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## BULLYING AND MACHIAVELLIANISM IN UNIVERSITY THROUGH SOCIAL NETWORK ANALYSIS

KYRIAKI SPANOU

*University of Thessaly, Greece*

[kyspanou@uth.gr](mailto:kyspanou@uth.gr)

ORCID iD: <http://orcid.org/0000-0003-2220-3805>

ALEXANDRA BEKIARI

*University of Thessaly, Greece*

[sandrab@pe.uth.gr](mailto:sandrab@pe.uth.gr)

ORCID iD: <http://orcid.org/0000-0001-5605-9165>

DIMITRIS THEOCHARIS

*University of Thessaly, Greece*

[theoj2009@gmail.com](mailto:theoj2009@gmail.com)

ORCID iD: <http://orcid.org/0000-0002-3670-3635>

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### ABSTRACT

The objectives of this study are to detect combinations of Machiavellian and bullying actions and to point out their determinants. A sample of five students' networks from Higher Education departments in central Greece (Business Administration, Veterinary and Physical Education & Sport Science) has been collected (245 nodes). Standardized questionnaires were used. Social Network Analysis, Spearman and PCA have been implemented. The Physical Education department exhibits denser bullying and Machiavellianism. Students who try to get beneficial information from their colleagues are susceptible to harm others. Deception is often more likely to happen under conditions of controllability. Making fun is present together with causing unhappiness. Victims of bullying in childhood are susceptible to be bullies as students. Students of high economic status seem to avoid the practice of bullying. Types of Machiavellian and bullying behaviors were proposed based on outdegree ("Offended Machiavellian", "Merciless", "Almost Bullying"), authority ("Angry-Machiavellian", "Bully Machiavellian", "Hidden-troublemaker") and Katz ("Just Offended Machiavellian", "Annoyed", "Amateur/self-seeker").

### KEYWORDS

Destructive behaviors; Social determinants; University students networks.

## BULLYING Y MAQUIAVELISMO EN LA UNIVERSIDAD A TRAVÉS DEL ANÁLISIS DE REDES SOCIALES

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### RESUMEN

Los objetivos de este estudio son detectar combinaciones de acciones maquiavélicas y de bullying (acoso escolar) y señalar sus determinantes. Se ha recopilado una muestra de cinco redes de estudiantes de los departamentos de Educación Superior en el centro de Grecia (Administración de Empresas, Veterinaria y Educación Física & Ciencias del Deporte) (245 nodos). Se han utilizado cuestionarios estandarizados. Se ha implementado análisis de redes sociales, Spearman y PCA. El departamento de Educación Física exhibe un bullying más denso y acciones maquiavélicas. Los estudiantes que tratan de obtener información beneficiosa de sus colegas son susceptibles de dañar a otros. El engaño a menudo es más susceptible de ocurrir en condiciones de controlabilidad. Burlarse aparece junto con causar infelicidad. Las víctimas de bullying en la infancia son susceptibles de ser acosadas como estudiantes. Los estudiantes de alto estado económico parecen evitar practicar el bullying. Se propusieron tipos de comportamientos maquiavélicos y de acoso escolar basados en el grado de salida ("Maquiavélico ofendido", "Despiadado", "Casi bullying"), la autoridad ("Maquiavélico enojado", "Maquiavélico acosador", "Agente de problemas oculto") y el marcador de nivel funcional ("Sólo Ofendido Maquiavélico", "Molesto", "Amateur/ auto-buscador").

### PALABRAS CLAVE

Conductas destructivas; Determinantes sociales; Redes de estudiantes universitarios.

## 1. INTRODUCTION

Both bullying and Machiavellianism are much-discussed and always topical issues in various sectors of human activity, including Higher Education. Both seem to be of too great an importance as to be left solely in the hands of journalists; research ought to be carried out on these issues. Bullying can be defined as the combination of repeatedly violent actions against a person, including not only slight teasing, but also serious collective violence (Olweus 2013). Specifically, bullying is an aggressive behavior characterized by an imbalance in the power relationship (power abuse) among peers due to a wide range of differences - social, emotional and physical (Olweus 2013). It consists of verbal attacks (incl. offensive gestures) or physical attacks, intentional exclusion, aimed at causing distress or harm (Bekiari 2012). The Student Experience Report (2008) stated that female students had experienced bullying more often than men, while 7% of all students in British Higher Education had reported bullying incidents. About 70% students committed verbal attacks against others (Ireland 2000). In general, Higher Education has been proved to be highly vulnerable to bullying (Taylor 2013). Moreover, bullying at Higher Education may carry on outside the campus, and can eventually even lead to crime (Rutter 1995). Decreased academic participation and achievement coupled with feelings of loneliness, anxiety, depression, general health complaints or, in extreme cases, criminal acts and alcohol abuse are amongst the potential effects of bullying on victims (Olweus 2013; Peterson and Skiba 2001).

