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## Analyzing Social Networks of Destructive Behaviours in Universities

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# Analyzing Social Networks of Destructive Behaviours in Universities

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## Abstract

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The aim consists in presenting determinants and types of verbal aggressiveness, bullying and Machiavellian behaviour among Physical Education students. Twelve network samples were collected from four Greek departments (538 students). Network questionnaires were used. Visone software was used for calculating network variables (in/outdegree, Katz, pagerank, authority). Spearman and PCA have been implemented for relating non-network variables with network ones. Results: Travelling abroad for athletic reasons, surfing internet for studies and being inspired from others' behaviours trigger disruptive behaviours. Mothers' education level, economic state, surfing internet for entertainment encourage victimization. Students who have experienced these detrimental behaviours as victims or victimizers during school years continue to experience destructive behaviours during academic years showing that such negative behaviours are adopted.

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**Keywords:** verbal aggressiveness, bullying, machiavellianism, social network analysis, university students

# **Analizando las Redes Sociales de Comportamientos Destructivos en las Universidades**

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## **Resumen**

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El objetivo consiste en presentar los determinantes y tipos de agresión verbal, intimidación y comportamiento maquiavélico entre los estudiantes de Educación Física. Se recogieron doce muestras de red de cuatro departamentos griegos (538 estudiantes). Se utilizaron cuestionarios de red. El software de Visone se utilizó para calcular las variables de red (entrada / salida, Katz, pagerank, autoridad). Spearman y PCA se han implementado para relacionar variables que no son de red con las de red. Resultados: viajar al extranjero por razones deportivas, navegar por Internet para estudiar e inspirarse en los comportamientos de comportamiento disruptivo de los demás. El nivel de educación de las madres, el estado económico, navegar por Internet para entretenerse fomentan la victimización. Los estudiantes que han experimentado estos comportamientos perjudiciales como víctimas o victimarios durante los años escolares continúan experimentando comportamientos destructivos durante los años académicos, lo que demuestra que se adoptan tales comportamientos negativos.

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**Palabras clave:** agresividad verbal, intimidación, maquiavelismo, análisis de redes sociales, estudiantes universitarios

**D**estructive behaviours are here distinguished in verbal aggressiveness, bullying and Machiavellianism. Such behavioural patterns appear not only in school or in everyday life but also in higher education. Infante and Wigley (1986) depict verbal aggressiveness as attack on individual's self-concept causing unpredictable psychological pain and constant negative outcomes (Infante & Rancer, 1996; Bekiari, Kokaridas, & Sakellariou, 2005; 2006; Bekiari, Digelidis, & Sakellariou, 2006; Bekiari et al. 2006; Bekiari, 2012; 2014; Bekiari, Perkos, & Gerodimos, 2015; Syrmipas & Bekiari, 2018), considering character attacks, threats, insults, sarcasm, yelling, profanity and belittling to be certain examples (Rancer & Avtig, 2006; Avtgis & Rancer, 2010). However, they have focused only on verbal aggressiveness considering it just from a psychometric (self-perceptual) and not structural (socially incorporated) point of view.

Research has shown that a period critical for students' development in personal, social and professional arena is considered to be their college years (Astin, 1993), without showing the implications of verbal aggression or any other kind of destructive behaviour. When verbal aggression is frequent then the individual is not characterized as a defender but rather as a verbal aggressor (Infante & Gorden, 1987; Mattina, 2008). However, this has not been structurally yet nor in combination with other kind of destructive behaviour.

A structural approach (complete network analysis) has been carried out revealing determinants of verbal aggressiveness hierarchies (highest and lowest verbal aggressor) (Bekiari & Hasanagas, 2015). In this way, both the detection and the visualization of the relations created by verbal aggressiveness through the social network analysis would provide a glimpse into its causes and impacts so as to reduce its "presence" in the academic sector and in general, individuals would "stop harming other human beings" (DeWall, Anderson, & Bushman, 2011). Therewith, several analyses on students' network samples exploring verbal aggressiveness were further implemented (Bekiari et al. 2019a; Vasilou, Bekiari, & Hasanagas, *in press*; Spanou, Bekiari, & Theocharis, *in press*). Nevertheless, the need of repeating network analyses on further samples from various sectors of the education system, offering additional insights in the non-network determinants and much more of exploring the interaction and possible

synergy of verbal aggressiveness with other kinds of destructive behaviours such as bullying or Machiavellianism was still remaining an open challenge.

Bullying is a destructive action more organized and discernible than verbal aggressiveness. Although bullying is considered to be a well-known phenomenon in the educational sector, it had drawn researchers' attention mainly when victims committed suicides and have killed others (Olweus, 1993; Karatzias, Power, & Swanson, 2002; Nansel et al. 2004; Molcho et al. 2009; Hilton, Anngela-Cole, & Wakita, 2010). Even in these cases, the approach had been a psychometric and not a structural one. Bullying is regarded as an intentional action of harming others repetitively by a more powerful person within the same social milieu (Greene, 2000; Monks & Smith, 2006; Atik & Güneri, 2013). However, though such definitions have been suggested by these papers, the question of what properties they have (namely what determinants and conditions bullying depends on or what its further impacts are) was disregarded.

Recent approaches include both individual and environmental factors such as peer groups, family, school environment and neighborhoods (Espelage & Swearer, 2010; Swearer et al., 2010), without, though, offering insights in the structural nature of this phenomenon nor focusing on university students. Also, there are students who can play the dual role of bullies and victims (Smith, Boulton, & Cowie, 1993; Austin & Joseph, 1996; Andreou, 2000; 2001), insisting, however, only on the psychometric approach, though the dual nature could be an appropriate issue for structural (network) analysis.

According to Adams and Lawrence (2011) and Chapell et al. (2006), students, who were victimized in school, were also victimized in college revealing not only a temporal stability of the 'bullying victim' role but also a close relation between past victimization and future one. "Negative baggage" of harassment can be carried from school to college environment. Thus, more support should be offered to formerly victimized students by the university staff as there is the risk of relapsing. Moreover, bullying victims in universities carry long-term effects into adulthood such as high stress levels, low self-esteem and psychological well-being (Schäfer et al., 2004; Newman, Holden, & Delville, 2005) let-alone-depression, anxiety and trauma (Sesar et al., 2012). Whether there are similar effects on college students who are suffering from constant victimization to those who have

experienced only a past one constitutes an open question (Young-Jones et al., 2015). Such issues could more insightfully be explored as structural effects. Consequently, it is urgent to approach bullying at higher education via social network analysis as the relations, which are based on bullying shape hierarchies (Bekiari, Pachi, & Hasanagas, 2017). Social network analysis is fundamental to quantify to what extent students tend to be victims or bullies within a network like a semester class (Bekiari et al., 2019a) since the network-based studies are limited up to now (Bekiari & Pachi, 2017). Nevertheless, the exploration of the synergy of bullying with other kind of destructive behavior and the repeating analyses of further samples are still a challenging research issue.

Machiavellianism is an additional and less discernible destructive behaviour. Kowalski (2001) as well as Paulhus and Williams (2002) suggested that Machiavellianism constitutes behavioural type of high abhorrence. It can be defined as a manipulative action in terms of management and leadership (Christie & Geis, 1970; Griffin & O’Leary-Kelly, 2004). It has also been used as an “umbrella” term for negative actions or thoughts which are related to aloof manipulation, ruthlessness, self-interest, contempt towards morality and cynicism (Zettler & Solga, 2013). In fact, Machiavellians act as “social chameleons” in order to adapt to the dominating environment (Láng, 2015) while considering other individuals “as a means to an end” (Ali, Amorim, & Chamorro-Premuzic, 2009). However, these papers just suggested definitions, without exploring determinants and empirical properties of the phenomenon.

As for the styles of Machiavellianism, evidently there is a negative view of victimizers about themselves and others when they both manipulate others and are manipulated themselves (Andreou, 2000; 2001) adopting the belief that they are members in a world where only victimizers or victims can survive. In this way, they tend to play both roles in order to be in accordance with their negative attitudes at society using Machiavellian tactics in their social interactions (Andreou, 2004). Such a dual nature of the Machiavellianism, however, could more insightfully be explored structurally (by network analysis).

