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# Seasonality and time-related aspects of suicides in Greece: an applied time-series analysis

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## Abstract

The background that underlies each committed suicide varies among people and constitutes a complex structure of psychological, behavioural and biological risk factors that may be triggered by external conditions. Recent studies have shed new light on the association of suicides with particular days and periods of year, in an attempt to resolve the inconsistencies met in literature regarding this relationship. The aim of this study is to look into any time-related patterns on suicides in Greece and to do so we analyzed the frequency of suicides over a period of 13 years (2000-2012) in terms of day of the week, month, major celebration and season. A seasonal ARIMA model revealed the association between suicide frequency and month of year, with a peak to be reached in May and July and increased numbers of suicides to be reported during spring and summer months. Monday was the most frequent day of suicide occurrence whereas Sunday was the least one. A season pattern of suicides was validated. The increase of suicide occurrences on Mondays could be explained by the "broken-promise effect" which has been described as the consequence of frustrated expectations of the weekend. Suicide peaks in spring and summer may be explained partially by biological factors (e.g. serotonergic alterations) as well as the experience of depressed people perceiving the social and emotional contrast to other people that enjoy outdoor activities at that period.

**Keywords:** Suicides, Greece, seasonality, weekdays, months, major celebrations, time-related patterns

## Introduction

Suicides constitute one of the major public health problems worldwide [1] and account for almost 1 million deaths per year [2] which might be translating into mortality rate of 16 per 100,000. Suicide rates in Greece are among the lowest in Europe [3] with 8,025 suicides being committed during the period 1992-2012 and the mean standardized suicide rate at 3.13/100,000 inhabitants [4]. For psychiatric and psychotherapeutic services, mental health clinicians and primary health-care professionals, the understanding of the mechanism that triggers a suicide attempt is a key point in their preventative interventions; however it is not always straightforward due to the complexity and the multifactorial causation that underlies this act [5]. In the literature we meet a long list of potential risk factors, including genetic, biological, socioeconomic, and environmental [6-10], that can be categorized into two general groups, external and internal. Past studies have investigated the link between committing a suicide and the external factor of the time-point that this occurs [5], revealed interesting time patterns.

According to Panser et al. [11], the festive period of Christmas and New Year, is accompanied with a suicidal preventive effect and a subsequent increase in suicide numbers. Cavanagh et al. [12] found significantly lower Christmas suicide rates in a subgroup analysis based on data from England, as Plöderl et al. [13] and Deisenhammer et al. [14] did using Austrian data. Another known effect is that of the day of the week. Several studies have showed significantly dissimilar distribution of the number of suicides over the days of a week; for example Cavanagh et al. [11], Ceccato and Uittenbogaard [15], and Lukaschek et al. [16] observed more suicides at the beginning of the week and especially on Mondays compared to the rest of its days.

Suicidal behavior has also been examined in terms of seasonality. Most of the studies that investigate the seasonal variations in the number of suicides, recognize an accumulation of suicides and suicide attempts in spring and early summer, both for the northern and (mirror image) southern hemisphere [17,18].

In this paper, we focused on the case of Greece, a country of great interest due to the economic crisis that hit it in 2008. Since then, the Greek people have experienced a decade of dramatic social rearrangements with adverse effects on various aspects of their daily life [4]. Periods of economic crises are usually associated with a significant increase of suicides [19-21], and that it is also reported in a recent study over the course of the economic crisis in Greece [3]. Papaslanis et al. [4] compared the number of suicides taking place few years before and after the onset of the crisis, 2001-2007 vs 2008-2011, and reported an increase of suicides by 27.2%

The purpose of our study is to investigate the hypothesis of time-related suicidal behaviour. For the analysis, the number of suicides per day over a 13-year period in Greece has been used. To the best of our knowledge this is the first study in Greece that aims to investigate seasonality of suicides via a seasonal autoregressive integrated moving average (SARIMA) model on monthly level. Moreover, we examined whether the suicide frequencies in terms of days of a week and in terms of season, confirm the distributions met in the majority of the published studies, according to which it is expected an augmentation of suicides through the period of financial crisis 2008-2012.

## Methods

For our analysis we used the number of suicides per day occurred in Greece in the period January 2000 – December 2012 from the records of the Hellenic Statistical Authority (ELSTAT). Apart from the descriptive statistics on the aggregated data, we applied SARIMA models that incorporate a seasonal and a non-seasonal part onto the disaggregated by month data. For this analysis, we created two indicators, one for the day of the week with values 1(=Monday) to 7(=Sunday) and a second one for the meteorological calendar of the Northern Hemisphere, where winter includes the months December, January and February; spring March, April and May; summer June, July and August; and autumn includes September, October and November. In order to investigate whether there are significant differences in the number of suicides in major Greek public

holidays, we compared the monthly mean number of suicides with the number of suicides of the corresponding day as well as the 3-day period before and after, as suggested by Deisenhammer, Stiglbauer and Kemmler [14]. Therefore, a new database was constructed where for each variable of major Greek celebrations, the daily data on each celebration day and the  $\pm 3$  day period were allocated to celebration day whereas daily data on all other days of that month were allocated to the non-celebration variable. This approach minimizes the bias due to seasonal variation since the rest of the year is used as a control period [13,22].

Additionally to the seasonal differences, we investigated the effect of the economic crisis upon the trends of suicides in the country. The first signs of the crisis appeared in the Greek economic indicators in 2008. The problem reached a peak during 2009-2010 and it was after the first memorandum in May 2010, when the circumstances of the crisis changed dramatically Greek people's lives. The period that our data cover, allowed us to subdivide the 13-year examined period into two sub-periods: "before" crisis, comprising the years 2000 up to 2007 and "during" crisis, from 2008 up to 2012. All statistical tests were performed at a significance level of 5%. IBM SPSS version 23 was used for all analyses.

## Results

### *Descriptives*

The day of the week with the largest number of suicides was Monday and that with the smallest was Sunday. May was the month with the largest number of suicides and February with the smallest. As for seasons, most of the suicides occurred during summer while the less during winter. (see Table 1).

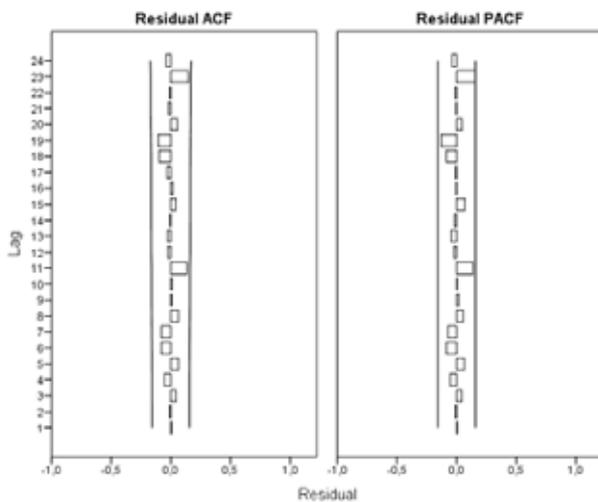
	N° suicides 2000-2012	Annual Mean No of suicides
Day of the week		
Monday	485	37.3
Wednesday	448	34.5
Tuesday	428	32.9
Thursday	426	32.8
Friday	417	32.1
Saturday	412	31.7
Sunday	401	30.8
Month		
May	284	21.8
July	279	21.5
June	275	21.2
August	262	20.2
April	253	19.5
March	249	19.2
September	249	19.2
January	242	18.6
November	242	18.6
October	239	18.4
December	224	17.2
February	220	16.9
Season		
Summer	813	62.5
Spring	786	60.5
Autumn	733	56.4
Winter	686	52.8

Table 1: Number of suicides and annual mean number of suicides per day, month and season of the year for the period 2000-2012

### Suicides and seasonality

A time-series model for monthly number of suicides was developed to examine the effect of time for the years 2000 - 2012. The 12-month series was used to identify a seasonal ARIMA (1, 0, 2) (1, 0, 1)<sub>12</sub> model. The goodness of fit test for that model is presented in the residual ACF and PACF graphs (see Figure 1).

Figure 1. Graph of ACF and PACF residuals for the (1, 0, 2), (1, 0, 1)<sub>12</sub> ARIMA model.



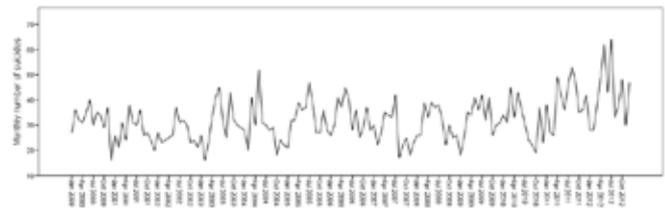
There was significant seasonality effect for all the months (seasonal autoregressive, lag 24 (SAR12) = 0.98,  $t = 15.35$ ,  $p < .001$ . R2 value of the final model was 0.35 (See Table 2 and Figure 2).

Table 2: ARIMA/SARIMA regression models for monthly number of suicides for the period 2000-2012

Independent variables	$\beta$	SE	T	p
AR1	0.58	0.19	2.97	.003
MA1	0.44	0.20	2.24	.026
MA2	-0.22	0.09	-2.30	.023
SAR12	0.98	0.06	15.35	<.001
SMA12	0.88	0.17	5.19	<.001
R2	0.35			

Note: AR1 = autoregressive, lag 1; MA1 = moving average, lag 1; MA2 = moving average, lag 2; SAR12 = seasonal autoregressive; SMA12 = seasonal moving average, lag12.

Figure 2. Monthly suicide time series for the period 2000 – 2012 in Greece



### Suicides, seasons and days of the week

A two way analysis of variance was conducted to test whether there were differences on the number of suicides per day by seasons (4: winter, spring, summer, autumn) and by day of the week (7: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday). The main effect was statistically significant,  $F(27,4721) = 4.14$ ,  $p < .001$ ,  $\eta^2 = .023$ . Both main effects at the season group  $F(3,4721) = 19.41$ ,  $p < .001$ ,  $\eta^2 = .012$ , and the day group  $F(6,4721) = 7.33$ ,  $p < .001$ ,  $\eta^2 = .009$  were significant.

The Bonferonni post hoc criterion was used on the differences among days and revealed systematic differences on number of suicides on Mondays (when we met the largest number of suicides) and Fridays, Saturdays and Sundays (when we met the smallest number of suicides). Regarding the season post hoc analysis, the Bonferonni criterion indicated that there were systematic differences on number of suicides between springs and summers (when the largest number of suicides are met) and autumns and winters (when we had the smallest number of suicides). There were not differences at the interaction of season and day of the week on the number of suicides per day  $F(18,4721) = 0.53$ ,  $p < .948$ ,  $\eta^2 = .002$  (see Table 2 and Figure 3).

Table 3. Daily mean number of suicides per season and day of the week for the period 2000 - 2012

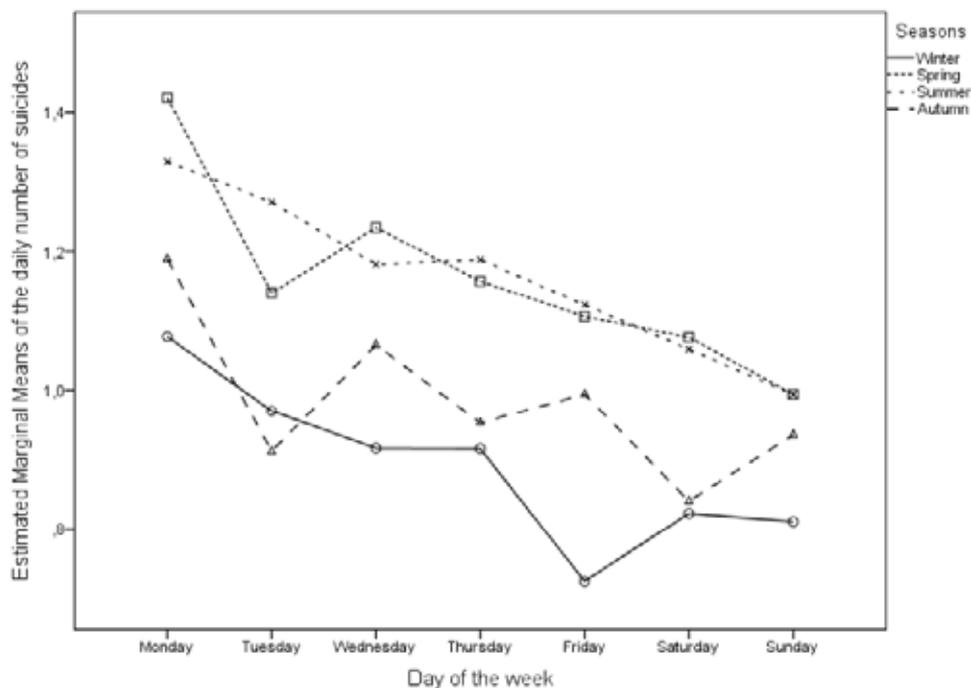
	Winter	Spring	Summer	Autumn						
	M	M	M	M	Df	F	$\eta^2$			
Suicides	0.89a	1.16b	1.16b	0.98a	3,4721	19.41***	.012			
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday			
	M	M	M	M	M	M	M	df	F	$\eta^2$
Suicides	1.25a	1.07ab	1.10ab	1.05ab	0.99b	0.95b	0.93b	6,4721	7.33***	.009

Note: \*\*\*  $p < .001$ . Means that share a common letter do not differ significantly according to the Bonferroni post hoc test at  $\alpha = .05$ .

Figure 3. Estimated marginal means of the daily number of suicides by season and day of the week for the period 2000-2012 in Greece

### *Suicides and major celebrations in Greece*

Multiple paired-samples t-tests were conducted to compare the number of suicides during major Greek public celebrations. For the comparison we used the mean number of suicides per day for each month comparing the mean number suicides for the day or for the  $\pm 3$  day period with the mean number of suicides per day for each month of the 13 years period. These tests



revealed that there was significant difference in the number of suicides during the 17th November celebration (Athens Polytechnic uprising) period ( $\pm 3$  days) ( $M = 1.29$ ,  $SD = 0.47$ ) and the mean number of suicides in November ( $M = 0.91$ ,  $SD = 0.26$ );  $t(12) = -2.45$ ,  $p = .031$ . Moreover, there was significant difference between the number of suicides in Christmas period ( $\pm 3$  days) ( $M = 0.75$ ,  $SD = 0.24$ ) and the mean number of December ( $M = 0.75$ ,  $SD = 0.24$ );  $t(12) = 2.51$ ,  $p = .027$  (see Table 3).

Table 4: Suicide means. Standard deviations and paired t test for major celebrations in Greece during 2000-2012

Mean of suicides	M	SD	t	df	p
January	0.88	0.16	-0.15	12	.881
Year's Day	0.92	1.04			
January	0.88	0.16	0.80	12	.442
New Year's Day $\pm 3$ days	0.82	0.29			
January	0.88	0.16	-0.37	12	.721
Epiphany	1.00	1.22			
January	0.91	0.19	1.34	12	.204
Epiphany $\pm 3$ days	0.78	0.30			
February	0.88	0.18	-1.06	12	.310
Valentine's day	1.23	1.24			
February	0.89	0.19	-0.12	12	.910
Valentine's $\pm 3$ days	0.90	0.32			
March	1.02	0.36	1.22	12	.247
National Independence Day (25th March)	0.69	0.95			
March	0.98	0.38	-0.66	12	.521
National Independence Day (25th March) $\pm 3$ days	1.09	0.57			
May	1.33	0.26	-0.33	12	.744

Labor Day	1.46	1.51			
May	1.31	0.25	-0.33	12	.750
Labor Day $\pm 3$ days	1.37	0.74			
April/May	1.24	0.24	0.97	12	.352
Easter	1.00	0.91			
April/May	1.24	0.25	0.15	12	.879
Easter $\pm 3$ days	1.22	0.51			
August	1.05	0.28	0.14	12	.889
Holy Mary's Day (15th August)	1.00	1.15			
August	1.06	0.29	0.75	12	.468
Holy Mary's Day (15th August) $\pm 3$ days	0.98	0.42			
October	0.93	0.25	1.45	12	.171
National OHI day (28th October)	0.54	0.97			
October	0.87	0.28	-1.37	12	.195
National OHI day (28th October) $\pm 3$ days	1.05	0.42			
November	0.99	0.22	-0.54	12	.601
17h November Celebration (Athens Polytechnic uprising)	1.15	1.07			
November	0.91	0.26	-2.45	12	.031
17th November Celebration (Athens Polytechnic uprising) $\pm 3$ days	1.29	0.47			
December	0.89	0.30	0.67	12	.513
Christmas	0.69	0.95			
December	0.92	0.31	2.51	12	.027
Christmas $\pm 3$ days	0.75	0.24			

Note: In the mean number of the month it was excluded the day or the period  $\pm 3$  days. The mean number of Easter depends on the year (April or May).

### *Suicides and financial crisis*

An independent samples t-test was conducted to compare the number of suicides per day before the Greek economic crisis (period 2000-2007) with that of the first period of the crisis (period 2008-2012). According to this, there was significant difference in the mean number of suicides of the period 2000-2007 ( $M = 0.98$ ,  $SD = 1.03$ ) and the mean number of suicides of the period 2008-2012 ( $M = 1.16$ ,  $SD = 1.12$ );  $t(3643,97) = -5.67$ ,  $p < .001$ .

## Discussion

We examined 5,023 cases of suicide recorded in the study period in Greece for significant differences in their frequency in terms of temporal aspects. In particular, fluctuations observed concerning the day of the week, the seasonal distribution and the period of economic crisis in Greece. Suicidal behavior is a complex phenomenon and the result of the interplay of various factors; thus it can never be fully explained by a single factor. According to Deisenhammer, Stiglbauer and Kemmler [14] these factors may be chronic / distal or acute / proximal, neurobiological or psychological, societal or individual, genetic, biographical, or environmental. As suggested by Woo, Okusaga and Postolache [23] geographic location, allergens, allergy related asthma, rhinitis, and atopic dermatitis, suicide method and occupation are factors that were found to be related to seasonality in suicide. However, more research is needed to elucidate the association between mental disorders, bioclimatic factors, viruses, pollutants and the underlying mechanisms of this phenomenon [22].

Our first objective was to examine seasonal trends in suicide incidence. The results showed seasonal trends in suicide incidence in Greece that reaches their peak in spring and summer season. While conducting a systematic literature on seasonal

variations in suicides in Greece, we didn't meet any conclusions based on the methodological approach that was used in this paper, the seasonal ARIMA models. According to Tsai and Cho [24] SARIMA is more appropriate than multiple regression for the time-series analysis of seasonality. When considering the suicides according to the seasonal distribution, there was a peak in number of suicides in May and summer months (as an aggregated set of months), when significantly more suicides occurred than those in the "darker" seasons. Our results validate the pattern of seasonality that is also observed in relevant references on Europe [25,26] and Asian countries [27-29].

There were two socio-psychological theories that try interpret the seasonal patterns in suicide. According to Durkheim [30] suicide incidence is higher in spring and summer because social and occupational activities—that mostly take place at daytime—increase in spring and summer as the days become longer. Indeed, suicide incidence is higher at daytime [31-33], and peaks in suicide incidence shift throughout the year in the same way as the change in timing of sunrise and sunset does [31]. The second one is suggested by Gabennesch [34] who introduce a psychological interpretation for the spring-peak. During this period of the year people have expectations for feeling better at times that might promise a new beginning, such as spring, weekends, or holidays. In cases where these expectations are greater than what they deliver, a negative effect on subjective well-being may be triggered and often this effect might be worse than before their expectations being developed. Therefore, the peak of number of suicides in the bright, warm months could be linked to the experience of depressive people, who perceive a contrast between their social and emotional deficits and the perceived reality of other people that enjoy their outdoor activities [14].

Furthermore, biological interpretations have been given regarding the seasonality in suicides. In this context, there is seasonal variation in the binding potential of the serotonin transmitter [35], or association with the number of hours of sunshine as Lambert et al. [36] suggested. Makris et al. [37] shed light on the serotonergic antidepressants while the role of melatonin has been additionally investigated. [38].

The second objective of the study was to examine the relationship between the day of the week and the suicide events. Regarding the distribution of suicides, we found a peak at the beginning of the week where significantly more suicide cases occur on Monday while the least suicides take place on Friday, Saturday and Sunday. This is consistent with most of the previous study results [11,13,14,26]. The peak number of suicides just at the beginning of the week, in turn, could also have a "broken-promise effect" [14,34]. For a depressive person the expectations of the recovery effect of a weekend, is not the same as it has been experienced in the past before the appearance of depression, or if the weekend does not bring the hoped-for positive social experiences, then that person may suffer during the work week that seems much harder.

Our third objective was to examine seasonal trends in suicide incidence in reference to Greek holidays and celebrations. Regarding the time around Greek holidays and celebrations, our investigation showed no statistical deviations except for the period Christmas (lower) and the celebration of 17th November (higher). The incidence of suicide at Christmas differed from other days in December. According to Deisenhammer Stiglbauer and Kemmler [14] there was a lower tendency for suicides during the period of 17 December to 8 January. Our finding about Christmas period is in line with international research [39-42]. Despite the suggestion that people experience lower emotional well-being and life satisfaction before Christmas, and that alcohol use and psychopathology severity are increased at Christmas time [39,43], which are all risk factors for suicide, this is not confirmed by our study. Moreover, as suggested by relevant international studies, the overall utilization of psychiatric emergency services and admissions, the number of self-harm presentations, non-fatal suicide attempts, and completed suicides are all decreased [39,44]. A reduced risk of suicides on - especially family significant - holidays could also be related to the actually increased social contacts that take place then, which can be emotionally positive and act as a border to suicidal attempts [14]. International studies found that only men showed significant fewer suicides on Christmas day [45], while others reported a greater reduction in women [12,40]. In our study we did not explore the impact of sex dif-

ferences due to the available sample size. Future studies could address the impact of gender in suicides' seasonality in Greece.