In addition to bullying, Machiavellianism is also a pathologic phenomenon at Higher Education level. Although Machiavellianism originates from political terminology, and refers to the use of any exploitative and unacceptable means in order to achieve dominance on a whole community, this notion is transposed in a sociological context, where it comes to mean an individual dominance within an interpersonal relation or group, imposed by exploiting weaknesses, character traits, or secrets of people. More precisely, Machiavellianism consists in manipulating others through malice, deceitfulness and opportunism. A Machiavellian person is characterized by the ability to influence and control others, motivated by their personal interest (Walter *et al.* 2005). Machiavellians are ideologically and emotionally neutral and tend to avoid commitments (Dahling *et al.* 2009). Machiavellianism is associated with a lack of conscience (Paulhus and Williams 2002), impatience (Aziz and Vallejo 2007) and dishonesty (Ashton *et al.* 2000). In particular, it consists of four dimensions; distrusting others, involvement in amoral manipulation, a desire for control over others and for status for oneself (Dahling *et al.* 2009). An offensive, forceful, and dishonest manner, as well as violation of others rights and deviant behavior are often a characteristic of

Machiavellians (Zagenczyk *et al.* 2014). Machiavellianism is also present in Higher Education in other forms, such as triggered ethical arguments than personal interests (Hren *et al.* 2006) or money lust (Tang *et al.* 2008). Finally, it has been suggested that anti-bullying interventions decrease aggressiveness and Machiavellian attitudes, respectively (Andreou 2004).

Machiavellianism, as well as bullying, have hardly been examined as structural phenomena, namely as phenomena occurring through social networking. Nevertheless, due to the fact that both Machiavellianism and bullying (incl. verbal attacks) are closely related to power relations (imposition and exploitation of relations), it is evident that both phenomena can be analyzed through social network analysis (Bekiari and Hasanagas 2016; Hasanagas *et al.* 2017). As social structures, Machiavellianism and bullying (e.g. verbal attacks) can also be explored in terms of the concentration of most Machiavellian or bullying actions exerted by others, the shape of the subsequent chains of such actions, and the final receiver of all of these (Theocharis and Bekiari 2017). Only some network-based studies have been carried out on verbal aggressiveness, which can be regarded just as one particular dimension of or relevant to bullying (Bekiari *et al.* 2017a; Bekiari *et al.* 2017c; Bekiari and Spyropoulou 2016). The network-based studies specifically on bullying are relatively restricted at present (Bekiari and Pachi 2017; Bekiari *et al.* 2017d). As for Machiavellianism, it has been little explored until now on a structural basis (e.g., Bekiari and Spanou 2017). Thus, more extensive network analysis on this subject would be useful.

The innovative academic added value of this study is based on the in-depth analysis of Machiavellian and bullying patterns and the application of social network analysis in academic institutions. As for the practical added value, this consists both of the detection and the distinction of profile groups susceptible to Machiavellian and bullying strategies, enabling instructors to formulate preventive strategies.

## 2. MATERIALS AND METHODS

### 2.1. Sampling

In total, a sample of five students' classes of Higher Education departments at the University of Thessaly (Greece) has been analyzed as network samples: two classes of the Veterinary dept. ( $N_1=66$  of the 4<sup>th</sup> semester- male=23, female=43,  $N_2=53$  of the 8<sup>th</sup> semester- male=21, female=32), a class of the Business Administration dept. of the Technological Educational Institute of Thessaly ( $N_3=27$  of the 6<sup>th</sup> semester- male=13, female=14) and two classes of the Physical Education and Sport Sciences dept. ( $N_4=57$  of the 4<sup>th</sup> semester- male=29, female=28,  $N_5=42$  of the 8<sup>th</sup> semester- male=19, female=23) were selected. Thus, there were a total of 245 nodes.

It is noticeably advantageous that there was variability in semesters among the three departments. Additionally, the current study included different departments in order to avoid biased conclusions; it is a well-known fact that departments such as those of Physical Education and Business Administration are believed to be quite susceptible to Machiavellian tactics (considerable competitiveness in sports and business matters). Apart from that, Business Administration students were selected due to their tendency to adopt specific values related to money love, risk taking, Machiavellian tactics or unethical values, differing from students in other fields (Tang *et al.* 2008).

Nevertheless, we should like to point out that the fact that the networks are not a random sample, but rather a judgment sample, is not a weakness, given that our study aims at analytic and not descriptive statistics. The participants were encouraged not to hesitate in providing sincere answers, as it was emphasized that research ethics would be observed and discretion would also be guaranteed. It was clarified that no personal data, but just compiled results would be presented.

The participants were properly informed about the research goal and ethics and they signed consent forms. The 1975 Declaration of Helsinki (as revised in Tokyo in 2004) was taken into account and not violated by the researchers' actions.

## 2.2. Measures

Tested questionnaires were used concerning the network variables (Bekiari and Spanou 2017; Bekiari *et al.* 2017d). The variables which were relevant to relations of Machiavellianism and bullying were measured as network indicators (centralities). The personal features of students such as age, socio-economic state, gender etc. constituted the non-network variables. Numerous network variables (centralities) such as outdegree and indegree (expressing occasional effect), pagerank and Katz status (expressing accumulative influence) and authority (expressing qualified competitiveness) were calculated with Visone 1.1.

More specifically, the following indicators were calculated by appropriate software (Visone) and normalized (%). Their structural meaning is described below, without formulas, as these are accessible on several websites: 1) In-degree and outdegree were perceived as a position of occasional effect (nodes which were first-contacted); it is a percentage of relations received by a certain node. 2) Katz (1953) can be interpreted as a position of accumulative effect; it is calculated as a power series describing successive relations chains. 3) Pagerank indicates a position of a distributive effect, expressing the successively transferred value from every node to others. 4) Authority can be interpreted as qualified competitiveness, highlighting nodes which attract the most links which come from as many as possible other nodes, seeking to develop links.