At higher education, Machiavellians hide any sign of weakness or vulnerability as part of their defense system in order to retain their image of strength, dominance and perfectionism (Gurtman, 1992), portraying

themselves as competent and skillful (Shepperd & Socheran, 1997), though, being characterized by low levels of life satisfaction (Kiamarsi & Abdi, 2008) and creating social relationships of poor quality in adulthood (Lyons & Aitken, 2010). Nevertheless, these approaches were psychometric and not structural ones.

Malinowski (2009) emphasized that cheating and lying belong to the Machiavellians' features (Fletcher, 1990) and their life perception is far away from their peers' needs, rights and feelings (Winter, Stylianou, & Giacalone, 2004; Rawwas, Swaidan, & Oyman, 2005). Malinowski and Smith (1985) found out a positive relation between cheating and desire for social approval. However, these papers suggested a self-perceptual and not socially incorporated point of view. Rawwas (1996) concluded that the more ethical an individual is, the less a Machiavellian he is. Considering that Machiavellian relations in a university students' class (social network) shape certain hierarchies where each student can cover a scale from high to low victimization. Therefore, a holistic exploration of Machiavellian behaviour as a structural phenomenon can be emerged via the approach of a complete network analysis (Bekiari & Spanou, 2017). A further challenge would be not just a structural approach based on additional network samples and the examination of possible of Machiavellianism with other destructive behaviours such as verbal aggressiveness and bullying.

### **Expected Innovation**

All the aforementioned research works have been based on self-perceptual (psychometric) approaches and not on structural ones until 2015. The structural (network) analysis on such destructive behaviours (verbal aggressiveness, bullying and Machiavellianism) appearing afterwards still need support by additional network samples and insights in the non-network determinants of the network-depicted behaviours in the university students' environment as well as in the synergy among these behaviours. This is the research gap which is expected to be covered by this research.

Thus, goal of this research is to explore parameters and depict types of verbal aggressiveness, bullying and Machiavellian behaviour among university students. The innovation is expected to lie in the extensiveness of sampling focused on all three destructive behaviours (verbal aggressiveness,

bullying, Machiavellianism) among students. Particularly, twelve students' classes of all Physical Education & Sports Science departments of Greece (University of Athens, Thessaly, Thessaloniki and Thrace) were examined as social networks.

The theoretical added value lies in exploring the relevant processes being responsible for the three aforementioned behavioural phenomena via network analysis (semester classes). The analysis of hierarchies shaped by the relations of these behavioural (and structural) phenomena would detect perpetrators who have the tendency to practice these behaviours or victims preferred as targets.

The practical added value lies in investigating core dimensions of the aforementioned detrimental behaviours in university. In fact, the recognition of prevalent behavioural patterns (typology) concerning verbal aggression, bullying or Machiavellianism would reduce the occurrence of these behaviours. This is crucial both for the everyday life and for the professional profile of the future scientists, especially in the field of sports which would reasonably be supposed to be susceptible to aggressiveness.

### **Method**

The design of this study is strongly connected with the method used, which is network analysis. The behavioral dimensions (of verbal aggressiveness, bullying and Machiavellianism) are going to be measured as cross-assessed variables within classes of university students and thereafter the behavioural variables will be processed with network indicators. Thus, the design of this study consists in the correlation of these behavioural (network) variables with non-network variables (personal features which are expected to make someone verbally aggressive, bully or Machiavellian). The network variables will also be correlated with each other.

Network analysis is not based on conventional statistics but on algebraic indicators aiming at depicting hierarchies derived from the interactive relations among the nodes (students). The nodes belong to the same semester class and they are selected from all Physical Education departments in Greece. Each class of  $n$  students is visually depicted as a polygon ( $n$ -gon) representing a network of  $n$  nodes. The diagonals depict the relations of verbal aggressiveness, bullying and Machiavellianism among the nodes. The



polygon itself provides an illustration of the structures.

The variables describing verbal aggressiveness, bullying and Machiavellianism reveal that these relations which were witnessed among the nodes, playing the role of victims or perpetrators, were measured as network indicators (algorithms). They were calculated and normalized (%) by software Visone. Specifically, the simplest social interpretation of the aforementioned indicators is depicted as follows (formulas are not presented here as they are accessible in the web): in- and out-degree (occasional hierarchy – the directly contacted nodes), Katz status (accumulative hierarchy - successive contacts), pagerank (distributive hierarchy - successively transferred value), authority (qualified competitiveness - attracting most links seeking to develop relations such as verbal aggression, Machiavellianism or bullying). Students' personal features such as socio-economic state, gender etc. are non-network variables.

### **Sample and Questionnaires**

Network samples are by definition non-random. This is not considered to be a weakness of this research as its purpose is to provide analytical statistics (correlations) and not descriptive ones (generalization of the total population). Apart from that, a purposive sampling was necessary for this research, as a population of noticeable verbal aggressiveness, bullying and Machiavellianism was needed in order to present more intensive phenomena and structures of such behaviours. Thus, department classes of all Physical Education & Sports Science departments of Greece were selected as network samples because they are supposed to be susceptible to verbal aggressiveness, bullying and Machiavellian tactics due to the considerable sport-like competitiveness, high levels of stress and extreme pressure comparing their co-athletes/co-students athletic performances.

Each student's class was considered to constitute a network, where the nodes were the students and the links among them the behaviours (verbal aggression, bullying and Machiavellian tactics to each other). Each class was examined as a clearly bounded network (without implications of any other network where the students might be involved, e.g. students associations, family etc). Thereby, each network was formally bounded as a particular semester class of certain members and definite size and its analysis was

feasible. Thus, the whole network (class) was analyzed and the class population was well known. Network sampling has been applied in this study because the goal was to detect and measure structures and not psychometric (self-perceptual) data.

Twelve semester class networks were collected from all Physical Education & Sports Science departments in Greece: five classes from the Thessaly University (82, 58, 59, 63 and 54 students), one class from Thrace University (45 students), two classes of Athens University (42 students in each one of them) and four classes of Thessaloniki University (23, 24, 24 and 22 students). In total, the sample consisted of 538 nodes (265 female and 273 male). The students came from different regions of Greece and Cyprus and they were familiar to each other in each class (network).

Standardized questionnaires were distributed and answered by the students during the lectures regarding relations of verbal aggressiveness, bullying and Machiavellianism which may experience among them at the end of the semester. Questions relevant to verbal aggressiveness, bullying and Machiavellianism were converted from psychometric into network form (Infante & Wigley, 1986; Espelage & Holt, 2001; Dahling, Whitaker & Levy, 2009). Tested questionnaires contained network variables (verbal aggressiveness, bullying and Machiavellianism structures) which were measured as network indicators (centralities) (Hasanagas & Bekiari, 2015; 2017; Bekiari, Pachi, & Hasanagas, 2017; Bekiari & Spanou, 2017; Spanou, Bekiari, & Theocharis, *in press*). The questionnaires had to be named, so as the nodes (students) of a network to be recognizable for carrying out complete network analysis. Therefore, it was emphasized to students that research ethics and discretion would be guaranteed concerning their personal data in order not to hesitate to provide sincere answers, as only the researcher would have access to their data. Permission was provided by the responsible academic staff and the students so as to avoid any disturbance of the teaching or research program.

## **Statistical Analysis**

Visone 1.1 software was used for calculating centrality network variables like in- and outdegree, Katz status, pagerank and authority. Both non-network and network data were entered and processed in SPSS. It should be

pointed out that although permutation techniques have usually been developed to deal with dependence limitations of network data (QAP, ERGM etc.) and probabilities of ties appearance and correlations between networks considering them as “dependent” and “independent” variables as a whole, these techniques cannot exhibit such a correlation in this research, where various centrality values of nodes (not ties) are correlated not only between each other but also with non-network variables.

