteria for DRM lists of words that were about to be used in a word stem completion task, two pilot studies were conducted before the present study.

The first pilot study took place in order to ensure the baseline completion rate of lures, as to avoid ceiling effects. A total of 47 first year students completed 30 lures words stem with the first word that come to mind. The lures were chosen from the validated DRM lists in Romanian language (Horoiță & Opre, 2020), in keeping the standard of maximum 45 % completion rate in the first pilot study. At the end of Pilot I study, a total of 12 critical lures were chosen to form the 12 DRM lists of words matching the word stem completion test. 15 associate item target words, with the highest to lowest association frequency, were then chosen to form the 12 DRM lists (Horoiță & Opre, 2020). In the encoding phase, we have chosen to use only 10 associates per list, in order to avoid memory loading.

A second pilot study was taken to match the list targets to critical lures on word frequency and baseline completion rate, as this is known to influence repetition priming (Scarborough, Cortese, & Scarborough, 1977; as cited in McKone, 2000). Therefore, 35 first year students completed 36 stem words with the first word that came to mind. Target words were chosen from position 3,4 and 5 from each list, therefore we had 36 list items matching the critical lures on word frequency and baseline completion rate. Out of the three target words, one was chosen to best fit the closest baseline completion rate of each lure for each DRM list. Therefore, critical lures were matched to list targets on word frequency (M= 37 and 27 occurrences per million, ranges 2 to 221 and 1 to 117, with frequency counting based on the Romanian lexical database of Brysbaert & New, 2009) and baseline completion rate (M=12% and 8 %, ranges 4 to 37 and 1 to 62).

The 12 DRM lists were then divided into two sets of 6 DRM lists, to allow counterbalancing of studied vs nonstudied words. The sets were matched as closely as possible on word frequency and baseline completion rate, as in previous implicit false memories studies (McKone, 2000; Van Damme & d'Ydewalle, 2009). The target words which were to be tested were not allowed to appear in the first two or last two positions in the DRM lists.

The list of words to be tested was constructed from 6 list targets from each DRM studied list, 6 critical lures from each DRM studied list, 12 distraction words created from 6 list targets and 6 critical lures from the unstudied DRM lists, giving us a total of 24 words to be used in the testing phase. The distractor words will provide as baseline scores, in order to reduce explicit contamination of implicit false memories results (McKone & Murphy, 2000).

Procedure

University students in their first academic year were tested in students groups in two rounds, for each group assignment, Delay and No Delay. Each

group received the Informed Consent and the study instructions. They were not told that this a study that investigates memory, they were told that the study investigates words, their participation is voluntary and there is a reward for each 30st participant. Participants read the Informed Consent and signed it. Each group received afterwards the encoding phase, where the 6 studied DRM lists were presented in the same word order to them. The instruction for the encoding phase was „Please read carefully the next words which will be presented to you”. Participants view 60 words on a PowerPoint display, at a 2s interval between them. The critical lures were not displayed, and each DRM list was separated from the next one by *, at a 4s duration.

The next step was the test phase, which for the No Delay group was done immediately, and for the Delay group was one week after the encoding phase. In the test phase, all participants received instructions for an implicit task and an explicit task, in this particular order because if the explicit test were to be used before the implicit test, the explicit contamination could have been higher (McKone, 2004). For the implicit task, a word stem completion test was used. Subjects received the instruction to write down the first word that come to mind which complete the stems they will view on the slides. The experimenter used an example for better understanding of the task. The 24 word stems were presented on a PowerPoint display, at a 4s interval, which had the same writing font. Participants wrote down the first word that came to mind which completed the stems from the slides on a paper sheet, that contained only the instruction, given by the experimenter. They were instructed to leave blank the stem for which they can't find a word. After the implicit test, all participants received an Awareness Questionnaire, in order to avoid explicit contamination. Following McKone & Murphy (2000), they were asked: (1) “What was your general strategy when completing the word stems?”; (2) “Did you deliberately try to complete stems with words you remembered from the study lists?”; and (3) “Did you complete stems with whatever word popped into your head first?”. Not all participants responded *no* to question number 2 and *yes* to question number 3, therefore they were excluded from the study.

After the implicit task, the explicit task followed, in which we have used the same type test, word stem recall. Subjects were asked on a A4 paper to write down all the words they can remember from the previous word presentation, that could complete the letters on their paper. The specific instruction was “Please write down a word that you can remember from the previous lists of words that you saw in the previous presentation, which complete the following sets of letters. If you don't remember the word, please leave the space uncompleted and move to the next word.”. The 24 stems were already printed on the paper they received, along with the instruction. *59 Participants received*

the Awareness Questionnaire for this explicit task also, and 54 did not, therefore the authors decided to include all 54 answers, as the instruction for explicit task is clearly explicit, therefore all participants deliberately tried to remember the words seen before in the word presentation.

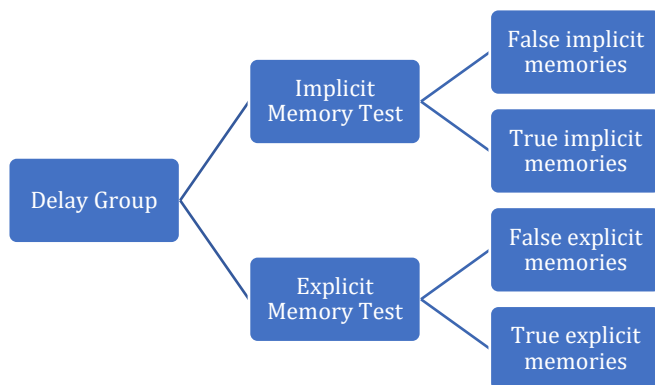
No time constraints were used for this explicit task.

At the end of the experimenter, four reward books were handed out to the participants.

RESULTS

The design of the present study is Delay Interval(Absent x Present) x Type of Memory Test (Explicit Memory x Implicit Memory) x Item Type(Targets x Lures). The independent variable is the Delay interval, the between factor, which randomly formed the groups No Delay and Delay. The dependent variables are type of memory test (explicit vs implicit), and type of memory items (true-targets vs false-lures). For a more accurate view of the design, Fig.1 shows all variables used in the present study.

We have first analysed, using a dependent T test, the differences between studied and unstudied words, for each of the groups. Significant differences were found for the (No Delay) Explicit Targets, $t(74)=13.73$, $p<.001$, Cohen's $d= 1.58$, (No Delay) Implicit Targets, $t(55)= 5.98$, $p<.001$, Cohen's $d= 0.79$, and for the (Delay) Explicit Targets, $t(33)= 6.30$, $p<.001$, Cohen's $d= 1.41$.



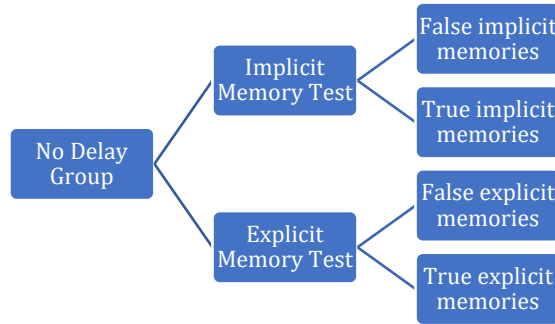


Fig. 1. The design of the study

Table 1 shows the proportions for implicit and explicit memory, both lures (false memory) and targets (veridical memory), for No Delay group and Delay group, and Fig. 2 a visual representations of the mean proportions for true and false memories, implicit and explicit, at No Delay and Delay conditions.

Table 1. Mean proportions and Standard Deviations for Explicit and Implicit Lures and Targets in the No Delay and Delay Groups

		Explicit Test			Implicit Test		
		Studied	Unstudied	Memory Scores	Studied	Unstudied	Memory Scores
No Delay Group	Target List (N=75; N=56)						
	M	3.63	1.31	2.32	2.86	1.75	1.11
	SD	1.35	0.822	1.46	1.14	0.83	1.38
No Delay Group	Lures (N=75; N=56)						
	M	2.31	1.83	0.493	2.00	2.34	-0.339
	SD	1.36	1.16	1.55	1.10	0.793	1.40
Delay Group	Target List (N=34; N=24)						
	M	2.71	1.29	1.41	2.08	1.50	0.583
	SD	1.24	0.719	1.31	0.776	0.834	1.14
Delay Group	Lures (N=34, N=24)						
	M	2.24	2.21	0.05	1.71	2.17	-0.458
	SD	1.18	0.845	1.15	1.30	0.868	1.18

Note. Proportions of Means and Standard Deviations for Implicit and Explicit True (Targets) and False Memories (Lures) in No Delay and Delay Groups, for each participant. *M*=mean, *SD*=Standard Deviation.

IMPLICIT AND EXPLICIT FALSE MEMORIES CONDITIONED BY LAPSE OF TIME

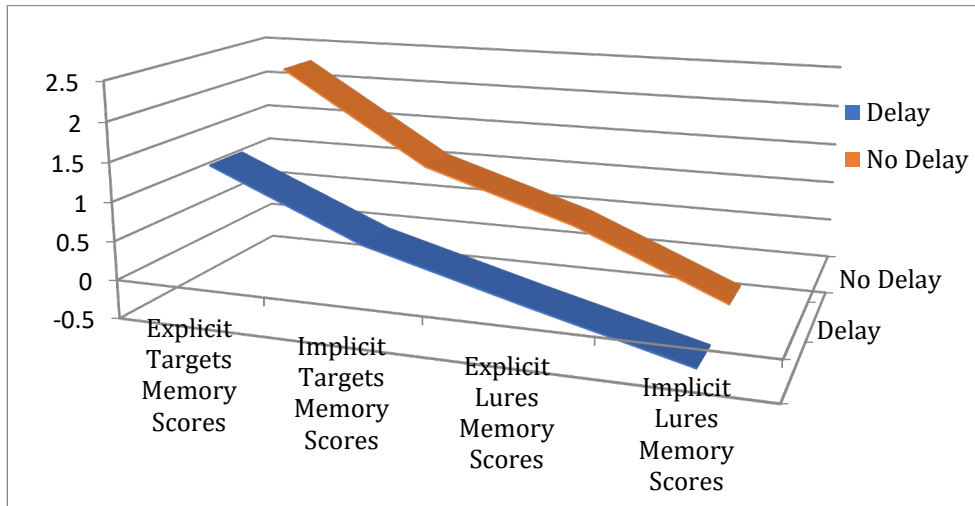


Fig 2. Proportion of memory scores (Studied-Unstudied) for each condition and each group.

We can read from the table that most studied words have greater means than the unstudied one, except in the case of implicit lures, in both groups. Comparison with baseline (the unstudied words) allows us to notice memory scores higher than 0, therefore priming was obtained for true memory scores in the implicit and explicit tests, but false implicit memory scores were not greater than 0, therefore priming for lures was not obtained, therefore priming for false implicit memories were not obtained. However, for both groups, explicit true and false memory was obtained, and implicit true memory.

Given that participants were tested first for the implicit memory, and then for the explicit memory, we have also run a Paired Samples T Test to investigate if there are significant differences between implicit memory scores and explicit ones, in the same group of participants. Results indicated significant differences in No Delay group between implicit and explicit targets memory scores ($t(52) = -5.93, p < .001$), and between implicit and explicit lures memory scores ($t(52) = -3.52, p < .001$). For the Delay group, there were also significant differences between implicit and explicit targets memory scores ($t(22) = -2.56, p = .018$, where p is significant at $p \leq .05$) and between implicit and explicit lures memory scores ($t(22) = -2.51, p = .020$, where p is significant at $p \leq .05$). All t scores are negative, given that implicit memory scores were lower overall than explicit memory scores.

Given that we have an independent variable with two modalities (delay, no delay) and 3 dependent variables with two modalities each (studied and unstudied, explicit and implicit memory, true and false memory), a Manova test was used to test the effect of delay on memory. However, a Shapiro-Wilk test indicated that our sample size didn't fit the normality assumption, $p < .001$. Therefore, we employed a non-parametrical test, One-Way Anova Kruskal-Wallis, and the results showed statistical significance at $H(1) = 10.75$, $P = .001$ for explicit studied targets and $H(1) = 7.85$, $P = .005$ for the implicit studied targets. In the case of memory scores (studied-unstudied), statistical significance was found only for the explicit targets, $H(1) = 8.25$, $P = .004$. The effect of delay between encoding and testing phase has significant implication for the true explicit and implicit memory, but not for false memory.

DISCUSSIONS

Our present study had the objective to identify if the delay is an important factor in increasing or decreasing false explicit and implicit memories. Our results indicated that one week delay, used as a between factor variables, has no effect on false memories, explicit or implicit. It had however, an effect on the veridical memory, for both explicit and implicit memory, therefore subjects remembered less studied true explicit and implicit memories after one-week delay. Our results are in accordance with other scientific results

Our results didn't replicate the false memory priming found in previous studies (McKone, 2000; McKone & Murphy, 2004; etc). One possible explanation for this occurrence is the small number of participants. Another possible explanation could be the procedure, given that participants were tested first for the implicit memory and afterwards for the explicit memory. The residual information may have created confusion in participants mind, which were told first to complete the stems with the first word that came to mind and then with the words seen in the previous presentation. Future studies could focus on different groups of participants for the implicit condition and different participants for the explicit condition, as was also the case in previous studies where implicit false memory priming was found (McKone, 2000; McKone & Murphy, 2004; VanDamme, 2009, 2010; etc).

Our results are in accordance to the literature on false memory, which shows that explicit false memories, in particular false recall, remain more robust over time than true memories (Jou & Flores, 2012). It is however unclear what happens to implicit false memories, if the robustness of implicit memory and that of the explicit false memories will lead to a higher robustness over time on implicit false memories, therefore future directions of research could investigate more this question of research.

A direction of our hypothesis, which stated that implicit false memory performances will decrease over time, could be seen in both explicit and implicit memory scores, which were lower in the Delay group. Nevertheless, time had a statistical effect on explicit and implicit veridical memory, therefore true memory decreases over time. These results are in line with previous findings, for example in Kathleen McDermott's study (1996), explicit false memories were not affected by a two-days delay, but true explicit memory (free recall test) was.

Limits of the present study are represented by the big difference in the number of participants between the two groups, the different number of participants in explicit and implicit condition, and also the small number of participants overall. The procedure may have a limit in that it tested implicit memory and then explicit memory on the same participants. The previous implicit test, along with the Awareness Questions which immediately followed the implicit test, could have influenced the explicit test. Latest research suggest that implicit priming leads to increased explicit recollection, given that implicit memory increase the processing fluency, which leads to increased familiarity of the "old words", therefore to increased explicit recollection (Park & Donaldson, 2016).

Future directions of research could maybe try to investigate the effect of time on implicit and explicit memory with 4 groups of participants, one for implicit memory and one for explicit memory, therefore 2 groups tested in no delay condition and 2 groups in delay condition. An interesting approach would be to test the delay condition after two or three weeks, therefore, to increase time and investigate the possible effect on true and false explicit and implicit memory. Future lines of research could also investigate if the specific perceptual characteristics of false memories fade after one week delay or longer, considering that this hypothesis initially offered by Loftus (1994; as cited in Neuschatz et al, 2001) was not confirmed at a 48-hours delay (Neuschatz et al, 2001).

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Declaration of interest statement

The authors report no conflict of interest.

Disclosure statement

The authors report there are no competing interests to declare.

Data availability statement

The data that support the findings of this study are available from the corresponding author, AO, upon reasonable request.

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The effect of focused reappraisal strategies on emotional intensity

Karol J. WILD , Andrei R. COSTEA , Sebastian PINTEA ,
Bianca MACAVEI , Oana Cătălina FODOR , Adrian N. OPRE^{1,*} 

ABSTRACT. The intensity of healthy positive emotions could determine our ability to savour our lives fully. Focused reappraisal strategies which are effective in reducing negative unhealthy emotions could also have the effect of down-regulating positive emotions. **Objective:** The aim of our study was to investigate the effect of the extensive use of reappraisal strategies on changes in overall levels of emotional intensity. **Methods:** Our sample consisted of 108 subjects. Based on our experimental design, images from NAPS were used as positive and negative emotional stimuli. The valence and arousal of the emotional responses were measured. The subjects' responses were categorised on the basis of which of the eight focused reappraisal strategies they applied. We used Linear Regression in order to test our hypothesis. **Results:** Based on our data, we identify justification and humour as reappraisal strategies that can lead to a decrease in the valence of positive emotions, with acceptance having an effect on the arousal of both negative and positive emotions. **Conclusions:** Our results suggest that in order to decrease unhealthy negative emotion, without at the same time reducing our ability to savour our lives by also decreasing the level of positive emotions, optimum levels of justification, humour and acceptance, used as reappraisal strategies, are needed. Limitations and recommendation for future research regarding emotional self-regulation interventions are identified and discussed.