## 2.3 Data processing

Visone 1.1 was used for calculating centrality network variables like Katz status, in- and outdegree, pagerank and authority. Both non-network and network variables were entered in SPSS. Spearman test was used [ $p \leq 0.01$  (\*) and  $p \leq 0.05$  (\*\*)]. This bivariate test was preferred to multivariate analysis, because it is a non-parametric test. The results were interpreted using in-depth interviews. Additionally, it should be clarified that permutation techniques (QAP, ERGM etc.) were developed for detecting possible ties and correlations between whole networks (and not among centralities, as it is the case here). Centrality values of nodes (not ties) have here been correlated with non-network variables and with each other. Conventional statistics (Spearman test) have been applied for this purpose. Consequently, a bivariate analysis was preferred, enabling an overview on all possible relations, to a multivariate analysis (Hasanagas and Bekiari 2015; 2017). Last but not least, for the purpose of revealing behavioral patterns (typology), a Principal Component Analysis (PCA) was implemented (Bekiari 2016; 2017a; 2017b).

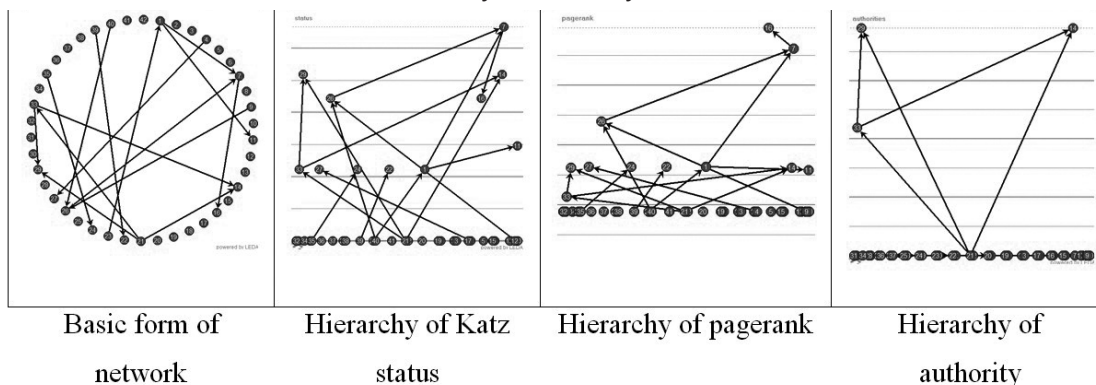
## 3. RESULTS

In "Figure 1, 2", four examples of networks of Machiavellian and bullying behavior are illustrated as hierarchies by three hierarchical algorithms (Katz status, pagerank, authority). It is noticeable that there are differences between the structures of bullying and Machiavellian networks. The density among networks differs as seen in the networks of bullying (2.128% and 0.020%) and Machiavellianism (1.148% and 1.021%). In particular, the density of the relations between students in the university departments was reflected by the density of the networks. For instance, the networks of "controlling others" and "causing unhappiness to peers" are by far denser in the Physical Education depart. (1.148% and 2.128% respectively) than in the Veterinary depart. (1.021% and 0.020% respectively). This may be attributed to the fact that Physical Education students exhibit a dense network of bullying and Machiavellianism, due to the extreme pressure from constant competition they are faced with in their department.

If we look at "control over others" in the Physical Education department, it does not differ greatly in density or pyramid structure when compared to the Veterinary department (see Figure 1: 1.148%, Figure 3: 1.021%). Thereby, "control over others" is not related to the specific academic department, but mainly to the common mentality of students in these departments. Notwithstanding, it is evident that there is a noticeable difference in density as far as the "causing unhappiness to peers", or else bullying behavior, is concerned between these academic departments (see Figure 2: 2.128%, Figure 4: 0.020%), which is understandable based on the competitive nature of the Physical Education department.

**Figura 1.**

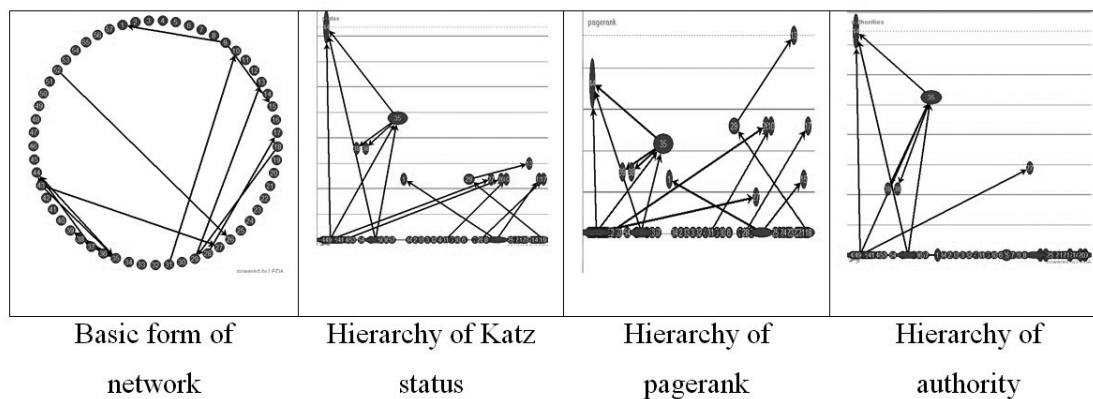
*Network of Machiavellianism (control over others) at the Dept. of Physical Education and Sports Science, University of Thessaly, Greece*



Relation: Machiavellian behavior, dimension: control over others (Physical Education department), nodes=42, links=15 [density=15/(42<sup>2</sup>-42)=1.148%]