We also found higher mean of number of suicides the days around the celebration of 17th November in comparison with the mean number of suicides of the month. The reasons for this result are not yet entirely understood. The interpretation of this trend is complicated and there are not any findings in the relevant bibliography to interpret it. Overall, there was not observed significant impact of the Greek celebrations/holidays on suicides' seasonality.

Our fourth aim was to examine whether there are differences in the number of suicides between a pre-crisis period (years 2000-2007) and a during crisis period (years 2008-2012) that hit Greece and led to tough social changes. This is the first study that investigates differences at the daily number of suicides during this crucial period and our analysis revealed statistically significant increase in the number of suicides during the Greek economic crisis. Our findings were in accordance with relevant studies [4,46,47] and should be considered in caution since using daily number of suicides maybe be a very sensitive measure in detecting differences between the two periods. Chew and McCleary [48] proposed dual hypotheses for suicidal seasonality: bioclimatic and sociodemographic hypotheses. Although they emphasized that these two dimensions may not be mutually exclusive, and physical climate and social activity do interact, as well as both socio-demographic and bioclimatic factors affect suicide seasonality, they recognized that socio-demographic factors explained more cross-sectional variation. However in a study the results indicate that climatic factors have more effect on suicidal seasonality than the economic factors [24]. Future studies could address the relationship between socio-demographic and bioclimatic factors on suicides' seasonality.

Our work clearly has some limitations. In order to prevent loss of anonymity, Hellenic Statistical Authority (ELSTAT) does not publish daily data in age groups and geographical areas breakdowns. The period we studied was relatively small (13 years) and the present findings are based on population of a single country. Although the descriptive results do not allow

any identification of causal variables, they offer a context within which hypotheses for future work on this direction may be formulated.

The results of the present study validate the association of the frequency of suicide with certain days and seasons. Our findings can benefit the understanding of temporal aspects of suicide in Greece. This study contributes also to knowledge and awareness about high-risk time frames. The high-risk time frames identified and that take place in May, in the summer season and on Mondays may be used for planning mental health interventions and prevention strategies. Obtaining better understanding of suicide mechanisms that trigger the seasonal peaks of suicide attempts, may lead to the identification of factors that are amenable to preventative interventions [27].

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# The Interpersonal Reactivity Index (IRI) scale in Greek patients with dementia.

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## Abstract

**Background:** Empathy, which refers to a cognitive and emotional process of continuously detecting the changing intentions of others, differs in the behavioral variant frontotemporal degeneration (bvFTD) compared with other dementia types. Interpersonal Reactivity Index scale (IRI) could help in understanding their differential patterns of empathy. We suggested that both emotional and cognitive aspects of empathy would be significantly decreased in bvFTD patients compared to other dementia groups in the Greek population.

**Methods:** We examined 162 subjects with dementia of various types and normal control. (normal control: 61; Alzheimer's disease (AD): 61; bvFTD 19; semantic variant of Primary Progressive Aphasia: 14; nonfluent variant of Primary Progressive Aphasia: 7). Two subscales of IRI, Empathic Concern and Perspective-Taking, used to measure the cognitive and emotional components of empathy.

**Results:** Patients with bvFTD showed extreme deficits in both empathic concern and perspective taking compared to the other patient groups. AD patients showed greater impairment in empathic concern but not in perspective taking than has previously been seen.

**Conclusions:** In the Greek population, patients with different types of dementia and different patterns of anatomical lesions show a reduction in distinct aspects of empathy. Thus, IRI is a cross-cultural useful tool for immediate neuropsychological examination regarding the evaluation of empathy.

**Keywords:** empathic concern; perspective taking; behavioral variant frontotemporal degeneration; social cognition

## Introduction

Empathy is the ability to understand and participate in the internal mental life of others. Empathy refers to a cognitive and an emotional process which is detecting the continuously changing intentions of others, overt and hidden, and the attempt to influence or exploit them. The model of empathy used by Davis [1] suggests that there are four specific aspects of empathy (cognitive and emotional). Perspective taking and fantasy are the cognitive aspects while empathic concern and personal distress are the emotional. Perspective taking is the tendency to spontaneously imagine the cognitive perspective of another person. Fantasy refers to the tendency to project oneself into the place of fictional characters in books and movies. Empathic concern is the other-centered emotional response resulting from the perception of another's emotional state and personal distress is a self-centered emotional response involving fear or distress that results from witnessing another's stressful circumstances or negative emotional state. [1]

Recent efforts to measure empathy in patient samples show divergent patterns of emotional versus cognitive empathy [2]. This dissociation likely arises from diverse patterns of damage that arise from various clinical syndromes, and multiple studies have demonstrated that this can have diagnostic value.

Cognitive and emotional aspects of empathy differ in behavioral variant frontotemporal degeneration (bvFTD) and Alzheimer's disease (AD) patients. In general, bvFTD patients show less empathy than AD patients. More specifically, bvFTD patients present with impairment in both cognitive and emotional aspects of empathy, likely due to the early involvement of emotion generating structures in the salience network of the brain [3,4] while AD patients preserve emotional aspects, but are often impaired in cognitive aspects of empathy [2,5]. Sturm et al [6] suggest that in patients AD, neurodegeneration of ventrolateral temporal lobe structures is associated with up-regulation of emotion-generating mechanisms, corresponding to greater personal distress.

FTD is a common syndrome of dementia, especially in presenile cases, but its diagnosis remains particularly challenging.

Not only is there continued difficulties in differentiating bvFTD from AD diagnostically, but patients with AD and bvFTD are frequently misdiagnosed as having a psychiatric disorder early in their disease. [7,8] Thus, understanding their differential patterns of empathy, particularly with respect to how they present in a cultural setting other than the US or the UK, could help with differential diagnosis.

While patients with any of the subtypes of frontotemporal degeneration (FTD) can show changes in behavior and personality, those with bvFTD show significant deficits in empathy, including early loss of insight, disinhibition, social inappropriateness and emotional alterations. [5,9]

Previous studies have shown that the diagnosis of bvFTD may vary depending on the cultural environment in which it takes place. [10] As socioeconomic status (SES) could be a critical differentiating factor and these differences have been seen in clinical samples only in the US, UK, it is unclear whether these patterns will continue to be seen in patients in other sociocultural settings and particularly in the Greek population.

The aim of the study was to investigate if the patterns of empathy that have been seen in the US and UK samples will also appear in a Greek sample. Furthermore, we examine if bvFTD patients will present divergent patterns of empathy compared to other dementia forms.

## Methods

### Subjects

This study recruited 162 subjects, 61 of whom were healthy older controls (NC). Normal controls were recruited from the community during information campaigns for dementia through the Memory Clinic at the G. Gennimatas Hospital, Neurology department, Athens, Greece and the Third Age Centre "IASIS" also in Athens. The patients were recruited through the same structures as above, first having been identified in the clinic subject pool through diagnosis and then recruited as potential study participants. These subjects and their caregivers signed an institutional review board-approved research consent form including an agreement to fill out questionnaires for research purposes. Patients seen at this dementia clinic varied

according to sex, education level, and socioeconomic status. Patient diagnosis was derived by a multidisciplinary team of neurologists, neuropsychologists, psychiatrists, and nurses. The study was conducted in compliance with the regulations of the local ethics committee and in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Among the patients, 61 patients were diagnosed as meeting core clinical criteria for AD according to the McKhann criteria [11,12]; Forty patients were diagnosed with one of the FTD syndromes, including 19 with the bvFTD [13], 14 with the semantic variant of Primary Progressive Aphasia (svPPA), 7 with the nonfluent variant of Primary Progressive Aphasia (nfvPPA). [14]

### *Neuropsychological procedures*

#### Neuropsychological Testing

All participants were administered a battery of tests in the Greek language. Mini-Mental State Examination (MMSE) [15], was used in the exploration of global cognition. Addenbrook's Cognitive Examination (ACE-R) is a brief battery that provides an evaluation of six cognitive domains (orientation, attention, memory, verbal fluency, language, and visuospatial ability) [16]. We used ACE-R to detect dementia and for differentiating subtypes of dementia, [17] In an exploration of their ability to generate verbal and non-verbal material the test of words and animals reported in absolute numbers per minute was administered (phonemic and semantic fluency, respectively). We also used the Frontal Assessment Battery (FAB) [18], in the exploration of the executive functions, a brief battery of six neuropsychological tasks designed to assess frontal lobe function at the bedside. (Similarities-conceptualization, motor series-programming, conflicting, instructions-sensitivity to interference, inhibitory control, prehension behavior-environmental autonomy)

#### Empathy Testing

The Interpersonal Reactivity Index (IRI) is a measure of both cognitive and emotional components of empathy that is ad-

ministered in questionnaire form. It includes two seven-item subscales measuring cognitive empathy: Perspective Taking, (PT) and Fantasy (FS), as well as two seven-item subscales measuring emotional empathy: Empathic Concern (EC) and Personal Distress (PD). An informant (a close relative) was asked to rate on a 5-point Likert scale ("Does not describe me well" to "Describe me very well) how well each of the 28 statements described the participant [1]. We used only the Perspective Taking (PT) and Empathic Concern (EC) sub-scales of IRI as previous studies have shown that only these sub-scales are useful for depicting empathy differences in patients with dementia syndromes and demonstrate a strong correlation with underlying atrophy. Fantasy (FS) and Personal Distress (PD) sub-scales were not used in our research as previous studies have shown that these two subscales of the IRI are not useful for depicting empathy differences in patients with dementia.[ 1,19,20] In particular, FS has demonstrated problems with construct and criterion validity while PD has shown little predictive utility in the differential diagnosis of dementia.[1,2,19,20]

#### Neuropsychiatric Assessment

Participants were administered the Geriatric Depression Scale (GDS) [21] for subjects older than 65 years and the Zung Depression Scale [22] for younger subjects to evaluate depression. In order to compare scores from subjects of different age groups, scores on each of the depression questionnaires were divided into three levels of severity (0-3; GDS: 0-9 = 0, 10-16 = 1, 17-23 = 2, 24-30 = 3; Zung: 20-50 = 0, 51-60 = 1, 61-70 = 2, 71-80 = 3).

### *Statistical Analysis*

Statistical analyses were performed using SPSS. Before statistical analysis, all variables were tested for normality using the Kolmogorov-Smirnov criterion. Numerical data are expressed as mean  $\pm$  SD. Independent sample t-test (age and years of education) and  $\chi^2$  statistics (sex) were used to investigate possible differences in age, education, and sex between the groups. As age and education variables showing differences were included in the later analysis as potential confounds. Analysis of covariance (ANCOVA) was used to determine differences between dementia groups in empathy, controlling for age and

education, followed by the Bonferroni test. Statistical analyses were performed setting the threshold of statistical significance at  $p < 0.05$ .

## Results

### Demographic data

Normal controls were significantly younger than patients with AD ( $p < 0.001$ ). They also had more years of education compared with AD, bvFTD and svPPA groups ( $p < 0.001$ ,  $p < 0.001$  and  $p < 0.05$  respectively). There were no sex differences or differences in severity of disease across patient groups. (Table 1). Thus, age and years of education were included in all statistical models.

Table 1: Demographic Data

	N	Sex M/W	Age (years)	E d u - c a t i o n (years)	Years of Disease
Normal	61	20/41	63.2 (7.8)	13.5 (3.1)	-
AD	61	23/38	73.5 (7.6) ‡	10.1 (7.9) ‡	3.7 (2.7)
FTD	40				
bvFTD	19	5/14	67.3 (5.7) *	8.2 (3.2) ‡	3.5 (3.4)
svPPA	14	7/7	66.9 (8.5)	10.3 (4) *	3.5 (2.3)
nfvPPA	7	3/4	66 (6.5)	13.4 (3.9)	3.5 (1.7)
TOTAL	162				

Note: AD, Alzheimer's Disease; FTD, Frontotemporal dementia; bvFTD, behavioral variant Frontotemporal dementia; svPPA, semantic variant Primary Progressive Aphasia; nfvPPA, nonfluent variant Primary Progressive Aphasia;

Values are expressed as mean and standard deviation (mean ± SD). Significantly differ from NC group at \*  $P < 0.05$ , ‡  $P < 0.001$

### Empathy measures

#### Cognitive empathy

Normal controls performed significantly higher than all dementia groups on the PT subscale, while AD patients had significantly higher scores on PT than bvFTD and svPPA. Also, patients with bvFTD had lower PT than all other patient groups except svPPA patients.

Figure 1: Box plot of PT subscale and dementia syndromes

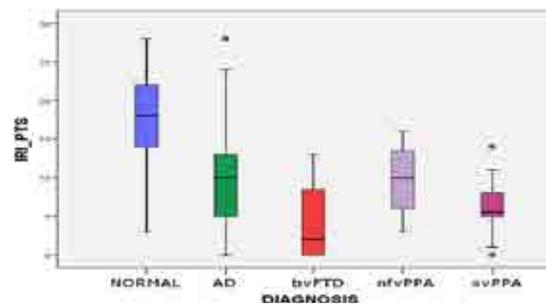


Figure 1	Normal	AD	bvFTD	nfvPPA	svPPA
Normal	---	**	***	*	***
AD	***	---	***	ns	*
bvFTD	***	**	---	*	ns
nfvPPA	*	ns	*	---	ns
svPPA	***	*	ns	ns	---

ns = non-significant; \* =  $p \leq 0.05$ ; \*\* =  $p \leq 0.01$ ; \*\*\* =  $p \leq 0.001$

Table 2: Empathy subscales and neuropsychological data

		IRI PT	IRI EC	MMSE	ACE-R	Phonemic Fluency	Semantic Fluency	FAB	Depression severity
Normal		17.6 (6)	24 (4.1)	29.3 (0.9)	94 (4)	13.9 (3)	17 (2.4)	17.5 (0.8) ‡	0.1 (0.3)
AD		10 (6.5) ‡	19.7 (6.1)*	23.2 (3.2) ‡	65.2 (10) ‡	7 (4.4) ‡	8.7 (2.6) ‡	12.4 (3.6) *	0.2 (0.5)
FTD									
	bvFTD	4.3 (4.5) ‡	11.8 (7.2) ‡	24.6 (3.9) ‡	72 (15) ‡	5.7 (3.1) ‡	8 (3.3) ‡	9.5 (4.2) ‡	0.1 (0.3)
	svPPA	6.2 (3.7) ‡	17.9 (6.2)*	18.8 (8.4) ‡	51.8 (18) ‡	3.6 (1.9) ‡	5.6 (4.2) ‡	12.7 (3.5) *	0.4 (1)
	nfvPPA	9.7 (4.8)*	18.5 (6.8)*	22.8 (3.6) ‡	60.8 (13.7) ‡	5.4 (2.7) ‡	5.6 (3.7) ‡	8.6 (5.1) ‡	0.2 (0.4)

### Emotional empathy

Only bvFTD and svPPA patients had significantly lower EC than normal controls. In addition, patients with bvFTD had significantly lower EC scores than all other groups of patients. Also, the AD patients had significantly higher EC scores than bvFTD.

Figure 2: Box plot of EC subscale and dementia syndromes

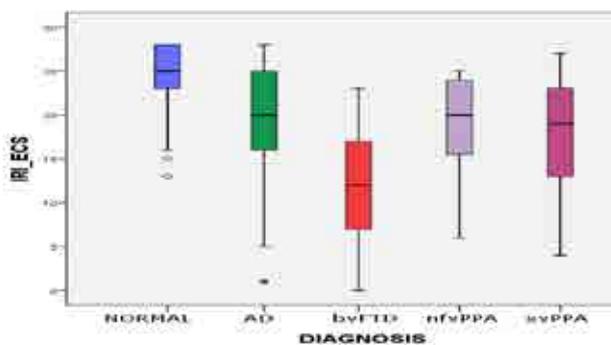


Figure 2	Normal	AD	bvFTD	nfvPPA	svPPA
Normal	---	*	***	*	*
AD	*	---	***	ns	ns
bvFTD	***	**	---	*	*
nfvPPA	*	ns	*	---	ns
svPPA	*	ns	*	ns	---

ns = non-significant; \* =  $p \leq 0.05$ ; \*\* =  $p \leq 0.01$ ; \*\*\* =  $p \leq 0.001$

### Neuropsychological performance

Table 2 presents the neuropsychological performance of each group. The group of normal controls performed significantly higher than all dementia groups. Even both AD and bvFTD patients performed significantly lower than normal control there were no significant differences between them in the MMSE, semantic fluency (animals/minute) and phonemic fluency (words/minute).

### Discussion

#### Patterns of empathy in Greek sample

Our results indicate that patterns of empathy in the Greek sample are compatible with the findings in the US and UK samples of same diagnostic categories.[2] In our study, bvFTD patients present a distinctive empathy pattern. In our sample, bvFTD and svPPA patients presented with significantly lower cognitive empathy compared to both normal controls and other dementia groups. However, only patients with bvFTD had significantly lower emotional empathy than normal controls and other dementia patients.

We observed that patients who were diagnosed with bvFTD and svPPA demonstrated abnormally reduced cognitive empathy compared with the normal control which is consistent with a previous study in US sample. [2] Previous studies [23,24,25,26] have shown that medial frontal and anterior temporal brain structures support the cognitive mechanisms that are responsible for effortful attempts to understand the other (i.e., cognitive perspective taking). These structures are likely recruited

because mental representation and differentiation of cognitive and emotional states, both within ourselves and in others, are required for cognitive empathy. Our bvFTD and svPPA patients had structural defects in both these regions.

However, patients with bvFTD but not with svPPA had abnormally reduced emotional empathy, which does not agree with a previous study in a US sample which did not present reduced emotional empathy. [2] Although the reason for this difference between Greek and US samples it is not obvious, the decrease which observed in the Greek sample may be due to the damage [15,27] to structures in the salience network, a symptom seen often in bvFTD patients. [3,4,19] The amygdala and the circuits of subcortical structures-OFC, which are associated with the feeling of fear and the evaluation of a potential behavior based on reward or punishment, are more damaged to such an extent as to show a massive reduction of EC [28]. Damage to regions in this network has been directly associated with many of the socioemotional deficits observed in bvFTD patients, likely via the mechanism of reduced reward-related attention to social cues.[29,30,31] With regard to emotional empathy, bvFTD patients may no longer have the capacity to respond emotionally to others' distress, and may not recognize that others' emotional expressions can be important, personally "salient" cues. The decrease in emotional empathy in Greek sample is possibly due to the age difference between Greek and US bvFTD patients [26] [mean age (SD): 67.3 (5.7) vs 59.5 (8.7) years, respectively]. As the Greek patients are older than the US, they are probably more progressed in disease course and also more impaired, resulting in wider reduced emotional empathy.

Patients with AD in this sample showed a reduction in both perspective taking and empathic concern compared to normal. This is different from the patterns observed previously in samples from other cultures, including in the US [2], where the perspective taking is lost in AD, but core emotional empathy remains normal. The overall loss of empathy seen in AD patients might be considered a result of the degree of general cognitive deterioration observed in these patients. According to the Rankin, Kramer, & Miller [2] deficits observed in empathy, and reflected in the PT and EC subscales, are mainly due

to impairment of specific frontal and temporal brain regions, which are often also impacted in more advanced AD. Patients in our sample were of moderate dementia severity (ACE-R Score = 65.2), (Table 2) thus were more progressed in their disease course than other reported samples. A previous study indicates that at diagnosis, FTD patients in Greece are more impaired than patients in the United States. Patients with FTD in Greece are diagnosed later in the disease course, as their behavioral symptoms are not easily detected by the medical system. [10] Cultural factors might also be responsible for this difference; it is possible that there is a higher baseline degree of socioemotional relatedness in Greek culture compared to the US, and any losses in emotional empathy would be more noticeable to informants.

### *Patterns of empathy in bvFTD vs svPPA*

Our study has shown that bvFTD patients in the Greek sample present the most drastic deficit in both cognitive and emotional empathy than other dementia forms. In our sample, bvFTD patients showed significantly reduced cognitive empathy compared with all other dementia groups except svPPA, as well as significantly reduced emotional empathy compared with all other dementia groups. (Figure 1, Figure 2)

Yet because there are anatomical differences in the underlying brain lesions of these two groups, their loss of perspective taking may be due to different causes. For patients with bvFTD, their loss of perspective taking may be due to apathy, which might cause them to fail to actively pay attention to and engage in interpersonal activities. Also, because bvFTD patients often have a high degree of social disinhibition, their perspective taking may be reduced because they fail to carefully deliberate about others' emotions or thoughts, instead of jumping to conclusions or selecting inappropriate responses. For patients with svPPA, who have significant loss of both non-social and socioemotional semantics, they may lose perspective taking due to poor understanding of interpersonal situations. Conversely, svPPA patients did not have significant deficits in empathic concern, though patients with bvFTD did. This may reflect the greater relative vulnerability of structures supporting emotional experience and responsiveness in patients with

bvFTD.

## Conclusions

In summary, our data confirm that in a sample of Greek individuals, patients with different types of dementia show a reduction in distinct aspects of empathy. This is consistent with what has previously been reported by Rankin, Kramer, & Miller, [2] and suggests that the lesions in specific brain structures in these dementia syndromes and lead to loss of empathy. However, Greek patients with AD showed greater impairment in empathic concern than has previously been seen in US patient samples, potentially due to cultural differences. In different sociocultural regions, health conditions are viewed differently. Divergent patterns across the subscales of the IRI can also contribute to the differential diagnosis of patients, with bvFTD patients showing the most extreme deficits in both empathic concern and emotional perspective taking compared to the other patient groups. Thus, even in a cross-cultural setting, IRI can be used for immediate neuropsychological examination regarding the evaluation of social cognition and specifically of empathy.

## Disclosure of interest

The authors report no conflicts of interest.

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# Knowledge and attitudes towards mental health patients' rights among mental health professionals

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## Abstract

**Introduction:** It is well known that people with psychiatric disorders experience violations of their human rights. Both knowledge and attitude of mental health professionals could play a core role in guaranteeing the rights of this sensitive patient population. The aim of the present study was to explore the attitudes of mental health professionals, psychiatrists and nurses, towards mental health patients and to determine the level of knowledge towards their rights.