Keywords: emotional regulation, reappraisal strategies, emotional intensity, emotional valence, quality of life.

¹ Applied Cognitive Psychology Doctoral School, Department of Psychology, "Babes-Bolyai" University. Correspondence concerning this article should be addressed to Adrian N. Opre, Cluj Napoca, Strada Sindicatelor, No.7.

* Corresponding author: adrianopre@psychology.ro



INTRODUCTION

Positive and negative emotions have important roles to play in our lives, from increasing the motivation required to attain our goals to helping to maintain meaningful relationships and improving cognitive flexibility (Gruber, 2011a, 2011b, Li et al., 2020, Newman & Nezlek, 2022). Consequently, applying inadequate emotional regulation strategies could lead to depression (Mueller et al., 2024, Vanderlind et al., 2020;) and other psychological disorders (Millgram et al., 2020, Watson & Naragon-Gainey, 2010). On a related note, studies that investigate the implication of applying emotional regulation strategies to positive emotions are limited. (Boemo et al., 2022, Mueller et al., 2024). In cases where someone experiences positive emotions such as joy, excitement, pride or happiness, we would think that no emotional regulation is needed or need be used. However, studies investigating the involvement of goals, expectations, social norms, and cultural differences on how people regulate their emotions, reveal that in many cases people are inclined to down-regulate their positive emotions (Boemo et al., 2022; Mueller et al., 2024; Tamir 2009, 2016; Tamir et al., 2007, 2015) Positive emotions can play an important role as a counterbalance to overall mood in the case of affective disorder (Boemo et al., 2022; Mueller et al.2024). Therefore, the down-regulation of intensely activated positive emotions (e.g., interest, excitement, desire, gladness, and joy) may result in the experience of less intense and potentially dysfunctional positive emotions (e.g., satisfaction, contentment, happiness, and fulfilment) (David et al. 2004; Ellis & DiGiuseppe, 2003; Tiba & Szentagotai, 2005). This shift could impede efforts to achieve goals and reduce cognitive flexibility (Gruber, 2011a, 2011b; Li et al., 2020; Newman & Nezlek, 2022).

In this respect, studies on the up and down-regulation of positive and negative emotions could help us to understand and help guide effective interventions to improve and maintain our state of well-being (Farmer and Kashdan, 2012, Kanske et al., 2010, Li et al., 2020, Newman & Nezlek, 2022, Shafir et al., 2018).

Many studies in the scientific literature which investigate the effectiveness and the mechanisms used in reappraisal strategies and other emotional self-regulation modalities often use specific instructions to up or down-regulate positive and negative emotions and emotion eliciting stimuli. Kanske et al., (2010) obtained a significant decrease in the intensity of negative as well positive emotions in reappraisal conditions involving responses to negative, neutral and positive emotion eliciting images, using a procedure that asked the subjects to down-regulate all their emotional responses. The subjects also showed changes in neural network responses. Gunaydin et al., (2016) have shown through their experience sampling method study that trait reappraisal, or in other

words, the frequent use of reappraisal strategies, could be responsible for lower negative emotions, and also a lower overall intensity of positive emotions in everyday life.

In contradistinction to this, Brans et al., (2013) examined two experience-sampling studies which aimed at investigating the use of six emotion regulation strategies found in the complexity of everyday life. In one of their studies they demonstrated that reappraisal was linked to an increase in the intensity of positive emotions. Unfortunately, they measured reappraisal by the extent to which the subjects applied this emotion regulation strategy. Secondly, positive emotions were operationalised using two categories (happiness and relaxation). Normally, it would be high arousal positive emotions which are the main target of down-regulation, emotions such as being enthusiastic, alert, happy, proud, or excited. Newman and Nezlek, (2022) make a clear distinction between positive activated and positive deactivated affects. Differences in operationalising emotional response could also be an important factor in understanding the source of a reported increase in positive emotion, as opposed to a decrease, resulting from applying reappraisal strategies. We find that valence and arousal ratings, as used in multiple studies of reappraisal strategies (Lalot et al., 2014, Lin et al., 2022, Neta et al., 2022, Vlasenko et al., 2024), could be an optimal way of identifying possible decreases in the overall levels of positive and negative emotions. Emotional flattening can be described as the experience of positive and negative emotions at low intensity, near a neutral state. Intense activated positive emotions (such as interested, excited, desiring, gladness, joy) can make a difference in the attainment of desired outcomes, when they are present before and during the process of working towards our goals (Tiba & Szentagotai, 2005). In a broader context, increasing and experiencing intense positive emotions could have a counterbalancing effect on psychopathologies (Garland et al., 2010; Millgram et al., 2020; Watson & Naragon-Gainey, 2010). In contrast to this, emotional flattening could deprive the subject of the above-mentioned benefits of activated positive emotions.

Buhle et al., (2014) meta-analysed 48 neuroimaging studies of reappraisal. The majority of the studies involved specific down-regulation instructions regarding emotional responses. Only 14 studies included measurements of positive emotions, which suggests a limitation in the comparison of the effects on positive and negative emotions of reappraisal strategies. Lalot et al., (2014) compare the effects of reappraisal, suppression and mindfulness on valence rating and facial expression for positive emotions when presented with positive video clips. Their results show that in the mindfulness and reappraisal cases subjects have a less intense emotional and facial response. Neta et al., (2022) tested whether activating the use of reappraisal strategies through a pre-test task could influence the valence rating of ambiguous stimuli (faces and scenes).

Their results showed that the use of reappraisal strategies for one task could be transferred to subsequent experiences, and that the valence ratings of ambiguous stimuli were lower in both their studies (Boemo et al., 2022, Neta et al., 2022).

The findings of Neta et al., (2022) suggest that in some circumstances reappraisal strategies could be applied spontaneously. Vlasenko et al., (2024) compared the difference between spontaneous reappraisal groups and instructed reappraisal groups in the frequency and type of reappraisal strategies used. Their results showed that subjects from the instructed group use more reappraisal tactics than those in non-instructed group (Vlasenko et al., 2024). In ecological settings, if the cognitive costs of the use of consciously intended reappraisal strategies is perceived as high (Troy et al., 2018, Sheppes et al., 2014, Ortner et al., 2016; Sheppes & Meiran, 2008, Suri et al., 2015, Brans et al., 2013), this could lead to a lower use of conscious reappraisal strategies. In their study, Suri et al., (2015) obtained a figure of only 16% for the use of reappraisal strategies. Studies that contain specific instructions to subjects to up or down-regulate their emotions have limitations when the results are generalised to everyday life and when used to predict the state of well-being of the participants (Kobylin'ska & Kusev, 2019, Brans et al. 2013, Farmer & Kashdan, 2012, Neta et al., 2022, Yuan et al., 2015, Buhle et al., 2014, Kalokerinos et al., 2014).

Guassi Moreira et al., (2024) identify three types of approaches applied by their subjects to emotion regulation. Their results show that those regulators who selectively use cognitive reappraisal and situation selection, but who do not use expressive suppression, are often the most adaptive regulators. The study by Vlasenko et al., (2024) highlights the fact that some reappraisal strategies were used more frequently than others. More specifically, they showed that reality challenge and changing current circumstances were the most frequently used reappraisal strategies. Ruan et al., (2024) studied the use in close relationships of eight reappraisal strategies and their effect on relationship satisfaction. They identified situation modification as the most frequently used reappraisal strategy (Ruan et al., 2024).

Multiple studies use specific reappraisal categories in order to identify variations in their efficacy and their impact on emotional responses in aversive situations (Gross and Thompson, 2007; McRae et al., 2012; Ruan et al., 2024, Vlasenko et al., 2024, Webb, et al., 2012, Wild et al., 2024). A disproportionate use of some reappraisal strategies over others could be explained by a variety of reasons: (a) the characteristics of the emotional stimuli; (b) emotional intensity; and (c) the perception of controllability (Deplancke et al., 2022; Ford et al., 2018, Gutentag et al., 2016, Petrova et al., 2023). Efficacy in reducing negative emotions was significantly improved for participants with high trait reappraisal and with beliefs about the controllability of emotional responses.

The reappraisal strategies found by previous studies to be more frequently used (Ruan et al., 2024, Vlasenko et al., 2024) could be considered to be reality focused reappraisal strategies. The description of specific reappraisal strategies (Gross and Thompson, 2007), based on the subject of the reappraisal (Webb et al., 2012) categorises reappraisal strategies into four main kinds: (a) emotional stimuli; (b) emotional response; (c) perspective taking; and (d) mixed approach. We could classify them as reality focused reappraisal strategies and emotion focused reappraisal strategies (Blanke et al., 2022).

If the conclusions of these studies are correct (Buhle et al., 2014, Gunaydin et al., 2016, Lalot et al., 2014, Li et al., 2020, Shafir et al., 2018, Kanske et al., 2010), this could suggest that the use of a high level of reality focused reappraisal strategies could result in a lowering of the intensity of all our emotions, which suggests they have the possibility of reducing our ability to savour or enjoy our lives fully (Neta et al., 2022, Yuan et al., 2015).

Purpose of the present study

Our study has as its main goal the aim of determining the relationship between different emotional regulation strategies and the level of decrease in the emotional response or emotional flattening. It focusses on assessing the predictive power of the reality-focused reappraisal as opposed to emotion-focused reappraisal. This is underpinned by our analysis of the scientific literature which relies on the level of reappraisal strategies used by the subjects (Brans et al., 2013, Buhle et al., 2014, Farmer & Kashdan, 2012, Lalot et al., 2014, Newman & Nezlek, 2022, Gunaydin et al., 2016). More specifically, our aim is to identify the level of reduced intensity of emotional response (emotional flattening) in those subjects with a high use of reappraisal strategies in general, and reality focused reappraisal in particular.

In pursuit of this objective, we have formulated two hypotheses. We expected that the frequency of employing emotion regulation strategies associated with reality-focused reappraisal can predict the extent of emotional flattening. Secondly, we expected that the frequency of employing emotion regulation strategies associated with emotional-focused reappraisal would not predict the extent of emotional flattening.

METHODS

Participants

Our experimental sample consists of 108 subjects. The number of subjects needed for our study was calculated to be 67, using a sample size calculator (for regression - significance level = 0.05, power 0.8, predictors = 2, medium effect,

effect size = 0.39). We choose a medium effect size based on the scientific literature ($\eta^2_p = .35$ for ANCOVA according to Kalokerinos et al., 2014, $d = 0.36$ for t test according to Neta et al., 2023) and on the smallest effect size, as described by Lakens, D. (2022). The subjects were between 19-67 years old (mean age = 42, SD = 9.6; 85.7% female and 14.3% male; 66% married, 17% not married, 12.3% divorced, 4.7% other status), from a wide variety of occupational backgrounds. Participants were selected using the snowball effect by inviting volunteers for the study to share a link to the study on social media. To obtain the volunteers used in this sample we offered as an incentive the opportunity to participate free of charge in a webinar. An information sheet and a consent form were included at the beginning of the study. The participants were informed that they could decide to withdraw at any time and that the information collected would be confidential and would be used solely for the purposes of the present study. Approval for the project was obtained from the appropriate review committees at the authors' institutions. The participants were members of the general public with no previous history of mental disorders.

Measures

Emotional flattening. In our study, we treat emotional intensity as a dependent variable. To measure emotional intensity, we will ask participants to rate both their emotional valence and arousal using rating scales (Betella & Verschure, 2015, Kanske et al., 2010, Marchewka et al., 2013, Neta et al., 2022, Riegl et al., 2015). For emotional valence and arousal (reliability coefficients, $r = 0.93$ for arousal, and $r = 0.98$ for valence, Marchewka et al., 2013), participants will rate their feelings on a scale where the midpoint represents a neutral emotional state. The scale ranges from -5, indicating the maximum negative valence, to +5, indicating the maximum positive valence. To calculate the emotional intensity index for each trial, we will compute z-scores for both emotional valence (Z_v) and arousal (Z_a). The average of these z-scores across all trials will represent each participant's emotional response. A higher mean score indicates less emotional flattening, meaning participants are experiencing a broader range of emotions. Conversely, a mean score approaching 0 suggests a greater degree of emotional flattening, indicating a narrower range of emotional experiences.

Reality-focused reappraisal strategies. Reality-focused reappraisal is an independent variable in our design and it comprises of the following sub-strategies: (a) acceptance, defined as a way of thinking about aversive situations in a non-judgmental and non-oppositional way, (b) justification, defined as finding an plausible explanation for the experienced situations, (c) normality check, defined as assessment regarding the degree to which the experienced

situation is expected based on reality based facts and norms, (d) responsibility assumption, defined as the acceptance of the consequences of a given situation resulting from one's own decisions, and (e) solution formulation, defined as the mental focus on finding coping strategies and solutions with a view to changing the experienced situation (Wild et al., 2024). These reappraisal focused strategies have been identified in previous studies (Gross, 2015, McRae et al., 2012, Vlasenko et al., 2024, Wild et al., 2024). In our study design, reality-focused reappraisal will be taken to be the total sum of frequencies in which participants indicate practicing the specific sub-strategies encompassed by it ($m = 2.35$, $sd = 1.66$, $Cronbach \alpha = 0.907$).

Emotion-focused reappraisal strategies. Emotion-focused reappraisal is an independent variable in our design and it consists of the following sub-strategies: (a) humour, defined as the reinterpretation of the experienced situation in a humoristic way, (b) positive thinking, defined as the assessment of the experienced situation in order to find the present or future possible positive effects or expected outcomes, and (c) compensation, as distinct from positive thinking. Compensation focused on the positive benefits of the lessons extracted from the experienced situations, which may not necessarily be positive in nature (Wild et al., 2024, Gross, 2015, McRae et al., 2012, Vlasenko et al., 2024, Wild et al., 2024). Similar to the way in which we proceeded in the case of Reality-focused reappraisal, Emotion-focused reappraisal will be taken to be the total sum of frequencies in which participants indicate using the specific sub-strategies encompassed by it ($m = 2.12$, $sd = 1.83$, $Cronbach \alpha = 0.887$).

PROCEDURE

We used 16 images selected from the Nencki Affective Picture System (NAPS) (Marchewka et al., 2014, Michałowski et al., 2015, Riegel et al., 2016, Wierzba et al., 2015) as positive and negative emotional stimuli,² displayed in random order to each subject. The average valance for the selected negative images was $m = 3.24$; $SD = 1.44$, and $m = 7.42$; $SD = 1.26$ for the selected positive images. The valence values for the entire NAPS image data base ranging between $m = 1.33$ - 8.54 . Each image will be presented for 15 seconds followed by a reappraisal strategy assessment (spontaneous reappraisal) and emotional response scales (valence and arousal). The experiment was implemented using the gorilla experiment builder app.

² Images used: Animals 053, Faces 016, Faces 089, Faces 107, Faces 291, Faces 356, Faces 370, People 040, People 077, People 116, People 161, Object 003, Object 132, Object 261, Opposite sex couple 040, Landscapes 035

Statistical Analysis

We conducted the statistical analysis's with JAMOVI. In order to determine and test the relationship between variables we used the following calculation and statistical tests (to a 95 % Confidence Interval): (a) descriptive statistics including a distribution normality test; (b) for our hypotheses we used Linear Regression, with two dimensions of the dependent variable, namely (1) valence, and (2) arousal.