**Figura 2.**

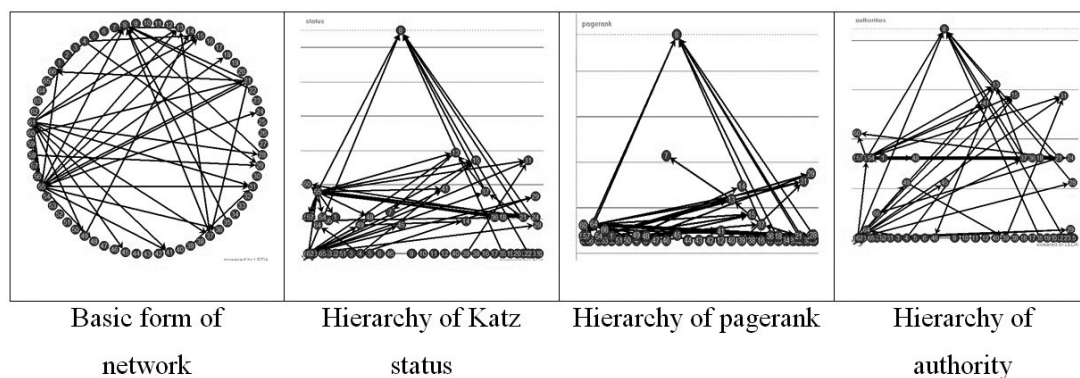
*Network of bullying (causing unhappiness to peers) at the Dept. of Physical Education and Sports Science, University of Thessaly, Greece*



Relation: Bullying behavior, dimension: causing unhappiness to peers (Physical Education department), nodes=57, links=15 [density=15/(57<sup>2</sup>-57)=2.128%]

**Figura 3.**

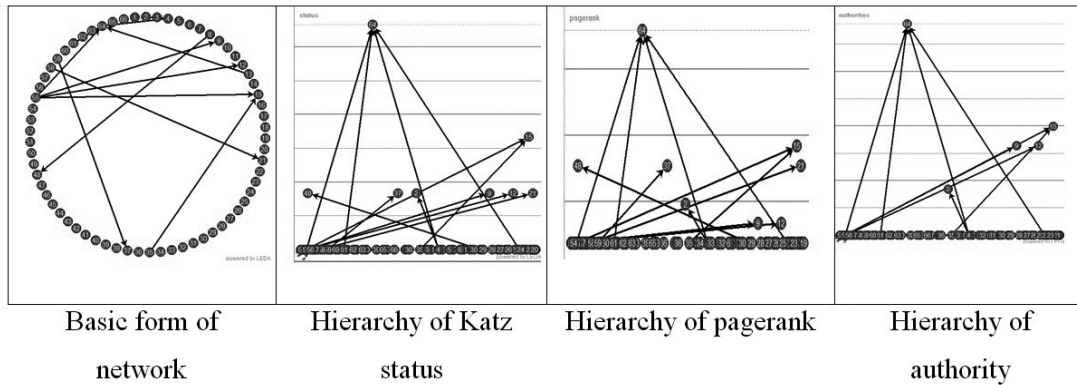
*Network of Machiavellianism (control over others) at the Dept. of Veterinary, University of Thessaly, Greece*



Relation: Machiavellian behavior, dimension: control over others (Veterinary department), nodes=66, links=42 [density=42/(66<sup>2</sup>-66)=1.021%]

**Figure 4.**

*Network of Bullying (causing unhappiness to peers) at the Dept. of Veterinary, University of Thessaly, Greece)*



Relation: Bullying behavior, dimension: causing unhappiness to peers (Veterinary department, nodes=66, links=12 [density=66/(12<sup>2</sup>-12)=0.02%])

In table 1, the Machiavellian parameters seem to be significantly relevant to the bullying ones. Students who try to get beneficial information from their colleagues, are also susceptible to harming others for their benefit (r=.225), and of course to deceiving them (r=.457). They also try to control them (r=.322), deny their help (r=.234), encourage scolding (r=.184) and even exclude them from their companions (r=.270). Those who are willing to harm others for their own benefit do

not hesitate to deceive (r=.268), desire to control others (r=.253), and encourage scolding (r=.654). Deception is often more likely to happen under conditions of controllability (r=.382) or in combination with denial of help (r=.200), or with the encouragement of scolding (r=.130). Controllability can easily encourage scolding (r=.132) or even harassment (r=.173). Encouragement of scolding (r=.188) and exclusion (r=.140) tend to be combined with harassment.