**Method:** The study was carried out at the Psychiatric Hospital of Thessaloniki among a sample of 166 mental health professionals (psychiatrists and nurses). A questionnaire, consisting of four parts, was designed for the purpose of the study.

**Results:** Of the total study population 68.7% were nurses and 25.3% were psychiatrists. Our findings suggest that the higher level of education is associated with a more positive attitude towards mental health patients, the attitude of mental health professionals towards the patients depends on the knowledge they have of their rights and also that psychiatrists who have a mental health patient in their family have a more positive attitude towards these patients than nurses.

**Conclusion:** Since knowledge of mental health patient's rights implies a better attitude towards these patients, initiatives to inform and educate mental health professionals on these rights should be further encouraged.

**Key-words:** Patients' Rights, Mental Health Care Professionals, Mental Health patients, Knowledge, Attitudes

## INTRODUCTION

Human rights are ethical claims enshrined in national and international legal texts that aim to protect the individual from third party abuses but also to contribute to the promotion of his welfare. The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”, linking health to human rights with a special reference to mental health. At international level, health is enshrined, *inter alia*, in the Treaties and Conventions of the International Organizations and the E.U. Charter of Fundamental Rights. The protection of the rights of persons with mental disorders is in the focus of several international conventions' resolutions and recommendations. The best known in this context are, among others: The United Nations General Assembly Resolution 46(119) “Principles of the Protection of Persons with Mental Illness and for the Improvement of Mental Health Care” (1), the Recommendation R (83) 2 “The legal protection of persons suffering from a mental disorder placed as involuntary patients” and the Declaration of Hawaii / II (2). In Greece, health as an individual and social right is enshrined primarily in Constitution 1975/1986/2001/2008 (Article 5 (2), Article 7 (3) and Article 21). Particularly, patients' rights, including mental patients' rights, are expressly provided for by Article 47 of Law 2071/1992. Moreover, in every hospital there is established a Health Protection Officer's Office (3). However, even though patients' rights have been legally enforced, in practice patients' rights and especially mental health patients' rights are often violated. For this reason, it is necessary to pursue a holistic approach in order to protect them. What is needed though, is that all stakeholders, from the mental healthcare policy makers to the mental health professionals, to get actively involved in this effort.

According to various studies, negative attitudes, such as stigma (4) and fear (5) towards people with mental illness, are prevalent among mental health professionals. A study conducted in Brazil revealed that among a national sample of 1,414 psychiatrists, 42.9% of them were identified as having prejudicial behavior and high social distance to-

wards people with schizophrenia (6). Another study (7) by Nordt et al. showed that mental health professionals had multiple negative attitudes towards people with mental disorders which were like those the general public had. It is undeniable that negative attitudes could lower the quality of health care provided to people with mental illness (8), while both knowledge and attitude of mental health professionals could play a core role in guaranteeing the rights of patients (9).

Unlike a large amount of studies comparing attitudes of mental health professionals with other healthcare professionals (10, 11) or general public (12, 13, 14), fewer studies have been conducted to examine correlates of attitudes to mental illness among mental health professionals. In this respect, the aim of the present study was to explore the attitudes of mental health professionals, psychiatrists and nurses, towards mental health patients and to determine the level of knowledge towards mental health patients' rights.

## METHODS

The study was carried out at the Psychiatric Hospital of Thessaloniki among mental health professionals (psychiatrists and nurses) working in acute ward clinics, rehabilitation clinics, out-of-hospital reintegration structures and the internal medicine clinic. A questionnaire consisting of four parts was designed for the purpose of the study. The first part included twelve questions about the general attitude of the participants in the research towards mental health patients. The second part included eighteen questions on knowledge of the existence of mental health patients' rights during their hospitalization in a psychiatric clinic, as well as whether psychiatrists and nurses know the status, the procedures and the legal framework applicable to involuntary hospitalization. The third part included five questions on whether the participants in the survey inform their patients about their rights and whether the mental health professionals themselves are informed and by whom about these rights. The fourth part included demographic param-

eters such as age, gender and type of profession (psychiatrist, nurse). The questionnaire was anonymous and was approved by the Scientific Council of the Psychiatric Hospital (protocol number: D3b / 24916 9-7-2018).

The data were analyzed using Statistical Package Software for Social Sciences (SPSS). Data were presented using descriptive statistics in the form of frequencies and percentages. Chi-square test was used to compare the proportions among various groups and a P-value of <0.05 was considered to be statistically significant. Where the assumptions of the test were not satisfied with the data (especially when the reported frequencies were very small), the Fisher Exact Test was used.

## RESULTS

### *Socio-demographic characteristics*

In total, 166 mental health professionals participated in the study, 68.7% (n=114) of them were nurses and 25.3% (n=42) were psychiatrists. In 6% of the questionnaires the field of professional specialization was not filled in. Regarding the type of profession, psychiatrists were fewer than the nurses, however, the nurses working in the Psychiatric Hospital are more than the psychiatrists, so, proportionately, the number of psychiatrists who took part in the survey was weighted with the number of nurses. More than half of the sample (68.1 %, n=113) were females, 31.3% (n=52) were male. Ten of the participants did not fill in the age field (6%).

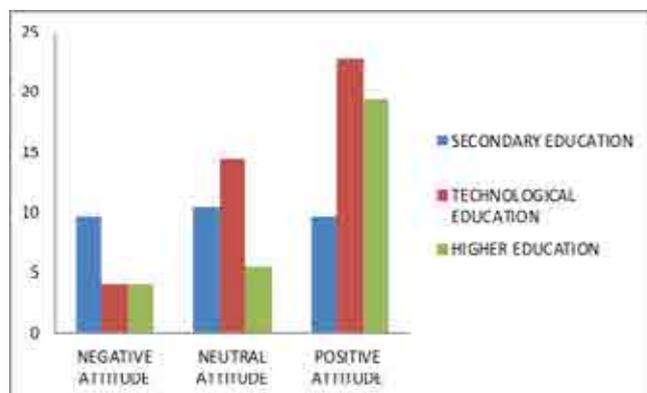
The age of the participants ranged between 18-66 years. The majority (67.5 %, n=103) were under 50 years of age. Almost half of the sample (47.6%, n=79) belonged to the age group of 36-50 years, followed by 50 years and over (31.9%, n=53). The majority (59.6%, n=99) of the respondents were married. 54.2% (n=90) of the participants had received higher education while 28.9% received secondary education. Among the psychiatrists, 28 had received higher education, 8 had a postgraduate degree and 5 had a doctorate degree, whereas 28.9% of the nurses had re-

ceived secondary education and 35.5% higher education. Regarding work experience in the field of health care, 42 mental healthcare professionals had up to 10 years of work experience (25.3%), 41 of the participants had 10-20 years of work experience (24.7%), 52 had 21-30 years of work experience (31.3%) and over 22 of the participants had more than 30 years of work experience (13.3%). Finally, 27 of the participants had a person in their family with mental illness; the psychiatrists had a person in the family with a mental illness to a greater extent (28.6%, n=12) than the nurses (13.2%, n=15).

### *Knowledge and attitudes*

According to the results of the statistical analysis, the attitude of mental health professionals towards mental patients depends on their education. A significant correlation between the level of education and the attitude towards the mental health patients was found, the higher level of education is associated with a more positive attitude towards the patients (p=0.005) (Figure 1).

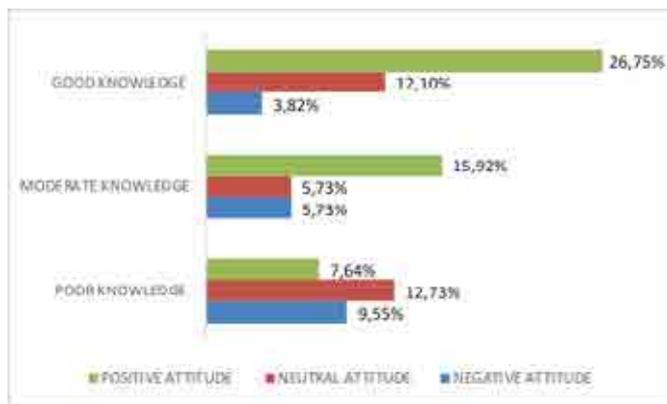
Figure 1: Correlation between attitude of mental health professionals towards mental health patients and their level of education



Another finding was that the attitude of mental health workers towards the patients depends on the knowledge that they have of their rights, since that knowledge both on the rights of mental health patients and the procedures

concerning involuntary hospitalization were associated positively with the attitude of mental health professionals towards the mentally ill ( $p=0.001$ ) (Figure 2).

Figure 2: Correlation between knowledge of mental health professionals regarding the human rights of mental health patients and their attitude towards them



Lastly, psychiatrists who have a patient with mental disorder in their family had a more positive attitude towards mental health patients than nurses ( $p=0.014$ ) (Table 1).

According to our results no significant association was found between: the type of profession (psychiatrist or nurse) and the attitude towards mental health patients ( $p=0.250$ ), the workplace and the attitude of the professionals towards the mental health patients ( $p=0.456$ ), and patients' information about their rights and the level of education or type of profession of the professionals ( $p=0.925$ ). In addition, a correlation between patient information about their rights and the age, gender, workplace and work-experience of the mental health professionals was not noticed. Moreover, no significant association was found between the knowledge on the rights of mental health patients both with level of education and work-experience of mental health professionals (Table 1).

Table 1: Knowledge and attitudes of mental health professionals towards mental health patients: positive and negative correlation

Positive correlation	Negative correlation
Attitude of mental health professionals towards mental patients depends on their education ( $p=0.005$ )	Attitude of mental health professionals towards mental patients does not depend on the type of their profession ( $p=0.250$ )
Attitude of mental health professionals towards mental patients depends on the knowledge that they have of their rights ( $p=0.001$ )	Patients' level of information regarding their rights does not depend on the type of profession and the level of education of mental health professionals ( $p=0.925$ )
Mental health professionals' awareness on the rights of mental patients depends on their knowledge of these rights ( $p=0.000$ )	Attitude of mental health professionals towards mentally ill patients does not depend on their workplace ( $p=0.456$ )
Psychiatrists who have a person with mental disorder in their family have a more positive attitude towards these patients than nurses ( $p=0.014$ )	Knowledge on the rights of mentally health patients does not depend on mental health professionals' work-experience ( $p=0.642$ )
	Knowledge on the rights of mental health patients does not depend on the level of education of mental health professionals ( $p=0.531$ )

## DISCUSSION

According to our results, there was a positive correlation between the level of education and the attitude towards the mental health patients; consequently, higher level of education among the mental health professionals was associated with a more positive attitude towards the patients. This finding is consistent with those reported by the majority of the studies in the literature. Yuan, et al. (15) showed that lower education was associated with more negative attitudes towards the mental health patients, while Parra (16) reported that education was the primary variable associated with attitudes towards mental illness. Another study on general attitudes to mental illness found various socio-demographic correlates relating to attitudes including education (17),

though various studies revealed that mental health professionals with higher education have better access to health information, or they have a better understanding of such information as a result of their higher education (18, 19, 20).

Another finding of our study was the positive correlation between the mental health workers knowledge on the rights of mentally ill patients and their attitude towards them. Mårtensson et al. (13) found that mental health care staff had more positive attitudes towards mental illness if their knowledge about mental illness was less stigmatized. The findings of another study conducted in hospitals of Bangalore, India, also revealed a positive correlation between knowledge and attitude of respondents on human rights of mentally ill patients. The correlation between knowledge and attitude at this study indicated that staff nurses with good knowledge on human rights of mental health patients have a favorable attitude towards them (21). In our study we also found that there was a strong correlation between the type of profession (psychiatrist or nurse) and attitude towards mental health patients when there is a patient with mental disorder in the family of a mental health care provider. Psychiatrists who have a mentally ill patient in their family had a more positive attitude towards these patients than nurses. The results of a previous study indicated that among mental healthcare professionals, having family or close friends diagnosed with mental illness (personal contact experience) predicted significantly less social distance towards those with mental illness (22). On the other hand, Mårtensson et al. (13) found that nursing staff contrary to other healthcare professionals had more positive attitudes towards mental illness if they had a friend with mental illness currently or in the past.

Conversely, the findings of our study indicated that there is no association between: the type of profession (psychiatrist or nurse) and the attitude towards the mental health patient; the type of profession and patients' information about their rights; the type of profession and information about patients' rights; patients' awareness about their rights and the level of education of the professionals; the workplace

of mental health care providers and their attitude towards the mental patient; the knowledge on the rights of mental health patients and the level of education of mental health professionals; the work experience in the field of health care of the participants and their knowledge on the status of involuntary hospitalization; the work experience in the field of healthcare of the participants and their knowledge on mental patients' rights. However, a study by Hansson and colleagues suggested that mental health professionals' attitudes towards mental illness might be affected by their work setting characteristics, with staff working within inpatient services having more negative attitudes than those working in out-patient services (12). Further, in contrast to the present study, a study conducted by Sheikhtaheri et al. (23) revealed that more experienced nurses had higher knowledge regarding the patients' rights.

## CONCLUSION

Concluding, our study suggests that mental health professionals tend to have more positive attitudes towards mental health patients if they are more educated and better informed regarding the human rights of psychiatric patients. In addition, psychiatrists who have a person with mental disorder in their family have a more positive attitude towards these patients than nurses. Lastly, our study revealed that mental health professionals' awareness on the rights of mental health patients depends on their knowledge of these rights. These results expose the need of continuing education through training programs of mental health professionals referring to mental health patients' rights.

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# The Sexual Education of Children with Intellectual Disability

Nikos Apteslis

## Abstract

The main objective of this research was to investigate the views of parents of children with and without intellectual disabilities in the sexual education of young people with intellectual disabilities. Our survey included 306 parents of children without intellectual disabilities and 304 parents of children with intellectual disabilities. Their views were investigated using a questionnaire created for research purposes based on Greek and international bibliography. The analysis of the data showed that the parents of both groups agree that the sexual education of all young people with and without intellectual disabilities is necessary and will offer the quality of life of the families that raise people with intellectual disabilities. They also think they have the skills and it's their responsibility to talk first of themselves about sex education to their children. They agree that sex education will offer a lot of respect for the human rights of disabled young people and they feel they should enjoy the same rights as their peers without disabilities.

**Keywords:** Intellectual disabilities, Parents, Sexual Rights, Sexual Education,

## Introduction

In Greece, the question of the sexual education of people with intellectual disabilities has clearly taken on a few researchers, despite its importance. The road that remains in our country until sexual education becomes an act is long. In recent years, of course, in the subject of sex education, a great deal has been devised about the concept of sexual education, its models of introduction and teaching, its content, methodology, and effectiveness [4, 6].

Previously, [28] focused on the experiences and difficulties faced by parents in raising their children with mental disabilities. In this study, respondents were consulted about sexual issues only on three questions. Whether or not the child will be in special education and what criteria will support this decision, the difficulties of accessing children in the special school due to distance or lack of means of transportation and the frustration experienced by parents and children with special needs from parent's children of co-educational regular schools.

In a study [6] on the sexual education of autistic young people, it was found that only 3% of the parents who took part welcomed the conclusion of sexual relations among young people with intellectual disabilities. (a) They, therefore, refuse to complete their sexual relations with their children; (b) As regards clothing, they try to dress them in a way that does not raise sexual desires for their children; (c) The majority of parents discard the solution of the house of tolerance, although ultimately adopted at higher rates; d) most of the male parents agree with the completion of the sexual relations of their boys with intellectual disabilities. In similar earlier research by Grunewald and Liner (1981), it has been shown that people with intellectual disabilities seem to have little or no sexual relations because they are afraid of sexual intercourse or have in mind that such relationships are forbidden. Nevertheless, there is always a desire to participate in a more active sex life in men or couples with intellectual disabilities, which is more intense in men than in women [11]. In another research, [6] reports that only 8% of parents agree to marry people with intellectual disabilities under very restrictive conditions. All the parents of his research, however, converge in the failure of such a marriage. But will

and desire for marital life are present especially in people with moderate intellectual disabilities. The primary reason is the abandonment of their previous social isolation. In a very old survey, [2] reports that marriage is a sign of regularity and gives a place of free man within the community. In a Greek study [11], the sexual behavior of Greek adults with Down syndrome was examined. The sample consisted of parents, relatives, and professionals. (N = 56) as a team that trains and educates young people with Down syndrome. Teachers and teachers were used as a control group (N = 55). Data were collected at 21 questions questionnaire. The results showed that Downward Adult Greek adults, like other adults, have the opportunity to express views on their sexual behavior when they are provided with appropriate conditions by the community and adults who are taught basic knowledge and experiences for individuals with Down syndrome get a positive view of these. Rechargers in Greece [2], investigated the information and sexual activity of adolescent boys with special needs and in particular the way and frequency of sexual information and life of adolescent boys with intellectual disabilities. We studied 110 boys aged 15-18 years with intellectual disabilities (intelligence index 40-70) and with normal genital development and secondary sex characteristics. The study was based on an interview with parents (and as much as possible about children) about masturbation, sexual intercourse of young people and the sexual information of young people at the initiative of parents or questions themselves.

The same questions were raised in the control group. It was found that 59% of young people are masturbating, for 16% there were indications of masturbation and 6% had sexual contacts, which were achieved by the parent or relative guidance. No child asked to be informed, and few parents did (informally ignorant) efforts to inform them. The control team found that 100% were masturbating and 61% had sex. The research concluded that the sexual information of teen boys has been virtually non-existent and their sexual activity very poor. Coordination of efforts is needed to make progress on this issue, which is fundamental to the psychosomatic health and right of all people. Furthermore, researchers investigated the attitudes of ordinary people to the sexuality of people with intellectual

disabilities in Greece [12]. The survey was conducted in Athens, Patras, and Agrinio, and 311 people of the general population took part. It was found that the participants generally expressed positive attitudes towards the sexual education of young people with intellectual disabilities in addition to some areas such as homosexuality and the acquisition of children. Research into the attitudes towards the sexuality of people with intellectual disabilities is limited due to the lack of a weighted assessment body that will allow a direct comparison of surveys [11]. This kind of measurement would allow researchers to make comparisons about attitudes to the sexual education of people with and without intellectual disabilities [11]. Other researchers [7], investigated the attitudes and perceptions of the educational staff of Special Education Schools regarding the introduction and teaching of sex education in school and sexual education in pupils with intellectual disabilities. The sample consisted of 196 people (teachers and support staff), and the results showed a high degree of necessity to apply sex education to school and the role of the persons involved in this education, the high degree of necessity of sexual education in people with intellectual disabilities and the important role of the family and the school in this issue has emerged.

Sexual education in the countries of the Europe, America, and Australia is quite developed and organized. These countries have developed enough education programs for several years, but which have not been evaluated over the years. Sexual education for all young people is considered very important [37]. It includes education in social skills, individual self-determination, respect for others, right and socially acceptable behavior, giving and accepting love, tenderness, and respect for the opposite sex. As for people with intellectual disabilities, the emergence of the normalization movement for their inclusion in the social environment that they belonged to had the same precondition for respecting their human rights that were ignored in the past. Sexual education, therefore, is undoubtedly the right of people with intellectual disabilities.

It was therefore considered, as a natural consequence, that they should receive the same training provided to their peers without intellectual disabilities. Even more so, when there is a

high rate of sexual abuse in people with intellectual disabilities and the only way to avoid it, is proper sexual education [21]. The views of parents and specialists involved in their education agree that they need to receive sexual education from an early age so that they can grow up to manage their feelings and needs and also to develop skills and knowledge on issues protection against sexual abuse, health, hygiene, and undesirable pregnancy. Parents themselves argue that a strict manipulation capable of suppressing any sexual expression is capable of protecting their children and admits to a large extent that they are unable to provide sufficient information or would prefer that another body take over this task [22].

In the literature, there are studies and programs of sexual education developed and implemented by other countries, sexual education programs for young people with intellectual disabilities are implemented [34, 23]. So one might wonder why a similar program does not apply in Greece. Perhaps, it should be noted here that these issues are related to the particular cultural characteristics [4, 6, 8, 12], which concern the culture of every people and thus it is difficult to generalize to different cultures. Almost all European countries have experience in sexual education. This experience may be a good resource for the study and needs of our country of the problems faced by autistic young people with regard to their sex education in relation to the views of parents with and without children with intellectual disabilities. In particular, what is observed with regard to sexual education is a lack of educational policy, an absence of programs, unscientific teachers and school staff [4, 6, 12].

Important parameters influencing and shaping the relationships of members of a family are the characteristics of the personality of each member, as well as the importance the family gives to personal, social and other values. Inside a family system, individuals are linked to each other, with strong, long-lasting and mutual ties, which may vary in intensity but last throughout the family's life [8]. Views on the value and effectiveness of the family as a social system vary. However, it is sure to be the primary physical placement of every person's exercise to develop interpersonal relationships. It is the framework through which each child learns to adhere to rules and order, to respect

persons and things, to experience and to shape himself, to develop skills that will help him later to find his place in society [1].