RESULTS

This section presents the findings concerning the influence of **reality-focused** and **emotion-focused reappraisal strategies** on emotional responses (valence and arousal) to positive and negative stimuli. Descriptive statistics for key variables, including valence, arousal, and reappraisal strategies, are summarized in Table 1. The results are organized into four subsections based on the analysis: reality-focused strategies for positive and negative emotions and emotion-focused strategies for positive and negative emotions.

Reality focused reappraisal strategies and positive emotions.

The relationship between reality-focused reappraisal strategies and emotional responses to positive stimuli was analysed using linear regression. Notably, the strategy of justification demonstrated significant negative effects on the valence ($B = -0.2955, p < .001$) and significant positive effects on the arousal ($B = 0.2556, p = .002$) of positive emotions. These findings indicate that while justification as a strategy reduces the perceived positivity (valence) of emotions, it simultaneously heightens emotional arousal.

Conversely, the acceptance strategy had a significant negative effect on emotional arousal ($B = -0.1268, p = .003$) but did not affect emotional valence ($p > .05$). This result suggests that acceptance contributes to emotional flattening by reducing arousal intensity without altering the perceived positivity of the experience. Taken together, justification and acceptance accounted for approximately 18% of the variation in the emotional response to positive stimuli (adjusted $R^2 = 0.18, F = 4.47, p = .001$).

Reality focused reappraisal strategies and negative emotions.

In response to negative stimuli, acceptance was the sole reality-focused reappraisal strategy to significantly influence emotional responses. Acceptance increased the valence of negative emotions ($B = 0.0944, p = .029$) and reduced

their arousal ($B = -0.0981, p = .022$). These results suggest that acceptance effectively moderates the intensity of negative emotions, consistent with its role in promoting adaptive emotion regulation.

Other strategies, such as justification, solution formulation, responsibility assumption, and normality check did not significantly predict changes in either valence or arousal of negative emotions ($p > .05$). Acceptance alone accounted for 11.2% of the variation in arousal-related outcomes (adjusted $R^2 = 0.11, F = 2.56, p = .031$), indicating its effectiveness in diminishing emotional intensity.

Emotion focused reappraisal strategies and positive emotions.

For emotion-focused reappraisal strategies, linear regression analyses revealed the contrasting effects of humour and positive thinking on positive emotions. Humour was negatively associated with the valence of positive emotions ($B = -0.1499, p = .024$), suggesting it dampens the perceived positivity of the emotional experience. In contradistinction to this, positive thinking positively influenced valence ($B = 0.1095, p = .015$), enhancing the subjective experience of positive emotions. Both strategies accounted for approximately 9.3% of the variation in valence-related outcomes (adjusted $R^2 = 0.093, F = 3.58, p = .017$).

However, neither humour nor positive thinking had significant effects on the arousal of positive emotions ($p > .05$). Similarly, the strategy of compensation showed no significant relationship with either valence or arousal ($p > .05$).

Emotion-Focused Reappraisal Strategies and Negative Emotions

As hypothesized, emotion-focused strategies had no significant effects on the valence or arousal of negative emotions. None of the analysed strategies (humour, positive thinking, or compensation) demonstrated predictive power in reducing the intensity of negative emotions ($p > .05$). These findings confirm the limited applicability of emotion-focused strategies in moderating responses to negative stimuli.

SUMMARY

The results highlight distinct effects of reality- and emotion-focused reappraisal strategies on emotional responses to positive and negative stimuli. Reality-focused strategies, particularly justification and acceptance, play a critical role in modulating both valence and arousal across emotional contexts, with differing effects on emotional intensity. Emotion-focused strategies, such as humour and positive thinking, appear more relevant to positive emotional

contexts, influencing valence but not arousal. These nuanced findings underscore the importance of strategy selection in achieving desired emotional outcomes.

DISCUSSION

Our research started from the question to what extent could effective reappraisal strategies not only decrease negative emotions, but also contribute to an overall low intensity for all emotional experiences, including positive emotions. This would lead to a cost in applying reappraisal extensively, the cost being a reduction in the ability to savour our lives. More specifically, we hypothesised that there could be differences in this effect, depending on which kinds of strategies were used, reality focused or emotion focused reappraisal strategies (Blanke et al., 2022).

Reappraisal and negative emotions

The effect identified on negative emotion of reality focused and emotional focused reappraisal strategies was the basis of our hypotheses. Similar to the results of Ruan et al., (2024) and Vlasenko et al., (2024) which show that some reappraisal strategies are not only used more frequently than others, but are also more effective, such as (a) situational modification and savouring (Ruan et al., 2024), and (b) reality challenge and change current circumstances (Vlasenko et al., 2024), we obtained significant results only for acceptance. This suggests that acceptance as a reality focused reappraisal strategy could be the most effective approach in decreasing negative unhealthy and unwanted emotions. A limitation of this result could consist in the fact that acceptance was the second most frequently used reappraisal strategy after solution formulation (85.2 % of participants used acceptance, 92.6% used solution formulation, and other strategies were used between 78.7% - 26.9% for negative emotions), and it is possible that a significantly larger sample could have shown lower levels of effects.

Based on our results, a second line of thought that emerges is the necessity to understand why other reappraisal strategies appear to have limited or no effect on emotional response. Is there a possibility that reappraisal strategies could fulfil multiple roles in the emotional self-regulation process? In our previous research, Wild et al., (2024), we identified reappraisal strategies that functioned to enhance the self-regulation process. Other studies identified the role of activated beliefs and thought processes that could increase the overall use of reappraisal strategies (Deplancke et al., 2022, Ford et al., 2018, Gutentag et al., 2016, 2022, Petrova et al., 2023). It would be useful for future

studies to investigate the possibility of direct and indirect roles of different reappraisal strategies through structural equation modelling (SEM) studies, in the same way that multiple studies investigated the mindfulness-to-meaning theory (Hanley et al., 2021, Cheung et al., 2020, Garland et al., 2017, Pagnini & Langer, 2015) and identified that awareness increases the use of reappraisal.

Reappraisal and valence of positive emotions

The effect of reappraisal strategies identified in the cases of positive emotion seems more complex. Mueller et al., (2024) show that the effectiveness of reappraisal strategies could depend on the characteristics of the context, more specifically they identified a difference between positive and negative events. In the case of positive situations, reappraisal and problem-solving were associated with low intensity emotional responses and the possibility of increased symptoms of depression (Mueller et al., 2024). Similar to their results, we identified justification as a reality focused reappraisal strategy and humour as an emotion focused reappraisal strategy as having significant negative effects on the valence rating of positive emotions, implying that a high use of these reappraisal strategies leads to low intensity in positive emotions, suggesting a high cost in terms of quality of life, through decreasing the subjective intensity of positive emotions. These results could support the possible need for an optimal or moderated extent in the use of these types of reappraisal.

In contrast to justification and humour reappraisal strategies, positive thinking as an emotion focused reappraisal strategy shows a positive relation to positive emotion, an indication of the effect of increasing the valence rating of positive emotion. This result could appear confusing at first sight, but positive thinking as a reappraisal strategy is perhaps the only one which focuses on the alteration of the valence rating of an emotion, as defined in the scientific literature (McRae et al., 2012, Vlasenko et al., 2024). The question that emerges from these results is to what extent the heterogeneous results in the scientific literature regarding the efficacy of reappraisal strategies are due to the fact that different reappraisal strategies modulate the emotional response differently, with some producing an emotional flattening while others do not. Only future studies can provide answers to this.

Reappraisal and arousal of positive emotions

As is the case with humour and positive thinking, which showed opposite effects on emotional valence, acceptance and justification as reality focused reappraisal strategies show opposite effects on the arousal ratings of positive emotion. Our results concur with those of Hofmann et al., (2009) which show that acceptance didn't affect the subjective rating of anxiety, suggesting that acceptance is effective in reducing the physiological effect of positive emotions.

Even if at first glance a calmer state could be seen as a positive state, low intensity arousal could come at a cost, that of a decrease in activated positive emotions such as enthusiasm, alertness, happiness, pride, or excitement. (Newman & Nezlek, 2022). There is an apparent contradiction between our results and those of Mueller et al., (2024), who, measuring positive emotion using a discrete way of operationalising positive emotions (happiness, pride, interest), showed an acceptance effect on improving positive emotion. The fact that the author used discrete emotions, which also included deactivated positive emotions such as interested, could partially explain the differences in the results obtained. Similar to justification in relation to valence rating, acceptance presented a flattening effect on the arousal of positive emotions, suggesting two possibilities (a) acceptance could be seen, as shown in multiple studies (Boemo et al., 2022), as another emotional regulation method different from reappraisal strategies, and (b) we can speak about reappraisal strategies with different effects on the valence and arousal rating of positive emotion, and therefore with costs on our experience of savouring our lives.

Practical Implications

The findings of this study offer valuable insights into the practical applications of emotion regulation strategies in real-world contexts, particularly in enhancing well-being and emotional balance. Firstly, the significant role of reality-focused strategies such as justification and acceptance highlight their utility in specific scenarios. For instance, justification, while effective in amplifying emotional arousal, may not be ideal in situations requiring heightened positivity or savouring of experiences, such as celebrations or moments of personal achievement. This suggests that individuals aiming to maximize the positive impact of joyful experiences may need to moderate their use of justification. Conversely, acceptance proves highly effective in mitigating emotional intensity—both for negative emotions by reducing arousal, and for positive emotions by tempering overly activated responses. This makes acceptance a practical strategy for contexts requiring emotional composure, such as conflict resolution or professional environments demanding neutrality and control (Hofmann et al., 2009; Gross, 2015).

Secondly, the contrasting effects of humour and positive thinking as emotion-focused strategies for positive emotions suggest tailored applications. Positive thinking emerges as a powerful tool for enhancing the perceived positivity of experiences, making it particularly valuable in interventions aimed at building resilience or fostering optimism in personal and professional growth programs (McRae et al., 2012). Humour, while often associated with relief in negative contexts, demonstrates a diminishing effect on the valence of positive emotions, indicating that its application should be context-sensitive to

avoid unintended emotional flattening. These findings could benefit from the integration of humour styles, as described by Martin and Ford (2018), as integrating into broader emotional regulation frameworks may provide practical pathways for emotional regulation.

To enhance emotional regulation, interventions should encourage adaptive humour styles like affiliative and self-enhancing humour to build resilience and strengthen relationships. Strategies can include humour-based workshops and cognitive-behavioural techniques to identify and reduce reliance on maladaptive styles, such as aggressive or self-defeating humour. Combining humour training with emotional intelligence programs can improve self-awareness and prevent inappropriate humour use. Tailoring interventions to cultural and age-specific needs ensures effectiveness across diverse groups (Jiang et al., 2020, Kalokerinos et al., 2014, Martin & Ford, 2018, Schneider et al., 2018, Tamir, 2016).

Finally, the limited efficacy of emotion-focused strategies in modulating negative emotions underscores the importance of strategic prioritization. Individuals managing high-stress or negative emotion-laden environments may benefit more from reality-focused approaches, such as acceptance, which directly address the intensity of such emotions (Boemo et al., 2022, Vlasenko et al., 2024). Together, these insights can guide clinicians, educators, and organizational leaders in crafting nuanced, evidence-based interventions that improve emotional regulation while safeguarding emotional richness and quality of life.

Limitations of our study

The design of our study has some limitations in terms of generalising our results, and there is a need for future studies to retest our findings. The first limitation consists in our sample size, which limited us in performing structural equation modelling (SEM) analysis in order to identify the answer to our question regarding those reappraisal strategies with different roles in the emotional regulation process. The second limitation consisted in the emotion eliciting stimuli that we used in order to test the spontaneous use of reappraisal strategies (Neta et al., 2022, Vlasenko et al., 2024). The results could show significant differences from results obtained by measuring the emotional response or use of reappraisal strategies in ecological settings through experience sampling methods or other momentary assessment studies (Newman & Nezlek, 2022). A third limitation could emerge from the fact that the participants were asked to recognise the type of reappraisal strategies that they used. This could have led to a prospective effect of previous activation of reappraisal strategies, as shown by Boemo et al., (2022), increasing the manifestation of reappraisal strategies compared to the real life spontaneous use of reappraisal strategies.

To sum up, our first hypothesis, that the frequency of employing emotion regulation strategies like reality-focused reappraisal can predict the extent of emotional flattening, was partially confirmed. Justification contributed to a flattening of the valence rating of positive emotions, while acceptance showed an effect on the arousal of positive emotions. Our second hypothesis, in which we expected that the frequency of employing emotion regulation strategies such as emotion-focused reappraisal would not predict the extent of emotional flattening, was confirmed for negative emotions, but not for the valence rating of positive emotions. Humour as an emotion focused reappraisal strategy appeared to contribute to the emotional flattening of positive emotions.

Conflict of Interest

The authors declare that they have no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon request.

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Table 1. Descriptive statistics for each variable

Variable	Mean	SD	Range
Valence poz.	2,83	1,33	-0,875 - 5,00
Valence neg.	-1,63	1,50	-5,00 - 3,50
Arousal poz.	-2,42	1,52	-5,00 - 3,50
Arousal neg.	1,64	1,44	-2,75 - 5,00
Reality focused reappraisal - poz.	2,08	1,63	0 - 40
Reality focused reappraisal - neg.	2,65	1,79	0 - 39
Emotional focused reappraisal - poz.	2,26	1,89	0 - 24
Emotional focused reappraisal - neg.	1,76	1,94	0 - 24

Note. N=108, poz. - positive stimuli / situations, neg. - negative stimuli/ situations, Shapiro-Wilks was used as distribution normality test

Table 2.

Reality Reappraisal and Z scor for Valence pozitive stimuli						Reality Reappraisal and Z scor for Arousal pozitive stimuli					
Effect	Estimate	SE	95% CI		p	Effect	Estimate	SE	95% CI		p
			Lower	Upper					Lower	Upper	
Intercept	-0,2128	0,222			0,340	Intercept	0,6208	0,218			0,005
Acceptance	0,0470	0,043	-0,094	0,326	0,277	Acceptance	-0,1268	0,042	-0,517	-0,106	0,003
Solution	-0,0869	0,082	-0,502	0,151	0,289	Solution	0,0761	0,080	-0,167	0,473	0,345
Justification	-0,2955	0,082	-0,592	-0,171	<.001	Justification	0,2556	0,080	0,123	0,535	0,002
Responsability	0,1001	0,063	-0,063	0,568	0,115	Responsability	-0,0708	0,061	-0,487	0,131	0,255
Normality	0,0509	0,051	-0,1187	0,361	0,319	Normality	-0,0419	0,049	-0,334	0,135	0,403

Note. R² for Z_v poz = 0,146; F=3,44 p=0,007

Note. R² for Z_a poz = 0,181; F=4,47 p=0,001

THE COMPARISON OF SEVERAL FACTORIAL STRUCTURES OF THE CORNELL CRITICAL THINKING TEST LEVEL Z

Table 3.

Reality Reappraisal and Z scor for Valence negative stimuli					Reality Reappraisal and Z scor for Arousal negative stimuli				
Effect	Estimate	SE	95% CI		p	E a r o u s a l n e g a t i v e s t i m u l i	95% CI		p
			L o w e r	U p p e r			L o w e r	U p p e r	
Intercept	0,0348	0,205			0,866				
Acceptance	0,0944	0,043	0,027	0,4814	0,029			-0,040	0,022
Solution	0,0087	0,057	0,060	0,3032	0,879			0,265	0,025
Justification	-0,0752	0,058	0,037	0,0798	0,201			0,366	0,020
Responsability	-0,0084	0,075	0,030	0,2739	0,911			0,253	0,013
Normality	-0,0744	0,065	0,056	0,1363	0,256			0,577	0,009

Note. R² for Zv neg = 0,092; F=2,07 p=0,076

Note. R² for Za neg = 0,112; F=2,56 p=0,031

Table 4.