**Table 1.**  
*Authority-specific relation between bullying and Machiavellianism*

	1	2	3	4	5	6	7	8
1.Info for benefit	1.000	<b>.225**</b>	<b>.457**</b>	<b>.322**</b>	<b>.234**</b>	<b>.184**</b>	<b>.270**</b>	.037
	-	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.004</b>	<b>.000</b>	.565
2.Harm for benefit	<b>.225**</b>	1.000	<b>.268**</b>	<b>.253**</b>	-.003	<b>.654**</b>	.064	.020
	<b>.000</b>	-	<b>.000</b>	<b>.000</b>	.961	<b>.000</b>	.320	.754
3.Deception	<b>.457**</b>	<b>.268**</b>	1.000	<b>.382**</b>	<b>.200**</b>	<b>.130*</b>	.120	-.045
	<b>.000</b>	<b>.000</b>	-	<b>.000</b>	<b>.002</b>	<b>.043</b>	.060	.487
4.Control	<b>.322**</b>	<b>.253**</b>	<b>.382**</b>	1.000	.050	<b>.132*</b>	.106	<b>.173**</b>
	<b>.000</b>	<b>.000</b>	<b>.000</b>	-	.433	<b>.039</b>	.098	<b>.007</b>
5.Deny help	<b>.234**</b>	-.003	<b>.200**</b>	.050	1.000	.037	<b>.281**</b>	.020
	<b>.000</b>	.961	<b>.002</b>	.433	-	.559	<b>.000</b>	.755
6.Encourage to scold	<b>.184**</b>	<b>.654**</b>	<b>.130*</b>	<b>.132*</b>	.037	1.000	.054	<b>.188**</b>
	<b>.004</b>	<b>.000</b>	<b>.043</b>	<b>.039</b>	.559	-	.402	<b>.003</b>
7.Exclude	<b>.270**</b>	.064	.120	.106	<b>.281**</b>	.054	1.000	<b>.140*</b>
	<b>.000</b>	.320	.060	.098	<b>.000</b>	.402	-	<b>.029</b>
8.Harassment	.037	.020	-.045	<b>.173**</b>	.020	<b>.188**</b>	<b>.140*</b>	1.000
	.565	.754	.487	<b>.007</b>	.755	<b>.003</b>	<b>.029</b>	.

\* Correlation is significant at the 0.05 level (2-tailed)  
 \*\* Correlation is significant at the 0.01 level (2-tailed)

In table 2, making fun often appears together with causing unhappiness ( $r=.428$ ), spreading rumors ( $r=.249$ ), denial of help ( $r=.353$ ), giving orders ( $r=.455$ ), controllability of the victim ( $r=.475$ ) and exploitation of weaknesses ( $r=.434$ ). Causing unhappiness seems also to be connected with spreading rumors ( $r=.435$ ), denying help ( $r=.377$ ), giving orders ( $r=.555$ ), control ( $r=.515$ ) and weaknesses ( $r=.279$ ). Spreading rumors is related to the denial of help ( $r=.417$ ), giving orders ( $r=.450$ ), controlling ( $r=.297$ ) and exploiting weaknesses ( $r=.190$ ). Denial of help is correlated with giving orders ( $r=.425$ ), control over the victim ( $r=.394$ ) and weaknesses ( $r=.215$ ). Giving orders tends to be in concordance with controlling ( $r=.674$ ) and exploitation of weaknesses of the victim ( $r=.395$ ). Finally, controlling and weaknesses ( $r=.284$ ) seem to appear in close connection to each other.

In table 3, those who had been victims of bullying in childhood are susceptible to attaining information for their own benefit ( $r=.185$ ), and even to fighting ( $r=.185$ ). On the contrary, students from families of high economic status seem to avoid practicing this dimension of bullying ( $r=-.256$ ). However, those who characterize others as socially successful tend to practice several forms of bullying, such as getting beneficial information ( $r=.392$ ), excluding others ( $r=.523$ ) and also fighting ( $r=.495$ ).

In table 4, three types of outdegree-specific bullying and Machiavellianism are revealed through PCA, which can be referred to as "Offended Machiavellian", "Merciless" and "Almost Bullying". The first one is a generalized aggressive behavioral pattern consisting of unhappiness (.757), hurting (.744), harassing

**Table 2.**  
*Outdegree-specific relation between bullying and Machiavellianism*

	1	2	3	4	5	6	7
1. Make fun	1.000	<b>.428**</b>	<b>.249**</b>	<b>.353**</b>	<b>.455**</b>	<b>.475**</b>	<b>.434**</b>
	-	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>
2. Unhappiness	<b>.428**</b>	1.000	<b>.435**</b>	<b>.377**</b>	<b>.555**</b>	<b>.515**</b>	<b>.279**</b>
	<b>.000</b>	-	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>
3. Spread rumors	<b>.249**</b>	<b>.435**</b>	1.000	<b>.417**</b>	<b>.450**</b>	<b>.297**</b>	<b>.190**</b>
	<b>.000</b>	<b>.000</b>	-	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.003</b>
4. Deny help	<b>.353**</b>	<b>.377**</b>	<b>.417**</b>	1.000	<b>.425**</b>	<b>.394**</b>	<b>.215**</b>
	<b>.000</b>	<b>.000</b>	<b>.000</b>	-	<b>.000</b>	<b>.000</b>	<b>.001</b>
5. Orders	<b>.455**</b>	<b>.555**</b>	<b>.450**</b>	<b>.425**</b>	1.000	<b>.674**</b>	<b>.395**</b>
	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	-	<b>.000</b>	<b>.000</b>
6. Control	<b>.475**</b>	<b>.515**</b>	<b>.297**</b>	<b>.394**</b>	<b>.674**</b>	1.000	<b>.284**</b>
	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	<b>.000</b>	-	<b>.000</b>
7. Weakness	<b>.434**</b>	<b>.279**</b>	<b>.190**</b>	<b>.215**</b>	<b>.395**</b>	<b>.284**</b>	1.000
	<b>.000</b>	<b>.000</b>	<b>.003</b>	<b>.001</b>	<b>.000</b>	<b>.000</b>	-

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

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

**Table 3.**  
*Determinants of practicing bullying and Machiavellianism*

Spearman's rho	Info for benefit outdegree	exclude outdegree	fight outdegree
victims of bullying as a child	<b>.185'</b>	.105	<b>.185'</b>
	<b>.038</b>	.243	<b>.038</b>
family economic situation	<b>-.256**</b>	.044	-.007
	<b>.004</b>	.623	.934
social status success outdegree	<b>.392**</b>	<b>.523**</b>	<b>.495**</b>
	<b>.000</b>	<b>.000</b>	<b>.000</b>

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

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

(.554), disagreeing (.749), controlling (.602), denying help (.529), exploiting the weaknesses of others (.554) and tending to characterize others as rich people (.691). The second type is a behavioral type consisting of controlling (.606) and exploitation of weaknesses (.722). The third type contains only harassment (.756).