Additionally, aim of this research is not to make predictions if a network will derive from another but to investigate if, for instance, an occasional verbal aggressor (high indegree) has the tendency to become an accumulative not only verbal but even worse a physical aggressor (high Katz status). As a result, this can be calculated with techniques related to conventional analytic statistics such as Spearman test which has been applied after normality control was conducted with Shapiro-Wilk and Kolmogorov-Smorinov test and it was focused on statistically coefficient statistics [ $p \leq 0.01$  (\*) and  $p \leq 0.05$  (\*\*)]. Consequently, as it is a non-parametric test, a Bivariate Analysis was preferable to multivariate analysis, because it can reveal various correlations among network and non-network variables unfolding any possible relations (Hasanagas & Bekiari, 2015; 2017; Bekiari & Spyropoulou, 2016). A Principal Component Analysis (PCA) was also implemented for formulating typology (behavioural patterns). The results were interpreted using in-depth interviews.

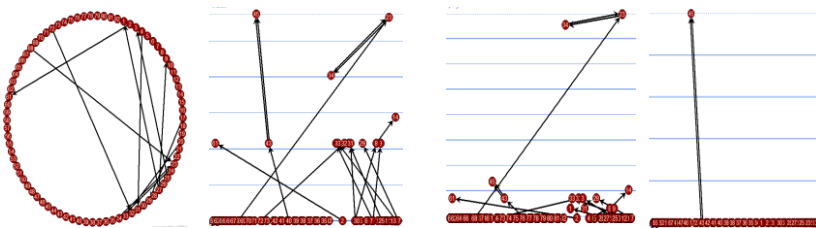
## **Results**

In Figure 1, three network examples of verbal aggressiveness (irony), bullying (disseminating negative rumors) and Machiavellian (using information for personal benefit) behaviour are illustrated as hierarchies by three hierarchical indicators - Katz status, pagerank, authority - (nodes who are at the top of the pyramids are supposed to be highly targeted). It is noticeable that the density among the networks seems to be similar as depicted at the networks of verbal aggressiveness, Machiavellianism and bullying (0,24%, 0,31%, 0,33% respectively). In particular, the intensity of the relations between students at the same university department was reflected by the density of the networks.

This constitutes the first evidence that students of the Physical Education

department exhibit an average network of verbal aggressiveness, bullying and Machiavellianism since they are subject to constant competition and pressure due to the competitive nature of this department. Another point worth mentioning is that students who are at the last year of studying (4<sup>th</sup> year) seem to adopt the use of destructive behaviours such as verbal aggressiveness, bullying and Machiavellianism in order to succeed in their goals proving that targeted students are relatively easy to discrete throughout the academic years.

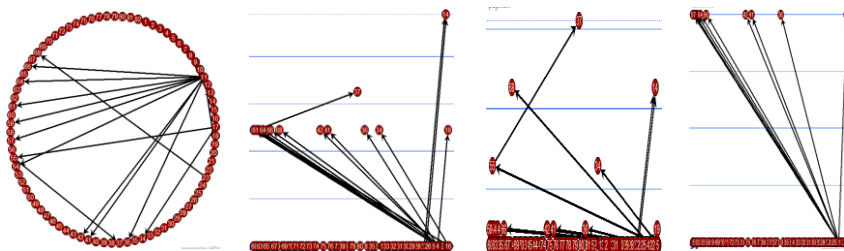
On the contrary, in Figure 2, the three network examples of verbal aggressiveness, bullying and Machiavellian behaviour demonstrate differences between the structures of these networks. The density and the pyramid structure among networks appear to be similar at the networks of bullying and Machiavellianism (0.30%) while it significantly increases at the network of verbal aggressiveness (0.85%). This is understandable since students of the previous to last year of studying (3<sup>rd</sup> year) do not seem to present so much intimacy with their fellow students as those in Figure 1 who are at their final year of studying (4<sup>th</sup> year). Thus, they hesitate to express their bullying and Machiavellian tactics, though, this is not the case with verbal aggressiveness (irony), which may be characterized as a common (and easily expressed) pattern of aggressiveness or even considered as a friendly teasing and therefore, many students may often practice it.



Basic form of network	Hierarchy of Katz status	Hierarchy of pagerank	Hierarchy of authority
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Relation: Verbal Aggressiveness, dimension: irony (Physical Education department),

nodes = 82, links = 21 [density =  $16 / (82^2 - 82) = 0.24\%$ ]



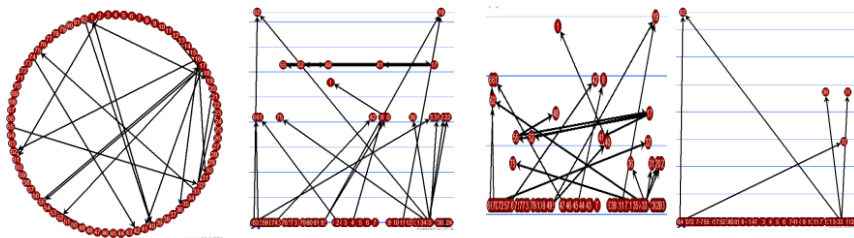
Basic form of network

Hierarchy of Katz status

Hierarchy of pagerank

Hierarchy of authority

Relation: Bullying behavior, dimension: negative rumors (Physical Education department), nodes = 82, links = 22 [density =  $22/(82^2-82) = 0.33\%$ ]



Basic form of network

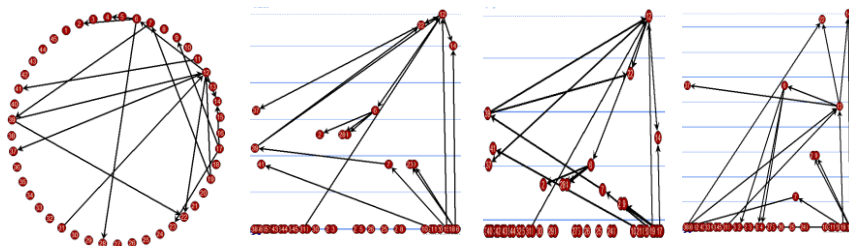
Hierarchy of Katz status

Hierarchy of pagerank

Hierarchy of authority

Relation: Machiavellianism, dimension: information for own benefit (Physical Education department), nodes = 82, links = 21 [density =  $21/(82^2-82) = 0.31\%$ ]

Figure 1. Examples of diagrams at the Dept. of Physical Education & Sports Science (4<sup>th</sup> year), University of Thessaly, Greece.



Basic form of network

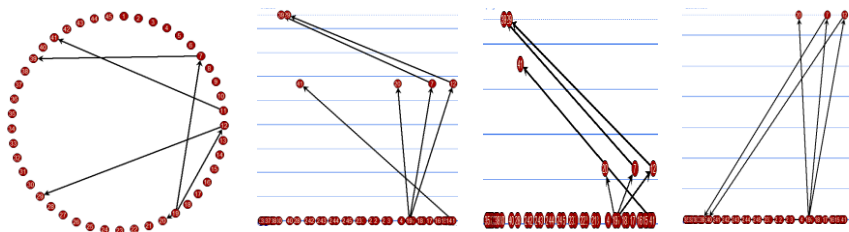
Hierarchy of Katz status

Hierarchy of pagerank

Hierarchy of authority

Relation: Verbal Aggressiveness, dimension: irony (Physical Education department),

nodes = 45, links = 17 [density =  $17/(45^2-45) = 0.85\%$ ]



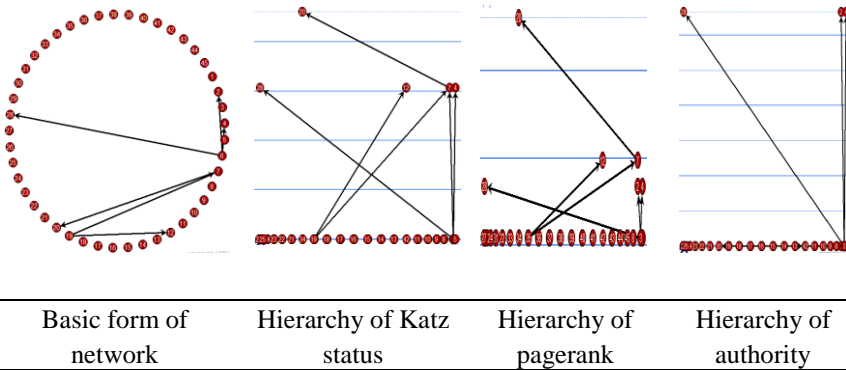
Basic form of network

Hierarchy of Katz status

Hierarchy of pagerank

Hierarchy of authority

Relation: Bullying behavior, dimension: negative rumors (Physical Education department), nodes = 45, links = 6 [density =  $6/(45^2-45) = 0.30\%$ ]



Relation: Machiavellianism, dimension: information for own benefit (Physical Education department), nodes = 45, links = 6 [density =  $6/(45^2 - 45) = 0.30\%$ ]

Figure 2. Examples of diagrams at the Dept. of Physical Education & Sports Science (3<sup>rd</sup> year), University of Thrace, Greece.