Emotion Reappraisal and Z scor for Valence pozitiv stimuli						Emotion Reappraisal and Z scor for Arousal pozitiv stimuli					
Effect	Estimate	SE	95% CI		p	Effect	Estimate	SE	95% CI		p
			Lower	Upper					Lower	Upper	
Intercept	-0,2596	0,154			0,095	Intercept	0,2613	0,157			0,098
Humor	-0,1499	0,066	-0,483	-0,0346	0,024	Humor	0,1097	0,067	-0,039	0,415	0,103
Compensation	0,0326	0,051	-0,165	0,3213	0,527	Compensation	-0,0550	0,052	-0,378	0,116	0,294
Pozitive thinking	0,1095	0,044	0,060	0,5304	0,015	Pozitive thinking	-0,0820	0,045	-0,458	0,019	0,070

Note. R² for Z_v poz = 0,0935; F=3,58 p=0,017

Note. R² for Z_a poz = 0,0696; F=2,59 p=0,056

Prosocial behavior in convicted offenders: A scoping review

Liliana HUREZAN^{1,2} , Sara Maria JUGANARU³, Ioana-Anastasia GORAN¹, Elena Emanuela VELICEA¹, Laura VISU-PETRA^{1,4,*} 

ABSTRACT. Despite considerable interest and relevance to the broader community, prosocial behavior in prisons remains an understudied topic. The purpose of the present study was to summarize existing research on prosocial behavior among incarcerated offenders. A complex search of three electronic citation databases (Google Scholar, Web of Science, and PsychInfo) was conducted, covering articles published in the last decade (January 2012 to December 2023). Of the 248 articles initially found, only 12 were included in the scoping review after eligibility screening. The included studies reported on prosocial behavior as measured by self-report questionnaires or experimental tasks/economic games and were conducted with incarcerated offenders.

A first set of studies aimed to assess prisoners' self-reported prosocial behavior, while a second set of studies provided a less subjective approach to offender prosociality by using a variety of games that allowed for the investigation of two main types of actual prosocial behavior: resource sharing and reciprocal prosocial behavior (cooperation).

Existing studies conducted in prisons provide valuable insights into different types of prosociality and the factors that may influence offenders' decisions to engage in prosocial behavior. Further research is needed, particularly using ecological methods reflecting actual prosocial behavior in high-stakes settings to get an accurate picture of the authenticity of prosociality among convicted offenders.

Keywords: prosocial behavior, social behavior, Economic games, prisoners, incarcerated offenders.

¹ Research in Individual Differences and Legal Psychology (RIDDLE) Lab, Department of Psychology, Babeş-Bolyai University, Republicii, 37, 400015, Cluj-Napoca, Romania.

² Arad Penitentiary, Alexandru Ioan Cuza, 1, 310160, Arad, Romania.

³ University of Groningen, PO Box 729700 AB Groningen, The Netherlands.

⁴ Department of Social and Human Research, Romanian Academy, 400015 Cluj-Napoca, Romania.

* Corresponding author:laurapetra@psychology.ro



INTRODUCTION

Human beings are social creatures by nature, and every society is based on the ability of its members to cooperate and help one another. At the same time, acting for the benefit of others involves a variety of costs in terms of personal resources and can incur some disadvantages in the long run. Prosocial behavior thus became an important focus of scientific research across different disciplines, in the attempt to identify and study the emergence and maintenance of socially oriented acts (Batson, 2011; Lefevor et al., 2017; Warneken & Tomasello, 2009).

Prosocial behavior can be *defined* as voluntary, intentional behavior that benefits others, the “social glue” that allows people of all ages to live peacefully and productively together (Eisenberg & Miller, 1987). Prosocial behavior encompasses a wide range of actions, such as comforting someone (offering verbal or physical support, Svetlova et al., 2010), practical support (retrieving an out-of-reach object, Warneken & Tomasello, 2006), sharing resources (giving others access to resources or personal belongings, Brownell et al., 2009; Hay, 1979) or cooperating for mutual benefit (reciprocal prosocial behavior, working together towards a common goal, Fehr & Gintis, 2007).

Regarding the *methods* for studying prosocial behavior, the most prevalent approach is to directly ask individuals via the use of **self-report questionnaires** assessing the propensity to help and support others (the Prosocialness Scale, Caprara et al., 2005), the individuals’ preference for resource allocation between themselves and another person (Social Value Orientation Scale, Van Lange, 1999) or the tendency towards egocentric or moral-based behavior (the Machiavelli Index, Henning & Six, 1977). Self-report questionnaires do not measure actual prosocial behavior, but instead focus on perceptions and how individuals see and describe themselves in terms of prosociality. Consequently, they may not reflect the reality of prosocial behavior due to a variety of factors (such as a general positivity bias).

Moving beyond the subjective experience of individuals, other paradigms have focused on more ecological measures of **actual prosocial behavior**, albeit in a controlled setting. One line of research has examined *sharing behaviors* (e.g., inhibition of selfish impulses, altruism, generosity) using hypothetical resource distribution tasks such as the Dictator Game (Camerer, 2003), donation tasks (Tusche et al., 2016), or the Social Discounting Task (Jones & Rachlin, 2006). To elicit and assess reciprocal prosocial behavior or *cooperation*, researchers developed economic-based games such as the Prisoner’s Dilemma (Tucker, 1950, as cited in Poundstone, 1992), the Trust Game (Berg, Dickhaut, & McCabe, 1995), the Ultimatum Game (Harsanyi, 1961), or the Second / Third Person Punishment

Game (Fehr & Fischbacher, 2004) which allowed to investigate strategic giving, cost-benefit calculations, fairness perceptions, and norm motivated behavior.

Despite the growing existing literature, there are still many challenges and controversies in understanding prosocial behavior, mainly because different research approaches tend to use distinct methodologies to explore various facets of prosociality, while at the same time being limited to specific developmental stages or populations. An understudied, yet highly relevant population with regards to prosociality is that of **convicted offenders**. Although some studies underline the protective role of prosociality in reducing antisocial behavior and even recidivism (Andrews and Bonta, 2010a,b; Martí-Vilar et al., 2010; 2019, Walters, 2017b), there is still a lack of systematic research on the relationship between prosocial behavior and criminal conduct and aggressiveness, or on the potential differences between offenders and non-offenders. Some studies suggest that convicted offenders have lower levels of prosocial behavior and higher levels of aggressiveness, with the association being stronger for recidivists compared to non-offenders (Clark et al., 2015; Hämäläinen & Pulkkinen, 1995). However, other studies point to an increase in prisoners' prosociality in certain situations such as after being exposed to empathy-inducing training (Mayer et al., 2018) or identify very small or negligible differences from the general population (Birkeland et al., 2014; Chmura et al., 2016).

The lack of systematic or consistent findings could be explained by the different methodologies used (self-report, economic-based games, or behavioral tasks), overlooking the role of individual differences in personal and situational factors related to prosocial behavior, as well as the challenges and limitations inherent to the prison environment, which make the behavioral study of prosocial behavior less feasible.

PURPOSE OF THIS REVIEW

To the best of our knowledge, there has been no published scoping or systematic review regarding the prosocial behavior of convicted offenders. We focused on the few existing self-reported and actual prosocial behavior studies (using experimental tasks or economic games) to map the existing state of research on inmate prosociality conducted with incarcerated offenders. The scoping review summarizes the content, scope, and methodology of each identified study, providing an overview of the main findings according to the category of prosocial behavior and the underlying individual differences in prosocial behavior that occur in the prison setting.

METHOD

In conducting this scoping review, we followed the six-step framework provided by Arksey and O'Malley (2005) and the general guidelines outlined by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses, Liberati et al., 2009).

Search Strategy

Database searches. A complex search was conducted for 3 electronic citation databases: Google Scholar (first 500 hits), Web of Science, and PsychInfo. The search was conducted in 2024 and covered articles published between January 2012 and December 2023. Only articles in English were included in the searches. The following keywords were used with all databases: prosocial behavior, social behavior, prosocial motivation, Economic games, altruistic behavior, experiment, dictator game, charity, helping behavior, Prisoner's Dilemma, inmates, prisoners, criminals, offenders, incarcerated offenders.

Article selection. Title and abstract screening. As a first step, the titles and abstracts were separately screened by trained students and the first author, to establish if they reported studies regarding prosocial behavior and were (1) measured through self-report questionnaires or experimental tasks / economic games (2) conducted on incarcerated offenders (3). All articles meeting the mentioned criteria were included in the review.

Article screening. We obtained the full-text version for each article selected after the title and abstract screening. For this step, we established a set of inclusion and exclusion criteria, three students were trained by the first author on article evaluation and screening procedure. The selected articles were randomly divided into three equivalent groups and each trained student was assigned to a group. An independent two-step rating strategy was used, so an article was first read by a trained student and afterward by the first author. The two ratings were compared and the corresponding author mediated each case of under 90% agreement between the two raters and confirmed the exclusion of articles.

Exclusion criteria:

Studies not focused on reported / actual prosocial conduct – this included all articles that didn't measure prosocial behavior (e.g. moral reasoning studies, which didn't measure prosocial behavior).

Studies with non-incarcerated offenders – articles reporting studies that didn't involve convicted inmates, placed in an actual prison setting.

Intervention studies or evaluation of prison programs – articles describing research focus solely on evaluating intervention programs aimed at improving prosocial attitudes and skills, without reporting results of pre/post measures of prosocial behavior.

Qualitative studies of prosocial behavior – studies using interviews/focus groups as measures of prosocial behavior.

Systematic reviews, scoping reviews, books, and book chapters.

Non-English articles – articles written in a language other than English.

Inclusion criteria

Studies of self-report questionnaires, experimental tasks, and economic games regarding prosocial behavior – articles reporting on the psychometric properties of different measures of prosocial behavior.

Studies conducted on convicted offenders – articles reporting research involving offenders currently serving a prison sentence. Articles were included regardless of the offenders' sex, age (youth or adult offenders), or enforcement condition (offenders serving a sentence inside a prison or in special settings in the community, under the prison administration).

Article categorization. Following the articles' screening process, three main categories emerged, based on the type of measures used for prosocial behavior: a) self-reported prosocial behavior, b) prosocial behavior based on sharing of resources, and c) prosocial behavior involving cooperation and distribution of resources. Each article was included in only one category, that best characterized the reported research. The present scoping review focuses on all three categories and reports the outcomes regarding individual differences in offenders' prosocial behavior.

Data Extraction

The three trained students initially extracted the data. Each student was responsible for reading the articles and extracting data for a specific category: self-reported prosocial behavior, prosocial behavior based on sharing of resources, and prosocial behavior involving cooperation and distribution of resources. The first author independently read each article and extracted the relevant data. Afterward, the results were compared and the authors collaborated and discussed the existing differences until they reached comparable results.

For data extraction, an Excel charting form was developed, containing the following information:

- Author(s), year of publication;
- Type of prosocial behavior;

- Assessment of prosocial behavior (self-report questionnaires/ experimental tasks/ economic games);
- Study population (type – prison group and/or community sample, if applicable, sample size, main age, sex);
- Relevant results/ findings.

DATA ANALYSIS

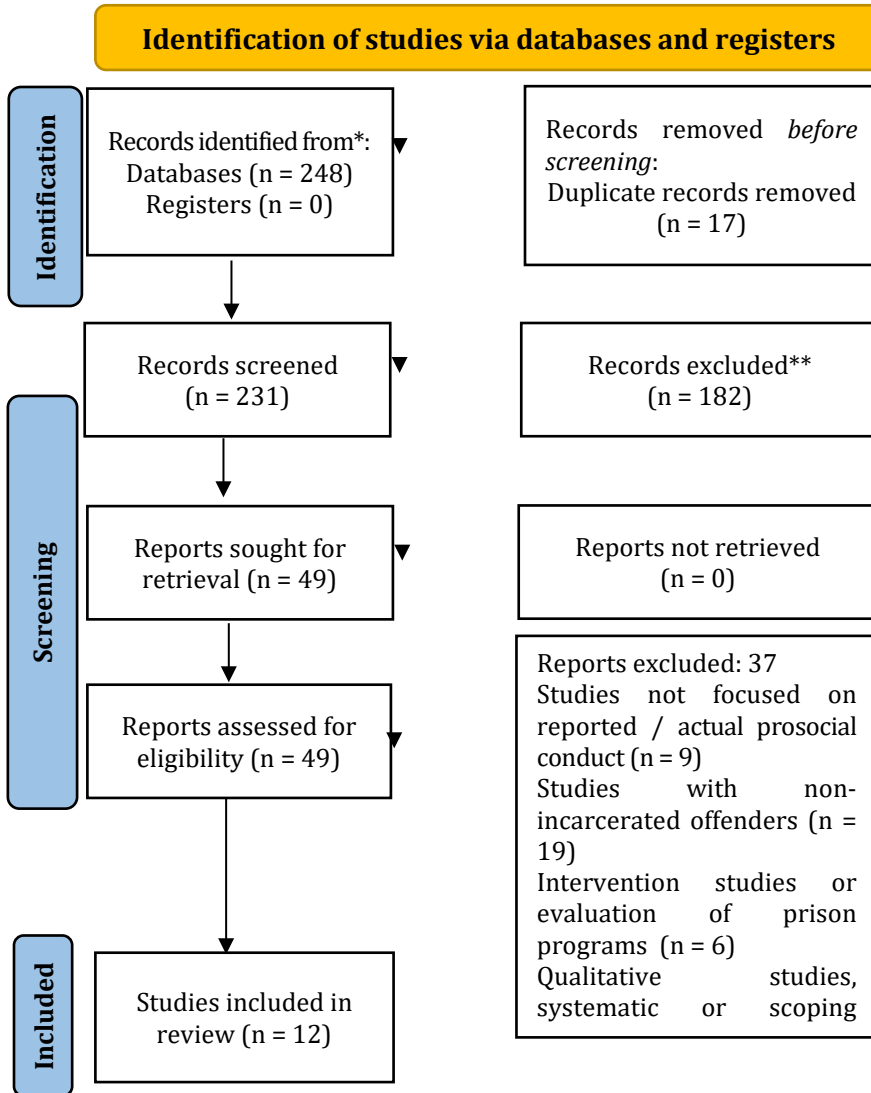
We collated all extracted data and produced a chart mapping the basic characteristics of the selected studies: different types of prosocial behavior assessed in the prison setting, with convicted offenders, type of assessment measures used, and main findings. Second, we analyzed the main findings according to the category of prosocial behavior, underlying the individual differences that appear in the prison setting.

RESULTS

Article selection. After the initial search, 248 articles were found in the three databases (Google Scholar, Web of Science, and PsychInfo), with 17 articles being removed as duplicates. 231 articles were initially considered, of which 182 were excluded during the title and abstract screening stage, while 49 were included for full-text review. After reviewing the 49 articles for eligibility in the full-text screening stage, 37 were excluded (the studies did not focus on reported/ actual prosocial behavior, measured by self-report questionnaires, experimental tasks, and economic games, were conducted with non-incarcerated offenders, reported intervention studies/ evaluations of prison programs or were qualitative studies, systematic reviews, scoping reviews, books and book chapters). In the end, only 12 articles met the criteria and were included in the data analysis. For a visual representation of the selection process, see *Diagram 1*.

The 12 articles were divided into three categories focused on self-reported prosocial behavior ($n = 2$ articles), prosocial behavior based on the sharing of resources ($n = 6$ articles), and prosocial behavior involving cooperation and distribution of resources ($n = 4$ articles).

Our analysis focused on the type of measure used for prosocial behavior assessment in the prison setting, as well as the main findings regarding individual differences in prosocial behavior of incarcerated offenders. *Table 1* presents an overview of the study design, population, and main findings for each article.



* Databases: Google Scholar (first 500 hits), Web of Science, and PsychInfo

**The records were excluded by the authors.

Diagram 1

Table 1.