## Method

### Participants

Participants were total 614 and from them, 308 had children with intellectual disabilities from 6 to 23 years old and 306 had children with typical development from 6 to 18 years old. Children and young people with intellectual disabilities attended educational structures in general or special education, according to the Greek law for the education of children with special needs

### Research questions

Based on what has been mentioned above, this research focuses on the following research questions:

Parents of children with and without intellectual disabilities

- 1) Consider the provision of sexual education to their children a human right
- 2) Consider the sexual education of young people with intellectual disabilities in school age to be important
- 3) Have the ability to properly prepare their children for the socio-sexual aspects of life?
- 4) Are responsible for the sexual education of their children

### Data collection tool

In order to be able to collect data for the present research, a specific questionnaire invented which consisted of 3 parts (1st) Demographic features of the parents outlining their social profile as age, marital status, occupation, educational level and place of residence (2nd) Parents' views on sexual education for young people with intellectual disabilities about their concern on sexual education of young people in general [15, 16], if they are willing to take the responsibility to talk to their children

about sex education or if they prefer someone else to do so [26, 27, 40] and their views on the sexual rights of young people with intellectual disabilities grouped in eight pillars on (1) the creation and family upbringing of children with intellectual disabilities [45, 40] (2) the usefulness of sexual education [47, 48] (3) the most important areas of sexual education [40] (4) the areas of hygiene and protection [46, 50] (5) the young people's interpersonal relations with a intellectual disabilities [22, 23] (6) the human rights of young people with intellectual disabilities [46, 50] (7) the prevention of disease transmission and exploitation through [38, 40] and the prevention of unwanted pregnancy [43, 45] and (3rd) Parents participation in the implementation of sexual education as the most appropriate age at which sexual intercourse begins educating young people with intellectual disabilities [50] which is the most appropriate person to undertake sexual education of young people with intellectual disabilities [47] the purpose and content of sexual education programs [43, 44] in what ways can parents teach sexual education [13, 46], the characteristics that parents need to have to teach children with intellectual disabilities [6, 47] points to emphasize sexual education [1] the different way that each family faces the issues sexual education [50, 39, 41] the issues of sexual education that the same parents consider more important to teach [33, 27] whether they consider puberty the most appropriate age to talk about sexual education for their children [7, 11, 16] the reasons why there is no sexual education for young people with intellectual disabilities in Greece [40, 13, 23]. The questions are of the Likert type [51] in which the respondent is asked to declare the degree of agreement or disagreement on a five-point graded scale (1 = totally disagree, 2 = disagree, 3 = neither disagree nor agree, 4 = agree and 5 = totally agree) or there were five options from which respondents should choose one, or Yes/ No options.

### Data analysis

Psychometric Properties of the Measurement Scale of Parenting of Children with and without Intellectual disabilities on Sexual Education of Young People with intellectual disabilities

Cronbach's internal consistency (reliability) score for the total

scale of 25 questions was calculated at  $\alpha = 0.811$  and considered satisfactory [35, 36]. By convention, the ratio of 0.60 [35, 36] or 0.70 and above [35] is considered satisfactory. Thus, in the case of the particular measuring tool, the overall scale of the 25 questions was considered to be sufficiently reliable in terms of internal consistency. In order to demonstrate the internal coherence of the total scale and the individual factorial axes, the respective discrimination indices were calculated.

The total scale discrimination indices were satisfactory with a median of 0.38. Conventional median bid index values  $> 0.20$  are considered sufficient [35]. The credibility of the factorial axes was evaluated on the basis of CCR (Composite Construct Reliability) [36].

Analysis in Main Components highlighted nine factors (F1-F9, the questions that make up these factors have a good degree of correlation with each other) that interpret a total of 64.8% of the total dispersion.

## Results

Table 1: Positive results of sexuality education

	I ab- solutely dis- agree	rather disagree	do not agree or not agree	rather agree	strongly agree
	N	N	N	N	N
Parents of children with I.D.	0	0	4	47	255
Parents of typical children	0	0	5	44	259
Total	0	0	9	91	514

"Parents of children with and without intellectual disabilities in a very large proportion of 84.1% and 83.3% believe that sex education will have a positive effect on the lives of their mentally disabled children. And have the capacity to properly prepare their own children for the socio-sexual aspects of life." Parents of children without intellectual disability and parents of children with intellectual disabilities replied "I totally agree" to a large extent on all the questions.

Table 2: Human rights

	I abso- lutely dis- agree	rather disagree	do not agree or not agree	rather agree	strong- ly agree
	N	N	N	N	N
Parents of children with I.D.	2	2	8	65	228
Parents of typical children	2	2	8	66	229
Total	4	4	16	131	457

In a very high percentage, parents of both groups (eg 74.6% and 74.8%) believe that sex education is a basic quality human right. In this question, however, we see a fairly high percentage of around 22% not responding in the affirmative.

**Table 3: Getting Sexual Training**

	l abso- lutely dis- agree	r ather disagree	do not agree or not agree	r ather agee	strongly agree
	N	N	N	N	N
Parents of chil- dren with I.D.	1	1	4	60	240
Parents of typical children	1	1	5	62	239
<b>Total</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>122</b>	<b>479</b>

The parents of both groups at a very high rate (77.6% and 78.4%) agree that children with intellectual disabilities should receive sex education

**Table 4: Ease of discussion**

	l ab- solutely disagree	rath- er dis- agree	do not a g r e e or not agree	r ather agee	strongly agree
	N	N	N	N	N
P a r - ents of children with I.D.	13	59	41	103	90
Parents of typi- cal chil- dren	21	54	48	104	81
<b>Total</b>	<b>34</b>	<b>113</b>	<b>89</b>	<b>207</b>	<b>171</b>

By contrast, only 1 in 4 parents, e.g. thinks it's easy to talk to their children about sex education. The percentage of parents were. is 29%, ie 1 in the three parents think they can talk to their

children about sex education

**Table 5: the difficulty of discussion**

	l ab- solutely disagree	r ather disagree	do not a g r e e or not agree	r ather agee	strong- ly agree
	N	N	N	N	N
P a r - ents of children with I.D.	22	157	52	51	24
Parents of typical children	41	130	61	48	28
<b>Total</b>	<b>63</b>	<b>287</b>	<b>113</b>	<b>99</b>	<b>52</b>

Parents of non-disabled children, at a rate of 42.2%, feel they have no difficulty in discussing with their children about sex education. At a rate of 51.3%, the parents of children with intellectual disabilities consider that they will have difficulty in making such conversations with their children.

**Table 6: Liability of the discussion**

	l ab- solutely disagree	r ather disagree	do not a g r e e or not agree	r ather agee	strong- ly agree
	N	N	N	N	N
P a r - ents of children with I.D.	31	155	43	50	27
Parents of typical children	42	133	47	56	30
<b>Total</b>	<b>73</b>	<b>288</b>	<b>90</b>	<b>106</b>	<b>57</b>

Nearly half of parents (50%) with children with intellectual disabilities completely disagree that it is the responsibility of others to talk about sex education to their children because they would obviously want to be the ones responsible for the sexual education of their children. A similar and a slightly higher percentage is the percentage of parents with children without disabilities (43%) who feel that others have to deal with the sexual education of their children.

## Discussion

Investigators refer to a lack of discussion about sex education and disability and argue that the social relations between people with and without intellectual disabilities, the symbolic notion of disability, and the psychological impact of experiencing multiple barriers to sexual expression and the development of sexual relations among people with intellectual disabilities [10, 13, 14].

According to the findings of our research, both parent groups, for example, and so on to a very large extent, consider that the sexual education of all young people with and without intellectual disabilities will have positive effects on the quality of their family life. From the data we have, we find that in 1988 the percentage of adolescents who were pregnant in Greece was about 10.3% in all pregnancies, the annual number of abortions exceeds the medical organizations of Northern Greece (AUTH, 2002), and there was an announcement that spoke about 40,000 abortions per year in young people aged up to 16 years. The above elements, therefore, support the need for parents to consider the sexual education of all young people as very important. After all, many problems that have to do with the sexuality and sexual behavior of young people are the results of parents' ignorance. For example, according to the Hellenic Institute of Sexology (1995), many parents, in order to overcome their fears about the erotic preferences of their sons, force them to have early erotic experiences.

Most of the research on the sexual education of people with intellectual disabilities has been examined only from the medical perspective. [18, 16]. According to this theory, disability is still considered a "defect" and the suppression or questioning of the sexuality of people with intellectual disabilities as an

inevitable part of it. The sexuality of people with intellectual disabilities is considered as something abusive, and should be treated, treated and controlled [23, 24, 27] argues that medical science-based "research" examines sexual education issues by focusing on the difficulties only created by disability, and considers emotional and romantic relationships among young people with intellectual disabilities to be impossible and undesirable.

The results of the study [13, 14] show a more modern concept of sexual education since the parents who participated in their research seemed to believe how young people with intellectual disabilities need sexual education as well as young people without intellectual disabilities. However, there will always be parents who will not encourage the provision of sexual education to their children with intellectual disabilities, fear of possible negative effects on their lives [28]. From the fact that there are no differences in the views of the two parent groups in our research, it is concluded that the sexuality of young people with intellectual disabilities is recognized and this can be seen as an indication that the interviewed parents are willing to work to eliminate various negative stereotypes developed in the past for sex education [16, 18, 21].

In our survey, parents showed a desire to be these original sexuality instructors for their children. So almost half from both teams disagree with the prospect to take other sexual education of their children, apparently because they want to raise their children according to their own family and moral values. Investigators also stated that parents are the best sexual instructors for all young people [9, 13]. So, in our research, we see this fact confirmed, that is, families want to play a very important role in the early sexual education of their children. Also has been shown that in the Netherlands, where many families consider it as an important responsibility to talk openly with their children about sex and sexuality, this fact contributes to greater cultural honesty about sex and sexuality and improved sexual health among of all young people [13, 14]. The responses of both parent groups and confirm similar results from other studies, according to which, the parents want to be the first ones who have the responsibility to talk to their children about

sex education [37].

Furthermore, in our research, one-third of the parents and the two groups do not find it easy to talk about sex education to their children. These low rates are in agreement with a previous study by [33], where they reported that parents of autistic children might not feel comfortable discussing sexuality with their children because they think they could give their child the wrong impression they are promoting sexual activity. Sex education issues are usually hard for some parents, and some even find it particularly difficult to talk about the sexual needs of their child [23, 24]. Investigators report in their research that parents of children with intellectual disabilities do not recognize or consider their children's need for sexual education and often keep the contact of young men and women with intellectual disabilities limited from the fear of sexual abuse and unwanted pregnancy [17, 18]

In contrast, another survey, which looked at the level of comfort of parents to speak to their children about sexuality, reported that 83% of parents with children with and without disabilities felt comfortable in discussing these issues [30, 31]. However, in the same study, 48% of autistic young people who were also included in the survey reported that their parents had a little talk about sexual assault [31]. However urges all parents to learn and teach their children about sex education from an early age [32]. Parents, of course, often find themselves comfortable talking and giving information, but they do not do it, probably or because they do not know how or because they tend to see their child as an eternal child. In particular, this is the case with the parents of children with intellectual disabilities. Another reason may be their uncertainty as to time, place and way of presenting their children with the information they want [29].

## Conclusion

In conclusion, the parents of both groups express very clearly their positive view of the need for sexual education of all young people with and without intellectual disabilities, but only one in three of both groups felt it easy to teach sexual education to their children. The family should fulfill this role, regardless of

any physical or intellectual disabilities of her child. Research into these problems, which begins with this study, will help to initiate discussion and scientifically explore the issues of sexual education of young people with intellectual disabilities. Nevertheless, more studies and surveys are needed to target social and cultural circumstances in our country so that any sex education programs can meet the needs of our social and cultural reality.

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# Subjective experience of positive emotions and impact of disordered eating behaviors in individuals with bulimia nervosa

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## Abstract

**Background:** Quantitative research and systematic reviews have long supported the pivotal role of emotions in the development and maintenance of bulimia nervosa (BN). However, few are the qualitative studies examining the relationship between affect and the bulimic cycle.

**Aims:** The current study aims to gain an in depth understanding of the experienced positive emotions and their interaction with beliefs and behaviors of bulimic individuals. It is focused on the experiences of women in order to achieve sample homogeneity and attempts to explore the perceived positive emotions and their association with different parts of the bulimic cycle, as well as their impact on various aspects of the disorder.

**Method:** Qualitative data were collected through semi-structured interviews with 5 women who have been diagnosed with BN and were undergoing treatment for their disorder. Transcripts of the interviews were analyzed using Interpretative Phenomenological Analysis (IPA) methods.

**Results:** Participants interpreted binge eating as a practice to fill the void they felt from the absence of positive emotions and situations. It also served as a transformation technique to concretize these situations into something manageable by them. Self induced vomiting and extreme exercise provided comfort and catharsis as short term results but also instilled faith, hope and optimism for the future. Bulimia as a whole was experienced as a valuable companion and friend, allowing freedom for the true self to emerge and provided a sense of normality to self and others.

**Conclusion:** Bulimia was conceptualized as the bearer of many positive attributes into bulimic individuals' lives and disordered eating behaviors seemed to play a significant role to the resilience, perpetuation and secretive nature of BN.

**Key-words:** eating disorders, bulimia nervosa, positive emotions.

## INTRODUCTION

Emotional functioning is theorized to play a pivotal role in the development and maintenance of eating disorders [1] along with overall course of the disorders and treatment outcome [2]. Individuals with eating disorders (ED) experience significant difficulties in emotional regulation, leading to maladaptive behavioral strategies in order to cope with emotional intolerance [3]. Evidence indicates that pathological eating behaviors may result from these maladaptive strategies and coping patterns [4]. Although emotional regulation difficulties seem to reside in the core of ED, there seems to be a paucity of studies and reviews focusing on the experiential part of emotions, the perception and interpretation of emotional states by bulimic individuals and their possible interaction with beliefs and behaviors of the bulimic cycle of [5].

Eating disorders maybe characterized as “cognitive disorders”, having in the core of their psychopathology shape and size overvaluation but are also conceptualized as dysfunctional emotion coping strategies [6, 7]. Fairburn et al. [8] introduced a transdiagnostic model for eating disorders, emphasizing the complex relationship between binge eating and emotions by acknowledging mood intolerance as a key factor of eating psychopathology. The later statement is supported by a number of theoretical models suggesting that maladaptive eating behaviors are the result of unsuccessful affect regulation strategies [1, 9, 10]. Binging episodes are associated with negative affect alleviation [11], reduction of aversive emotional self-awareness [12] and serve as a dissociating mechanism for painful emotions [9]. Both binging and purging are considered emotion blocking/suppressive strategies, simply utilized at different moments during the bulimic cycle [13].

Despite the fact that disordered eating behaviors are mostly associated with negative affective states, particularly anger, depression and anxiety (e.g. [14, 15, 16, 17, 18]), positive affects also seem to contribute in eating psychopathology. Disordered eating behaviors may be heralds of positive emotions such as mastery and control [19] while pride is associated with maladaptive eating patterns in anorectic individuals [20]. Positive emotions such as euphoria that is generated by accomplishing

food restriction and weight loss are significant incentives and motivational reinforcement for the perpetuation of the bulimic and anorectic cycle [21]. Elevated levels of euphoria may also serve as a mechanism to reduce anger awareness, thus maintaining and reinforcing disordered eating behaviors [7].

In addition, studies have shown that bulimic individuals use their body as a means of regulation and self definition due to absence of a clear self perception and identity disturbance. Physical bodies serve as a metaphor for the self until they are able to grow an independent sense of identity. Binging and purging behaviors are used to transform intolerable negative affect and situations into something more concrete and thus more manageable [22]. Thus, BN also serves as an attempt for constructing a coherent sense of self to individuals lacking structure or constructive resources to deal with personal crisis [23, 24]. Refocusing attention to certain traits (shape, weight, eating) allows bulimic individuals to gain a sense of emotional control and some gratification from the ability to restrict food consumption at times. Unattainable goals such as building the perfect body figure offer some kind of meaning, emotional fulfillment and coherence which their lives are lacking of. Investing in total control over body and eating generate thoughts of possible control over different aspects of their lives [25].

Dieting and maintaining certain weight and shape is a compensation strategy to gain a sense of self-worth and identity while challenging feelings of worthlessness and ineffectiveness [8]. Weight and shape are used as a medium in order for bulimic individuals to gain self acceptance but also to elicit acceptance by others [9]. Pleasing others is an important factor of getting approval and self worth for bulimic individuals since positive feedback and support by others generate positive emotions and improvement in the perceived sense of self [26]. Being in control and being special are also positive qualities attributed to BN in the conceptualization of self by bulimic individuals [27].

Binge eating is a strategy utilised by bulimic individuals to self soothe and manage interpersonal dysfunction and negative affect [28]. Shame seems to be one of these negative emotional states, occurring both prior to binge eating, but afterwards

as well. Shame prior to binge eating may be related to body weight and shape but also associated to external and situational factors. Shame may be accompanying the binge episode and trigger compensatory behaviors such as purging to eliminate the effect of physical and emotional dysphoria [29]. Shame is also related to external criticism, leading to feelings of inferiority and worthlessness about the self [30], motivating the instinctual urge to prevent further exposure and result in hiding [31]. BN, as a secret kept close to the self, seems to provide the safe place bulimic individuals need in order to soothe themselves and regroup.

Loneliness is one of the negative affects bulimic individuals try to numb through binge eating. Women utilize overeating when there are issues of real or imaginary abandonment [32] while bingeing and purging are used as coping strategies when confronted with feelings of loneliness, stress, boredom and humiliation [33]. Loneliness is affected by the quality of interpersonal relationships and not only by their number. Bulimic women seem to live in families with poor marital relationship and poor communication and affection by the parents [34]. The sense of loneliness is elevated in women with bulimia despite having friends and family around [35] while high levels of loneliness usually are present at the beginning of the bulimic cycle and remain high throughout, until purging subsides them by elevating levels of relief and happiness [36].

Although binge eating is a paradoxical pattern of behavior, since it undermines efforts to achieve desired shape and size, it also serves the desire of bulimic individuals to escape from painful self awareness. According to the escape model bulimic individuals are characterized by high expectations and are extremely sensitive to demands by others [12]. When high expectations by self and others are not met, aversive patterns of self awareness along with emotional distress, most commonly depression and anxiety, emerge. Binge eating provides an escape from this negative emotional state by narrowing attention to food consumption and restricting meaningful thinking.

Self-induced vomiting is present in more than 90% of cases of BN [37] due to instant relief from food consumption. A study by Johnson and Larson [38] support the aforementioned claim,

highlighting the fact that bulimic individuals were happy by the prospect of getting away with something they shouldn't be doing plus the fact that food became their closest companion over the years.

Hsu [16] found that during the first part of a bingeing episode, there was a decrease in dysphoric feelings and also feelings of happiness, relaxation, relief and oblivion. At the end of the episode, when participants felt full, although negative emotions increased, there were still some that experienced relief and oblivion. During self-induced vomiting, negative feelings decreased while the sense of relief was the dominant emotion. Further negative affect reduction continued after purging while positive emotions of relief, relaxation and happiness were vividly present. In addition, statements supporting the end of disordered eating behaviors by allowing one last binge, enabled bingeing to result in self-induced vomiting, driven by the motivation of achieving a clean slate for a new start.

The aim of the current study is to explore and gain an in-depth understanding of how positive emotions are perceived by women with BN within the context of the disorder. While there is a number of studies providing substantial evidence to support the link between symptoms of eating disorders and emotions (e.g. [39, 17, 40, 41]), in most cases emotions are treated as unitary phenomenon across eating disorders, something that they are clearly not (Ioannou & Fox, 2009). There is a paucity of studies concerning positive emotions and how they are linked with eating disorders [39] and currently there are no studies directly exploring subjective experience of positive emotions in either anorexic or bulimic individuals [5].

## METHOD

Although there are a number of quantitative studies regarding emotional processes in BN, qualitative research seems somehow neglected. Qualitative methodology attempts to understand the interviewees' perspective considering an experienced phenomenon [42]. The unique advantage of employing an inductive approach provides in depth and detailed exploration of the subject matter while retaining the ambiguity and subtlety of it, possibly addressing knowledge gaps considering

research over the examined phenomena [43]. Interpretative Phenomenological Analysis (IPA) is a qualitative research method aiming to explore participants' interpretation and assigned meaning of particular experiences, states and events concerning their personal and social world [44]. IPA support the notion that an individual is an expert concerning its own experiences and tries to explore all aspects and views of held by the participant about the observed phenomenon [45]. Research is focused on making sense of the individuals' attempt to make sense of the world [46]. It is an excellent tool to provide insight on how bulimic individuals perceive and shape emotions in order to fit into their unique world and how these emotions are linked with different parts of the bulimic cycle. It allows research to actively explore new or understudied concepts (e.g. positive affect in bulimic individuals) since pre-established framework and theoretical constraints are not an operational prerequisite [47].

### Research design

A cross case analysis research design was used for the purposes of this study. The sample selected was small (five participants) and purposeful. Smith et al. [44] suggest that 3-6 participants construe a reasonable sample for an IPA study. These numbers provide sufficient cases in order to achieve homogeneity, enable detailed case by case analysis for developing meaningful points but also allow micro analysis for similarities and differences between cases [48].

Semi structured interviews relevant to the aims of the study were conducted, audio recorded, verbatim transcribed and analyzed by the first author (DB) according to IPA guidelines and procedures. Semi structured interviews are the preferred means of data collection concerning detailed life experience narratives, thoughts, feelings and participants' interpretation of the investigated phenomena [47].

### Participants

Participants had been diagnosed with BN, purging or non purging, were adult females, of Greek origin and residency. Sample homogeneity was served by recruiting individuals from one specific eating disorder and only from one gender. Nationality was chosen due to lack of research concerning the

specific population, as well as the accessibility of the sample. Adult participants were preferred for the advantage of richer self-narratives due to longer life histories over minors.

Psychologists and dieticians were given a summary of the research's goals and procedures in order to be aware of suitable and possibly interested clients. Participant Information Sheet was given to potential volunteers in order to thoroughly explain the procedure, aims and goals of this research. It provided information about the researcher, along with contact methods and participants' obligations and prerogatives. It also included information about data accessibility and data storage. All interviews conducted in a private practice office and participants who were interested made direct contact in order to make an appointment for an interview and attain additional details.

Five participants volunteered to take part in this study. All participants were Caucasian female of Greek ethnicity and residency, age ranging from 29 to 40 years old. All of them were receiving some form of therapy for their disorder and one of them with also comorbid depression with prescribed medication. Two of them were married with children while all were currently employed at full time jobs.