In Table 1, those who had been victims of verbal aggression, bullying and Machiavellianism during their school years seem to have adopted an aggressive behaviour and became verbal aggressors, bullies and Machiavellians themselves at university too. Students, who experienced behaviours of verbal aggression, bullying and Machiavellianism during their school years, either as victims or as victimizers, have presented a holistic tendency of practicing all these destructive behavioural patterns (.364 to .274, .361 to .285, .248 and .470, .369 and .403, .396). Simultaneously, deception, harassment and irony tend also to be simultaneously practiced at university (.396, .463 and .222). Finally, it is noticeable that those who were victims of Machiavellianism at school slightly tend to reproduce this behaviour as university students (.168).

Table 1.

*Relation between non- network and network determinants of practicing destructive behaviours in the past and the present.*

Spearman's rho		In the past (at school)					In the present (at university)		
		Machiavellists	Verbal aggressors	Victims of bullying	Victims of Machiavellianism	Victims of verbal aggression	Practicing deception (outdegree)	Practicing harassment (outdegree)	Practicing irony(outdegree)
In the past (at school)	Bullies	<b>.364**</b>	<b>.360**</b>	<b>.324**</b>	<b>.356**</b>	<b>.274**</b>	.122	-.099	.115
		.000	.000	.000	.000	.000	.094	.175	.114
	Machiavellists		<b>.361**</b>	<b>.207**</b>	<b>.449**</b>	<b>.285**</b>	.075	-.002	.005
			.000	.004	.000	.000	.301	.978	.941
	Verbal aggressors			.075	<b>.248**</b>	<b>.470**</b>	.088	.035	.013
				.307	.001	.000	.230	.632	.858
	Victims of bullying				<b>.369**</b>	<b>.403**</b>	.022	-.069	-.041
					.000	.000	.768	.344	.577
	Victims of Machiavellianism					<b>.396**</b>	<b>.168*</b>	.044	.102
						.000	.020	.548	.163
In the present (at university)	Practicing deception (outdegree)							<b>.396**</b>	<b>.463**</b>
								.000	.000
	Practicing harassment (outdegree)								<b>.222**</b>
									.000

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

In Table 2, non-network variables examined in this study seem to be relevant for becoming a target of verbal aggression, bullying and Machiavellianism. As for the family background, the high education level of mother appears to encourage victimization (.163 to .192 and .194). The family's high financial status seems to trigger targeting of Machiavellian strategies in terms of deception (.168). Students who are not characterized



by orderliness (absence at school and university) tend to avoid targeting of verbal aggression in terms of being hurt through insulting comments (-.196 and -.164).

Concerning the travelling experience, specifically for athletic reasons, it seems to be quite irrelevant to almost all destructive behaviours. It encourages (.166 and .179), however, Machiavellian tactics such as controlling and deception. Concerning internet surfing, it appears to affect various dimensions of destructive behaviours (.157, -.161, -.158, -.180, -.169). The effect is either encouraging destructive behaviours or protective against them.

As for the experience of destructive behaviours either as victimizers (.205 to .144) or as victims (-.160 and -.147), it seems that both properties have effect to the students targeting. Although there are students who seem to admit that they behave as bullies at university, they themselves draw Machiavellians' attention in terms of control and deception not to mention that they are subject to refusal of help (bullying tactic) by their fellow students. On the other hand, students who admit that they are undergone Machiavellianism at university, are protected against harassment and irony.

Table 2.

*Non-network determinants of being a target of destructive behaviours (sum = indegree + katz status + pagerank + authority).*

		Harm for benefit	Control	Dece- ption	Refuse help	Harass- ment	Exclu- sion	Irony	Insulting comments
Family Situation	Mother' s education level	<b>.163(*)</b>	<b>.147(*)</b>	<b>.142(*)</b>	<b>.152(*)</b>	<b>.183(*)</b>	<b>.192(**)</b>	.125	<b>.194(**)</b>
	Economic status	.025	.043	.050	.036	.011	.008	.085	.007
	Absence at school	.117	.100	<b>.168(*)</b>	.108	.068	.064	.110	.099
Travel Study Situation	Absence at university	.116	.180	.023	.146	.358	.388	.137	.182
	Abroad for sport	-.037	-.049	-.078	-.084	-.018	-.110	-.019	<b>-.196(**)</b>
	Internet surfing for studies	.616	.499	.283	.251	.804	.131	.790	.007
Internet Use	Internet surfing for fun	-.065	-.019	-.089	-.111	-.099	-.032	-.031	<b>-.164(*)</b>
	Bullies at university	.374	.794	.221	.126	-.099	.663	.667	.023
	Victims of Mach at university	.095	<b>.166(*)</b>	<b>.179(*)</b>	.113	.100	.122	.031	.083
Bullying and Machiav experience	Victims of Mach at university	.191	.013	.021	.120	.169	.092	.667	.254
	Internet surfing for studies	.055	<b>.157(*)</b>	.043	.109	.002	.046	-.134	-.088
	Internet surfing for fun	.450	.030	.553	.132	.980	.531	.065	.224
Machiav experience	Bullies at university	<b>-.161(*)</b>	-.072	<b>-.158(*)</b>	-.095	-.096	<b>-.180(*)</b>	<b>-.169(*)</b>	-.099
	Victims of Mach at university	.026	.323	.029	.191	.185	.013	.019	.174
	Victims of Mach at university	.086	<b>.205(**)</b>	<b>.147(*)</b>	<b>.144(*)</b>	.038	.087	.083	.116
		.237	.005	.042	.047	.602	.234	.256	.111
		-.092	.013	.013	-.089	<b>-.160(*)</b>	-.119	<b>-.147(*)</b>	-.073
		.205	.854	.859	.222	.027	.102	.043	.317

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

In Table 3, practicing verbal aggression, bullying and Machiavellianism seems to be encouraged by various non-network variables. In other words, students who travel abroad for athletic reasons (.184 and .199) appear to be susceptible to practice bullying (refuse help and exclusion) since they become more competitive and dominant due to their broadening of their athletic ambitiousness. Surfing internet for academic reasons (.151, .163 and .150) is also another factor that enhances the practicing of verbal aggression (causing hurt by insulting comments), bullying (causing harassment) and Machiavellianism (harming others for personal benefit). The inspiration of other students' behaviour (.158) seems to necessitate the practice of controlling others (Machiavellian dimension) in order to manipulate and control students' actions pursuing their future goals. Moreover, the desire of a successful professional career (.162) seems to stimulate the practicing of bullying in terms of refusing help.

As expected, having experienced behaviours of verbal aggression, bullying and Machiavellianism during school years seems to be correlated with such detrimental actions at university too. More specifically, students, who were victims of bullying at school, have become Machiavellians at university (.190) while students, who admit that they behave as bullies at university, adopt Machiavellians' tactics at university (.174 and .159). Students, who admit that they are victims of Machiavellianism at university, are involved in Machiavellians' practices of harming (.203). Students, who were victims of Machiavellianism at school, have become Machiavellians and bullies at university (.255, .168 and .152). Students, who were victims of verbal aggression at school, have become Machiavellians at university (.159) while students who admit that they are verbal aggressors at university they act as Machiavellians as well (.159 and .149).