In table 5, the authority-specific PCA typology reveals three types: the “Angry-Machiavellian”, “Bully-Machiavellian” and “Hidden-Troublemaker”. The first one represents weaknesses (.762), controllability (.775), disagreements (.550) and social success

(.782). The second one involves harming (.502), denial of help (.798) and disagreement (.432). The third one consists of scolding (.661) and rumors (.576).

In table 6, the Katz-specific behavioral PCA types are the “Just Offended”, “Annoyed” and “Amateur/self-seeker”. The first one consists of wealth attribute (.777), social success (.779), controllability (.755), disagreement (.586), exclusion (.507) and harassment (.434). The second one consists of scolding (.581), exclusion (.410) and harassment (.700). The third one is composed of harming (.818) and exclusion (.452).

**Table 4.**  
*Outdegree-specific typology of Machiavellianism and bullying*

	“Offended Machiavellian”	“Merciless”	“Almost Bullying”
unhappiness outdegree	<b>.757</b>	-.316	.180
hurt outdegree	<b>.744</b>	-.203	-.267
harassment outdegree	<b>.554</b>	-.195	<b>.756</b>
disagreements outdegree	<b>.749</b>	-.288	-.097
control outdegree	<b>.602</b>	<b>.606</b>	-.033
rich people outdegree	<b>.691</b>	.227	-.153
weakness outdegree	<b>.554</b>	<b>.722</b>	.053
deny help outdegree	<b>.529</b>	-.392	-.354

Extraction Method: Principal Component Analysis, 3 components extracted

**Table 5.**  
*Authority-specific typology of Machiavellianism and Bullying*

	“Angry-Machiavellian”	“Bully-Machiavellian”	“Hidden-Troublemaker”
weakness_authority	<b>.762</b>	-.041	-.097
harm_for_benefit_authority	.338	<b>.502</b>	-.462
social_status_success_authority	<b>.782</b>	-.398	-.011
control_authority	<b>.775</b>	-.483	-.040
encourage_to_scold_authority	.076	.142	<b>.661</b>
deny_help_authority	.378	<b>.798</b>	-.008
disagreements_authority	<b>.550</b>	<b>.432</b>	.328
spread_rumors_authority	.075	-.043	<b>.576</b>

Extraction Method: Principal Component Analysis, 3 components extracted

**Table 6.**  
*Katz-specific typology of Machiavellianism and Bullying*

	“ Just Offended”	“ Annoyed”	“Amateur/self-seeker”
harm for benefit katz	.271	.074	<b>.818</b>
rich people katz	<b>.777</b>	-.428	-.220
social status success katz	<b>.779</b>	-.452	-.092
control katz	<b>.755</b>	-.234	.151
encourage to scold katz	.309	<b>.581</b>	-.313
disagreements katz	<b>.586</b>	.256	-.290
exclude katz	<b>.507</b>	<b>.410</b>	<b>.452</b>
harassment katz	<b>.434</b>	<b>.700</b>	-.129

Extraction Method: Principal Component Analysis, 3 components extracted

## 4. DISCUSSION

The aim of this study is to examine hierarchies shaped by Machiavellian and bullying relations, to detect relations among dimensions of Machiavellianism and bullying, as well as possible determinants of them. It should be emphasized that there are no other studies applying network analysis in Machiavellianism and bullying in universities. Thus, no extensive comparison with other studies can be made.

We can observe that there are differences between the density and structures of bullying and Machiavellian networks. In particular, the density of the relations between students at the university departments was reflected by the density of the networks. This may be attributed to the fact that Physical Education students exhibit a dense network of bullying and Machiavellianism due to the extreme pressure caused by the constant competition they are subject to in their department. "Control over others" is not related to the specific academic department but depends mainly on students' common mentality in these departments. Notwithstanding, it is evident that there is a noticeable difference in density as far as the "causing unhappiness to peers", or else bullying behavior, is concerned between these academic departments; this is understandable, given the competitive nature of the Physical Education department. Such hierarchy analyses have been made in previous studies (e.g., Bekiari and Pachi 2017; Bekiari and Spyropoulou 2016).

This research supports the view that Machiavellianism, as a personality variable, is associated with bullying behavior. Machiavellian students exhibit high levels of bullying. This is in accordance with the Machiavellian notion that bullying may be an ideal way to influence others (Piltch and Turska 2015). Additionally, Machiavellian behavior is characterized by manipulation and unethical manners. As social manipulators, social attractiveness is their priority, without fear of recurring to aggression when it is deemed profitable. As a result, Machiavellians resort to bullying when they realize that they may benefit from it (Paulhus and Williams 2002). Both, students in the department of Physical Education and in the department of Business Administration, who are dominated by stressful sport competitions and extreme tension and pressure respectively, were expected to be susceptible to bullying and Machiavellian strategies; this is not so much due to the pressure they face, but mainly to the common prevailing mentality. Indeed, having experienced or practiced various combinations of bullying seems to make individuals more vulnerable to Machiavellianism. These behavioral patterns seem to be "committed" with the intention of fulfilling measurable profits.