Table 1: Participant characteristics and demographics

Participant's pseudonym	Age	Diagnosis	Length of the ED	Marital status	Time in therapy
Melissa	29	BN Purging	10yrs	Single	5 yrs
Adrianna	30	BN Purging	16yrs	Single	4 yrs
Delilah	39	BN Purging	23 yrs	Married	6 months
Cassandra	38	BN Restrictive	15yrs	Single	4 months
Dimitra	40	BN Purging	21yrs	Married	1 ½ yrs

## Ethics

The present research was conducted as partial fulfillment of the first author's MSc Thesis on Cognitive Behavioral Psychotherapies from the University of Bolton. Ethical approval was gained through the Research Ethics Committee by both University of Bolton and New York College. Informed consent was safeguarded on appointment by ensuring that participants have read and fully understood all the material on the Participant Information Sheet. Prior to the interview, participants were asked to sign a written Consent Form. Questions related to the recordings and confidentiality matters were explained and agreed, along with the fact that participation in the study was voluntary without being offered any reward of any kind. Risks of potential distress were minimized by informing participants beforehand about the content of the interview, the ability to take a break during the interview, not to answer specific questions and withdraw from the study at any time, if they wished to. The interview was conducted in the most subtle possible way and during debriefing period interviewees were checked about mood and distress. They were also given a debriefing form containing the necessary information and support needed after the interview.

## Procedure

Participants were contacted and interviews arrangements were planned. All interviews took place in a private office setting. Before starting the interview, there was a verbatim briefing concerning information about the researcher and purpose of the study while relevant questions were answered. Participants were given the opportunity to go through the interview agenda and they were also informed about the interview procedure. Additional information was given about the recordings, material handling and confidentiality issues. Participants information sheet was handed and emerging questions were addressed. Consent and demographics form were filled and the interview begun. Questions were asked according to the interview agenda but subsequently modified to fit participants' answers and explore emerging data. Prompts were used when deemed necessary, questions were asked with openness and in a reflective manner while extreme caution was present to avoid questions, prompts and attitudes that might be consid-

ered leading. Participants were given time to answer questions and encouraged to be thorough and elaborative presenting their life experiences. A wheel of emotion was given as aid when asked further about experienced emotions and empathy was evident when sensitive matters were investigated. At the end of each interview, participants were thanked, checked about their emotional state and well-being and were given a debriefing form including supporting information.

## Data collection

Information by relevant research, semi structured interview guidelines, prior experience in IPA research and extended discussions with supervisor led to the development of a semi structured interview with questions and probes according to the relevance of the study's aims. The questions were used in a flexible manner in order to explore experiences and cover possible unanticipated areas that might emerge during the interviews. Interviews lasted between 53 and 76 minutes. They were audio recorded and transcribed verbatim, having all identifying information removed.

## Data analysis

IPA was the qualitative approach used in order to analyse the data. Interviews were conducted and verbatim transcribed by the first author (DB) while recordings were listened at least once for every case. Each recording went through an in-depth analyses individually while initial noting and exploratory comments took place on the right side of text margin. Additional reading in order to overview initial notes, text deconstruction and conceptualization of comments allowed research to investigate the material in both emic and etic perspectives [48] and developed themes' emergence [44]. Supervision was obtained by a psychologist/researcher specialised in eating disorders as well as in qualitative methods (MK). Supervision and IPA guidelines were used in every step of the analytic process to safeguard validity and quality of the current research. Reduction of detail volume by shifting analytic work from transcript to initial noting allowed focus on discrete parts of the transcript, leading to identification of emergent themes [44]. Super ordinate themes were developed by clustering similar emergent themes into one under a new name (abstraction), identifying contextual or

narrative elements in the analysis (contextualization), identifying important themes by taking into account the frequency of their appearance (numeration) and how these themes function within the transcript (function) [44]. Cross case analyses was used in order to identify patterns across cases, clustering similar themes into master themes, not exclusively by prevalence within the data but also by contextual richness and subject matter illumination [49]. Although early qualitative works lack the validity and reliability criteria met in quantitative studies, a number of guidelines and appropriate in relation criteria are produced in order to assess validity and quality in quantitative research [44]. Yardley's [50] four broad principles, sensitivity to context, commitment and rigour, transparency and coherence and impact and importance, were chosen as the most suitable guidelines to address validity in IPA research studies [44]. In order to minimize potential research bias in the current study, a set of strategies were utilized: field preparation prior to participant recruitment, including research topic exploration and carefully designed and role played semi structured interviews. Sample was purposefully gathered while ethical and reflective stance was evident during interviews. Transcripts were read and reread while time was allowed between each case analysis in order to contextualize each case in its own terms. Emergent themes were subjected to continuous peer and external evaluation, refining outcome and minimizing potential research bias. A reflective diary was kept from day one, identifying and deconstructing prior held information and beliefs on the investigated phenomenon while supervision was utilized in every step of the process, benefiting results through experienced guidance, constructive criticism and an unbiased overview.

## RESULTS

Three master themes emerged concerning the positive interaction between different aspects on BN and participants' emotions:

- Positive aspects of participants regarding food and binge eating
- The role of self-induced vomiting and exercise, in both

present and the future.

- Participant's views of BN and the impact on their sense of normality and feelings of loneliness.

These themes did not cover all the experiences held by the participants about BN but were selected according to the relevance of the research question and interpretative focus of the researcher. Although themes were common across the five cases, different life experiences of each participant produced divergence at some points in narrative and perception, mostly highlighted and addressed through data analysis. Verbatim extracts might have gone through some minor changes and alterations in order to make more sense when presented in written form and all identifying information have been removed, safeguarding the anonymity of the participants. Utterances (such as hmm, ermm, etc), minor pauses and some word repetitions have been removed, dotted lines prior or afterwards the extract indicate the presence of omitted verbatim content due to irrelevance and brackets indicate added material such as explanatory comments. Emergent master themes and superordinate themes are illustrated in the table below (table 2)

Table 2: Master Themes and Superordinate Themes

Master Themes	Superordinate Themes
Perception of food consumption/ binge eating	Absence of positive emotions - Filling the void
	Replacing negative emotions and situations into a manageable problem
The role of self-induced vomiting in both present and the future	Positive aspects with immediate effect
	Positive aspects related to future expectations
Positive attributes of BN as a concept	Freedom – release from “perfect self”
	Perception of normality to self and others through BN
	BN as companion

### 1. Perception of food consumption/binge eating

This master theme aimed to explore the possible positive aspects related to food consumption and binge eating. Despite binge eating viewed by participants as the primary situation to overcome in order to transform themselves into their concept of ideal self, food consumption seemed to be the first line of defense against intolerable negative affect.

### 1.1 Absence of positive emotions - Filling the void

All participants described various negative situations which preceded excessive food consumption. Responses to the question of "a brief history of bulimia" present an array of real life losses (father, mother), negligence by caregivers, abandonment (perceived or real), strict and demanding rules concerning dietary regimens or performance expectations. Melissa's extract provides the impact of loss, neglect and pin points the importance of body weight in her family:

*I was eleven years old when my mother passed away, something that had a deep impact in me and led to depression when I was around thirteen... I was an individual with normal weight, a role model and an object of admiration within my family until that age, then, I gained 10 kilos in nine months... I asked my father to help me, take me to a psychologist but he didn't believe in all that stuff so he never did...*

Adrianna shared a different kind of loss since her mother was away from her due to weight related health issues until she was 7 years old. Until that age, she was separated from her older sister (raised by grandparents) and Adrianna lived with her father, a man rigid and perfectionist described as:

*...he had very strict criteria to what was right and wrong, it was just these two conditions, there was nothing in the middle...at one point he was forcing me to eat fried stuff he made for me and on the other hand he would say "eat, eat and you will become fat like your mother", food was my only shelter back then!"*

Delilah and Dimitra shared the same strict family dietary rules and obsession with healthy lifestyles while they both started binge eating as a mean to counter the excessive pressure of entrance exams for the university. Dimitra recalls:

*...my father grounded me for almost a year, permitting me to go*

*outside only once per week, in order to study harder and succeed the second time. There was not one positive feeling about this situation. My only indulgence in this captivity was coming from listening to music and eating.*

Cassandra explained the meaning of binge eating in direct correlation with absence of positive emotions:

*Why binge eating? Because for some reason I miss some flavors in my life, because some flavors are relieving. I know that some of the food I am craving is full of serotonin, they contain all things missing from my life, joy, comfort, tranquility and security...*

Absence of positive affect and accumulated negative experiences seem to create a sort of existential void, manifested in a form of boredom, unexplainable dissatisfaction and lack of motivation. Binge eating provides a desperate mean to fill that void through sort lived numbness. Melissa and Dimitra shared some commonalities in their descriptions:

*Melissa: ...boredom, I am bored, isn't this new chocolate great?!... lets eat 5-6 of them watching television for the next 8 hours...I have nothing to do in my life and I don't know how to fill my emptiness.*

*Dimitra: I used to sit for hours in front of the television, filled with boredom, eating all sort of junk, vomiting and then eating again. This happened much more than once per day. And I wasn't even watching anything; I just kept changing the channels. I felt so empty inside, like there was none and nothing to comfort me than the food stuffed in my mouth.*

Cassandra expressed feelings of emptiness through lack of motivation. Boredom was also present at her thoughts but the existential struggle and clinical perfectionism made the possible correlation between food consumption and boredom somehow blurry in her eyes:

*...there are no ups and downs in my life, I am financially secure, I have achieved so much at work and received the much needed credit for them...maybe my ambitions touched the ceiling and there is nothing more I want to achieve, maybe I am bored and I want to do something else, I feel that there is no more joy left...ev-*

*everything is almost perfect, I have my boyfriend, nothing is missing. Why is this happening to me? (Refers to binge eating).*

## **1.2 Replacing negative emotions and situations into a manageable problem**

All the aforementioned situations and experienced emotions, including hardships not mentioned due to irrelevance with the study, besides being unbearable, they also were out of participants' control. This superordinate theme explores how bulimic individuals turned conditions beyond their reach into a more manageable problem that of binge eating.

*Cassandra: It is comforting; it provides me the security of something that I can eventually control, I know that I can do it! So, let's do it, eat, hit rock bottom and then start over again; like a new beginning every time, like something, I don't know*

Besides what Cassandra mentioned as new beginning, a concept further explored at the next master theme, Melissa enriches negative emotions replacement with the aspect of buying time in order to become stronger and resolve all the loose ends in her life:

*I tried to ask help about all these negative emotions that I was experiencing but that was not possible, they (family and father denying help from a health care specialist regarding the passing of her mother) could not help me, nobody could. This is how binge eating begun, this is how the bulimic cycle begun; and with that new beginning I took all my emotions, locked them up in a drawer and said, "ok, remind me to deal with them at some point when I will be able to do so!"*

Adrianna had a very difficult time growing up, since there was an intense fear about the deteriorating health of her mother, bullying from the rest of the family towards mother's eating habits and Adrianna's shape and size, she concluded:

*Adrianna: I have never felt compassion, understanding, recognition and love in my own home. Nobody was ever proud of what have I achieved; there was never joy in my home.*

*DB: how did you deal with all these negative emotions?*

*Adrianna: all things were revolving around food at that time.*

*There were a lot of things going on but I had no other way of managing these emotions apart from binge eating.*

Delilah utilizes excessive food consumption as an immediate relief to stress deriving from work, family obligations and even depression related issues, always resulting in vomiting for the last twenty years of her life. When asked about the role of binge eating in her life her answer was staggering:

*It is a way out but it is something that needs to be resolved. There is a hope and an obligation to yourself and your family that you will fix this. This is what keeps me alive! If it wasn't for that hope, that I will be able at some point to fix this problem I would have jump off a terrace!*

Control is an important factor in order for Cassandra to feel the much needed safety and security in her life. Experiencing negative situations and emotions out of her control is something that she is not able to fully comprehend yet, turning even binge eating into something voluntary and almost manageable:

*I have control over food consumption, I have achieved even that! I let it slip out of my hands on purpose, deliberately. Nothing happens without my knowledge! Why I want to let control slip is something I yet don't know...there is an inner struggle but in the end I choose to let it go, so I am still in control!*

Dimitra described the constant fighting of her parents as something unbearable which somehow included her involvement. Trying her best but not being able to restore love, happiness and tranquility among her parents, made her transform the negative external states and affect into a more manageable problem, relying solely on herself for its resolution:

*It was something I could not stand! I tried and tried but nothing seemed to work. At some point I said "I don't care anymore about your problems, you are adults, find it out yourselves". I have never looked back ever since, well, that's not entirely true but anyhow, and by that time I had my own life to live and my own problems to solve: and being able to control my binge eating and acquire the desired shape and size was a full time responsibility!*

## 2. The role of self-induced vomiting in both present and the future

This second master theme emerged, reflected participants' perceptions about the compensatory strategy of purging after binge eating, in order to keep their body weight under control. Cross case analysis revealed that self-induced vomiting produced a number of positive outcomes to all participants whether correlated with immediate benefits or linked with sorts of future expectations. It is worth to be noted that no participant perceived the purging procedure or equivalent compensation strategies (laxatives, extreme exercise, intense fasting) as something out of the ordinary or alien to their own daily routine until they realised that they have an eating disorder years later since the onset of it.

### 2.1 Positive aspects with immediate effect

Most of the times, binge eating was perceived as a process which did not offer any pleasure or if it did, it was very brief. There was an array of negative emotions experienced, which were perceived as intolerable and needed to be dealt with right away. Self-induced vomiting was the immediate response, providing comfort and catharsis to both physical and psychological symptoms and effects. Delilah's extract emphasizes the aforementioned claims as well as the absolute necessity of purging:

*Delilah: ... when you are stressed or angry, well, you are going to eat. There is no satisfaction from eating; you eat as a coping strategy for what is going on.*

*DB: what about the self induced vomiting?*

*Delilah: at that moment, yes! It is absolutely not possible to continue living if you don't purge right away! Vomit at that point is an instant relief and comfort. You can't live if you don't do it, that's a fact!*

Shame seemed to be the most prevalent feeling accompanying binge eating for Adrianna. Self-induced vomiting may not be endearing to her but was necessary to alleviate shame induced from not being strong enough to carry out her strict dietary schedule:

*I was never as thin as I wanted and binge eating brought forth all feelings of shame, guilt and remorse. Purging was there to rescue me from these feelings. It was not something I enjoyed doing but I needed salvation: salvation and relief.*

Melissa was experiencing a wide range of negative emotions after her binges. Purging not only alleviated painful emotions, doubts and self criticisms but also served as a weight controlling strategy:

*... too much guilt from excessive eating, I ate too much, why have I done that? It is really ugly what have I done and very, very wrong. I am so stupid, I am fat, I am disgusting, I must lose weight. Self induce vomiting was established as a mean to manage all that stress and pressure. It provided a form of catharsis, a clean state if you want to start anew; plus it was an excellent way to keep my weight in order.*

Dimitra during her narrative summed most of the previous claims about the positive qualities of purging, while Cassandra described similar situations, only she was imploring means of self starvation and extreme exercise. Both strategies used to such extend which were harmful for her (no menstruation, fall of hair and nails, physical deterioration) at some period of her life:

*... Everything is about the caloric balance. I have to go to the gym even though I am exhausted because if I don't, I will experience intense levels of stress and anger towards myself; and guilt, excessive guilt for breaking up the pact I had done with myself; it is mandatory because if I don't I will be caught in the vortex of a downward spiral and this is something I cannot stand.*

### 2.2 Positive aspects related to future expectations

Beside the immediate positive affects linked with self induced vomiting, purging also served as a springboard for a more optimistic future regarding the abolishment of bulimic practices but also the materialization of the ideal self. A vivid paradigm of how purging restored faith and confidence in both is portrait in the following extract by Melissa:

*... the interesting part (of purging) is that at the same time there were positive emotions such as hope. Hope that this will be the last*

*time, ok I might have slipped (binge eating) but now I will purge and take laxatives and everything will be over! It won't happen again! When I wake up tomorrow I will have a toast and a cup of coffee and my eating habits will be different from now on! Not only that but when I will reach the ideal weight, boys will like me more and I will definitely be coolest person in my gang!*

Self-induced vomiting may produce a range of diverse emotions. Amidst intense and intolerable negative ones, hope and faith about resolving this situation offered the optimistic stance necessary for bulimic individuals to continue endeavoring in order to become what they really aspired to be:

*Dimitra: I remember looking myself at the mirror with mixed emotions. Sometimes it was with pity and self loathing but most times it was guilt and disgust about myself and what have I done, disgust and some kind of silent rage, accompanied with a perverse grin! Self soothing in order not to lose my mind from all this negative intensity was the promise that this would be the last time, tomorrow there is going to be a new Dimitra and none of these will ever happen again! A new strong Dimitra which will include all that ever imagined but never had thus far.*

Adrianna held similar views about self induced vomiting and its ability to reset negative affect. Her paradigm, besides the hope of a new found strength to stop the bulimic cycle, it also included promises of greater endurance (of all negatives to come) and redemption for what she already bared responsibility.

Cassandra perceived the presence of extreme exercise, along with absence of almost any food consumption, as an indicator of experiencing and relying positive emotions. For her, there was no hope for positive future aspirations without the ability to perform her extreme workout schedule.

Delilah was the only participant not directly relating purging with future expectations. It is worth mentioning though that in order to reach the ideal shape and the desired size for her body she didn't mind practicing self induced vomit for the rest of her life.

### 3. Positive attributes of BN as a concept

This final master theme attempted to explore how BN is perceived as a term by participants and possible positive impact it may reflect in their lives. Three superordinate themes emerged related to issues of freedom, normality to self and others, along with the importance of BN as a companion in times of need.

#### 3.1 Freedom – release from “perfect self”

All participants in this study encountered a number of difficult situations at the time of their upbringing which continued in their adult lives. Strict rules abided not only to dietary constrain but seems like both familial and societal high expectations were perceived as unbroken rules to be followed with reverence. To their understanding, they were not allowed to be anything less than what others wanted to see in them. In order to be able to constantly abide to those expectations, BN provided a safe place where participants' could enjoy in secrecy the privilege of expressing what they really were and how they really felt.

Adrianna was raised by a father who allowed no weakness to be expressed or experienced. Adrianna should have always been strong since signs of weariness and tears were signs of cowardness. Talking about emotions and BN as a concept, Adrianna provided the following extract:

*Adrianna: for me, bulimia and purging were a safe place, my shelter! There were periods where I felt so much guilt and so much shame for not being strong enough, shame that I could not do everything. Purging was the only place I could be real, the only place I was allowed to show my weakness and be real.*

Cassandra was also dealing with the concept of weakness. She was the one needing perfection in everything, something which was imposed to herself by her and not externally developed. As illustrated below, clinical perfectionism and control issues create ambivalence about the elusiveness of the bulimic cycle and BN as concept:

*...I was so perfect in everything and this is the only thing that I cannot be! There are times that I realize the importance of slowing down and make a mistake once in a while but most times it is infuriating; infuriating and frustrating at the same time.*

Melissa was experiencing BN as an indicator of independence and rebellion, replacing negative affect and frustration with the concept of freedom as to decisions concerning her own body and health:

*My best friend was yelling at me about my eating habits and the my low caloric income per day but she basically is jealous because when I lose this kilos; she is just jealous, she doesn't understand... and I don't care about what my father criticizes the way I eat, he is an idiot and knows nothing!*

Melissa though, was experiencing some form of freedom not only from other people's restraints and but also within the context of BN:

*I like the ability to live as I want and at that time I was living on edges. I can starve and go to the gym and vomit or I can eat a packet of biscuits, four packages of chips and five ice creams, why do the middle thing? Why compromise? I can have both!*

For Delilah, binge eating and purging came as a result of her new found freedom during high school and university years. Strict dietary habits and obsession with healthy food consumption, weight watching and restriction of certain foods as forbidden by her mother, produced the opposite effect for Delilah as she grew up. Acquiring imbalanced eating habits seemed to state the independence she needed:

*This entire food obsession was very intense, very restricting. This is the reason I gained all that weight, because food was something forbidden until then. But when you become independent during the end of high school, well, you have the freedom to do whatever you want and this was what I chose!*

Dimitra, who was also forced to follow strict dietary rules along with an over concern about body and shape from both parents, presented similarities with Delilah concerning the new found freedom when she was able to change her eating habits. She distinctively mentioned how she avoided healthy snacks and based her entire nutrition on junk food and sweets for more than a decade. She also shared Melissa's opinion about living on the edges and described how liberating it felt at times to eat as much as you could and preserve your desired weight

by purging or exercise.

### 3.2 Perception of normality to self and others through BN

According to participants' experiences, BN seems to provide a needed sense of normality to themselves in order to project it to family members or wider social environment. Situations and emotions that were perceived as beyond repair and insufferable had a profound negative impact on their sense of self. By relocating this self-distorted image to body shape and weight, BN transformed it to something concrete, thus allowing a more acceptable view of their self, self-perception by others and social interactions.

Having not realized the impact of negative affects on her at that time, Melissa presented an ideal world she had created, aided by BN, in order to cope with difficult and unresolved problems she went through at that time:

*DB: if I asked you about your emotions back then, what would you tell me?*

*Melissa: back then? I am very happy, I feel really good, everything in life is going great! I have an excellent relation with my father, my mother; lets not talk about that, an excellent relationship with my brother, my boyfriend and our relationship is great, everything is perfect!*

Melissa also describes the BN as something that gave her a boost of confidence to interact with her social circle. She was perceived by others as being perfect and hoped that she will become everything that she aspired of at some point in the future.