Table 3.

*Non-network determinants of practicing destructive behaviours (outdegree).*

		Harm for benefit	Control	Deception	Refuse help	Harassment	Exclusion	Irony	Insulting comments
Travel	Travel abroad for sports	.021	.134	.094	<b>.184*</b>	.119	<b>.199**</b>	-.075	.035
	Surf internet for studies	<b>.151*</b>	.092	.137	.127	<b>.163*</b>	.134	.057	<b>.150*</b>
Inspiration	Inspired from others behavior	.037	.204	.060	.081	.024	.065	.430	.039
	Professional success	-.013	<b>.158*</b>	.108	.086	.073	.058	<b>.175*</b>	.048
Future goals	Future goals	.862	.029	.137	.238	.315	.426	.303	.514
	Bullying experience	.030	.081	.084	<b>.162*</b>	.119	.038	.054	.124
Machiavellianism experience	Victims bullying school	.679	.264	.250	.025	.101	.604	.459	.088
	Bullies university	-.014	<b>.190**</b>	.022	-.022	-.069	.035	.125	.008
Verbal Aggressiveness Experience	Victims of Mach university	.844	.008	.768	.761	.344	.636	.086	.916
	Victims of Mach school	<b>.174*</b>	<b>.159*</b>	.134	-.002	-.058	.085	.095	.067
Machiavellianism experience	Machiavellianists university	.016	.028	.064	.973	.430	.242	.192	.356
	Victims of verbal aggression school	<b>.203**</b>	.107	.090	.017	.007	.066	.084	.115
Verbal Aggressiveness Experience	Verbal aggressors university	.005	.142	.219	.812	.921	.367	.252	.115
	Verbal aggressors university	.124	<b>.255**</b>	<b>.168*</b>	.128	.044	<b>.152*</b>	.033	.088
Machiavellianism experience	Verbal aggressors university	.088	.000	.020	.079	.548	.036	.656	.229
	Verbal aggressors university	<b>.155*</b>	.134	.073	-.016	-.067	-.042	.041	-.058
Verbal Aggressiveness Experience	Verbal aggressors university	.033	.066	.318	.825	.359	.565	.573	.428
	Verbal aggressors university	.116	<b>.194**</b>	.104	.099	.083	.110	.112	.077
Verbal Aggressiveness Experience	Verbal aggressors university	.116	.007	.154	.174	.255	.131	.122	.291
	Verbal aggressors university	<b>.159*</b>	-.007	<b>.149*</b>	.111	.063	.077	.126	.090
Verbal Aggressiveness Experience	Verbal aggressors university	.029	.919	.041	.129	.386	.291	.084	.220

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

In Table 4, three behavioural types of verbal aggressors, bullies and Machiavellists at university in combination with the practicing of these behaviours at school are revealed. These can be named “Current tactical manipulator” (.682 to .494, .834 and .764), “Current pure bully” (.638 to .840) (meaning presently at university) and “Former abuser” (.747 to .769) (in the past at school).

Table 4.

*Typology of destructive behaviour (practicing).*

			“Current tactical manipulator”	“Current pure bully”	“Former abuser”
Practicing (outdegree) at university	Verbal Aggressiveness & Bullying Machiavellianism	Harming for benefit	<b>.682</b>	.336	.028
		Control	<b>.648</b>	-.004	.062
		Deception	<b>.797</b>	.276	.065
		Refusing help	<b>.494</b>	<b>.638</b>	.075
		Harassment	.125	<b>.801</b>	.099
		Exclusion	.197	<b>.840</b>	-.056
		Irony	<b>.834</b>	.108	.014
		Insulting comments	<b>.764</b>	.230	-.086
		make use of verbal aggression	.019	.017	<b>.747</b>
		make use of bullying	.074	-.047	<b>.789</b>
School Behaviour	make use of Machiavellianism	-.029	.115	<b>.769</b>	

Extraction Method: Principal Component Analysis, 3 components extracted.

In Table 5, five behavioural types of victims of verbal aggressiveness, bullying and Machiavellianism in combination with the experience of these behaviours at school are pointed out, which can be named “Easy target” (.592 to .670), “Past victim” (.788 to .775), “Just victimized” (.642 and .602), “Controlled” (.877) and “Deceived” (.921).

Table 5.

*Typology of destructive behaviour (targeting defined as sum=indegree + katz status + pagerank + authority).*

			“Easy target”	“Past victim”	“Just victimised”	“Controlled”	“Deceived”
Targeting at university	Mach/nism	Harming for benefit	.459	.156	<b>.642</b>	-.044	.098
		Control	.094	.199	-.054	<b>.877</b>	.298
		Deception	.135	-.039	-.068	-.292	<b>.921</b>
		Refusing help	<b>.592</b>	-.061	<b>.602</b>	.076	.006
		Harassment	<b>.733</b>	-.047	.151	-.005	-.162
	Bullying	Exclusion	<b>.668</b>	.010	-.237	-.231	-.007
		Verbal Aggress/ness	Irony	<b>.583</b>	.076	-.503	.153
	Insulting comments		<b>.670</b>	.119	-.458	-.093	-.036
	School Behaviour		victim of verbal aggression	.004	<b>.788</b>	.211	-.065
		victim of bullying	-.222	<b>.725</b>	-.054	-.281	-.017
victim of machiavellianism		.015	<b>.775</b>	-.104	.106	.084	

Extraction Method: Principal Component Analysis, 5 components extracted.

### Discussion and Conclusions

Aim of this research was to detect relations of verbal aggressiveness, bullying and Machiavellianism among students of all Physical Education departments of Greece (University of Athens, Thessaly, Thessaloniki and Thrace) and examine hierarchies shaped of these relations as well as possible determinants of them since there are no other studies applying network analysis in verbal aggressiveness, bullying and Machiavellianism within student classes at the university. Focusing on the data analyzed above, the following interpretation can be endeavored:

It is noticeable that there are differences between the density and structures of verbal aggressiveness, bullying and Machiavellian networks (figure 1). In particular, this constitutes the first evidence that all the aforementioned behavioural forms are not necessarily characterized by the same intensity, as also has been proved in previous papers (Bekiari et al.

2019a, 2019b; Vasilou, Bekiari, and Hasanagas, in press). For example, verbal aggressiveness (irony) seems to be a common practice among students and therefore, they often practice it even in terms of a friendly teasing.

As far as the practicing of these destructive behaviours is concerned (table 1), the holistic adoption of practicing destructive behaviours both at school and university age shows that the aggressors seem not to be tactically selective considering the appropriateness and effectiveness of each destructive behaviours under each particular condition or incident but rather to be impulsive, and that this destructive impulsiveness does not depend on the age (and subsequently on the age-related everyday experience which would obviously include disappointments and observations or also distancing from them). This seems rather to support the hypothesis of the aggression instinct rather than the models of observational learning or disappointment-induced aggression. Especially, Machiavellianism seems also to be regenerated through observational patterns. Similar research has been carried out (Bekiari & Spanou, 2017; Spanou, Bekiari, & Theocharis, in press).

As for the determinants of becoming target of destructive behaviours (table 2), the fact that the high education level of mother appears to encourage victimization can be attributed to the fact that as motherhood dominates in the children's upbringing - children's personalities are evolved to be tolerant and compromise to those negative behaviours according to a "mother figure" in a Greek family setting. Students originating from rich families are easy victims of deception, since they adopt a "naive" and innocent way of living due to their upbringing and their family background. Students not characterized by orderliness (absence at school and university) seem to be not targeted as absence from educational institutions (school, university) is an indicator of gradual disintegration (from school to university) in the educational system which acts against verbal aggressiveness probably as ignorance towards those students. Simultaneously, it is evident that the more frequently one is absent, the less targeted he becomes.