Students who have used tactics of bullying under the veil of verbal aggressiveness are keen on exploiting possible weaknesses on the part of others, in order to manipulate them, while Machiavellian students

are likely to exhibit bullying features. This is compatible with the findings of a previous study showing a positive relationship between Machiavellianism and aggression (Andreou 2004). Particular components of Machiavellianism attract specific components of bullying and vice versa, it seems that these two behavioral patterns reveal types of targeting ranging from generalized to more selective strategies of bullying and Machiavellianism.

Authority-specific relations between bullying and Machiavellianism have revealed that students who exhibit features of Machiavellianism, such as elements of deception in the name of their personal interest, quests for information for their own benefit, and willingness to harm others for their own benefit, seem to maintain features of bullying such as encouraging other students to scold or exclude certain students from socializing. This is understandable, as students who have the tendency not only to exclude others from their companionship, but also to cause scolding among students, are considered to be Machiavellians in terms of using information for their own benefit, or trying to deceive others, and vice versa (that is to say, students who present Machiavellian tactics are deemed to be involved in bullying involving exclusion or scolding of certain students). Previous studies have suggested similar results (e.g., Bekiari and Hasanagas 2016).

Outdegree-specific relations between bullying and Machiavellianism support that bullying parameters are of relevance for ascribing Machiavellianism to students, and vice versa. In other words, students who have used tactics of bullying under the veil of verbal aggressiveness, such as making fun of others or spreading rumors against others, and denying help to their fellow-students, are regarded to be Machiavellians in several aspects. More specifically, they are keen on giving orders to others, controlling them and exploiting possible weaknesses on the part of others in order to manipulate and impose themselves. On the other hand, students who use Machiavellian tactics are likely to exhibit bullying features as they get familiar with such a hostile environment. In past studies, supportive results have been proposed (Theocharis and Bekiari 2017).

Concerning the determinants of practicing bullying and Machiavellianism, those who had been victims of bullying as children seem to have adopted an aggressive behavior. In other words, bullying reproduces itself diachronically. Furthermore, students who have been involved in fights under the influence of extreme anger and have excluded other students from their companionship (bullying parameters) were those students who were found to desire a high social status as a sign of success, and to seek information which would benefit them (Machiavellian parameters). This is clearly illustrated by the fact that students who are ambitious, do not hesitate to use violent tactics in order to achieve their goals and vice versa. To put it another way, students seem to be willing to use aggressive



conducts with the intention of increasing their social status as a proof of personal success. There are older findings which are in accordance with these (Bekiari and Spanou 2017; Bekiari and Spyropoulou 2016).

The outdegree-specific typology of Machiavellianism and bullying demarcated three types of students who use bullying and Machiavellian tactics: a) The “Offended Machiavellian” is a person who exhibits high levels of bullying behavior while trying to exploit others and acquire wealth; b) The “Merciless”, who seems to use selective Machiavellian forms (control and exploitation of weakness); c) The “Almost Bullying” is a person who employs only a few forms of bullying, such as, for example, harassment. Thus, the above mentioned typology implies that Machiavellians tend to end up as those who either appear to control others and exploit their weakness, or are ambitious and desire to pursue a wealthy life; in doing so, they develop a gradual selectiveness of offensive strategies of verbal aggressiveness (which is an element of bullying), related to harassment, the denial of help, causing disagreements and unhappiness. Previous findings, compatible with the above, can be found (Bekiari *et al.* 2017c; Bekiari and Pachi 2017).

Respectively, in the authority-specific typology of Machiavellianism and Bullying, there are three types of students: a) The “Angry-Machiavellian” is a person who has the tendency to exploit others’ weakness and control them in the name of their social status, while causing disagreements; b) The “Bully-Machiavellian” seems to aim at acquiring serious benefits by harming others, but at the same time uses a mixture of behavioral strategies which constitute bullying behavior (denying help and causing disagreements); and c) The “Hidden-troublemaker” is a person who selects certain bullying forms such as dissemination of rumors and encouragement to scold. Previous studies have proposed results which support the above (Theoharis *et al.* 2017; Bekiari *et al.* 2017d).

Comparatively, the “Offended Machiavellian” type depicts the bullying and Machiavellianism strategy, while the “Angry-Machiavellian” type does not use all types of bullying and Machiavellianism. The “Bully-Machiavellian” type implements, above all, bullying tactics with discrete patterns of Machiavellian strategy. They harm for their own benefit, while the “Merciless” only adopts bullying behaviors with no sign of Machiavellianism. The “Hidden-troublemaker” type is quite selective in their behavioral tactics, as only bullying strategies are exhibited. Similarly, the “Almost Bullying” type tends to practice only one type of bullying, which is harassment. In this way, regarding Machiavellians, there seems to be either students who try to control others and exploit others’ weakness, or those who cause disagreements in order to become socially successful (“Angry Machiavellian”). This is considered to be a provocative strategy of Machiavellianism. Moreover, there are students who aim at

personal benefits, harming others, encouraging conflicts and denying help (“Bully Machiavellian”), revealing that bullying strategies are dominant. Finally, selective behavioral patterns closely related to bullying such as encouraging scolding and disseminating rumours (“Hidden-troublemaker”) are evident.