Dimitra was not able to cope with the constant feuds between her parents and she tried to regain her sense of self by distancing herself from them. She was able to define her identity by adopting BN's distorted but yet much better perceived adversities. Furthermore, BN provided the tools not only to retain her social image as a strong and independent woman but also to appear in acceptable ways towards her family's values:

I should be perfect all the time, never sad or angry...or at least

*not in front of anyone else...I am strong, I can deal with anything, I can do anything.*

Adrianna's previous extract about freedom also describes the ability to redefine herself through the disorder. In addition, BN was enabling her to appear normal to her family and abide by their standards:

*I didn't realize how much I was hurting myself (refers to self-induced vomiting). But there was no other way. For my family, weakness is shame, you should not need anything, it is shameful when you bent, it shameful when you break. I was not able to tell him how tiring and exhausting this was for me, physically and mentally.*

Delilah used BN as means of appearing normal to herself, her husband and her children. She was married and had her first child right after school. Her pregnancy was followed by post-partum depression, eventually turning to depression, something neither she nor her husband acknowledged for many years. Delilah seemed more comfortable adopting BN's traits over depression even when she went through multiple hospitalizations during her second pregnancy due to self-induced vomiting. BN also relieved her from constant anxiety and stress, allowing her to perform adequately to her familial and social duties while keeping it secret contributed to the semblance of normalcy by others.

Cassandra also utilized bulimic strategies to normalize encountered adversities. Experiencing situations of intense domestic violence, physical abuse by spouse, a terminated pregnancy and the loss of her father, Cassandra resolved to BN in order to displace control and to create a sense of normality for herself and how she was perceived others. Repressing her negative emotions in order to maintain a normal and acceptable façade by everyone else is an ongoing practice:

*DB: all these negative emotions, do you feel them outside your disorder?*

*Cassandra: I don't feel them anywhere else! I am not going to take them out on someone else, I am not going to be mad or aggressive with someone else. Whatever is related with these kinds*

*of emotions it is corresponding to food consumption and exercise.*

### 3.3 BN as companion

Loneliness is one of the emotions experienced and shared in narratives by all participants to a great extent, to some even valid until today. Feelings of neglect and inability of caregivers to adequately be present and address certain difficult situations only amplified this isolation and BN was somehow chosen as something to be resolved on their own and in complete secrecy by all others.

While everyone else seemed unavailable to participate in perceived and experienced life difficulties, BN somehow replaced them and provided a sort of stable relationship. In participants' eyes, BN was always there for them, always ready to help them overcome adversity. Melissa was able to call BN a friend who provided a helping hand at her times of need:

*DB: is there something positive that comes to mind when you hear the word bulimia today?*

*Melissa: yes, first of all it has been a very good friend of mine because she helped me all these years! And I don't mention that as a mean to control my weight. I mean that she helped me and made me able to cope with all the hardships I experienced all these years. There was none else but it was there for me and for that I thank her very much.*

Dimitra described similar feelings with Melissa, considering BN as a very good companion, probably the only one she had as "loyal and always present when things got rough". Although Dimitra maintains an excellent relationship with her husband, at times she experienced an "unexplained form of loneliness" and anxiety which only BN seemed to alleviate until recently.

Talking about emotions experienced back then, Adrianna mentioned an array of negative affects such as fear of uncertainty, loneliness and ever-present shame. Everybody was demanding something of her, "built to endure, built to be strong, that was my signature trait", but when difficult moments emerged, "food was the only companion I ever had". BN was there for her, although feelings of shame and fear of social rejection refrains her from revealing her condition even today.

Delilah and Cassandra may not directly correlate BN and possible qualities of companionship but they still experiencing loneliness, with nowhere to turn to. Delilah has performed sincere efforts to make her disorder and her struggles known to her husband but he doesn't seem to be on board: "I try to explain to him that I am not ok, that something serious is going on but he always undermines the subject; and doesn't realize the importance of what I am saying to him".

Cassandra on the other hand made no attempt to relay her disorder since a part of her still thinks that it is something she can control. At the same time, she feels none of her family members nor her boyfriend close enough to share or even able to contribute to the "stagnation my minds suffers from". BN is the only thing that is challenging her intellect: "chasing my own tail provides the necessary alertness, something intriguing in order to drag my full time attention, since none else is able to do it for me".

## DISCUSSION

The aim of the present study was to explore and gain an in depth understanding of positive emotions and beliefs bulimic individuals may experience within the context of their disorder. There is a paucity of studies examining the concept of positive aspects of BN and this study contributes to the literature by describing how participants view the relation between emotions and different parts of the bulimic cycle. Results present the complexity and controversy generated by the presence of positive emotions in disordered eating behaviors.

Theory suggests that difficulties in affect regulation are a significant factor in adopting bulimic behaviors [9, 10, 51]. Consistent with existing theory and literature about BN [11, 13], participants of this study discussed their engagement in maladaptive eating habits as a coping strategy in order to regulate or alleviate negative affect. This study aimed to explore positive emotions and beliefs held behind these disordered behaviors which possibly contribute to their continuation and resilience in time and therapy. Some of the emergent themes explored understudied concepts within the bulimic disorder while some suggested new concepts such as freedom and optimism asso-

ciated with different parts of bulimic circle and perception of the disorder as a whole.

The first superordinate theme explored how participants ascribe a positive interpretation of food consumption as a mean to fill the void they fill due to absence of positive emotions and situations in their lives. Consistent with the literature, findings revealed experiences of loss, including bereavement and separation from significant family members [52], real or imaginary abandonment [53], poor communicative skills and lack of affection within participants' families [34] and emotional abuse in the form of invalidation and neglect [54, 55]. Intolerable negative emotions were replaced by less severe and more acceptable one, such as boredom, general dissatisfaction and lack of motivation while food was utilized in order to get brief indulgence and satisfaction due to absence of support and other positive cues. One participant correlated binge eating with positive emotions of joy, comfort, security and tranquility. Food consumption and binge eating were served as a means of mind numbing and negative affect coping strategies but it was also a necessity for participants in order to be able to carry on with their lives.

Binge eating also seemed to serve as a replacement to negative situations and emotions that were beyond participants' reach, such as poor relationship with parents [34] and parental marital conflict [52] into a concrete problem to focus, deal with and try to resolve. Refocusing attention to body shape and food restriction provided a sense of life meaning goal while lack of control of other life aspects reduced its impact by concentrating efforts in managing a problem depended totally by themselves [25].

Positive influences of self induced vomiting were explored in the second master theme. There are a number of studies associating purging with instant relief and comfort (e.g. [38, 56]) from physical and psychological distress. Levels of guilt/shame, anxiety/worry and anger/frustration are elevated prior and during binging episodes [36] and self-induced vomiting seems to be act as a negative reinforce by alleviating most of these affective states [57].

Positive affects linking self induced vomiting and future expectations included hope and an optimistic stance towards their future selves and the resolution of the disorder. Almost all participants experienced purging as the ability to reset and restore faith in changing every unwanted part of their lives. Most times vomit served as catharsis, not only promising new found strength in order to end disordered eating behaviors but also incorporating hopes for ideal shape and size, greater endurance and even whole concepts such as the emergence of a whole new self. Implications for the aforementioned findings were reported only in a study by Hsu [16].

BN as a concept, including all aspects of bulimic behaviors and impact on participants' lives were investigated in the third master theme of this study. BN was associated with various types of freedom, personal, familial and social. It was interpreted as a state in which individuals were allowed to be and feel what were not able to express in the outside world. Depending on what intolerable restrictions were imposed in their lives, participants found shelter in BN, giving different meanings to different behaviors. Purging was a place where weakness could be experienced as part of the true self, binge eating served as freedom from self perfectionism, high expectations from others and liberation from obsessive dietary restrains. For some participants, BN was the "perfect" solution in living their lives to the fullest, materializing the ability to binge as much as they wanted to escape from negative affect and at the same time maintain body weight and shape in control by purging and exercise. Hsu [16] in his study presented some cues related to the findings described in this superordinate theme.

The second concept linked to BN by participants was a sense of normality, not only considering their own selves but also significant others. Normality to themselves included rationalization, acceptance or avoidance of insufferable negative emotional states and conditions which would make them feel worthless and ineffective [8]. Utilization of BN led to extremes, from considering perfection in all aspects of life or even in total withdrawal from the situation at hand. Positive feedback and approval by others generated positive emotions in women with eating disorders since self-worth and identity were largely

depended by them [26]. In order to achieve self and social acceptance, negative affect such as anger, shame and even clinical conditions such as depression were contained within the disorder allowing bulimic individuals to present themselves in a suitable and positive manner [58].

Loneliness was one of the most vivid negative emotions presented by all participants. Research has shown that binge eating is related with cues of abandonment and loneliness [32] and the sense of aloneness contributes in the perpetuation of the bulimic cycle [59]. Participants reported loneliness despite the presence of family and friends [35] while BN was considered as a loyal companion, a good friend and a helper which enable them to get through hardships over the years. BN may also be a challenging friend who requires constant attention but most importantly, BN was always available and accessible to participants when no one else was.

### *Limitations*

This study is not without limitations. Sample size was appropriate according to IPA guidelines but small nonetheless. Selected method and procedure was an excellent tool to gain in-depth knowledge of the subject matter but findings are not applicable to the general population. It was also restricted only to Greek Caucasian female participants while long term experience with the disorder was a prerequisite in order to ensure the experience needed for reflection upon asked questions. Verbal responses of participants were translated and slightly modified in order to be understood in written English language. Although all necessary precautions were used to minimize researcher bias, there is the possibility that participants' narratives and experiences may be interpreted according to personal constructs of the interviewer. Interview protocol and researcher personality may have shaped answers while it is possible that current living conditions and situations along with general participants' knowledge about BN may have influenced recalled experiences and the emotional reflection towards them.

Another possible limitation is that participants received psychotherapy from different traditions and this may have affected their language and interpretations of the disorder. Perceptions

and responses considering the subject matter may were also influenced by the fact that participants were at different stages of their individual therapy. Among the sample, one participant was diagnosed with depression and was under medication, another potential bias considering her perceived experience of the disorder.

### *Suggestions for future research*

Future research should address the aforementioned limitation of bulimic individuals receiving different types of psychotherapy and the potential impact of co morbidity with other mental disorders on research results.

It seems that existing literature review and theoretical models are mostly preoccupied with elaborating negative notions of BN and the implications they have on perpetuating the bulimic cycle. The current study presented an in depth exploration of the positive aspects of the disorder as perceived and experienced by people living with it. BN goes untreated for many years since onset because, after a certain point, bulimic individuals cannot separate the disorder from themselves, they are unified. BN offers the means to cope with intolerable affect and situations, to be functional within familial and social context and to regain a sense of self, control and freedom. Important concepts which seem somehow neglected thus far. Future research and therapy should further investigate the benefits of BN since it seems to affect lives in their entirety, rooting in almost every cognitive, behavioral, social and emotional aspect. Discovering positive associations between BN and bulimic individuals may provide a better understanding of the disorder. In addition, it will enable more effective treatment planning and the opportunity to actively decrease symptomatology by replacing these associations with more functional ones, thus reducing stressful physical sensations and misplaced positive interpretations.

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### *Conflict of interest statement :*

We declare that we have no conflict of interest.

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# The relation between phonological perception and production and vocabulary development in Specific Language Impairment

Aikaterini Doulou

## Abstract

The present study is an investigation of the phonology and the lexical development of a child with Specific Language Impairment (SLI). The participants of the study were one child with SLI, one child of the same chronological age as the child with SLI (CA child) and finally one typically developing child of younger age (LD child). These children were evaluated with regard to their phonological and lexical skills with the use of three different types of tests: The Athina test diagnosis of learning difficulties, the Assessment of phonetic and phonological development and the Diagnostic Verbal IQ test. The results of the study show that the child with SLI as well as the L(D) child, presented the most phonological and lexical deficits. Moreover there is relation between the phonology and vocabulary development of the child with SLI and the L(D) child, a fact that is also reported in the relevant literature.

**Keywords:** phonology, lexical skills, vocabulary, language impairment, phonetic development, specific learning difficulties

## 1. Theoretical background

In chapter 1 an introduction about what specifically language impairment (SLI) is will be carried out. Afterwards, a reference to the diagnostic criteria of this language impairment as well as the prevalence, the causes and the language characteristics both in comprehension and production will be presented. Finally, this chapter will concentrate on the phonological perception and production in SLI as well as in the relation of them with the lexical development.

### 1.1. Specific Language Impairment (SLI)

Specific language impairment can be defined as a developmental language disorder where there appears to be no neurological damage, hearing loss, mental retardation or cognitive deficits. Thus, children with specific language impairment are those who exhibit marked difficulties in the acquisition of linguistic ability (23).

In order to define this disorder there are a lot of terms that have been used in the literature such as “congenital aphasia”, “hearing mutism”, “delayed speech development”, “congenital word deafness”, “developmental dysphasia” and “delayed speech” (19). Despite the fact that the most commonly term used is “specific language impairment”, there is a lot of disagreement regarding its definition as there are still differences between the terms that are used (19, 23). For instance, the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (1) refers to two different types of disorders, the “expressive language disorder” and the “expressive-receptive language disorder”. The main characteristic of children with SLI is a slow language development in comparison with typically developing children. There is a weakness in the five levels of language, including production as well as comprehension (23).

### 1.2. Diagnostic criteria

There are a lot of exclusionary criteria so as to distinguish SLI from other types of language disorders (35). These criteria are the basis of diagnosis and differential diagnosis of SLI. According to Leonard (19), the presence of deficits in language abili-

ty and more specifically in production as well as in perception is necessary. Moreover, a determinant of diagnosing children with SLI is the level of non verbal IQ. Children with SLI should have a higher than 85 score on non verbal IQ measurements (19, 23). Another significant criterion is the absence of hearing impairments which can affect the language ability. A pathological disease that is related to hearing impairments is Otitis media with effusion (OME). OME can cause hearing impairments which can impact on language learning. Thus, the absence of OME is necessary when there are language problems regarding a diagnosis of SLI (19, 35). Additionally, it is very important that language problems do not co-exist with neurological dysfunctions (19). Conditions such as cerebral palsy, traumatic brain injury, seizure disorders or brain lesions should be excluded. Moreover, children that present dysfunction in the articulation mechanism that can cause production problems can not be included in the category of children with SLI (35). Finally, another significant criterion is that children with SLI interact normally with people and participate in activities. There should be an absence of psychological problems and autistic elements (19).

### 1.3. Prevalence

Concerning the prevalence of SLI there has not been a clear determination yet. According to the American Psychiatric Association's DSM-IV (1), there is a percentage of 5% of children with SLI that presented production deficits, whereas children with SLI with both comprehension and production deficits are about 3%. A lot of research also has been conducted in order to qualify the prevalence of this type of disorder. Tomblin (45), using linguistic and non-linguistic tests in five-year-old children estimated the prevalence of SLI to be 7, 4 %. However, Tallal (43) estimated a percentage of about 1, 5 %.

It is generally considered that SLI is more frequent in males than in females with a ratio of approximately 2.8:1, while other studies estimate a higher ratio of 4.8:1 (32). Finally, it has been observed that children with a family history of language disorders are more prone to present SLI (19). Additionally, it has been observed that there is a high percentage of SLI in monozygotic twins (45).

### 1.4. Causes of SLI

A lot of studies have tried to provide evidence regarding the factors that cause SLI. It is suggested that the basis of this disorder can be detected in prenatal or perinatal factors (3, 46). For instance, some researchers argue that there is a connection between the mother's illness during pregnancy and SLI (19). Moreover, there are hereditary factors that should not be neglected. There is a high percentage of 30%, of children with SLI with a family history of language problems (47).

Neuroanatomic differences and dysfunctions are also related to SLI, despite the fact that SLI is characterized by the absence of neurological disorders (19). Some irregularities in the brain structure have been observed which can cause difficulties in language learning (15). These irregularities have been detected through the use of magnetic resonance techniques, metabolic neuroimaging and post-mortem brain examinations (4). These results have shown that there is symmetry between the right and the left temporal planes and the two hemispheres, contrary to the perisylvian area where the left side is smaller than the right one (19, 45). Dysfunctions have also presented in the frontal cortex and the basal ganglia. Thus, it is very important to study the family background and the brain structure of these children in order to understand deeply the factors that can cause difficulty in language acquisition (19, 43).

### 1.5. Accounts of specific language impairment

A number of theories have tried to explain the language deficits of children with SLI (9). There are two main theoretical perspectives: the linguistic and the non-linguistic ones. According to the linguistic theories, it is suggested that language difficulties in SLI children are primary and caused by a disorganized language system. On the other hand, non-linguistic perspectives suggest language difficulties are secondary and they are caused by general processing deficits such as an impaired cognitive mechanism or limited capacity on processing (5).

#### 1.5.1. Non linguistic theories

According to the "information processing deficit affecting phonology" (11) the deficits of SLI are due to an impaired pho-

nological working memory. This can cause difficulties in language comprehension and in learning of new words.

Other researchers mention the "temporal processing deficit hypothesis", where the language difficulties of children with SLI are due to a perceptual processing impairment. More specifically, they present weaknesses in the discrimination of phonemes and in tasks related to the representation of items (43, 44).

According to the "surface hypothesis" (18) children with SLI present a limited use of grammatical morphemes and this limitation can affect the perception of grammatical morphemes. This hypothesis argues that the language difficulties in children with SLI are due their grammatical dysfunction.

Leonard, McGregor & Allen (18), in a discussion of the "auditory perceptual hypothesis" argue that the language difficulties in children with SLI are due to a perceptual deficit where a difficulty in the discrimination of 'low-phonetic substance' or non-salient morphemes.

#### 1.5.2. Linguistic theories

According to the "missing feature-blindness hypothesis" (12), children with SLI exhibit difficulty in the acquisition of grammatical rules and in the relations between grammatical and lexical morphemes. Thus, it affects the syntactic structure of language and the grammatical system (47).

Rice and Wexler (31), in a discussion of the "extended optional infinitive account" argue that children of typical language development remain in a phase during which they do not use frequently the mark tense in main clauses despite the fact that they know the grammatical rules. Children with SLI persist in this developmental phase by using more infinitive constructions for a longer period than typically developing children and thus they present language deficits that are more serious in grammar.

## 1.6. Language characteristics

### 1.6.1. Language production

Children with SLI present expression problems and combine receptive and expressive difficulties (19). These difficulties can occur in different areas of communication such as phonology, lexicon, morphology or syntax (35). More particularly, in the phonological production of children with SLI, reversals, omissions, cluster simplifications, substitutions, stoppings and voicings are observed (19) whereas the lexicon is characterized by generalizations, semantic substitutions and production of inappropriate words. Finally in the morphosyntax they present difficulty in the use of grammatical morphemes such as substitutions, transformations or omissions that can affect the use of syntactic rules (47), limited use in main syntactic categories such as nouns, pronouns or verbs (28) and difficulties in the use of definitive articles, passive voice, wh words and in the formulation of past time (17).

### 1.6.2. Language comprehension

A lot of studies have been conducted concerning the language comprehension ability of children with SLI. Many of them argue that children with SLI often perform poorly in the auditory-processing ability including sequencing, auditory discrimination, serial memory and synthesis (19). This can cause comprehension problems and difficulties in the discrimination of grammatical morphemes, phonemes and acoustic information (8, 19).

Moreover, it is suggested that there is a relation between phonological working memory and language perception (28). Gathercole & Baddeley (11), through the use of a non-word repetition test in children with SLI, detected that children with SLI had an impaired working memory with a limited capacity. Also, according to Montgomery (28) it has been observed that these children present difficulties in the phonological encoding of words and have a limited capacity to store information.

## 1.7. Phonology in SLI children

A part of language where children with SLI present significant impairment is phonology. Many researchers argue that the phonological deficits of these children are the main cause of deficits in other areas of language such as in the lexicon, the syntax, the morphology and the expressive vocabulary (22). Some of the theories that have been presented above such as the “temporal processing deficit hypothesis” and the “information processing deficit affecting phonology” can explain the nature of these phonological problems. However, the phonological ability of SLI children is a scientific field that has been researched for a considerable period of time and there are a lot of different hypotheses trying to explain the nature and the profile of this impairment. There can be deficits either of phonology perception or phonology production (10, 16). A detailed description of both of them will be presented below, in order to gain an in depth understanding of this impairment and to detect any relation between them.

### 1.7.1. Phonological production

According to many researchers, the phonological production of children is the result of perceptual-encoding rules and do not differ from the production of younger typically developing children (25, 19, 26, 22). It has been observed that children with SLI acquire at a later stage the segments of language contrary to the typically developing children (19). Children initially acquire the phonemes with the less discriminated characteristics such as /b/, /m/ and /n/ and with the most obvious contrasts for instance labial-palatal (13, 21). However, the acquisition of segments such as /s/ and /v/ can be more difficult (10, 13). Moreover, there is a delay in the acquisition of complex syllabic structures (22). Studies by Bortolini and Leonard (6), have found that children with SLI simplify consonant clusters with CCV frame to CV frame. However, it is not clear yet if this phonological process is caused by the complex structure of the syllables or by the characteristics of the consonants (22).

In a research by Orsolini (29) children with SLI presented a lot of consonant substitutions in the segments acquired later. For instance, they were replacing /r/ with /l/, /v/ with /d/ or /f/ and

/s/ with /t/. Also, children with SLI seem to have difficulty in the use of the distinctive features of segments with similarities (19). For instance, they hold up to acquire the [+strident] and that is why they produce [tol] for hall. Additionally, they make prevocalic substitutions which are not so frequent such as [-voice] for [-voice] (2, 6, 21).

A research by Bortolini & Leonard (7), where the phonological production of nine English-speaking SLI children were compared, showed that these children were omitting both the weak syllable in the initial position of the word and the final consonants of words (27).

It has been observed that a lot of unusual errors are committed by children with SLI (19). For instance, they add nasal segments to the initial or to the final position of the word, or they produce sounds with unusual characteristics such as alveolar affricates, lateral fricatives, ingressive lateral fricatives and ingressive alveolar (16, 21).

### 1.7.2. Phonological perception

Tallal (42), by using repetition tasks concluded that children with SLI performed poorly on auditory processing. It is argued that this deficit can be the root of phonological and language impairments (34). In a study using discrimination tasks, it has been observed that children with SLI do not present a difficulty in the discrimination of words that differ by one phoneme (29, 48). However, there were difficulties in discriminating words where the two syllables differed in the way and the place of articulation (18, 29). For instance, they were failing in the discrimination between syllables with stopping segments or in the discrimination between distributive phones that were phonetically highly similar (29).