Regarding the determinants of practicing destructive behaviours (table 3), travelling experience for sport reasons and the subsequent students' feelings of jealousy towards their fellow students' athletic recognition abroad can be

expressed under the “veil” of manipulation in order not to be so obvious and provocative. The fact that students surfing internet for academic reasons tend to be targeted by Machiavellians (table 2) can be understandable as they are absorbed in collecting information on the internet about their university projects in order to increase their academic performance. Thus, they are easy targets of Machiavellians who may attempt to control them even in their academic work in order to gain recognition (even based on deceit).

Nevertheless, students who surf the internet for entertainment tend to be protected from being targets of many dimensions of destructive behaviours (table 2), since they belong to a “global community” via the social media which helps them be aware of “exploitation signs” such as those of verbal aggressors, bullies and Machiavellians or to discourage them with staggering arguments. The fact that Machiavellian students draw also Machiavellians’ attention (table 3) can be attributed to that students due to their familiarity (3<sup>rd</sup>-4<sup>th</sup> semesters) with the students behavioural arena use these tactics to the “official” bullies in order to control, deceive and reject them from the students’ social milieu. On the other hand, the partial protection of students who admit that they are undergone Machiavellianism at university (table 2) indicates that they are well prepared and familiar with negative behaviours with the intention of defending themselves. Such network analysis has been made in previous studies (e.g. [Bekiari & Spyropoulou, 2016](#); [Bekiari & Pachi, 2017](#)).

The positive relation of surfing internet for academic reasons with the practicing of destructive behaviours (table 3) shows the desire of dominance in the student community via mental and social superiority which is represented by the constant use of internet applications in the name of a high academic performance. The parallel Machiavellian behaviour of controlling other students and refusing help to them (table 4) can be understood as a tendency to adopt an extremely competitive value system which forces them to desire superiority, even unsociably.

It is noticeable that students who are demonstrating such negative behaviours as “recipients” or “providers” at school (table 2 and 3) continue to “play these roles” or “exchange” them at university either as a defense tool to protect themselves or as a more decisive action to become dominant. Students who had a disruptive behaviour at school equipped with all the above personality variables have “carried” it to the university with more



generalized or selected strategies as their upbringing was characterized by similar hostile environments under the “veil” of normality (Bandura, 1977; Andreou, 2000; 2001; 2004; Spanou, Bekiari, & Theocharis, in press).

As for the types of practicing destructive behaviours (table 4), the first one (“Current tactical manipulator”) depicts a verbally aggressive (irony, hurting through insulting comments) and manipulative (through the Machiavellian tactics of harming for benefit, control and deception) behavioural pattern of a person who is totally directed by Machiavellian and verbal aggression tactics, while being selective in his bullying behavioural patterns as he prefers less provocative strategies of bullying such as “refusing help” (instead of “harassment” and “exclusion”). In other words, it is a type which activates destructive behaviours extensively but also selectively. Extensiveness and selectiveness point out a tactical mentality which tries to combine appropriate behaviours. On the contrary, the second type (“Current pure bully”) illustrates a person who mainly functions under the “auspices” of bullying behaviours (refusing help, harassment, and exclusion). This is a behaviourally straight type which does not combine many various dimensions of destructive behaviours but only bullying. The third type (“Former abuser”) reveals a person who has “confessed” the practicing of the above mentioned detrimental behavioural phenomena during school years without significantly adopting destructive behaviours at university. It seems to be a type which could be characterized as “mature”, “saturated” with destructive behaviours in the past or regretted.

Comparing the types described above, only bullying dimensions appear as an autonomous type (second one) of current behaviour. This could be perceived as an effect of the explicitly destructive character of bullying. Bullying aims at the immediate social elimination and normally takes place when the asymmetry of power relations between victimizer and victim is considered to be certain (in contrast to verbal aggression and Machiavellianism which may be reciprocal, not necessarily eliminating and may implemented complementarily). Such typologies have been proposed in previous papers (Bekiari & Spyropoulou, 2016; Bekiari, Nikolaidou, & Hasanagas, 2017).

Concerning the victim types (table 5), the “Easy Target” depicts a person victimized with verbal aggression and bullying (refusing help, harassment, exclusion, irony, insulting comments) while this is not the case with

Machiavellianism. In contrast to Machiavellianism which necessitates planning and sophistication and thus, it cannot be practiced by anyone to anyone, bullying and verbal aggression are quite simplistic destructive behaviours. As a result, this type constitutes an easy target.

The “Past Victim” is a behavioural pattern that highlights a person who had been a victim of verbal aggression, bullying and Machiavellian tactics throughout the school years. This type does not appear to become a target at university, as his experience at school seems to help him/her avoid such a targeting at university.

The “Just Victimized” is a particular type that seems to be vulnerable to certain combination of bullying and Machiavellian dimensions (refusing help and harming for benefit). These dimensions depict a tactically selective but ruthless exploitation of a victim (both harming for benefit without even helping when needed). The “Controlled” and “Deceived” seem to be sole victims of quite selective Machiavellian dimensions in order to be manipulative such as controlling and deceit respectively.

These five types of targets mentioned above express five strategies of a selective victimization creating a variety of victimization patterns, ranging from quite serious “Easy Target” which represents a extreme case of marginalization to less serious ones like the “Controlled” or “Deceived”, which seem to be common ways of behaviour in today’s competitive society. Beyond typologies suggested in the past (Bekiari & Hasanagas, 2015; Bekiari & Pachi, 2017), a gradual victimization is “diagnosed” via this typology.

In conclusion, verbal aggressiveness, bullying and Machiavellianism among students of all Physical Education departments in Greece has been carried out to shed light on the above mentioned devastating behaviours among students in the academic arena through a pedagogic and social spectrum. In other words, depicting these behavioural patterns as social relations, measure and quantify them as network variables (algebraic approaches) in university student communities - relatively unexplored milieu - was of paramount importance to provide innovative material and significant evidence to discover what parameters lead to such destructive behaviours and what correlations among non-network and network variables function as determinants to the demonstration of those detrimental behaviours in order to be minimized or even better avoided in the long run.

An additional theoretical and practical aim of this research is based on the typology of practicing and targeting of verbal aggressiveness, bullying and Machiavellianism. Thereby, various dimensions related with these deconstructive behaviours seemed to be combined in certain types respectively depicting distinct and stable student profiles of social roles varying from quite invulnerable to totally victimized.

As in most empirical social researches, both limitation and challenge for further research is to expand the sample in various higher education departments not only in Greece but also in other countries in order to have a deeper insight to different nations and disciplines concerning these pathogenic phenomena. Consequently, future results based on more extensive and detailed typologies of verbal aggression, bullying and Machiavellianism patterns, more non-network variables and their correlations with network ones (also deepened with qualitative research) would be of paramount importance with the purpose of enriching our awareness about the functions of these disruptive behaviours worldwide.

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### **References**

- Adams, F. D., & Lawrence, G. J. (2011). Bullying victims: The effects last into college. *American Secondary Education*, 40, 4-13.
- Ali, F., Amorim, S., & Chamorro-Premuzic, T. (2009). Empathy deficits and trait emotional intelligence in psychopathy and Machiavellianism. *Personality and Individual Differences*, 47, 758-762.  
[doi:10.1016/j.paid.2009.06.016](https://doi.org/10.1016/j.paid.2009.06.016)