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Self-report	Samper et al. (2021)	• The Prosocial Behaviour Scale (Caprara & Pastorelli, 1993)	<u>Offenders</u> : $n = 220$, mean age = 16.22 years, 67.3% adolescent males <u>Non-offenders</u> : $n = 220$, mean age = 16.40 years, 65.9% adolescent males	<ul style="list-style-type: none"> • Empathic concern and perspective-taking were positively associated with helping behavior. • The role of empathy in promoting positive social action was significant for both groups.
	Cardona-Isaza et al. (2023)	• The Prosocial Behaviour Scale (Caprara & Pastorelli, 1993)	Offenders: $n = 413$, mean age = 16.67 years, 82.6 % adolescent males	<ul style="list-style-type: none"> • Empathy and rational decision-making were positively associated with self-reported prosocial behavior in juvenile offenders. • Participants with stronger rational decision-making skills were more likely to report engaging in prosocial behavior.
Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Sharing of resources	Birkeland et al. (2014)	• The Dictator game	Lab experiment <u>Offenders</u> : $n = 187$, All adult males <u>Non-offenders</u> : $n = 173$, All adult males Internet experiment <u>Ex-offenders</u> : $n = 378$, Adult males and females <u>Non-offenders</u> : $n = 1148$, Adult males and females	<ul style="list-style-type: none"> • There was no significant difference between offenders and the general population in the <i>Dictator game</i>. • The sharing rates were similar in both groups, regardless of the other player's membership to the in/out-group (prisoner or general population). • In the online experiment, there was no statistically significant difference in prosocial behavior between participants with and without a criminal record in their sharing rates.

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Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Sharing of resources	Chmura et al. (2016)	<ul style="list-style-type: none"> The Dictator game 	<p><u>Offenders:</u></p> <p>Experiment 1 <i>n</i> = 58, mean age = 19.64 years, All adult males</p> <p>Experiment 2 <i>n</i> = 62, mean age = 19.81 years, All adult males</p>	<ul style="list-style-type: none"> In the <i>Dictator game</i>, prisoners gave more than students and less than matched participants from the general population. In the <i>modified Dictator game</i>, prisoners gave more to charity than to an anonymous prisoner. In terms of offense type, based on the degree of violence involved in committing a crime, there was no clear evidence of a difference between prisoners convicted of violent crimes and those convicted of property crimes in their sharing behavior.

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Sharing of resources	Mayer et al. (2018)	<ul style="list-style-type: none"> The classical Dictator game The empathic Dictator game 	<p><u>Offenders:</u> <i>n</i> = 42, mean age = 32.79 years, All adult males</p> <p><u>Non-offenders:</u> <i>n</i> = 33, mean age = 28.82 years, All adult males</p>	<ul style="list-style-type: none"> Violent offenders don't seem to have impaired empathic competencies compared to non-offenders, with similar data being observed in self-reports, video-based measures (assessed by the MASC), and sensitivity to empathy induction. The offender group showed lower levels of sharing compared to the general population. Both groups exhibited higher empathy scores and higher rates of prosocial behavior following the empathy induction videos. Psychopathic traits were associated with low levels of self-reported trait empathy and with impairments in the ability to understand one's feelings (alexithymia).

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Sharing of resources	Gummerum & Hanoch (2012)	• The Dictator game	<p><u>Offenders</u>: $n = 50$, mean age = 38.24 years, All adult males</p> <p><u>Non-offenders</u>: $n = 50$, mean age = 35.22 years, All adult males</p>	<ul style="list-style-type: none"> • Both groups exhibited altruistic behavior, although prisoners offered significantly more money than participants without a criminal record. • Comparing self-report data, prisoners showed higher levels of empathic concern and perspective-taking than non-offenders, and no significant difference was observed in their personal belief in a just world. • In the general population, only empathic concern was a predictor of increased offers to share in the <i>Dictator game</i>. • In the prisoner group, increased belief in a just world and higher levels of perspective-taking were predictors of increased offers in the <i>Dictator game</i>. • The level of empathic concern did not affect the prisoners' decision to share resources.

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Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Sharing of resources	Mayer et al. (2018)	<ul style="list-style-type: none"> The Dictator Game The Ultimatum Game 	<p><u>Offenders</u>: n = 25, mean age = 19.68 years, All adult males</p> <p><u>Non-offenders</u>: n = 24, mean age = 19.58 years, All adult males</p>	<ul style="list-style-type: none"> In the <i>Dictator game</i>, prisoners showed lower levels of sharing behavior compared to the general population. In the <i>Ultimatum game</i>, when they took on the role of proposer, prisoners, and non-offenders behaved similarly, making comparable offers. Antisocial violent offenders behaved rationally and strategically and had intact fairness norms compliance when it was in line with their personal goals. The social context (human versus computer proposer) influenced the acceptance rates of participants from the general population but did not affect the prisoner sample (prisoners generally accepted more offers regardless of the type of proposer, confirming a tendency towards more rational and profit-oriented behavior).

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Sharing of resources	Radke et al. (2013)	<ul style="list-style-type: none"> The modified Ultimatum game 	<p><u>Offenders with psychopathy</u>: n = 18, mean age = 42.5 years, All adult males</p> <p><u>Offenders without psychopathy</u>: n = 14, mean age = 39.7 years, All adult males</p> <p><u>Non-offenders</u>: n = 18, mean age = 37.4 years, All adult males</p>	<ul style="list-style-type: none"> Participants were more likely to reject unfair offers when the alternative to the offer was fair and the offer was made intentionally. The rejection rates of offenders in the psychopathy group were similar to those of non-offenders. Offenders with lower levels of psychopathy were not influenced by the alternative offer to an unfair proposal, suggesting an indifference to fairness considerations.

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Reciprocal prosocial behavior (cooperation)	Khadjavi & Lange (2013)	• The Prisoner's Dilemma game	<u>Offenders</u> : n = 90, All adult females <u>Non-offenders</u> : n = 92, All adult females	<ul style="list-style-type: none"> • Prisoners cooperated more often than students in the <i>simultaneous</i> task, but the relationship was reversed in the <i>sequential</i> task, with students being more likely to cooperate as first players than prisoners. • Prisoners' cooperation rates in the <i>simultaneous</i> and <i>sequential</i> task were rather similar, suggesting consistency in their behavior. • The increase in cooperation rates for students in the <i>sequential</i> task (as the first player) compared to the <i>simultaneous</i> task, but not for prisoners, could be explained by possible differences in the ability to anticipate others' strategies. • Both groups responded positively and cooperated when the first player cooperated in the <i>sequential</i> task, confirming conditional cooperation and reciprocity. • Defection in response occurred after the first player failed to cooperate.

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Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Reciprocal prosocial behavior (cooperation)	Nese et al. (2016)	<ul style="list-style-type: none"> The Prisoner's Dilemma game The Third Party Punishment task 	<p><u>Camorra Offenders:</u> $n = 129$, age = 25-30 years, All adult males</p> <p><u>"Ordinary" Offenders:</u> $n = 109$, age = 25-30 years, All adult males</p> <p><u>Non-offenders:</u> $n = 109$, age = 25-30 years, All students</p>	<ul style="list-style-type: none"> The Camorristi were found to be more cooperative than both the students and the "ordinary" prisoners, and the "ordinary" prisoners showed lower levels of cooperation than the students. In the presence of exogenous sanctions, the Camorristi and students became significantly less cooperative; an increase in cooperation was observed among "ordinary" prisoners, although the effect was not statistically significant. Regarding the tendency to punish, both groups of prisoners were more likely to impose sanctions than the student sample. When playing the role of the punisher, both the Camorristi and the students, but not "ordinary" prisoners, were more likely to punish the defection if it occurred after the cooperative behavior of the other player. "Ordinary" prisoners reported a significantly greater tendency to cooperate than both the Camorristi and the students in questionnaires, in contrast with their performance in the behavioral tasks.

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Reciprocal prosocial behavior (cooperation)	Balafouta et al. (2020)	<ul style="list-style-type: none"> • The Trust Game • The Prisoner's Dilemma game • The Equal Allocation Task 	<p><u>Offenders:</u> $n = 105$, mean age = 35.95 years, All adult males</p> <p><u>Non-offenders:</u> $n = 40$, 25 female students, 15 male students</p>	<ul style="list-style-type: none"> • Prisoners showed lower levels of reciprocity and cooperation towards the out-group (participants from outside the prison) than towards other prisoners, partly explained by their identification with their group and longer time spent in prison. • The preference for their in-group was also observed for the student sample. • The priming intervention increased the prisoners' reciprocity and cooperation towards the out-group, although it did not affect their behavior towards the in-group or their distributional choices in the equal allocation task. • A longer time spent in prison was associated with lower levels of cooperation and trust towards the out-group. • Prisoners' benevolence towards others (regardless of in/out group membership) decreased when the player had an advantage compared to the other player.

Type of prosocial behavior	Author(s), year of publication	Assessment of prosocial behavior	Participants	Main findings
Reciprocal prosocial behavior (cooperation)	Balafouta et al. (2021)	<ul style="list-style-type: none"> The Prisoner's Dilemma game The Trust game The Equality Equivalence Test The Corruption game 	<p><u>Offenders</u>: n = 176, mean age = 36.40 years, All adult males</p>	<ul style="list-style-type: none"> In the behavioral tasks, for almost half of the cases, prisoners adopted a prosocial behavior, indicating trust and cooperation, as well as an orientation towards social welfare in the social dilemma tasks. Prisoners with higher psychopathy scores show less cooperation, reciprocity, trust, and higher levels of selfishness, suggesting a negative role of this dark personality trait in social interactions.

Main findings

a. Self-reported prosocial behavior

Self-report measures are often used to assess prosocial behavior because they provide valuable insights into an individual's subjective experience of their prosociality. In addition, compared to other methods, they are easier to administer to larger populations and their results can be interpreted with greater efficiency.

A commonly used instrument for self-reported prosocial behavior is the **Prosocial Behavior Scale** (Caprara et al., 2005), which measures behaviors that indicate altruism, trust, and agreeableness. The total score is calculated by averaging all items, with higher scores indicating greater prosociality. Examples of items are: 'I try to help others', 'I trust others', and 'I try to make sad people happier'.

The two articles included in the review used the Prosocial Behavior Scale to measure prosociality in juvenile offenders to identify individual differences between offenders and non-offenders. One article focused on the relationship between self-reported prosociality and multiple variables such as parenting and emotional instability (Samper et al., 2021). The results highlight the importance of empathic concern and perspective-taking for helping behavior. The role of empathy in promoting positive social action was significant for both

groups. Similarly, Cardona-Isaza et al. (2023) examined the impact of empathy and rational decision-making on self-reported prosocial behavior in juvenile prisoners. Although the results were consistent with previous research indicating the essential role of empathy in offenders' helping behavior, the added cognitive dimension provided new insights, suggesting that participants with stronger rational decision-making skills were more likely to report engaging in prosocial behavior.

Prosocial behavior based on the sharing of resources

Our analysis revealed that resource sharing as a type of prosocial behavior has been a point of interest in a few studies conducted in prison settings, with the preferred method of investigation being the Dictator Game, as well as donation tasks. The Dictator Game was originally developed by Daniel Kahneman (1980) as a derivative of the Ultimatum Game. Later, the game was further simplified (Forsythe et al., 1994) and in its current form involves a decision maker (the dictator) who has to decide how to divide a sum of money between himself and a second passive player (the recipient).

In a study focused on comparing the prosocial behavior of convicted offenders and non-offenders (Birkeland et al., 2014), the researchers conducted two experiments. The first study involved prisoners from a semi-open prison in Norway, as well as participants randomly selected from the general population. The procedure consisted of 12 sessions of the classic Dictator game, where two participants were anonymously paired to play the role of a dictator and a receiver. The dictator had to decide how to divide a sum of money between himself and the recipient. There's no payoff to the decision to share, as the receiver cannot react to the dictator's decision. The game consisted of 12 sessions, 4 mixed sessions (participants from both groups, prisoners and the general population), and 8 single sessions (both dictator and receiver from the same group). The main findings showed no significant difference between prisoners and the general population in the Dictator game. Also, the sharing rates (average share ranging between 30-40%) were similar regardless of the other player's membership in the in/out-group (prisoner or general population). A second experiment via the internet included randomly selected participants from the general adult population in Denmark, who at the time had been convicted and sentenced to a fine, as well as individuals with no criminal record. Similar results were found in the online experiment (no statistically significant difference in prosocial behavior between participants with and without a criminal record).

Another study focusing on resource sharing used the Dictator game to investigate the role of selfishness and the need to maintain a positive self-image in the adoption of prosocial behavior (Chmura et al., 2016). In the first experiment, the sample consisted of prisoners convicted of violent and property crimes, as well as students and adult participants from the general population. Using the Dictator Game, participants were demographically matched into pairs and then randomly and anonymously assigned an identification number. Only one participant was randomly chosen to play the role of the dictator and was given the task of deciding how much of a total of 5 euros should be given to the other player. The second experiment followed a similar pattern, except that none of the participants had participated in the first experiment. Each prisoner participated in a replication of the Dictator game from the first experiment, and in a second modified Dictator game in which each had an active role as a dictator and had to decide to donate part of the 5 Euros to charity. The results suggest that, in the Dictator game, prisoners gave more than students and less than matched participants from the general population. In the modified Dictator game, prisoners gave more to charity than to an anonymous prisoner. In terms of offense type, based on the degree of violence involved in committing a crime, the results did not provide clear evidence of a difference between prisoners convicted of violent crimes and those convicted of property crimes in their sharing behavior.

Another line of research examined the relationship between empathy and prosocial behavior, conceptualized as sharing resources without personal gain (Mayer et al., 2018). The study was conducted on a sample of violent male offenders from a correctional institution in Germany, and a control group of age and education-matched individuals. All participants completed an intelligence task and questionnaires measuring psychopathic and aggressive behavior, trait empathy, and alexithymia. A video-based social cognition task (Movie for the assessment of social cognition, Dziobek, 2006) for empathy induction was followed by a classic Dictator game and an empathic Dictator game. In the first part of the experiment, participants watched empathy-inducing and control videos and had to give an empathy rating. In the second part, participants were presented with the classic Dictator game and guided through a game scenario in which they had to decide how to divide 10 monetary units between themselves and a hypothetical player. Participants were then presented with the same videos they had seen in the first part of the experiment and were instructed to play the empathic Dictator game after each video sequence (they had to decide whether and how to share the 10 monetary units with the person in the video). They were also informed that the monetary units they chose to keep would be converted into real money and offered to them at the end of the

experiment. The study yielded interesting results, suggesting that violent offenders don't have impaired empathic competencies compared to non-offenders, with similar data observed in both self-reports and video-based measures (assessed by the MASC), and sensitivity to empathy induction. In terms of the prosocial behavior of violent prisoners, the offender group showed lower levels of sharing behavior compared to the general population, although both groups exhibited higher empathy scores and higher rates of prosocial behavior following the empathy induction videos. Psychopathic traits were associated with low levels of self-reported trait empathy and with impairments in the ability to understand one's feelings (alexithymia).

Using the Dictator game paradigm, a study compared the sharing behavior of prisoners and non-prisoners and examined three factors that may influence prosocial conduct: belief in a just world, perspective-taking, and empathy (Gummerum & Hanoch, 2012). The sample consisted of a group of 50 convicted offenders from a low-security prison and 50 men with no criminal record, all from the UK. First, participants played a classic Dictator game in which the dictator had to decide how much of 20 coins worth €2 to divide between himself and an anonymous player. Participants then completed two questionnaires assessing their perceptions of how fairly they are treated and whether they deserve what they get (the Personal Belief in a Just World Questionnaire, Dalbert, 1999) and perspective taking and empathic concern (the Interpersonal Reactivity Index, Davis, 1983). Results showed that both groups exhibited altruistic behavior, although prisoners offered significantly more money than participants without a criminal record. Comparing self-report data, prisoners showed higher levels of empathic concern and perspective-taking than non-offenders, and no significant difference was observed in their personal belief in a just world. In the general population, only empathic concern was a predictor of increased offers to share in the Dictator game. Conversely, in the prisoner group, increased belief in a just world and higher levels of perspective-taking were predictors of increased offers in the Dictator game. Interestingly, the level of empathic concern did not affect the prisoners' decision to share resources.