Furthermore, children with SLI exhibit difficulty in developing phonological representations of words in their long-term memory (28). This fact is due to a limitation of the phonological information that is stored in the phonological and serial memory (28). Gathercole and Baddelay (11) by the use of a non-word repetition task detected that there was a great difficulty in children with SLI to repeat three or four syllable non-words

contrary to normal language developing children, because of a limited capacity of phonological working memory. According to research by Sutherland & Gillon (41) and Joanisse & Seidenberg (14), children with SLI have a great difficulty in the phonological hierarchy of words because of an inability to manage the storage and the processing functions of phonological working memory. Thus, they present difficulty in learning new words with their phonological and morphological characteristics and consequently they simplify their speech content.

## 1.8. Vocabulary-Lexical development

It is suggested that children with SLI present a significant delay in the acquisition of new words (33). In comparison to normally developing children, children with SLI exhibit difficulty in using the name of new objects that have been learned or to associate the new knowledge of words with the previous one (37). This kind of delay, affects the expressive vocabulary that children with SLI should have as opposed to normally developing children. Thus, deficits in phonological skills may be presented because of this lexical inability (19, 39). Additionally, it is very frequent that children with SLI present “word-finding” problems. This can cause generalizations, semantic substitutions such as “trousers” for “shorts”, use of inappropriate words or circumlocutions (24).

### 1.8.1. Phonology and the lexicon

It has also been suggested that there is a relation between the phonological abilities of SLI children and the number of words in their vocabulary (19). More specifically, according to a research by Shelley (36), a limited phonological memory may cause difficulties in the comprehension and the acquisition of new words. When a child has a limited phonological memory is difficult to store a word with unfamiliar phonological representation. Difficulties with phonological representation also may affect the creation of semantic representation (40). It has also been discovered that SLI children present difficulty in the fast mapping ability, according to this a child hears a word, creates a phonological representation and a phonological link with semantic representations (36, 40).

### 1.9. Hypotheses/Research questions

The present study aims to describe the phonological system of a child with SLI by analyzing the deficits of the speech production and the difficulties in the phonological perception as well as the lexical development with the use of tests. It also aims to show that the child with SLI is in the same developmental stage with a child of a younger chronological age regarding their phonological and lexical skills. At the end of this procedure, a comparison between our results and those of other studies will be carried out. In this way, it is hoped that more evidence regarding the phonological processes of this group of the population will arise, which will possibly lead to a better understanding of the disorder and its treatment.

According to the above, our hypothesis is that phonological perception and phonological production share a connection between them and so does phonology with vocabulary development. We expect the impaired phonological production to be caused by deficits in phonological perception. Moreover, we expect the phonological as well as the lexical skills of children with SLI to differ from those of children of the same age and of a typical language development but to be similar with children of younger chronological age. So, the following research questions will be arising: Is there any relation between the phonological perception and the phonological production of children with SLI? Is there any relation between the phonology and the vocabulary development of children with SLI? Is there any difference between the children with SLI and their unimpaired peers as far as their phonological skills and lexical skills are concerned? Are children with SLI and those of a younger chronological age at the same developmental stage regarding their phonological and lexical skills? There is lot of research on which the above hypotheses are based. However, it would be a great field for further study if any different results, according to these hypotheses, could be presented.

## 2. Methodology

### 2.1. Participants

For the purpose of this study three children participated. The first child having been diagnosed with specific language impairment (SLI child), the second one was of the same chronological age as the child with SLI (CA child) and finally the third child had typical language development and matches the child with SLI in respect of language ability (LD child). All participants were male. Moreover, they were Greek native speakers and belonged to families of the same socioeconomic status. Each child was met two times by the researcher of a 45 minutes session at their homes, in order to assess and analyze their phonological and lexical skills. Moreover, the parents of each child were interviewed about the medical, the developmental, the educational and the social history of their child.

#### 2.1.1. Child with SLI

The name of this child is G. and had been diagnosed with specific language impairment according to the diagnostic criteria of Leonard (19). The age of G., is 6;5 and he goes to the first class of elementary school. G. also, has been attending a program of speech and language therapy for 2 years in a center of Athens. Additionally, he did not have any hearing impairment, neurological disorder, problems in social interaction or otitis media.

#### 2.1.2. Chronological age matched child, C (A)

This child has typical language development and is of the same age as the child with specific language impairment. Specifically, his name is J., his age is 6;8 and he attends the first class of elementary school. Furthermore, he did not present any neurological, psychological, developmental or cognitive disorder such as mental retardation, learning difficulties, syndromes, hyperactivity and attention deficit disorder (HADD). Also, his language abilities were assessed by the use of the Diagnostic Verbal IQ test (39). This test assesses the production and the perception of morphology and syntax as well as the lexical skills of Greek native speakers. According to the results of the DVIQ test, he had normally developed language skills and he did not exhibit any language disorder or delay.

### 2.1.3. Typically Language Development child, L (D)

This child has a lower chronological age but is at the same language developmental stage as the child with SLI. The matching was done based on his DVIQ scores. The name of this child is T., is 4;8 years old and he attends kindergarten. Finally, he does not present any neurological, psychological, developmental or cognitive disorders.

## 2.2. Materials

For the purposes of the study three assessment/experimental tools were used, corresponding to the three variables investigated (phonological perception, phonological production and lexical development). As a first tool, two sections of The Athina test diagnosis of learning difficulties (Translated by Doulou Aikaterini: The Athina test diagnosis diskolion mathisis) (30) were used, which evaluate the phonological perception of each child. The second tool used was the Assessment of phonetic and phonological development (Translated by Doulou Aikaterini: Dokimasia Fonitikis kai Fonologikis Ekseliksisis) (20), which is designed to assess phonological production. Finally as a third tool, the production of vocabulary section of the Diagnostic Verbal IQ test (39) was used in order to evaluate the lexical skills of each child. In order to record this procedure a tape recorder was used. Specific information on each of the experimental materials follows in the next sections.

### 2.2.1. The Athina test diagnosis of learning difficulties (30)

The Athina test consists of 14 main diagnostic procedures which assess motor, perceptive, cognitive and psycholinguistic processes in children between 5 and 9 years old. The Athina test, comprises of forms, books and leaflets such as the “examiner’s guide” and the “examination leaflet”, cards with subjects and geometrical shapes and objects such as a pencil sharpener. However, in this case, a selective administration of the test was preferred rather than a complete one, in order to investigate the phonological perception of the children. More specifically, two scales were selected, the “synthesis of phonemes” and the

“discrimination of phonemes”.

The “synthesis of phonemes” scale assesses abilities such as blending phonemes and formulating words. It consists of 32 words that include the phonemes of the Greek language in a lot of combinations.

(1) Target: m-o-l-i-v-i

(2) Target: s-a-l-o-n-i

It also contains a block of 12 cards, each of which has 4 pictures with words having phonological similarities.

(3) Example: [psi.´ji.o] - [´pli.o] - [vi.´li.o] - [θra.´ni.o]

The “discrimination of phonemes” scale evaluates the ability of a child to distinguish between phonemes. It consists of 32 pairs of false words, some of which are the same, and some of them are different because a phoneme may have been replaced, omitted or transposed.

(4) Example: [yar.ða.´θos] - [yar.ða.´θos]

(5) Example: [´vo.la]-[´yo.la]

### 2.2.2. Assessment of phonetic and phonological development (APPD) (20)

The APPD tool records and analyzes the phonological system of a child and also evaluates whether the phonemes that acquired by a child correspond to his/her age. Additionally, it compares the phonological system and the phonotactic abilities of a child with language impairment to those of children of the same age. This test consists of a book containing 60 simple pictures such as a cow, a shoe or a swan and two complex pictures concerning the description of a playground and a kitchen. Moreover, there is an answer sheet where the phonetic transcription and the phonological analysis are noted. It consists of two-syllable words with a simple syllabic structure (cvcv) as well as of multi-syllable words with more complex syllabic structure.

(6) Target: [ˈzo.ni]

(7) Target: [er.yo.ˈsta.si.o]

### 2.2.3. Diagnostic Verbal IQ test (DVIQ) (39)

DVIQ evaluates language abilities in preschool children (2;5-5 years). More specifically, it assesses the understanding of basic language concepts such as size, quantity or attribute as well as the acquisition of language concepts such as subjects or more abstract concepts. Moreover, it assesses the production and the perception of morphology and syntax as well as the lexical skills of Greek native speakers. More specifically, DVIQ consists of three sections. The first section evaluates the morphosyntactic as well as the lexical production, whereas in the second section the comprehension of morphosyntax and metalinguistic concepts are evaluated. Finally, the third section evaluates the ability of a child to recall syntactic structures. The section that was used assesses the lexical skills and consists of 27 pictures and 27 questions where the use of 14 verbs, 23 nouns and 7 articles were assessed.

(8) Question: Ti ine afto? Target: Tetradia

(9) Question: Ti kanei o antras? Target : Sideronei ta rouxa

### 2.3. Procedure

The researcher had two individual 45-minute meetings with each child, which took place in their homes. In the first session, the children's phonological perception was assessed by applying the Athina test, as well as their lexical skills through the DVIQ test. The second session took place one week later, when the APPD was administered.

Concerning the "Synthesis of phonemes" scale, the researcher pronounced the phones of each word one by one in a natural way and with the rhythm of two phonemes per second. The first 10 questions were administered by the use of pictures, without the researcher naming them. More specifically, the researcher pronounced a word and asked the child to show the

corresponding picture by naming it. Questions 11 to 32 were administered in the same way, but without the use of pictures. The researcher pronounced each word, phoneme by phoneme, and asked the child to recognize the word. In the examination answersheet, the researcher checked either "right" or "wrong" according to the answer of the child. The maximum score for this part of the test is again 32 right answers.

The procedure of the tests was the following: In, the "discrimination of phonemes" scale of the Athina test, the researcher asked the child to turn his/her back so as to avoid lip-reading. Then, he would read the pairs of false words one by one in a natural way, and would then ask the child if the words were the same or different. Depending on the child's answers, the researcher checked in the column of the examination answersheet either "Different" or "Same". The maximum score that someone can achieve is 32 right answers.

In the APPD, the researcher showed the child pictures from a book one by one and asked him to name them. Then, the answers of the child were recorded on the answer sheet. The researcher noted the phonetic and the phonotactic transcription of the word and any phonological procedures that had been carried out. In the event where the child did not answer, the researcher measured it as a false answer.

Concerning the DVIQ test, the researcher showed each child pictures from a book one by one and asked them questions such as "What are these?" or "What are the children doing?" in order to evaluate the use of subjects and actions. For each picture there was only one answer. The researcher noted "1" for each right answer, "0" for each wrong answer and "no answer" if the child did not answer. At the end of this procedure the sum of right answers was calculated.

### 2.4. Measurements

The results of the research were produced by calculating the right and wrong answers from each test, as those were provided by all the children participating. At first, the analysis focused on the relationship between the two variables, namely the phonological perception and the phonological production of each child. More specifically, it was considered whether the dif-

difficulties in the phonological perception affect the phonological production and vice-versa, by comparing the right answers from each test. Secondly, the relationship between the phonological system and the lexical skills of each child was analyzed. It was queried, by calculating the false and right answers from each test, whether the phonological difficulties of children with SLI can affect lexical development. Following this, a comparison was made between the children with SLI and those in the control groups. This comparative approach was used in order to measure how the phonology and the lexical skills of children with SLI differed to those of children of the same age and how they were the same with those of children of a lower chronological age.

### 3. Results

In chapter 3 the results and the measurements from the study of the phonology and the lexical skills of the child with SLI, of the child with the typical language development and of the same age - Chronological age matched control (CA) - as well as of the child with the lower chronological age (LD) are presented. More specifically, the children's error percentages were examined in all three types of tests that were used.

#### 3.1. Phonological production

The full results regarding the number and the percentage of correct answers of each child in naming simple pictures as well as describing complex pictures are provided in Table 1.

Table 1: Correct answers in simple picture naming and complex picture description

Groups	Simple pictures		Complex pictures	
	Correct	%	Correct	%
	N	%	N	%
SLI	47/70	67,1	19/31	61,3
C(A)	66/70	94,3	31/31	100
L(D)	51/70	72,9	24/31	77,4

Table 1 shows that based on the correct answers of the three participants there are distinct differences. More specifically, in simple picture naming the child with SLI gave the fewest number of correct answers (47/70) compared to the C(A) child and the L(D) child. Moreover, there was only a marginal difference between the SLI and L(D) children (47 and 51 correct answers respectively). Regarding the description of complex pictures, the child with SLI provided the fewest correct answers (19/31) with a marginal difference from L(D) who had 24 right answers. C(A) did not give any wrong answer in this task.

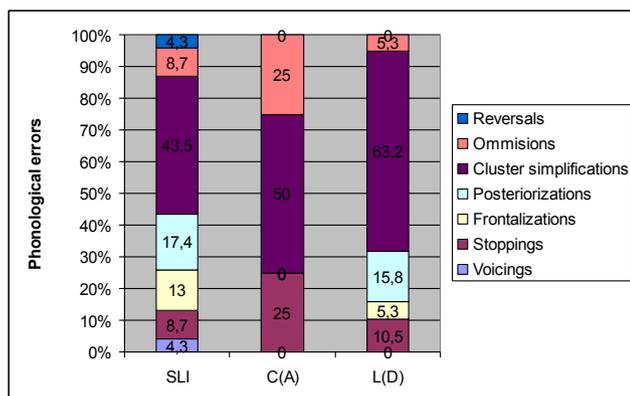
Table 2 presents the types of phonological errors that were produced by the SLI, C(A) and L(D) children in the naming of simple pictures.

Table 2: Phonological errors in simple picture naming

Phonological errors	SLI		C(A)		L(D)	
	N	%	N	%	N	%
Voicings	1	4,3	0	0	0	0
Stoppings	2	8,7	1	25	2	10,5
Frontalizations	3	13	0	0	1	5,3
Posteriorizations	4	17,4	0	0	3	15,8
Cluster simplifications	10	43,5	2	50	12	63,2
Omissions	2	8,7	1	25	1	5,3
Reversals	1	4,3	0	0	0	0
Total number	23	32,9	4	5,7	19	27,1

Figure 1 presents a comparison between the phonological errors that were observed in each child.

Figure 1: Comparison of phonological errors in simple picture naming



From Figure 1 it can be deduced that some of the phonological errors are common between the SLI child and the L(D) child. More specifically, the highest percentage of the SLI child's phonological errors, as well as of the other two children, concern the cluster simplifications (43,5%), whereas there is a small percentage of 8,7% concerning the omissions of phonemes and stoppings.

(10) SLI child: [ˈvi.si] Target: [ˈvri.si]

(11) L(D) child: [fi.ˈtza.ni] Target: [fli.ˈtza.ni]

Reversals and voicings are also observed in the child with SLI while with the L(D) child they do not exist. Moreover, the L(D) child presents a high percentage of 63,2% of cluster simplifications but fewer phonological errors are omissions and frontalizations (5,3%). The L(D) child also presented other phonological errors such as posteriorizations and stoppings (15,8% and 10,5% respectively).

(12) L(D) child: [tu.ˈla.pa] Target: [du.ˈla.pa]

(13) L(D) child: [sfi.ˈrik.stra] Target: [sfi.ˈrix.tra]

The C(A) child presented the smaller number of phonological errors, compared to the other children, characterized only by cluster simplifications (50%), omissions (25%) and stoppings (25%). More specifically, he did not present other types of phonological errors such as reversals, posteriorizations, frontaliza-

tions and voicings.

(14) C(A) child: [sko.ˈli.o] Target: [sxo.ˈli.o]

(15) C(A) child: [ska.ˈni] Target: [skam.ˈni]

(16) C(A) child: [a.ro.ˈpla.no] Target: [a.e.ro.ˈp-la.no]

Table 3 presents the types of phonological errors that were produced by the SLI, C(A) and L(D) children in the naming of complex pictures.

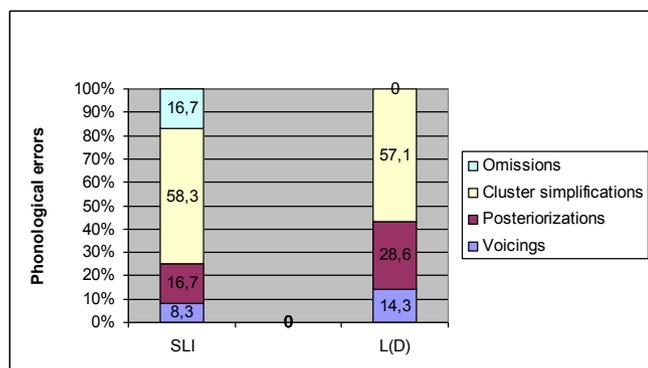
Table 3: Data about the types of phonological errors in complex picture description

Phonological errors	SLI	C(A)	L(D)				
	N	%	N	%	N	%	
Voicings	1	8,3	0	0	1	14,3	
Posteriorizations	2	16,7	0	0	2	28,6	
Consonant simplifications	7	58,3	0	0	4	57,1	
Omissions	2	16,7	0	0	0	0	
Total number	12	38,7	0	0	7	22,6	

In Table 3 it can be seen that the SLI child and the L(D) one made the same type of phonological errors, despite the omissions that did not present in L(D). More specifically, voicings, posteriorizations as well as consonant simplifications were observed. Consonant simplifications was the type of error that was observed to occur more frequently as opposed to voicings and posteriorizations that did not occur with the 2 children that often. C(A) did not present any phonological error in this task.

Figure 2 presents a comparison between the phonological errors that were observed in each child.

Figure 2: Comparison of phonological errors in complex picture description



In Figure 2 it can be noticed that there was no notable difference concerning the cluster simplifications presented by the child with SLI and L(D) (58,3% and 57,1% respectively). Additionally, voicings were presented by the two children with a lower percentage (8,3% and 14,3% respectively) whereas posteriorizations were observed more often in L(D) with a percentage of 28,6%, contrary to the child with SLI where a percentage of 16,7% is presented.

(17) SLI child: [su. 'li.θra] Target: [tsu. 'li.θra]

(18) SLI child: ['ca.nta] Target: ['tsa. nta]

(19) L(D) child: [ka. 'ro.ci] Target: [ka. 'ro.tsi]

(20) L(D) child: ['fu.ces] Target: ['fu.skəs]

### 3.2. Phonological perception

In Table 4 the total number of right answers of each child concerning the tasks of discrimination and synthesis of phonemes are presented.

Table 4: Total number of answers in phoneme discrimination and synthesis

Groups	Discrimination of phonemes	Synthesis of phonemes		
	Correct	Correct		
	N	%	N	%
SLI	21/32	65,6	12/32	37,5
C(A)	30/32	93,8	25/32	78,1
L(D)	17/32	53,1	8/32	25,0

From Table 4 it can be noticed that in the discrimination of phonemes the child with SLI presented a significant difficulty in answering correctly in 65,6% of words. Like the child with SLI, L(D) also presented great difficulty (53,1% of correct answers). On the other hand, C(A) performed well in this task by answering correctly with a success rate of 93,8%.

(21) SLI child: ['ma.la]-['ma.la] Different Target: Same

(22) L(D) child: ['a.fa.li]-['a.θa.li] Same Target: Different

(23) C(A) child [na. 'ða.fa]-[na. 'va.fa] Same Target: Different

Concerning the synthesis of phonemes, the child with SLI and L(D) performed poorly with a percentage of correct answers of 37,5% and 25% respectively. It is noteworthy that there is a difference between them while the L(D) child presented greater difficulty than the child with SLI. In contrast, C(A) gave the highest number of correct answers with a percentage of 78,1%. The following are some examples of words that children presented difficulty:

(24) SLI child: [b.u.k.a.l.i]

(25) L(D) child: [tz.a.m.i]

(26) C(A) child: [δ.a.k.t.i.l.o]

### 3.3. Lexical skills

In Table 5 the total number of right answers of each child concerning the assessment of lexical skills is presented.

**Table 5: Total number of answers in the assessment of lexical skills**

Group	Correct	Incor- rect	No an- swer			
	N	%	N	%	N	%
SLI	15/27	55,6	12	44,4	0	0
C(A)	22/27	81,5	5	18,5	0	0
L(D)	18/27	66,7	9	33,3	3	11,1

In table 5 it can be seen that the child with SLI and L(D) gave the shortest correct answers (55,6% and 66,7% respectively) indicating that between them there is a difference, whereas C(A) answered correctly with a percentage of 81,5%. It is worth noting here that there is a percentage of 11, 1% where L(D) did not answer.

(27) SLI child: "Kani pisw ta fila" Target: Skalizi ton kipo

(28) L(D) child: "Sfougarizei ta fila" Target: Skalizi ton kipo

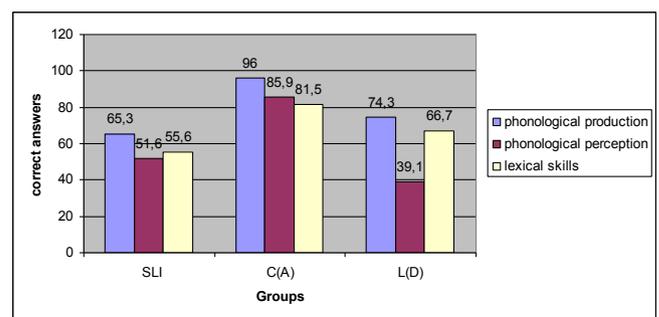
(29) C(A) child: "Skoupizi to xoma" Target: Skalizi ton kipo

In Table 6 the total number of right answers of each child concerning the assessment of phonological production, phonological perception and lexical skills are presented.

**Table 6: Total number of answers in the three types of tests**

Groups	Phono- logical					
produc- tion	Phono- logical percep- tion	Lexical skills				
	Correct	Correct	Correct			
	N	%	N	%	N	%
SLI	66/101	65,3	33/64	51,6	15/27	55,6
L(D)	75/101	74,3	25/64	39,1	18/27	66,7
C(A)	97/101	96	55/64	85,9	22/27	81,5

In Figure 3 a comparative presentation of the correct answers in tasks concerning the assessment of phonological production, phonological perception and lexical skills of each child has been carried out.