- Andreou, E. (2000). Bully/victim problems and their association with psychological constructs in 8-to 12-year-old Greek schoolchildren. *Aggressive Behavior: Official Journal of the International Society for Research on Aggression*, 26(1), 49-56. doi:10.1002/(SICI)1098- 2337(2000)26:149::AID-AB43.0.CO;2-M
- Andreou, E. (2001). Bully/Victim Problems and their Association with Coping Behavior in Conflictual Peer Interactions Among School-age Children. *Educational Psychology*, 21(1), 59-66. doi:10.1080/01443410020019830
- Andreou, E. (2004). Bully/Victim Problems and Their Association with Machiavellianism and Self-Efficacy in Greek Primary School Children. *British Journal of Educational Psychology*, 74, 297-309. doi:10.1348/000709904773839897
- Astin, A. W. (1993). *What matters in college: Four critical years revisited*. San Francisco: Jossey-Bass.
- Atik, G., & Güneri, O. Y. (2013). Bullying and victimization: Predictive role of individual, parental, and academic factors. *School Psychology International*, 34(6), 658-673. doi:10.1177/0143034313479699
- Austin, S., & Joseph, S. (1996). Assessment of Bully/Victim Problems in 8 to 11 Year Olds. *British Journal of Educational Psychology*, 66, 447-457.
- Avtgis, T., & Rancer, A. S. (2010). *Arguments, aggression and conflict: New directions in theory and practice*. New York: Routledge.
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, 84(2), 191.
- Bekiari, A. (2012). Perceptions of Instructors' Verbal Aggressiveness and Physical Education Students' Affective Learning. *Perceptual and Motor Skills*, 115, 325-335. doi:10.2466/06.11.16.PMS.115.4.325-335
- Bekiari, A. (2014). Verbal Aggressiveness and Leadership Style of Sport Instructors and Their Relationship with Athletes' Intrinsic Motivation. *Creative Education*, 5, 114-121. doi:10.4236/ce.2014.52018
- Bekiari, A., Deliligka, S., Vasilou, A., & Hasanagas, N. (2019a). Socio educational determinants of “bad behavior” of students. A comparative analysis among primary, secondary and high school.

*The International Journal of Learner Diversity and Identities*, 26(1), 1-19. doi:10.18848/2327-0128/CGP/v26i01/1-19

- Bekiari, A., Deliligka, S., Vasilou, A., & Hasanagas, N. (2019b). Examining pedagogic parameters and verbal aggressiveness through social network analysis: Comparing primary, secondary and high school. *The International Journal of Interdisciplinary Educational Studies*, 15(1), 1-17. doi: 10.18848/2327-011X/CGP/v15i01/1-17
- Bekiari, A., Digelidis, N., & Sakellariou, K. (2006). Perceived verbal aggressiveness of coaches in volleyball and basketball: A preliminary study. *Perceptual and motor skills*, 103(2), 526-530. doi:10.2466/2Fpms.103.2.526-530
- Bekiari, A., & Hasanagas, N. (2015). Verbal Aggressiveness Exploration through Complete Social Network Analysis: Using Physical Education Students' Class as an Illustration. *International Journal of Social Science Studies*, 3, 30-49. doi:10.11114/ijsss.v3i3.729
- Bekiari, A., Kokaridas, D., & Sakellariou, K. (2005). Verbal aggressiveness of physical education teachers and students' self-reports of behavior. *Psychological Reports*, 96, 493-498. doi:10.2466/pr0.96.2.493-498
- Bekiari, A., Kokaridas, D., & Sakellariou, K. (2006). Associations of Students' Self-reports of Their Teacher's Verbal Aggression, Intrinsic Motivation, and Perceptions of Reasons for Discipline in Greek Physical Education Classes. *Psychological Reports*, 98(2), 451-461. doi:10.2466/pr0.98.2.451-461
- Bekiari, A., Nikolaidou, Z. A., & Hasanagas, N. (2017). Typology of Motivation and Aggression on the Basis of Social Network Variables: Examples of Complementary and Nested Behavioral Types through Conventional Statistics. *Social Networking*, 6(2), 135-147. doi:10.4236/sn.2017.62008
- Bekiari, A., & Pachi, V. (2017). Insights into Bullying and Verbal Aggressiveness through Social Network Analysis. *Journal of Computer and Communications*, 5(09), 79-101. doi:10.4236/jcc.2017.59006
- Bekiari, A., Pachi, V., & Hasanagas, N. (2017). Investigating bullying determinants and typologies with social network analysis. *Journal of Computer and Communications*, 5(07), 11-27. doi:10.4236/jcc.2017.57002

- Bekiari, A., Patsiaouras, A., Kokaridas, D., & Sakellariou, K. (2006). Verbal aggressiveness and state anxiety of volleyball players and coaches. *Psychological Reports, 99*(2), 630-634.  
doi:[10.2466%2Fpr0.99.2.630-634](https://doi.org/10.2466%2Fpr0.99.2.630-634)
- Bekiari, A., Perkos, S., & Gerodimos, V. (2015). Verbal aggression in basketball: perceived coach use and athlete intrinsic and extrinsic motivation. *Journal of Physical Education and Sport, 15*(1), 96-102.  
doi:[10.7752/jpes.2015.01016](https://doi.org/10.7752/jpes.2015.01016)
- Bekiari, A., & Spanou, K. (2017). Machiavellianism in Universities: Perceiving Exploitation in Student Networks. *Social Networking, 7*(01), 19-31. doi:[10.4236/sn.2018.71002](https://doi.org/10.4236/sn.2018.71002)
- Bekiari, A., & Spyropoulou, S. (2016). Exploration of verbal aggressiveness and interpersonal attraction through social network analysis: Using university physical education class as an illustration. *Open Journal of Social Sciences, 4*(6), 145-155. doi:[10.4236/jss.2016.46016](https://doi.org/10.4236/jss.2016.46016)
- Chapell, M. S., Hasselman, S. L., Kitchin, T., Lomon, S. N., MacIver, K. W., & Sarullo, P. L. (2006). Bullying in elementary school, high school, and college. *Adolescence, 41*(164), 633-649.
- Christie, R., & Geis, F. (1970). *Studies in Machiavellianism*. San Diego, CA: Academic Press.
- Dahling, J. J., Whitaker, B. G., & Levy, P. E. (2009). The development and validation of a new Machiavellianism scale. *Journal of management, 35*(2), 219-257. doi:[10.1177/0149206308318618](https://doi.org/10.1177/0149206308318618)
- DeWall, N. C., Anderson, C. A., & Bushman, B. J. (2011). The general aggression model: Theoretical extensions to violence. *Psychology of Violence, 1*(3), 245-258. doi:[10.1037/a0023842](https://doi.org/10.1037/a0023842)
- Espelage, D. L., & Holt, M. K. (2001). Bullying and victimization during early adolescence: Peer influences and psychosocial correlates. *Journal of Emotional Abuse, 2*(2-3), 123-142.  
doi:[10.1300/J135v02n0208](https://doi.org/10.1300/J135v02n0208)
- Espelage, D. L., & Swearer, S. M. (2010). A social-ecological model form bullying prevention and intervention: Understanding the impact of adults in the social ecology of youngsters. In S. R. Jimerson, S. M. Swearer, & D. L. Espelage (Eds.), *Handbook of bullying in schools. An International Perspective* (pp. 61-72). New York: Routledge.
- Fletcher, C. (1990). The relationship between candidate personality, self-

presentation strategies, and interviewer assessments in selection interviews: an empirical study. *Human Relations*, 43, 739-49.