Another line of research focusing on resource-sharing behavior examined fairness norms considerations and responses to their violation, as well as associated neural correlates in antisocial personality disorder (Mayer et al., 2018). The study included incarcerated violent offenders from a German prison and age-matched non-offenders enrolled in a vocational school. Data were collected on cognitive abilities (IQ), psychopathic traits, and aggressive behavior. Trained psychologists also assessed participants for Axis I psychopathology and antisocial personality disorder. In the next phase, participants took part in the

Dictator Game and the Ultimatum Game (Güth et al., 1982). In the Dictator Game, participants were told that they would be playing the game with another player who had already undergone the experiment. They were also told that the monetary units they decided to keep would later be converted into real money, which they would receive for personal use. In the Ultimatum game, participants played the first game as a proposer, who had the task of dividing 10 monetary units between themselves and a hypothetical player. They then played 144 Ultimatum games but in the role of the receiver. They were told that in some games the proposer would be another player, while in others the proposer would be the computer (to test the influence of social context on decision-making). In addition, to measure their consideration of fairness norms and their response to their violation, half of the trials were fair and half contained varying degrees of unfairness. Similar to the Dictator game, the monetary units earned were converted into real money and offered to the participants at the end of the experiment. In the Dictator game, results showed significant differences between antisocial violent offenders and the general population, with prisoners showing less sharing behavior, whereas in the Ultimatum game, when they took on the role of proposer, prisoners and non-offenders behaved similarly. These findings suggest that antisocial violent offenders tend to behave rationally and strategically, and have intact fairness norms compliance when it is in line with their personal goals. Another relevant result showed that the social context (human versus computer proposer) influenced the acceptance rates of participants from the general population, but had no effect on the prisoner sample, suggesting that they generally accepted more offers regardless of the type of proposer, confirming the tendency towards more rational and profit-oriented behavior.

Fairness considerations and the association with psychopathic traits were also investigated in offenders and non-offenders from the Netherlands, using a computerized version of the modified Ultimatum Game (Radke et al., 2013). Participants' cognitive abilities and psychopathic traits were assessed, resulting in three groups: offenders with psychopathy, offenders without psychopathy, and healthy individuals. The modified Ultimatum game allowed the manipulation of two factors: Intentionality and Context. The intentionality factor had two levels: intentional (the human player chose the offer) and unintentional (the choice was made by the computer). The context had four levels, depending on the alternatives to an unfair distribution: a fair alternative, a hyperfair-alternative, a hyperunfair-alternative, and no alternative. Participants were informed that they would be paired with another player and that on some trials the offer would be made by the second player, while on other trials the offer would be randomly selected by the computer. Participants had to decide

whether to accept or reject the offer, knowing that if they accepted, the coins would be distributed as proposed, or if they rejected the offer, all coins would be lost for both players. In this modified version, participants also received information about an unselected alternative, providing them with the context in which the offer was made and the intentionality of the offer. To counteract any possible loss of motivation, all participants were informed that their payoff would be determined at the end of the experiment, based solely on the results of a random number of trials. Results showed that participants were more likely to reject unfair offers when the alternative was fair and the offer was made intentionally. Interestingly, the rejection rates of offenders in the psychopathy group were similar to those of non-offenders, whereas offenders without psychopathy were not influenced by the alternative offer to an unfair proposal, suggesting an indifference to fairness considerations.

b. Prosocial behavior involving cooperation and distribution of resources

One of the most used economic-based games is the **Prisoner's Dilemma**, developed by Albert Tucker (1950) and based on *The Tragedy of the Commons* (Hardin, 1968). The game focuses on how people's rationality leads to either personal gain or mutual gain between participants through cooperation.

In a study focusing on the role of social preferences in conditional and unconditional cooperation, convicted criminals were compared with students in a *simultaneous* and *sequential* Prisoner's Dilemma game (Khadjavi & Lange, 2013). In the *simultaneous* task, a player chooses to either cooperate or defect depending on what they believe another player would do, without explicit confirmation of their actual behavior. Choosing to cooperate implies that the individual holds the belief that the other player will also cooperate, a presumption considered to be an indicator of social preference (orientation towards others). In the *sequential* task, a second player can choose to cooperate or defect in response to the first player's cooperation, indicating that individuals with a strong social preference will cooperate in response to cooperation. Conversely, an individual without social preference (self-interested) or with a strong social preference will usually defect in response to the first player's defection. The results highlighted that prisoners' cooperation rates in the two tasks were rather similar, suggesting consistency in their behavior. A relevant difference observed between the two populations was that prisoners cooperated more often than students in the simultaneous task, but the relationship was reversed in the sequential task, with students being more likely to cooperate as first players than prisoners. The increase in cooperation rates for students in the sequential task (as the first player) compared to the simultaneous task, but not for prisoners, could be explained by possible differences in the ability to

anticipate others' strategies. Both groups responded positively and cooperated when the first player cooperated in the sequential task, confirming conditional cooperation and reciprocity. Defection in response occurred after the first player failed to cooperate. The results suggest that the differences in social preference and cooperative behavior between offenders and non-offenders are not as strong as might be expected and that inmates also show cooperation in these types of tasks, sometimes similar to participants without a criminal record.

Staying in the area of social preferences, a second study was conducted on convicted criminals from Italy (Nese et al., 2016). The study used two types of tasks - the **Prisoner's Dilemma** and the **Third Party Punishment** - and compared three samples: students, prisoners involved in the Camorra mafia, and "ordinary" prisoners, not involved in organized crime (the two groups of offenders were similar in terms of the crimes committed). In addition, the participants completed a questionnaire assessing their propensity to cooperate and their locus of control. The study included two designs: the Prisoner's Dilemma task and the Prisoner's Dilemma task with Third Party Punishment. In the Prisoner's Dilemma task, participants were initially given 10 tokens and were paired with an anonymous partner. Each participant had to decide simultaneously what to do with the 10 tokens: keep them or give them to their partner. If a participant decided to give away the tokens, the researcher would triple the amount. In the second design, the Prisoner's Dilemma task with Third Party Punishment involved three types of players. First, the two participants faced the same decision as in the first design, but the difference was that they knew of the presence of a third player who could intervene in the second stage and influence their winnings by awarding penalty points to one or both of them. An important aspect of the study was that each participant only interacted with participants from the same sample. Significant differences were observed between the three groups: in the first design, the Camorristi were found to be more cooperative than both the students and the "ordinary" prisoners, and the "ordinary" prisoners showed lower levels of cooperation than the students. When exogenous sanctions were introduced in the second design, an increase in cooperation was observed among "ordinary" prisoners, although the effect was not statistically significant. At the same time, Camorristi prisoners and students became significantly less cooperative. Regarding the tendency to punish, both groups of prisoners were more likely to impose sanctions than the student sample. A possible explanation could be the "prison effect", which suggests a tendency to punish as a result of being punished during their sentence. An interesting observation was that both the Camorristi and the students, but not "ordinary" prisoners, when playing the role of the third player (punisher), were more likely to punish the defection if it occurred after the

cooperative behavior of the other player, suggesting a sense of justice and a tendency to punish those who are perceived to be taking unfair advantage. Concerning the self-reported data from the questionnaires, the Camorra participants reported higher levels of cooperation than the students, confirming the behavioral data. An interesting difference emerged when comparing the self-reported and behavioral data of the sample of "ordinary" prisoners, who reported a significantly greater tendency to cooperate than both the Camorristi and the students, an aspect that was not reflected in their actions during the Prisoner's Dilemma task. Considering attitudinal cooperativeness and internal locus of control, the results indicate that they are positively related to prosocial behavior in the Camorristi sample. However, a stronger internal locus of control reduced cooperation in the presence of exogenous sanctions, suggesting a rejection of external authority regardless of the subsequent costs. In contrast, the threat of sanctions increased the cooperation behavior of "ordinary inmates", suggesting a tendency towards opportunistic behavior in this sample.

Another line of research using cooperative games examined the effects of incarceration on the social behavior of convicted offenders and the impact of a priming intervention (reflecting on time spent in prison) on their prosociality (Balafoutas et al., 2020). The study was conducted on a sample of prisoners from two types of prison (a high-security and a low-security prison) and students, and used three games to measure prosocial behavior: the **Trust Game** (Berg et al., 1995), the **Prisoner's Dilemma** game, and the **Equal Allocation Task** (Kerschbamer, 2015). The Trust Game examined the relationship between a sender and a receiver, focusing on the trust/mistrust of the sender and the reciprocity/non-reciprocity of the receiver, as well as the resulting gains associated with each type of relationship. The Prisoner's Dilemma task was used in its simultaneous form, where players decided whether to cooperate or defect. The Equal Allocation task assessed the allocation of resources between two parties in a symmetric condition (decision to give each person the same payoff) and an asymmetric/inequality condition (unequal payoffs for the two parties). Players' choices in this task indicate their benevolence in situations of disadvantageous and advantageous inequality, distinguishing four types of behavior: altruistic (disadvantageous and advantageous inequality), inequality averse (benevolent when in advantage, but malevolent when the other player is in advantage), spiteful (malevolent in both disadvantageous and advantageous inequality) and inequality loving (benevolent when the other player is in advantage, but malevolent when he is in advantage). It is worth noting that after participating in the experimental tasks, participants completed questionnaires on demographics and prison conditions. Finally, a group of prisoners participated in an intervention that involved reflecting on their time in prison and how it

had affected their social behavior, a task used as a priming strategy to measure in/out-group preference. The results showed that inmates showed lower levels of reciprocity and cooperation towards the out-group (participants from outside the prison) than towards other prisoners, partly explained by their identification with their group and longer time spent in prison. Similar results were observed for the student sample (a preference for their in-group). The priming intervention showed the potential to significantly improve prisoners' prosocial behavior towards the out-group, increasing their reciprocity and cooperation, but did not affect their behavior towards the in-group or their distributional choices in the equal allocation task. An important observation is that longer time spent in prison was associated with lower levels of cooperation and trust towards the out-group. Also, the tendency of prisoners to behave benevolently towards others (regardless of in/out-group membership) decreased when the player had an advantage compared to the other player.

Another type of study using cooperation games focused on the relationship between psychopathy and social/antisocial behavior in convicted offenders (Balafoutas et al., 2021). The article reports on a study conducted with 176 prisoners from a high-security and a low-security prison. The design involved the use of four prosocial behavior games: the **Prisoner's Dilemma** task, the **Trust game**, the **Equality Equivalence Test** task, and the **Corruption game**. Psychopathy was assessed using the Levenson Self-Report Psychopathy Scale (Levenson et al., 1995). The Prisoner's Dilemma task, the Trust Game, and the Equality Equivalence Test task were administered similarly to the above-described study (Balafoutas et al., 2020). The Corruption Game (Jaber-López et al., 2014) involved a framed interaction protocol in which participants assumed the role of two "firms" and a "public official". The two "firms" bid for a "public project", offering either higher quality or a higher bribe to win the project. The "public official" had to choose the winning bid by deciding between the offers of the two firms. From the firms' point of view, offering a higher bribe was an indicator of low prosociality, i.e. the players traded off public welfare for personal gain (winning the project). For players in the role of 'public officials', a decision based on bribe (rather than quality) indicates selfish and low prosocial behavior. The results of the behavioral tasks suggest that in almost half of the cases, prisoners adopted prosocial behavior, indicating trust and cooperation, as well as an orientation towards social welfare in the social dilemma tasks. Regarding psychopathy, the data indicated that prisoners with higher psychopathy scores show less cooperation, reciprocity, trust, and higher selfishness, suggesting a negative role of this dark personality trait in social interactions.

DISCUSSION

The study of prosocial behavior provides a window into the heart of humanity and allows us to explore what makes us social beings. Despite its importance in understanding the foundations of human behavior, most research has focused on individuals from the general population, granting little attention to groups that exhibit specific aversive behaviors, such as convicted offenders. There are multiple examples of naturally occurring prosocial behavior by convicted offenders, ranging from acts of kindness towards other prisoners (sharing food or cigars, offering emotional support) to donations to charitable causes in the community or participation in volunteer programs outside prison. However, these types of social acts performed by prisoners tend to be seen as exceptional (Gummerum & Hanoch, 2012), reinforcing the prejudice that individuals who break legal and social rules are incapable of behaving in a truly prosocial manner.

This scoping review attempts to map the current state of research on prosocial behavior in prisons and to identify the limitations and underpinnings of the existing research. Although there has been a paucity of research in this area over the last decade, we have attempted to provide an overall picture and synthesize the main findings to provide a coordinated insight into the types of prosocial behavior adopted by prisoners and the possible differences when compared with the general population. We focused on studies that examined prisoners' prosocial behavior as measured by self-report instruments or behavioral tasks, with a particular interest in economic games.

A first set of studies aimed to assess prisoners' *self-reported* prosocial behavior, suggesting the importance of empathy and perspective-taking in the development and maintenance of prosocial behavior in juvenile offenders. A second set of studies provided a more *ecological* approach to prosociality in offenders, by using a variety of games that allowed investigating two main types of actual prosocial behavior: sharing resources and reciprocal prosocial behavior (cooperation).

Regarding prosocial behavior as *resource sharing*, the research focused on comparing convicted offenders and non-offenders, investigating the impact of several factors on social decision-making: in-group/out-group membership, type of offense (violent versus non-violent), empathic concern and perspective taking, personal belief in a just world, consideration of fairness norms and reactions to their violation. The main findings indicated a lack of consistent and clear difference between convicted offenders and those not involved in crime (students, adult matched participants without a criminal record), suggesting that prisoners are not directly impaired in their ability to share resources and may even be more prosocial in some situations than others, and are not

necessarily biased by in/out-group membership. Their decision to help by sharing could be positively influenced by increasing their ability to take the perspective of others, as well as by having a strong belief that the world is just and that rewards and sanctions are a consequence of our actions. Similarly, fairness consideration was quite similar in prisoners compared to the general population, suggesting that they can adapt their behavior to social norms and constraints. As for empathy and actual prosocial behavior, some studies suggest a strong link with sharing behavior in prisoners, while another study didn't find similar results in this regard, possibly due to different research methodologies. A cautionary note relates to the possibility that the documented (lack of) differences or increased reported or actual generosity may not be truly authentic. We need to bear in mind that the prison environment is characterized by clear norms and rules and promotes socially acceptable behavior through rehabilitation programs and a complex system of rewards and sanctions. Thus, a possible explanation for these findings could be related to learned positive behavior or even fear of adopting socially sanctioned behavior. At the same time, we need to consider the impact of social desirability on prisoners' responses and choices in the behavioral tasks, where the need to present themselves in a positive light may be evidence of their efforts to change their aversive tendencies.

From the perspective of *reciprocal prosocial behavior*, several studies have used the Prisoner's Dilemma paradigm, either alone or in combination with other behavioral tasks, to examine the role of social preference, internal locus of control and external authority, fairness perception, and psychopathy traits on strategic and opportunistic cooperation. In addition, one study focused on the effects of length of imprisonment, membership, and an empathic induction intervention on inmates' reciprocity and cooperation rates. Similar to the findings on resource-sharing behavior, prisoners' levels of cooperation were generally similar to those of the general population, confirming the existence of reciprocal behavior among convicted offenders. Attitudinal cooperativeness and an internal locus of control appeared to be positively associated with prosocial behavior, although the presence of an external authority capable of imposing sanctions may affect this association in a prison setting. In particular, exogenous sanctions increased the likelihood of prosocial behavior among inmates, while the opposite effect was observed among prisoners belonging to the Italian Mafia, a possible explanation being the values promoted by the Mafia culture, which focus on the rejection of external authority. It is also interesting to note that the tendency to punish unfair behavior was higher among mafia prisoners and students, suggesting a sense of justice and the ability to assess fairness appropriately, although this behavior was not consistent among non-affiliated inmates. Examining the link between dark personality and reciprocal behavior, an inverse association was observed, suggesting a decrease in

cooperation, reciprocity, and others' oriented conduct in the presence of high levels of psychopathic traits. Another important finding for policymakers and prison administrations was that longer time spent in prison decreased the probability of adopting prosocial behavior, especially towards participants from the community (seen as the out-group), suggesting a current failure of the prison setting in providing adequate services for effective rehabilitation.

All studies conducted within the prison system provide valuable data on the prosocial behavior of convicted offenders and contribute significantly to the development of effective rehabilitation practices. However, there are still important findings to be made in this area of research. As presented, the research covers a wide variety of aspects, but this diversity, combined with the small number of studies, may lead to an inconsistent approach to prisoners' prosocial behavior. Although they appear to use the same game paradigms, few studies explore similar dimensions and focus on an in-depth analysis of specific facets of prosociality, making it difficult to compare findings and clarify contrasting results.