In the Katz-specific typology of Machiavellianism and Bullying, there are three types of students: a) The “Just Offended Machiavellian” is a person whose behavior is closely associated with Machiavellianism, displaying involvement in bullying process; b) The “Annoyed” who depicts a person solely motivated by bullying strategies, without the influence of Machiavellian tactics; c) The “Amateur/self-seeker” is considered to be a person mainly selective in terms of behavioral patterns (harms in the name of their own benefit and excludes students from their companionship). The first type “Just Offended Machiavellian” is involved in the Machiavellianism process (controlling others, aiming at achieving wealth and high social status) associated with bullying strategies (encouraging disagreements, exclusion and harassment) in a balanced way which proves a gradual selectiveness in Machiavellian and bullying tactics, varying from “Offended Machiavellian” to “Just Offended Machiavellian”. Hence, the grade of Machiavellianism and offensiveness depends on selectiveness. This gradual selectiveness creates a variety of behavioral patterns where it can be assumed that bullying may influence Machiavellian attitudes and vice versa. The second type “Annoyed” is solely dominated by bullying patterns, such as harassment and exclusion, as well as encouragement to scolding and the spreading of rumors, avoiding Machiavellian tactics. The “Amateur/self-seeker” is characterized by a few patterns of Machiavellianism and bullying respectively (harming for their own benefit and excluding others from their companionship), proving that bullying encourages Machiavellianism and vice versa. Similar results are found in past studies (Bekiari *et al.* 2017b).

Further research is of paramount importance in order to clarify the behavioral patterns of Machiavellianism and bullying. The limitations of this study and points for future research should be applied to a wider range of Higher Education departments and varied milieus, not to mention as many non-network variables as possible, in order to provide insightful information for an in-depth awareness of how Machiavellianism and bullying function and their connection. It is also suggested that more emphasis should be placed on both interpersonal relationships and anti-bullying interventions with the intention of discouraging Machiavellian and bullying attitudes. Investigating attitudes associated with interpersonal relationships may have implications for intervention programmes against bullying and Machiavellian behaviors in universities in the long run. Exploring the bully/victims’ interactions in terms of Machiavellian attitudes in the academic field would reveal significant evidence of students’ personality.

## 5. CONCLUSIONS

Machiavellianism and bullying constitute much-discussed issues, not only at school level, but also in everyday university life. The exact nature of such behavioral patterns and the parameters leading to Machiavellianism or bullying at university are still open research questions. In comparison with other depts. (Veterinary and Business Administration), the Physical Education department exhibits denser bullying and Machiavellianism due to the extreme pressure of the competition. Students who try to attain beneficial information from their colleagues are susceptible to harming others. Deception is often more likely to happen under conditions of controllability. Making fun happens in parallel to causing unhappiness. Victims of bullying in childhood are susceptible to be bullies as students. Students of high economic status seem to avoid practicing bullying. Three types of outdegree-specific bullying and Machiavellianism are revealed (“Offended Machiavellian”, “Merciless”, “Almost Bullying”) depicting generalized aggressiveness, controlling or just harassment. Three authority-specific types (“Angry-Machiavellian”, “Bully-Machiavellian”, “Hidden-Troublemaker”) mainly present weaknesses exploitation, harming and scolding.

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- The Katz-specific behavioral types (“Just Offended”, “Annoyed”, “Amateur/self-seeker”) mainly relate to wealth attribute, scolding and harming. In general, components of Machiavellianism and bullying can be interrelated. Specific components of these appear in particular combinations (aforementioned types). As for the determinants, bullying experience in childhood, as well as social status and poor economic situation, seem to determine these behaviors and to perpetuate them, especially in terms of excluding, fighting and benefiting, while selecting friends based on intelligence criteria seems to prevent bullying.

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**KYRIAKI SPANOU** is a PhD candidate focusing on pedagogy and sociology in education at the Department of PE & Sport Science, University of Thessaly, Greece. She has received a PhD scholarship by the State Scholarship Foundation (IKY). She received a BA from the University of Beds, UK, an MA from the University of Westminster, London, UK, and a Certificate of Intercultural Communication at the University of the Aegean, Greece. She has more than 15 years teaching experience as an English Tutor in primary, secondary and higher education. She has published peer reviewed articles in international scientific journals and has participated with poster presentations in international conferences, focusing on pedagogy and sociology.

**ALEXANDRA BEKIARI** is Assistant Professor in Pedagogy at the Department of Physical Education and Sport Science, University of Thessaly, Greece. She obtained her BSc from the University of Athens, Greece, and PhD from University of Ioannina, Greece. She has taught 13 years in Bachelor and Master programs relevant to sociology and pedagogy at the University of Thessaly, of Thessaloniki and of Thrace. She has published more than 40 peer reviewed articles in international and Greek scientific journals, and has presented more than 70 papers at international conferences, focusing on pedagogy, philosophy, history and sociology. She has also published 4 books in these fields. Research interests: communication, social networks, education system.

**DIMITRIS THEOCHARIS** is a Maths teacher in secondary education. He received a BSc from the Aristotle University of Thessaloniki, Greece. He was awarded an MSc and MED by the Hellenic Open University, Greece. He is a PhD candidate at the Department of Physical Education and Sport Science, University of Thessaly focusing on leadership and aggressiveness in social networks. He has 20 years teaching experience as Maths teacher. He has published four peer reviewed articles in international and Greek scientific journals and has presented more than 15 papers at international conferences. He has published two books, focusing on leadership, Maths, pedagogy and new technologies.