[doi:10.1177/001872679004300803](https://doi.org/10.1177/001872679004300803)

- Greene, M. B. (2000). Bullying and harassment in schools. In R. S. Moser, & C. E. Franz (Eds.), *Shocking violence: Youth perpetrators and victims: A multidisciplinary perspective* (pp. 72-101). Springfield, IL: Charles C. Thomas.
- Griffin, R. W., & O’Leary-Kelly, A. M. (2004). An introduction to the dark side. In R. W. Griffin, & A.M. O’Leary-Kelly (Eds.), *The dark side of organizational behavior* (pp. 1-19). San Francisco: Jossey-Bass.
- Gurtman, M. B. (1992). Trust, distrust, and interpersonal problems: a circumflex analysis. *Journal of Personality and Social Psychology*, 62, 989–1002.
- Hasanagas, N., & Bekiari, A. (2015). Depicting Determinants and Effects of Intimacy and Verbal Aggressiveness Target through Social Network Analysis. *Sociology Mind*, 5(3), 162-175.  
[doi:10.4236/sm.2015.53015](https://doi.org/10.4236/sm.2015.53015)
- Hasanagas, N., & Bekiari, A. (2017). An exploration of the relation between hunting and aggressiveness: Using inmates networks at prison secondary school as an Illustration. *Social Networking*, 6(1), 19-37.  
[doi:10.4236/sn.2017.61002](https://doi.org/10.4236/sn.2017.61002)
- Hilton, J. M., Anngela-Cole, L., & Wakita, J. (2010). A cross-cultural comparison of factors associated with school bullying in Japan and the United States. *The Family Journal*, 18, 413–422.  
[doi:10.1177/1066480710372919](https://doi.org/10.1177/1066480710372919)
- Infante, D. A., & Wigley III, C. J. (1986). Verbal Aggressiveness: An Interpersonal Model and Measure. *Communication Monographs*, 53, 61-69. [doi:10.1080/03637758609376126](https://doi.org/10.1080/03637758609376126)
- Infante, D. A., & Gorden, W. I. (1987). Superior and subordinate communication profiles: Implications for independent-mindedness and upward effectiveness. *Communication Studies*, 38(2), 73-80.  
[doi:10.1080/10510978709368232](https://doi.org/10.1080/10510978709368232)
- Infante, D. A., & Rancer, A. S. (1996). Argumentativeness and Verbal Aggressiveness: A Review of Recent Theory and Research. *Communication Yearbook*, 19, 319-351.  
[doi:10.1080/23808985.1996.11678934](https://doi.org/10.1080/23808985.1996.11678934)

- Karatzias, A., Power, K. G., & Swanson, V. (2002). Bullying and victimization in Scottish secondary schools: Same or separate entities? *Aggressive Behavior*, 28, 45–61. doi:10.1002/ab.90005
- Kiamarsi, A., & Abdi, R. (2008). Machiavellianism and perfectionism as predictors of life satisfaction. *International Journal of Psychology*, 2(2), 103-117.
- Kowalski, R. M. (2001). *Behaving badly: Aversive behaviors in interpersonal relationships*. Washington, DC: American Psychological Association.
- Láng, A. (2015). Borderline personality organization predicts Machiavellian interpersonal tactics. *Personality and Individual Differences*, 80, 28-31. doi:10.1016/j.paid.2015.02.022
- Lyons, M., & Aitken, S. (2010). Machiavellian friends? The role of Machiavellianism in friendship formation and maintenance. *Journal of Social, Evolutionary, and Cultural Psychology*, 4(3), 194-202.
- Malinowski, C. I., & Smith, C. P. (1985). Moral reasoning and moral conduct: an investigation prompted by Kohlberg's theory. *Journal of Personality and Social Psychology*, 49, 1016-27. doi:10.1037/0022-3514.49.4.1016
- Malinowski, C. (2009). The relationship between Machiavellianism and undergraduate student attitudes about hypothetical marketing moral dilemmas. *Competitiveness Review: An International Business Journal*, 19(5), 398-408. doi:10.1108/10595420910996019
- Mattina, J. A. (2008). The influence of verbal aggressiveness and verbal argumentativeness on college student leadership styles (Doctoral dissertation). University of Southern Mississippi, Hattiesburg, MS. (UMI No. AAT 3346542).
- Molcho, M., Craig, W., Due, P., Pickett, W., Harel-Fisch, Y., & Overpeck, M. (2009). Cross-national time trends in bullying behaviour 1994–2006: findings from Europe and North America. *International journal of public health*, 54(2), 225-234. doi:10.1007/s00038-009-5414-8
- Monks, C. P., & Smith, P. K. (2006). Definitions of bullying: Age differences in understanding of the term, and the role of experience. *British Journal of Developmental Psychology*, 24(4), 801–821. doi:10.1348/026151005X82352
- Nansel, T. R., Craig, W., Overpeck, M. D., Saluja, G., & Ruan, J. W. (2004).



- Cross-national consistency in the relationship between bullying behaviors and psychosocial adjustment. *Archives Pediatric Adolescent Medicine*, 158, 730-736. doi:10.1001/archpedi.158.8.730
- Newman, M. L., Holden, G. W., & Delville, Y. (2005). Isolation and the stress of being bullied. *Journal of Adolescence*, 28, 343-357. doi:10.1016/j.adolescence.2004.08.002
- Olweus, D. (1993). *Bullying at school: What we know and what we can do*. Oxford: Blackwell.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of research in personality*, 36(6), 556-563. doi:10.1016/S0092-6566(02)00505-6
- Rancer, A. S., & Avtig, T. A. (2006). *Argumentative and aggressive communication: Theory, research, and application*. Thousand Oaks, CA: Sage.
- Rawwas, M. YA. (1996). Consumer ethics: an empirical investigation of the ethical beliefs of Austrian consumers. *Journal of Business Ethics*, 15, 1009-19. doi:10.1007/BF00705579
- Rawwas, M. YA., Swaidan, Z., & Oyman, M. (2005). Consumer ethics: a cross-cultural study of the ethical beliefs of Turkish and American consumers. *Journal of Business Ethics*, 57, 183-95. doi:10.1007/s10551-004-5092-7
- Schäfer, M., Korn, S., Smith, P. K., Hunter, S. C., Mora-Merchán, J. A., Singer, M. M., & Van der Meulen, K. (2004). Lonely in the crowd: Recollections of bullying. *British Journal of Developmental Psychology*, 22(3), 379-394. doi:10.1348/0261510041552756
- Sesar, K., Barišić, M., Pandža, M., & Dodaj, A. (2012). The relationship between difficulties in psychological adjustment in young adulthood and exposure to bullying behaviour in childhood and adolescence. *Acta Medica Academica*, 41, 131-144. doi:10.5644/ama2006-124.46
- Shepperd, J. A., & Socherman, R. E. (1997). On the manipulative behavior of low Machiavellians: Feigning incompetence to "sandbag" an opponent. *Journal of Personality and Social Psychology*, 72(6), 1448-1459. doi:10.1037/0022-3514.72.6.1448
- Smith, P. K., Boulton, M. J., & Cowie, H. (1993). The Impact of Cooperative Group Work on Ethnic Relations in Middle School. *School Psychology International*, 14, 21-42.

[doi:10.1177/0143034393141002](https://doi.org/10.1177/0143034393141002)

- Spanou, K., Bekiari, A., & Theocharis, D. (in press). Bullying and Machiavellianism in university through social network analysis. *International Journal of Sociology (Revista Internacional de Sociologia)*.
- Syrmpas, I., & Bekiari, A. (2018). Differences between leadership style and verbal aggressiveness profile of coaches and the satisfaction and goal orientation of young athletes. *Journal of Physical Education and Sport, 18*(2), 1008-1015. [doi:10.7752/jpes.2018.s2149](https://doi.org/10.7752/jpes.2018.s2149)
- Swearer, S. M., Espelage, D. L., Vaillancourt, T., & Hymel, S. (2010). What can be done about school bullying? Linking research to educational practice. *Educational Researcher, 39*, 38-47.  
[doi:10.3102/0013189X09357622](https://doi.org/10.3102/0013189X09357622)
- Vasilou, A., Bekiari, A., & Hasanagas, N. (in press). Aggressiveness networks at school classes: Dynamic analysis and comparison of structures. *The International Journal of Interdisciplinary Educational Studies*.
- Winter, S. J., Stylianou, A. C., & Giacalone, R. A. (2004). Individual differences in the acceptability of unethical information technology practices: the case of Machiavellianism and ethical ideology. *Journal of Business Ethics, 54*, 279-301.
- Young-Jones, A., Fursa, S., Byrket, J. S., & Sly, J. S. (2015). Bullying affects more than feelings: the long-term implications of victimization on academic motivation in higher education. *Social psychology of education, 18*(1), 185-200. [doi:10.1007/s11218-014-9287-1](https://doi.org/10.1007/s11218-014-9287-1)
- Zettler, I., & Solga, M. (2013). Not enough of a 'dark' trait? Linking Machiavellianism to job performance. *European Journal of Personality, 27*(6), 545-554. [doi:10.1002/per.1912](https://doi.org/10.1002/per.1912)

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