Also, there is still a discrepancy between self-reported and actual prosocial behavior among prisoners. While self-report measures are useful tools for understanding prosocial behavior in offender populations, they have *limitations*. For example, offenders may be inclined to respond in a socially desirable way, as they may feel pressured to present themselves in a positive light. At the same time, more ecological methods using economic games or behavioral tasks may be difficult to implement in the prison setting due to the specific and restrictive characteristics of this type of environment.

Concerning the prison population, the majority of studies have been conducted with incarcerated males, with a focus on violent offenses. While it is true that the prison population is predominantly male, the paucity of data on female prisoners or incarcerated juveniles results in a significant gap in the literature on the prosociality of convicted offenders. At the same time, despite the serious negative consequences of violent offenses, they do not define the entire prison population. Therefore, to obtain a complex and realistic picture of the prosocial behavior of convicted offenders, further studies should consider different types of offenses.

Another problematic aspect relates to the tendency of existing studies to focus on the concrete (sharing, cooperative) behavior of offenders as a marker of prosocial behavior, sometimes without a thorough investigation of the underlying mechanism (real motivation for the prosocial act). Also, other confounding but possibly explanatory factors, such as norms and rules specific to the prison environment, reinforced criminal behavior, rehabilitative interventions, the need to counter negative stereotypes, or the desire to compensate for previous aversive behavior, remain underexplored.

We can conclude that existing studies conducted in prisons provide valuable insights into different types of prosociality and the factors that may influence offenders' decisions to engage in prosocial behavior. The economic games and behavioral tasks presented above imply behaviors that are similar to social acts that are common in the community (e.g. sharing for charitable purposes), but they are an exception for people sentenced to prison. Consequently, although these findings are extremely useful in assessing the rehabilitative effects of prison sentences on prosociality, we believe that further research is needed on important aspects of inmates' social behavior, especially through the use of more realistic methodologies that reflect real prosocial behavior in different settings. Furthermore, the integration of these findings into the intervention procedures offered to prisoners is essential for the effective rehabilitation of individuals reintegrating into society.

Conflicts of Interest

The authors declare no conflict of interest.

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The pedagogical model for developing research/ investigation competence in primary school students (Natural Sciences)

Marieta NEAGU^{1,*} 

ABSTRACT. The article presents the theoretical foundation of the pedagogical model for developing research/investigation competence in primary school students (Natural Sciences) - DCCI-ECP (NS). This model is based on instructional theories, learning theories, educational paradigms focused on competence, socio-constructivist and cognitive approaches, as well as didactic principles. Its structure follows the logical and scientific argumentation of the components of the educational process involved in the development of research/investigation competence (RIC). The normative framework provided by educational policy documents integrates the epistemology and teleology of RIC. The originality of the model lies in its integrated approach through STEAM project-based activities in the Natural Sciences subject for primary school students, addressing all structural components of RIC: cognitive, conative, behavioral, objective/reflexive components. The article highlights the relevance of RIC for the development of young students as a general school competence within the Romanian educational system.

Keywords: school competence, research/investigation competence, didactic principle, educational paradigms, STE(A)M activities.

¹ PhD student, UPS „I. Creangă” from Chisinau primary school teacher, "Ion Ionescu" Gymnasium School, Valea Călugărească, Rachieri Secondary School - Prahova structure, Romania.

* E-mail: neagu.marieta2015@gmail.com



INTRODUCTION

In Romania, the Pre-university Education Law no. 198/2023 (Parliament of Romania, 2023) includes core competencies in mathematics, science, and technology as part of the national curriculum for primary and secondary education. These competencies are among the eight key areas that shape the student's educational profile. The first evaluation targeting competencies in the field of sciences is scheduled at the end of the sixth grade, through a transdisciplinary test covering language and communication, mathematics, and science. Although the study of sciences begins in an integrated manner in preschool education and in a disciplinary manner from the third grade of primary education.

Another significant assessment of science competencies is conducted through PISA. The PISA (OECD, 2022) results indicate that 44% of Romanian students who participated do not reach level 2 in science, meaning they are unable to apply everyday knowledge and basic procedures to identify and explain scientific phenomena. They also struggle to interpret data and formulate questions within a simple experiment. Furthermore, they are unable to draw valid conclusions from the provided data. These students do not demonstrate an understanding of the scientific process, as evidenced by their inability to formulate investigative questions (PISA, 2022).

In this context, it is imperative to develop scientific competencies from the primary education level to enhance students' ability to investigate scientific aspects and concepts in a reflective manner, preparing them as future engaged citizens. A student with scientific literacy is more likely to participate in an argumentative dialogue regarding science and technology. This participation requires specialized competencies to interpret and evaluate phenomena from a scientific perspective, as well as to design research, interpret data, and rigorously assess evidence.

Research/investigation competence in the educational context represents a contemporary pedagogical approach, which holds significant importance across all curricular areas. This competence encourages students to explore, question, analyze, and interpret information, thereby fostering critical thinking, problem-solving skills, and scientific curiosity. However, despite the concept being adopted in educational practice for over a decade, there remains a lack of cohesion and a solid theoretical and epistemological foundation that would provide a unified direction for its application across various disciplines and educational levels.

Research in Moldova highlights a significant recognition of the importance of research/investigation competence as an essential element in the educational process, both for young students (Teleman, 2010) and high school graduates (Sclifos, 2007).

In academic work, including doctoral theses, researchers in Moldova have approached and defined this concept in various ways, reflecting its diversity and complexity. Sclifos explores the concept of "scientific research competence" (Sclifos, 2007, p. 27) as a school competence expressed by "a totality of semantic orientations, knowledge, skills, habits, and students' action experience in relation to certain types of objects from the surrounding world, necessary for productive activities of personal, academic, and social significance". Beyond this approach, we consider that an important aspect for developing research/investigation competence (RIC) within the primary education process is the cognitive component, which the author mentions as an "integrated set of mental operations activated during research" (Teleman, 2010, p. 43).

Teleman defines "exploration/investigation competence" in terms of school competence as a completed structure, composed of "declarative, procedural, and conative components (savoir-dire, savoir-faire, savoir-être), generated by mobilizing a quantum of internal resources of the subject (knowledge, skills, attitudes) within a framework of significant situations (pedagogically intended or spontaneous, with disciplinary or inter-transdisciplinary character), which manifest in significant and intentional evaluation situations through school performance" (Teleman, 2010, p. 62).

Franțuzan describes scientific literacy as a fundamental educational concept central to modern pedagogical practices. It is approached as a multidisciplinary and transdisciplinary competence that integrates elements of different disciplines in the field of Science. The concept emphasizes not only the acquisition of concrete knowledge, but also the application of interactive learning methods and pedagogical models designed to stimulate critical thinking, analytical skills and systemic development of the world (Franțuzan, 2009).

Table 1. *Framework for Research Competence Development*

Category	Description and Contribution
Theoretical Foundations	
Research Results in Educational Republic of Moldova	"Integrated set of mental operations activated during research" (Teleman, 2010, p. 43).
	"A totality of semantic orientations, knowledge, skills, habits, and students' action experience in relation to certain types of objects" (Sclifos, 2007).
	The competence of scientific knowledge includes research competence as a component (Frânțușan, 2009).
Educational Policy Frameworks	
OECD PISA 2022	Assesses research competence as part of scientific literacy, focusing on inquiry-based problem-solving and critical analysis.
Education Code (Moldova, 2014)	Establishes the legal and policy framework necessary to prioritize and standardize the teaching of research competence across institutions.
Education Law (Romania, 2023)	Provides practical guidelines for implementing research competencies in curricula, ensuring equitable access and interdisciplinary learning (Parliament of Romania, 2023).
Curriculum Guidelines	
Reference Framework of the National Curriculum (Moldova, 2017)	Guides competency development in primary education, fostering inquiry-based learning, critical thinking, and foundational investigation skills (Guțu, Bucun, Ghicov et al., 2017).
Curriculum Paradigm – School Competence	Focuses on embedding research processes in competency-based learning through interdisciplinary, project-based approaches (Ministry of Education, Culture and Research of the Republic of Moldova, 2019).
National and Regional School Documents	
Romania: Natural Sciences Curriculum (Grades III-IV)	Aims to develop foundational research skills through observation, experimentation, and reporting in scientific exploration (Prahova County School Inspectorate, 2024).
Methodological Letter (2024)	Offers guidance for implementing research-focused teaching practices aligned with national standards.
Optimization Guide (2015)	Provides strategies for enhancing teaching practices to foster research competence in students (Botgros, Guidelin Frânțușan & Simion, 2015).
Other Educational Systems	
Finland: National Core Curriculum (2014)	Research competence integrated into all subjects; promotes active learning, experimentation, and collaboration (Ministry of Education and Culture, 2014).
Australia: Australian Curriculum (2000)	Highlights inquiry-based learning, interdisciplinary projects, and technology for supporting early research skills (Australian Curriculum Authority, 2000).

Definition

The definition of Research/Investigation Competence (RIC) accepted in our research aligns with the normative framework in Romania, represented by the Pre-university Education Law no. 198/2023, the Primary Education Framework Plan, and the curriculum for Natural Sciences for grades III-IV. This framework conceptualizes school competence as a structured ensemble of knowledge, skills, and attitudes. In Romania (Guidelines for Designing, Updating, and Evaluating the National Curriculum, 2019), RIC as a general competence studied over a school cycle is formulated as "Investigating the surrounding environment using specific tools and procedures" (Ministry of National Education, 2014., p. 4). In the Republic of Moldova, as a specific competence for grades II-III-IV, it is articulated as "Exploring-investigating the surrounding environment, demonstrating curiosity and interest in utilizing specific methods and tools for collecting and organizing results" (Ministry of Education, Culture, and Research of the Republic of Moldova, 2018., p. 72).

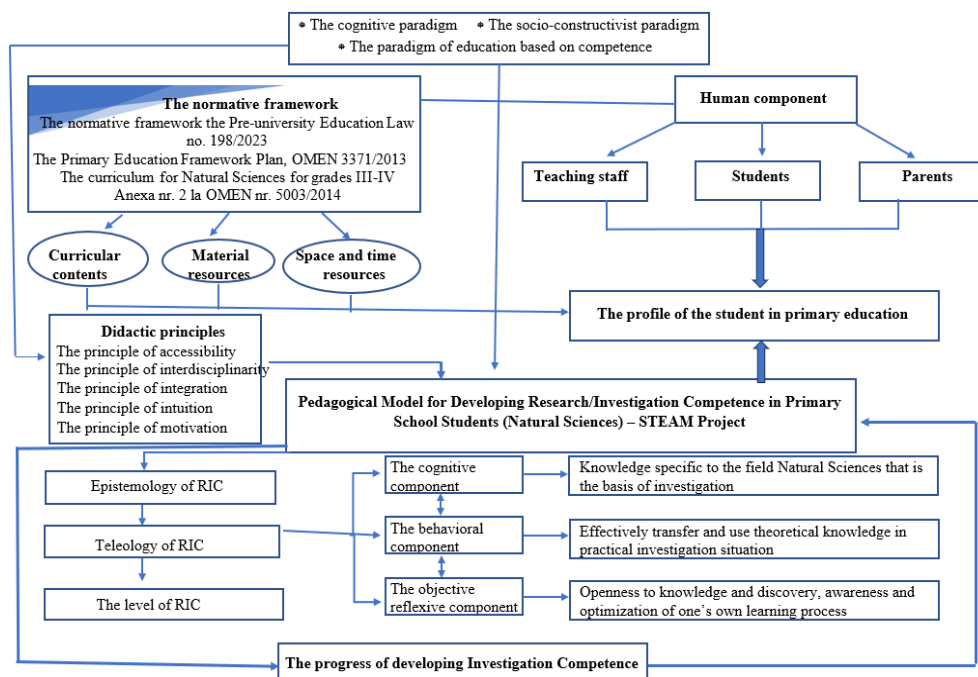


Figure 1. Pedagogical Model for Developing RIC in Primary School Students (Natural Sciences) - DCCI-ECP (NS)

The pedagogical model developed, titled "Pedagogical Model for Developing Research/Investigation Competence in Primary School Students (Natural Sciences) – PMDRIC-PS(NS)" (fig. 1), aims to structure and implement an instructional framework that systematically facilitates the development of this essential competence, integrating it as a central element in the educational trajectory of students. This involves identifying and applying optimized pedagogical methods that encourage critical thinking, analytical skills, and scientific investigation abilities, thus aligning with contemporary educational goals (Cristea, 2003).

The model reflects the essential characteristics of the phenomenon studied through a tripartite composition, as defined by Ionescu (1995). This structure is organized into input flows, consisting of human resources - participants in the educational process - and output flows, representing the learning outcomes that form the objective of our pedagogical intervention.

The Teleology of Research/Investigation Competence in Natural Sciences

The teleology of research/investigation competence in the context of scientific education focuses on the acquisition of specific knowledge and the development of skills, as well as the formation of attitudes and values that contribute to a deep and responsible understanding of the natural world and humanity's place within it. The primary goals of developing this competence in scientific education include (Ciascai & Dulama, 2013):

- **Fostering Critical Thinking and Scientific Mindset:** Encouraging students to adopt an evidence-based approach to understand phenomena, ask relevant questions, and critically evaluate information.
- **Developing Autonomy in Learning:** Promoting self-learning abilities and independent investigation skills among students.
- **Cultivating Responsibility and Environmental Awareness:** Emphasizing the understanding of human impact on the environment and promoting an ethic of care and conservation of natural resources.
- **Promoting Cooperation and Teamwork:** Encouraging collaborative learning and teamwork, with an emphasis on idea exchange in the scientific process.
- **Enhancing Communication Skills:** Improving the ability to effectively communicate scientific investigation results, both in written and oral forms.
- **Applying Knowledge to Real-Life Situations:** Utilizing scientific knowledge and research/investigation skills to approach and solve concrete problems in daily life and professional environments.
- **Stimulating Curiosity and Innovation:** Encouraging creative exploration and innovation in sciences.



Figure 2. Components of Research/Investigation Competence (RIC) in the Natural Sciences Discipline

The components of Research/Investigation Competence (RIC) within the Natural Sciences discipline include:

- **Cognitive Component:** This involves the knowledge and understanding of concepts, principles, and processes specific to this field, as well as the ability to identify and apply the correct steps in an investigative approach. This component is crucial as it provides the theoretical foundation necessary for formulating research questions, developing hypotheses, planning experiments, collecting and analyzing data, and drawing conclusions. It consists of domain-specific knowledge that students need to acquire, such as key concepts in biology, chemistry, physics, and Earth sciences. This component allows students to approach complex questions in Natural Sciences in a structured and informed manner, contributing to the development of critical thinking and problem-solving skills.

- **Conative Component:** The conative component of research/investigation competence in Sciences is essential for fostering a proactive attitude toward learning and scientific practice. It refers to the aspects related to motivation, attitudes, values, and dispositions that influence how primary school students engage in research and investigative activities. This includes the desire to explore, scientific curiosity, perseverance in the face of challenges, openness to new ideas, and the ability to apply knowledge to solve complex problems and develop creative thinking.

These components work together to create a comprehensive framework that supports students in developing their research and investigation skills in Natural Sciences, equipping them with the tools needed to engage deeply with scientific content and processes.

- **Conative Component (Continued):** This component stimulates interest and commitment to exploring natural phenomena and understanding scientific principles. It encourages students to persist in their investigations even when faced with difficulties or failures, learning from mistakes and persevering in the pursuit of solutions. Curiosity is highlighted as the driving force behind scientific inquiry, fostering the desire to learn more and discover new things. This component promotes the development of a critical and creative approach to problem-solving, encouraging innovation and the application of knowledge in new and unexpected ways. It also emphasizes the importance of teamwork and the exchange of ideas, which are essential for advancing scientific knowledge.

- **Behavioral Component:** The behavioral component refers to the concrete actions, practices, and behaviors that young students exhibit during an investigative process. It is essential for transforming theoretical knowledge and intentions into effective actions that lead to solving scientific problems. This component involves a range of practical skills, from rigorous planning and execution of experiments to the critical analysis of data and effective communication of results. These practices contribute to advancing knowledge in the natural sciences and developing a deeper understanding of natural phenomena.