**Figure 3: Comparison of three children concerning their skills in phonology and vocabulary**

In Figure 3 it can be observed that the C(A) child has the highest percentage of correct answers. Additionally, the phonological perception of the SLI and L(D) children is at lower level than that of phonological production. More specifically, regarding the child with SLI there is a percentage of 65,3% concerning the right answers in the assessment of phonological production whereas the percentage of correct answers in phonological perception's tasks is 56,6%. It deserves to be mentioned also, that contrary to the other two children, the L(D) child presents the lowest percentage of the correct answers concerning the phonological perception's tasks (39,1%). Another observation is that there is a relation between the vocabulary and the phonology of each child. However, it is noticeable that the percentage of correct answers of the child with SLI in the assessment of lexical skills was 55,6% while the correct answers in phonological perception tasks was only 51%. Finally, it is observed that the L(D) child gave more correct answers, contrary to the child with SLI, in tasks concerning the phonological production (74,3% and 65,3% respectively) and the lexical skills (66,7% and 55,6% respectively), while the child with SLI gave more correct answers in tasks concerning the phonological perception (51,6%).

On the whole, it is should be reported that the child with SLI

presents the highest level of difficulty in phonological production as well as in lexical skills. In comparison to the other two children, these difficulties of the child with SLI seem to bear similarities to those presented by L(D), who has a lower chronological age but the same language development stage. On the other hand, C(A) performed better in all tasks by committing considerably less phonological errors and by providing a larger number of correct responses in tasks concerning phonology and lexical skills.

#### 4. Discussion of results

In Chapter 4 the results of the study of the SLI child's phonological and lexical difficulties will be discussed. In the beginning, an overview concerning the aims of the study will be presented and thereafter the results of the study will be discussed in comparison to those of recent research.

##### 4.1. Overview

The present study describes the phonological system as well as the lexical skills of a child with SLI and compares them to those of a child of the same age as well as those of a child of a younger chronological age. The first aim of the study is to ascertain that the child with SLI differs from the child of the same age regarding the phonological and lexical skills, however when it comes to the child of a younger chronological age the difficulties are almost the same. The second aim of the study is to demonstrate that the phonological perception and production of the child with SLI are linked and that the phonological deficits are due to an impaired phonological perception. Finally, the third aim of the study is to show whether the small number of words in the SLI child's expressive vocabulary is due to an impaired phonological system.

#### 4.2. Discussion of results

##### 4.2.1. Phonology

According to many researchers, the phonological skills of children with SLI do not differ from those of younger typically developing children (25, 19, 26, 22). More specifically, a lot of phonological errors that have been observed in the present study were common between the SLI child and the (LD) child such as omissions, reversals, cluster simplifications, substitutions, stoppings and voicings. Regarding the total number of

correct answers in the study of the phonological production, it was established that the child with SLI has a marginal difference with the (LD) child. According to Leonard (19), children with SLI acquire later the segments of language contrary to the typically developing children. Additionally, children with SLI hold up to acquire the complex syllabic structures (22) and it has been found that they simplify consonant clusters very often (6). Orsolini (29) also, argues that children with SLI present a lot of consonant substitutions in the segments acquired later on. More specifically, the highest percentage of the SLI child's phonological errors as well as of L(D) child's in the naming of simple pictures concern the cluster simplifications.

According to Leonard (19), children with SLI also present difficulty in acquiring distinctive features such as the [+strident] and [+voice]. In accordance to the results of the study, there is a small percentage concerning the stoppings and the voicings in the naming of simple pictures, whereas in the description of complex pictures a small percentage of voicings is also presented. Finally, Bortolini and Leonard (7) argue that children with SLI omit the phonemes in the initial or in the final position of words. These findings are also observed in the results of the present study, where the child with SLI in the naming of simple picture as well as in the complex picture description presented a small percentage concerning the omissions.

Concerning the phonological perception of children with SLI, it is argued that there are difficulties in the discrimination of words where the two syllables differ in the way and the place of articulation (18, 29). As it can be noticed in the results of the present study, in the discrimination of phonemes the child with SLI demonstrated a significant difficulty in answering correctly like the L(D) child. Furthermore, children with SLI present difficulty in the phonological hierarchy of words (41, 14) as well as in the phonological representations due to an impaired serial memory (28). The results of the study showcase that the SLI and the L(D) children face difficulty in the synthesis of phonemes. More specifically, the L(D) child performed more poorly in comparison to the child with SLI in this task, and the reason for this may be the fact that L(D) because of his age has not yet developed his phonological awareness, contrary to the child

with SLI who attends the first class of elementary school and knows all the letters of the Greek alphabet and their combinations. It has been also noticed that the child with SLI faces difficulties in both the phonological production and phonological perception. Rosen (34), argues that the deficits in phonological perception can be the root of phonological impairment. Concerning the results of the study, the phonological perception of the L(D) and SLI children is at a lower level than that of phonological production.

#### 4.2.2. *Lexicon*

Regarding the total number of correct answers in the study of lexical skills, it has been observed that the child with SLI and the L(D) child gave the shortest correct answers. According to Sommers (37), SLI children present a delay in the acquisition of words as well as a difficulty in naming new objects that they have been recently introduced to. In accordance to the above, the results of our study show that the child with SLI presents difficulty both in phonology and in lexical skills. Many researchers also argue, that the deficits in lexical skills may be presented because of the phonological inability (19, 39). According to a research by Shelley (36), a limited phonological memory, difficulties with phonological representation and fast mapping may affect the ability of word learning.

#### 5.1. *Summary and conclusion*

A first conclusion that can be drawn from this study is that the phonological deficits as well as the limited vocabulary of the child with SLI were the main features of its expressive language. Moreover, it has been observed that the phonological and the lexical abilities of SLI and L(D) children have some similarities and some differences as well. Generally, the language development between these two children is not identical. This leads us to the conclusion that SLI is not a language delay but a language disorder characterized by its symptoms. Additionally, both SLI and L(D) children present difficulties in tasks concerning the synthesis and discrimination of phonemes, commit a lot of phonological errors such as omissions, reversals, cluster simplifications, substitutions, stoppings and voicings and face

a lot of difficulties when it comes to the process of word learning. Additionally, it should be mentioned that the child with SLI present difficulty both in phonological perception and in phonological production. There is an important link between them as an impaired phonological perception can be the root of the phonological impairment. Finally, it can be observed that there is a great relation between the phonology and lexical skills in SLI and L(D) children, a fact that is also reported in the relevant literature.

The above findings will hopefully help speech and language pathologists in their ongoing efforts to diagnose and treat difficulties in phonological processing and word learning which can lead to specific language impairment. Finally it could be also useful for differential diagnosis between SLI and language delay.

#### 5.2. *Future research*

For the purpose of the study only three children were used: one with SLI, one with the same age and one with a younger chronological age but with the same language development. Therefore, because of the limited number of the participants, the results of the present study cannot be generalized. It is essential that further research is carried out with a larger number of participants in order to understand in more depth the phonological deficits and the vocabulary acquisition of SLI children. The results of the present study can be the starting point of theoretical accounts concerning the relation between the phonology and the lexicon. Generally, there is a combination of interesting reasons as to why study SLI. First of all, it is very important to gain a deeper understanding of this type of language disorder, in order for new methods of assessment to be found and secondly some characteristics of SLI could be used in order to better understand other types of language disorders (19).

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I declare that this dissertation is all my own work and that all sources quoted are indicated and acknowledged by lists of references.

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# Gender dysphoria: A critical discussion of the understanding and treatment of gender dysphoria

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## Abstract

In DSM- 5, the American Psychiatry Association changed the diagnosis of gender identity disorder by adopting the term of gender dysphoria (GD). The development of gender identity is a complex and probably multi-factorial procedure relating to genetic, hormone and environmental factors. GD could be traced in two different developmental stages, either during childhood, or during adolescence. Transgenders require safe and effective hormonal support for the development of natural characteristics verifying their gender identity. The main indications for the beginning of the hormonal therapy are verified from the persistent fixation of dysphoria that they experience and the sufficient mental ability to give their consent and accept this irreversible therapy. Health practitioners should act within the framework of their duties, helping people with GD match their external appearance with their internal experience and improve their social functionality. Moreover, the support and proper communication between the family members will contribute to the acceptance of the gender identity, the reinforcement of self-confidence, the reduction of bias, the cause of emotional and behavioural mental disorders and the conquest of a good quality of living.

**Keywords:** gender dysphoria, transgender, diagnostic criteria, clinical health psychology, depathologization, psychological distress, gender nonconforming, DSM.

### *The DSM diagnostic criteria for gender dysphoria*

In the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM- 5), the American Psychiatry Association (APA) changed the diagnosis of gender identity disorder by adopting the term of gender dysphoria [1, 2]. This term refers to a person's dysphoria with the biologically determined gender and the intense desire to be relieved from the characteristics determining it [3, 4]. The heads of this term revision GD, Kenneth and Zucker, state that the new diagnosis relates to clinically important dysphoria (distress) or damage in the social, professional or other important sectors of a person's operation [1]. Main pursuit of the revision is the depathologization and the elimination of the stigma caused by the term disorder [5, 6, 7]. There is thus, emphasis placed on the focus of gender dysphoria and not on gender identity [8].

The diagnostic criteria include 'the unbearable discordance that people experience because of their biological gender, the intense desire to obtain the characteristics of another gender, the strong will to belong to another gender, the high confidence that they have emotions and responses that match with the other gender'. In order for one to be diagnosed, he should show two or more diagnostic criteria for at least six months' [1]. Furthermore, the diagnosis could be made in two different developmental stages, either during childhood (gender dysphoria in children), either during adolescence or adulthood (gender dysphoria in adolescents and adults) [1, 9]. According to recent estimations in the Western countries, rising is shown in the prevalence rate. About 1 out of 12,000 biological men and 1 out of 30,000 biological women experience this condition [10, 11]. However, the frequency of the referrals by paediatricians shows rapid increase [12]. In contrast with the European data, in a study conducted in Massachusetts, in a sample of 28,662 people, 0.5% were self-determined as transgender [13].

### *The causal biological, social and psychological factors*

Aiming at better understanding, it is very important to seek the deeper factors owed to the cause of gender dysphoria.

The development of gender identity is a complex and probably multi-factorial procedure relating to genetic, hormone and environmental factors [7]. According to the study of Coolidge, Thede & Young in 2002 [14], there is possibly high risk for hereditary predisposition reaching up to 62 %. Studies on the heredity of the transgender identity have shown that there could be genetic factors contributing to the gender development. In a recent review on 23 monozygotic male and female twins, 9 (39.1 %) met the criteria for gender dysphoria [9]. Nevertheless, the studies failed to establish the causal genes and isolate them [15].

Some theories place emphasis on the biological dimension to interpret this condition. In specific, they have dealt with the process of gender standardisation, focusing on proximal and peripheral biological effects, genetic and rewarding or hormonal and neuronal devices [16], as well as anatomical differences in the justification of genders and their variation [6]. Also, there are structural and functional differences in the brain, some of which are observed throughout life and others in specific developmental phases [17]. John Money & Anke Ehrhardt (1997) suggest the notion of brain sex, causing dispute [18, 7]. The hypothesis that many brain functions seem to have gender deformities led researchers to the study of whether transgender people have structures in the brain that align more with the verified gender. In this study, it was observed that the volume of the bed nucleus of stria terminalis in biological men was respective to the volume found in cisgender women [19, 20]. Opposite to this view more recent studies argued that these deformities were insignificant [21].

Gender differences in the brain are largely defined by the exposure to specific secretions during the sensitive prenatal period. The hormone environment of the developing foetal brain and its role in gender identity has constituted another sector of scientific study. It has been observed that during foetus life there are important differences for the gender configuration in the concentrations of these hormones [22]. Jordan-Young (2012) [23] argued that these differences could make a decisive factor in the differentiation of the behaviour of men and women later in their lives. In a study conducted it was observed that

infants with 46XX karyotype and inherent adrenal hyperplasia, girls are usually born, after being exposed during pregnancy to higher concentrations of androgens than normal [7]. In a meta-analysis, 5% of biological women showed gender dysphoria, which indicates that the prenatal exposure to androgens could influence the development of male gender identity characteristics [24]. In another study, conducted on 14 biological women patients with 46XY karyotype and Croatian exophthalmos, 8 (57%) formed a male identity [15]. Opposite to these highly rare cases, most transgenders have not identified themselves with endocrinopathy symptoms [7].

The theory of epigenesis argues that there is continuous interaction between genes and experiences, which changes the expression of genes, with no change in the underlying succession of the DNA [25]. Many studies state that social experiences can quite early imitate an epigenetic response and form permanent gender differences in the brain and in the behaviour [26, 27].

Social approaches turn to a different direction to understand the subject. The socio-cognitive theory underlines that men are an active constructor of cognitive schemas including gender and it is in constant interaction with the environment [6]. It has been argued that the social relationship between a parent and an infant in combination with cognitive learning with positive and negative reinforcement with respect to parents' expectations with social standards, contribute to the gender development in all children [28,29]. Robinow (2009) [30] argued that the presence of gender dysphoria could be attributed to difficulties in the relationship between a mother and a child, in the first two years. Undoubtedly, the attachment bonds in the beginning of life are crucial for the development of the gender identity [31]. The difficulty to create healthy relationships could be responsible for triggering or deactivating specific genes [32, 33]. Opposite to the adverse effects that it exerts on temperament of children, the lack of substantial relationship with the mother, positive correlation was not found between paternal social responsiveness and gender dysphoria [34].

However, modern researchers have extended their attention

to the inclusion of biological, social and psychological processes arising at the same time during developmental course [6, 35] and they are considered in a combined way [36]. As mentioned above, dysphoria could be traced in two different developmental stages, either during childhood, or during adolescence [7, 1]. However, Shechner (2010) [37] underlines that in certain extraordinary situations there are indications even in the first three years. It is though possible that the symptomatology draws back during adolescence or adulthood [38]. Some findings are based on this hypothesis and argue that it is possible that child dysphoria draws back and is expressed as homosexuality [39, 21, 40]. On the other hand, there are cases where aggravation of dysphoria is observed during adolescence [7, 40]. Efforts have been made to trace the factors that play a decisive role in the maintenance or otherwise of dysphoria in adolescents. In a study conducted on 53 adolescents, those showing high dysphoria in adolescence at the age of 10-13, could create a permanent transgender identity. Important factors were the social environment, emotions towards adolescent changes and occurrence of sexual attraction [41].

### *A holistic approach to the treatment of gender dysphoria*

Clinical doctors could use the aggravation of gender dysphoria in adolescents as a diagnostic tool and a criterion of suitability for medical intervention [42]. However, the uncertainty of obsession has led to intense disputes in terms of the therapeutic aspect [43]. There is lack of consent observed between health providers with respect to the objective of mental care in children before adolescence [44]. Some agree that the therapeutic objectives should focus on the reduction of dysphoria and on the acceptance of the biological gender [45].

Totally opposite approaches, they provide support to the families, they reinforce the acceptance of the transgender identity of children and they offer material support to facilitate the social transition [7]. Also, to avoid confusion in terms of the therapeutic intervention, the American Psychiatry Association published a guide suggesting to psychologists the provision of

support with “culturally competent, developmentally appropriate, and trans-affirmative psychological practice” [46].

Furthermore, researchers underline that there is imperative need to seek psychological support [47]. Specialised psychologists are called to negotiate with the unbearable dysphoria one feels and the difficulty in the relationships he/she forms either with the family or with the peers [48, 49]. Moreover, it is common that people with gender dysphoria also face other psychological and emotional difficulties, behaviour issues, mood disorders, worrying depression, anxiety, self-injury rates, even suicidal attitudes requiring therapeutic attention [50, 51]. In an ex-post facto study conducted by García-Vega, Camero, Fernández & Villaverde (2018) in 151 people, almost 38.3% faced risk from suicidal ideation and 23.8 had attempted to commit suicide [52]. Improper treatment of children with dysphoria could lead to destructive consequences [50].

Therapists have the knowledge and they try to improve the interpersonal relationships of these people thus, learning how to deal with their cross-gender behaviour, especially in conditions where one can cause interpersonal problems [47]. The psychotherapeutic approach suggested in this case, is the psychodynamic psychotherapy, because it places emphasis on internal conflicts of a person [6]. However, some studies are in progress and they will assess its effectiveness [40]. Whereas, therapy and support are highly necessary, and while they are broadly available, they are still insufficient for the full relief of these patients [53].

Meanwhile, therapy choices focusing on the biological basis of the issue vary. Some of them are the proportion of the gonadotropin hormone (GnRH) release, a reversible therapeutic method, which inhibits the secondary characteristics [53, 6]. Another therapy choice is through the gonadal steroid hormone, which is irreversible, just like the surgical removal of the genitals and the recreation of new ones depending on the desired gender [54]. The surgical operation includes a bilateral mastectomy, with breast restructuring, hysterectomy with ovary incision accompanied with metoidioplasty or phalloplasty in trans-female and bilateral emasculation with penis incision accompanied with vulva plastics and vagina plastics in trans-

male [55]. According to the healthcare standard of the World Professional Association of Transgender Health (WPATH) a suitability criterion is a person being at the legal maturity age set by each country. In most cases this is the age of 18 years old [54].

Puberty suppression takes place with the use of analogies (GnRH) in Tanner 2 or 3 stage of adolescence [56, 6]. Following, the hypothalamus generates GnRH at low levels in children at the pre-adolescence age. The levels evolve in circles leading to the production of the LH hormone and the FSH hormone from the anterior pituitary gland [53]. These hormones stimulate the ovaries and the testicles for the production of gender hormones, oestrogens and testosterone, which are responsible for the development of the genitals. Also, they guide the breast development, the voice deepening, the menstrual cycle, the muscle shrinkage [57].

With respect to the use (GnRH), the disadvantage is that few references to young transgender people are traced. De Vries, Steensma, Doreleijers & Cohen-Kettenis (2011) [58] were the first who introduced the concept and research by using blockers (inhibitors of secondary adolescence characteristics) for the treatment of gender dysphoria in transgenders. The basic idea behind the inhibition of endogenous adolescence is the reduction of dysphoria blocking the development of discordant secondary characteristics. In this way, young people are given more time to get familiar with this situation and investigate their gender better [6, 49, 56]. In a group under review, all 70 selectable candidates showed improved mental health and overall functionality. The researchers reached to the conclusion that the therapy was reversible, which was one of its main advantages [58].

Despite the positive results in the inhibition of the secondary adolescence characteristics, many experts still express concern with the application of this therapy. Viner et al. argued that the therapy could be physically harmful for adolescents and it could lead to adverse psychological effects [53]. Also, Olson, Durwood, DeMeules & McLaughlin (2016) [59], on the one hand, identified the moral dilemmas emerging, and on the other hand, admitted that the available data on the adolescence

inhibition are limited and many questions remain unanswered. One of the main reasons against this therapy is the argument that the transition to adolescence might lead to a person's agreement with their biological gender. Based on the findings of the study conducted by Steensma, McGuire, Kreukels, Beekman & Cohen-Kettenis (2013) [39], most children develop a homosexual orientation and gender dysphoria ceases to exist. However, in the cases of re-examination made in people who had been under therapy treatment (GnRH) no long-term consequences hindering their lives were found [53].

Concluding, the decision for the application of the GnRH therapy is very difficult and cannot be made by pushing aside the moral dilemmas emerging [53]. Both supporters and the opponents of the adolescence characteristics inhibition are guided by the same moral principles 'benefice, damage cause avoidance and autonomy' [60]. It is necessary to develop a clear overview taking into account, that the GnRH therapy is relatively new and controversial. Additional qualitative studies and empirical studies are required [7].

Transgenders require safe and effective hormonal support for the development of natural characteristics verifying their gender identity [45]. The main indications for the beginning of the hormonal therapy are verified from the persistent fixation of dysphoria that they experience and the sufficient mental ability to give their consent and accept this irreversible therapy [7]. According to recent guidelines of the Endocrinology Association, most adolescents develop this ability at the age of 16 [53]. Also, Hembree et al. (2017) [61] considered it necessary to start the therapy before 16, without having many published data of experiences relating to it. The main objectives of the hormone therapy are the repression of endogenous gender hormone determined by the genetic gender of a person and the maintenance of the gender hormone levels of the normal scale. This first offers relief to the dysphoria that a person feels, and it also gives them time for a conscious decision about gender change [61].

Many studies showed long-term safety and effectiveness in transgender adults with necessary the repetitive tests of possible complications [61]. A retrospective study of Jarin et al. on

116 adolescents, 14-25 years old with GD, noted that hormone therapy had minimum effect. Specifically, in trans-men the only findings were the increase of haemoglobin, haematocrit, body mass index and reduction of high density of fat proteins. In trans-women, lower testosterone and ALT were observed [53]. In another study, many statistically significant changes were noted in the mean rates of normal parameters without clinical concerns about safety [47]. However, there is lack of knowledge with respect to long-term results of the therapy, hence it is necessary to conduct more studies and re-examinations.

Summing up, clinical doctors are obliged to help a person and follow the subscribed hormone therapy, since there are no better choices at the time [53]. It has been observed that patients who are under therapy might develop serious psychological effects [62, 50, 51]. A more specialised approach, such as the "case by case" system will ensure a more appropriate therapy for each case. However, the optimal practice in this sector includes the interdisciplinary approach of the matter [63] and the search for a biopsychosocial intervention [6]. All health practitioners should act within the framework of their duties, helping people with GD match their external appearance with their internal experience and improve their social functionality [45]. Also, the support and proper communication between the family members [50] will contribute to the acceptance of the gender identity, the reinforcement of self-confidence, the reduction of bias, the cause of emotional and behavioural mental disorders and the conquest of a good quality of living [64, 65].

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