- **Objective/Reflective Component:** This component involves cultivating a proactive and curious attitude toward learning and discovery. It includes developing an open-mindedness that encourages students to be receptive and enthusiastic about new information and challenges, aiming to stimulate active engagement in investigative activities. By nurturing this component, the goal is to develop not only a solid foundation of scientific knowledge in students but also essential competencies such as critical thinking, problem-solving, creativity, and learning autonomy. Students become more capable of initiating and leading their own investigations, formulating hypotheses, collecting and analyzing data, and drawing relevant conclusions, guided by an intrinsic curiosity and a constant desire to explore and understand the world around them.

Epistemology of Research/Investigation Competence (RIC) in Young Students

The epistemology of Research/Investigation Competence (RIC) in young students refers to how they understand and apply scientific research methods and processes to explore the natural world. This learning process involves not only the accumulation of knowledge but also the development of

critical thinking skills and the application of scientific methods. During the research/investigation process, students must be capable of identifying and applying the following steps (Ivan, A.-O., 2016):

- **Formulating a Research Question:** Transforming natural curiosity into a specific, clear, and investigable question.
- **Constructing a Hypothesis:** Developing a prediction based on existing knowledge that will guide the investigative process.
- **Planning the Investigation:** Establishing methods and procedures for collecting the data needed to test the hypothesis, including the selection of appropriate tools and materials.
- **Data Collection:** Conducting experiments or observations, systematically gathering data.
- **Data Analysis:** Carefully examining and interpreting the collected data, using appropriate methods to identify patterns or trends.
- **Drawing Conclusions:** Based on the analysis, students determine whether the data support or refute the initial hypothesis.
- **Communicating Results:** Presenting the findings, either through a written report, an oral presentation, or other forms of expression.

This structured approach not only aids in the development of scientific knowledge but also fosters essential skills such as critical thinking, problem-solving, and effective communication. By engaging in this process, students become more skilled at understanding the natural world through a scientific lens, preparing them for more complex investigations in the future.

The Pedagogical Model

The pedagogical model was developed within the framework of the competence-centered pedagogy paradigm, the socio-constructivist paradigm, and the cognitive paradigm, which provides an important theoretical and practical foundation for the development of research competence in the field of natural sciences. These paradigms emphasize social interactions, cultural environment, learning support, and the significance of language and context in the learning and research process.

Students are exposed to diverse social and cultural environments that help them construct knowledge and develop research skills in a relevant and contextualized manner. They gain an understanding of complex concepts by applying them in practice through research and collaborative activities. This approach ensures that the learning process is both meaningful and aligned with the students' real-world experiences, fostering deeper engagement and comprehension.

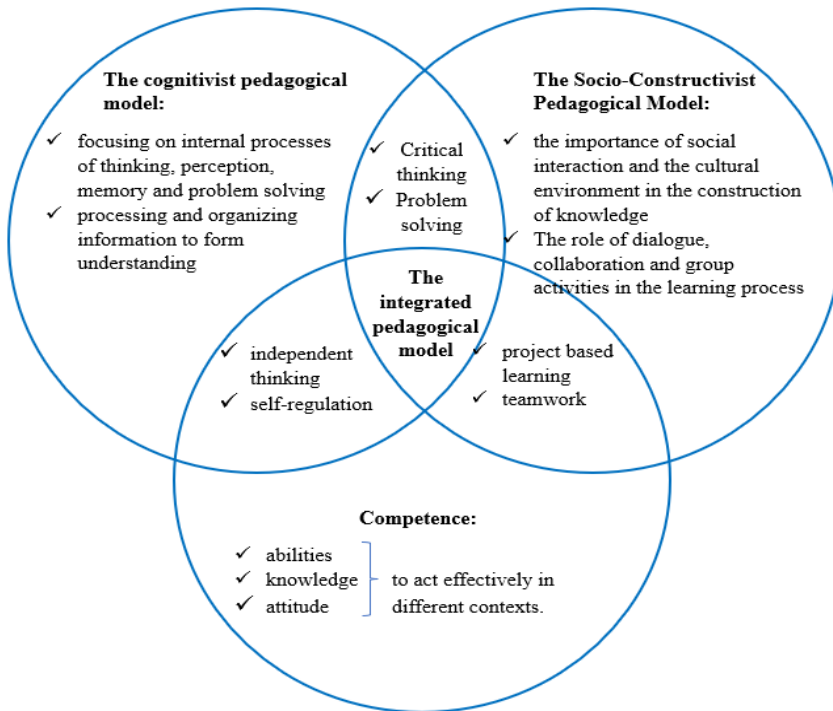


Figure 3. The Key of the Pedagogical Paradigm

This conceptual diagram highlights how integrating these pedagogical paradigms can provide a solid foundation for designing and implementing an effective pedagogical model that promotes meaningful learning and prepares students for the complex challenges of the modern world.

In the educational context of the Republic of Moldova, Guțu makes a significant contribution by describing the educational paradigm regarding the approach to school competence, analyzing it from the perspective of a triple logic: the logic of action in a situation, the curricular logic, and the logic of learning (Guțu, 2018). This approach aligns with the Reference Framework specific to the Republic of Moldova, the dynamics of PISA evaluation, the targeted competencies, and the theory and methodology of teaching and learning. Based on these theoretical and methodological foundations, an orientated pedagogical intervention model is developed, grounded in the principles of the general theory of education, with a focus on the rigorous conceptualization of fundamental school competence, specifically research/investigation competence (RIC). **Independent thinking** is a cornerstone of effective investigation, enabling individuals to approach problems critically, question assumptions, and arrive at conclusions based on evidence. It ensures that the investigative process is

not merely a repetition of existing knowledge but a pathway to discovering new insights and solutions. In the context of investigation, it involves a willingness to challenge existing theories, explore alternative perspectives, and rely on one's reasoning skills to derive conclusions (Miclea, 2002; Neacșu, 2015).

From these paradigms, important principles applicable to education in general, and the study of sciences in particular, can be derived. The principles of the educational process for developing RIC in science represent essential axioms, directives, and fundamental norms that guide the structuring, organization, and conduct of the teaching-learning process, aiming to achieve the established educational objectives. These principles constitute the methodological basis for teaching and learning science disciplines, including Natural Sciences, contributing to the optimization of educational objectives (Ministry of National Education, 2013; Ministry of Education, Culture, and Research of the Republic of Moldova, 2018). They represent the foundation upon which the efficient development of RIC is built within formal education, promoting an integrated and applied approach to learning. These principles shape a framework for RIC development, laying the groundwork for solid scientific education, tailored to the needs and characteristics of students, and fostering a deep and applied understanding of science in the context of everyday life and the challenges of contemporary society.

General Principles of Education, Organizational Principles of Scientific Education, and Investigative Principles

The general principles of education, organizational principles of scientific education, and investigative principles interact synergistically in the process of designing, organizing, and implementing educational activities. Therefore, in the design phase of educational activities, it is imperative to pay close attention to adhering to these principles and conditions, treating them as "guiding and normative reference points" (Gînju, 2021, p. 38). These principles underlie the achievement of general and specific competencies, as well as operational objectives, thereby contributing to the optimization of the educational process and the improvement of performance among young students.

Moreover, focusing on the functions of designing STE(A)M activities within the context of Natural Sciences classes emphasizes the praxiological value of this anticipatory approach, which is essential for ensuring the efficiency and quality of the educational process. This establishes a normative framework for the curricular development of research/investigation competence (RIC), ensuring an effective and coherent approach to education.

The development of RIC within the context of formal education is based on principles characterized by global, holistic, and systemic approaches. In the current educational paradigm, which prioritizes student-centered learning, we propose the following specific principles for the model of RIC development:

Principle of Ensuring Scientific Rigor in the Context of Accessibility

This principle involves adapting the educational process to the age and individual characteristics of students, ensuring scientific accuracy through the formulation of educational objectives, the selection of didactic content, the design of learning tasks, and the development of activity methodologies, while simultaneously ensuring the accessibility and relevance of these elements for students.

This approach guarantees that the educational activities are both scientifically rigorous and accessible, making the learning experience meaningful and effective for all students, regardless of their individual learning needs.

Principle of Interdisciplinarity and Transdisciplinarity

The principle of interdisciplinarity and transdisciplinarity (Manolescu, 2013; Ursu & Cutasevici, 2019; Pahome, 2023) aims to highlight the connections between different school subjects and various dimensions of education, promoting a holistic and integrated approach to learning that transcends traditional disciplinary boundaries. It emphasizes the importance of establishing multidimensional links between various academic disciplines (such as biology, physics, chemistry, geography, psychology, and sociology) and social sectors (such as education, economy, industry, and health), recognizing that without integrating knowledge from these areas, scientific education would be limited. Additionally, it acknowledges the value of connections with arts (such as visual arts, music, and literature), facilitating the application of STE(A)M approaches.

Principle of Integrating Scientific Culture and Scientific Consciousness

The principle of integrating scientific culture and scientific consciousness focuses on cultivating a scientific culture and consciousness through axiological values, encouraging the formation of appropriate scientific attitudes and behaviors. It emphasizes experiential learning, thereby facilitating the internalization of scientific knowledge and methods through direct and applied experiences. This approach ensures that students not only learn scientific facts and theories but also adopt the mindset and ethics of scientific inquiry, fostering a deeper appreciation for the scientific method and its applications.

Principle of Holistic Integration

The principle of holistic integration promotes a comprehensive approach to scientific education, encouraging the recognition of connections between

various scientific phenomena and concepts. It supports the development of a deep and multidimensional understanding of the natural world. This principle encourages the application of interdisciplinary knowledge in addressing complex problems and underscores the importance of an integrated education that fosters the holistic growth of students. The integration of theoretical knowledge, the development of research skills, and the cultivation of positive attitudes and ethical values are essential in this process. This pedagogical model prepares students to tackle contemporary ecological and social challenges, providing a solid foundation for understanding the complexity and interconnections within the scientific world.

By applying these principles, educators can design and implement educational activities that not only impart knowledge but also develop critical thinking, creativity, and ethical awareness, equipping students with the skills and mindset needed to navigate and address the complexities of the modern world.

Crouch's (2017) Seven Fundamental Principles in STEM Education

Crouch author, 2017 (apud Chiriac, 2022) emphasizes seven fundamental principles in STEM education that support teachers in efficiently planning lessons while enhancing the educational experience of students without negatively impacting task completion. These principles include:

1. **Active Student Engagement:** Involving students in hands-on projects that allow them to apply STEM concepts practically, fostering deeper understanding and retention.

2. **Relevance to Students' Future Careers:** Addressing the relevance of the subject matter to students' future professional lives, helping them see the value and applicability of what they are learning.

3. **Connecting Abstract STEM Concepts to Prior Knowledge:** Linking new, abstract STEM concepts to students' existing knowledge to maintain their interest and enhance comprehension.

4. **Modeling a Positive Attitude Towards STEM:** Teachers and parents alike should model a positive attitude toward STEM subjects, which can influence students' perceptions and engagement.

5. **Keeping Up with the Latest Trends:** Teachers must stay informed about the latest trends in curriculum development, technology, and pedagogy to provide the most current and effective education.

6. **Transdisciplinary Integration:** Promoting a transdisciplinary approach that connects STEM subjects with other disciplines, offering a more holistic understanding of the material.

7. **Promoting Continuous Learning:** Encouraging a culture of continuous learning, preparing students for a world that is constantly evolving and requiring ongoing adaptation.

By adhering to these principles, STEM education becomes more structured and relevant, providing students with a solid foundation for their academic and personal development. This approach ensures that students are better equipped to face the challenges of a rapidly changing world (Chiriac, 2022).



Figure 4. Didactic Principles in the Context of Investigative Approach and STE(A)M Activities

This diagram serves as a visual guide for integrating didactic principles into the planning and implementation of learning activities, emphasizing the connections between these principles and the focus on an investigative approach.

- **Contextual Relevance:** Demonstrates how STE(A)M activities are connected to real-world problems that are relevant to students, facilitating the understanding of the applicability of knowledge in real-life contexts.

- **Active Learning:** Highlights how STE(A)M activities engage students in active learning through experiments, projects, and exploration, stimulating curiosity and motivation.

- **Individualized Learning:** Involves adapting the educational process to the unique needs, interests, and learning pace of each student, allowing for personalized learning experiences.

- **Cooperative Learning:** Emphasizes the importance of teamwork and collaboration among students in STE(A)M projects, promoting the exchange of ideas and mutual learning.

- **Interdisciplinarity in Learning:** Shows how STE(A)M activities integrate knowledge and skills from multiple disciplines (science, technology, engineering, art, and mathematics), offering a holistic view of learning.

- **Reflection and Self-Assessment in Learning:** Stresses the importance of personal reflection and self-assessment in the learning process, encouraging students to evaluate their own progress and become autonomous learners.

Originality of the Model

The originality of the model lies in the adaptation of the curriculum and teaching methods for the development of Research/Investigation Competence (RIC) through STE(A)M activities, aiming not only to transmit knowledge but also to cultivate critical thinking, creativity, and the ability to solve complex problems.

- **Creating Unified Themes:** Develop unified themes that address topics from multiple STE(A)M disciplines simultaneously, emphasizing the connections between them and the application of knowledge in real contexts.

- **Using Project-Based Learning Methods:** Encourage collaboration, critical thinking, and practical application of knowledge through project-based learning.

- **Integrating Digital Tools in the Learning Process:** Utilize educational software, simulations, augmented reality (AR), or virtual reality (VR) to facilitate the exploration and understanding of complex concepts.

- **Encouraging Inquiry-Based Learning:** Promote student inquiry by encouraging them to ask questions, formulate hypotheses, and conduct experiments, thereby cultivating essential research/investigation skills.

- **Teaching Data Collection, Analysis, and Interpretation:** Instruct students on how to collect, analyze, and interpret data using scientific and mathematical methods.

- **Teamwork:** Highlight the importance of interdisciplinary collaboration and idea exchange for problem-solving.

- **Competence-Oriented Assessment:** Use competence-oriented assessments, such as project portfolios, presentations, research reports, and self-assessments, to reflect progress in developing RIC.

- **Open and Exploratory Learning Environment:** Foster an open and exploratory learning environment that encourages experimentation and discovery.

This model prepares students to engage deeply with STE(A)M subjects, equipping them with the skills and mindset necessary to navigate and address the challenges of the modern world effectively.

CONCLUSIONS

The proposed approach demonstrates a clear capacity to improve students' learning in natural sciences, developing critical thinking, learning autonomy and transversal skills essential for the future.

The RIC pedagogical model, based on well-defined didactic principles – such as scientific rigor, interdisciplinary integration, scientific culture and holism – provides a clear guide for teachers in designing educational activities. Visualizing the central elements of the model – cognitive, conative, behavioral and reflective components – supports teachers in understanding the relationships between them and in their differentiated application, depending on the needs and characteristics of their class. Participating teachers reported an increase in student motivation, enjoyment of learning, and confidence in their own abilities.

However, implementing the model also raised challenges, such as the time required for planning, integration into existing curricula, and the use of unconventional educational spaces. These challenges highlight the importance of managerial support and a clear institutional strategy for the effective integration of the model.

The proposed model is designed to facilitate the understanding and effective application of research/investigation competence, providing teachers and students with a structured framework for scientific inquiry. By integrating the logic of action into real-life situations, the model encourages students to apply theoretical knowledge in practical contexts, promoting experiential learning and problem-solving. Curricular logic ensures coherence and continuity in the development of competencies across different educational levels, while the logic of learning focuses on adapting instructional processes to the cognitive and motivational characteristics of students.

The pedagogical model represents a valuable resource for improving educational practices, offering an integrated perspective on the development of research/investigation competence in primary school students within the Natural Sciences discipline. By promoting this model, the aim is not only to enrich the educational experience for students but also to enhance the effectiveness of the educational process in line with contemporary educational standards and requirements.

In conclusion, this model provides an innovative example of integrating RIC into STE(A)M education, demonstrating its potential in contributing to a more holistic and relevant education for contemporary challenges. It remains open to revision and adaptation, and future research is needed to extend its applicability to diverse educational contexts.

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