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Experiencing Adverse Social Relationships: the Development and Validation of a Self-Report Scale that Measures Individuals' Histories of Social Punishment (HoSP)

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Abstract
Although the relationship between childhood trauma and psychological maladjustment is well established, the link between punishing social interactions and psychopathology has yet to be explored. This may be due, in part, to the lack of appropriate measurement tools. This investigation aimed to develop and validate an instrument to measure histories of social punishment defined as adverse, day-to-day interactions with significant others. Study 1 examined the factor structure and test-retest reliability of the scale. Study 2 confirmed the factor structure solution and tested its convergent and discriminant validity. Study 3 explored the relationship between social punishment and obsessive-compulsive disorder and depression, as well as the role of gender. Overall, the scale had very good to excellent psychometric properties. Significant correlations were found between ratings of social punishment and certain pathological behaviors. Further, our findings demonstrated that males tended to report more adverse social experiences than females and as a consequence more symptoms of psychopathology. These findings extend and support the link between adverse experiences and the development of various psychopathological conditions.

Keywords Social punishment · Aversive control · Psychopathology · Gender differences · Self-report scale

Punishment is broadly defined as the use of coercive practices of behavioral control that often induce feelings of fear, shame or sadness to the person being punished. Although it includes physical and emotional abuse, it may also comprise more common parenting practices, such as spanking or slapping. Day-to-day social interactions, such as disapproval, embarrassment, or mockery, also may function as punishers, although they may be less obvious. Several investigations have supported the relationship between experiences of harsh physical punishment in childhood and incapacitating mental health conditions in adulthood, including major depression, substance abuse, anxiety disorders, suicidal ideation, and physical impairments (Afifi et al. 2006; Afifi et al. 2013; MacMillan et al. 1999; Straus and Kantor 1994; Turner and Finkelhor 1996). It is also widely recognized that serious abusive and traumatic childhood events contribute to the development of psychological disorders (e.g., Afifi et al. 2014; Lindert et al. 2014). In particular, early sexual abuse is strongly associated with high rates of depression and anxiety (Levitan et al. 2003; Spataro et al. 2004), whereas physical abuse and neglect at an early age are associated with greater risk for substance abuse, and developmental delays (e.g., Herrenkohl et al. 2012; Oswald et al. 2010). Older adults (65+) who reported adverse childhood experiences have been found to have increased risks for developing anxiety, mood, or personality disorders (Raposo et al. 2014). Further, contemporary models of suicidality have suggested that the experience of adverse events, which often induce negative feelings and cognitions, contribute significantly to suicide behaviors, especially when combined with social isolation (O'Connor and Nock 2014).

A number of self-report scales have been developed to measure traumatic childhood events (e.g. Bifulco et al. 2005; Bremmer et al. 2007; Sanders and Becker-Lausen 1995);

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however, these measures tend to focus on severe traumatic experiences, such as childhood abuse and neglect, which are uncommon events for the general population. Studies measuring more common forms of punishment have focused almost exclusively on physical punishment (e.g., Afifi et al. 2012). The extent to which less severe forms of social punishment may impact on the development of psychological disorders is unknown. This lack of research may, in part, be due to the lack of a validated scale for measuring these forms of social punishment. Measuring histories of social punishment may be important for at least four reasons. First, it would set the occasion for a research literature that focuses on a broader definition of aversive events, both in childhood and later in life. Second, it would allow researchers to identify individuals who have been exposed to these types of experience and to study their impact on such variables as quality of life, physical well-being, personality traits, and mental health. Third, it may allow exploration of the mediating or moderating effects of such experiences to refine our understanding of the underlying mechanisms of psychopathology in adult and adolescent populations. Fourth, it may provide a useful tool for practitioners to inform their clinical formulations and develop effective clinical interventions.

It is interesting to note that the vast majority of studies exploring the relationship between punishment and psychopathology has utilized mostly American or Canadian samples (e.g., Afifi et al. 2012; Sareen et al. 2005). Little is known, however, with regard to the effects of severe or mild punishment experiences on the development of psychopathological patterns of behavior in other cultures. One culture in which mental health problems have begun to be examined is Greece. Studies have repeatedly revealed higher than normal occurrences of symptoms that characterize disorders such as obsessive-compulsive disorder and depression (e.g., Angelakis et al. 2017; Fountoukakis et al. 2001), but the reasons for elevated rates of these disorders in the general population have not been examined. In Greece, and in other cultures, it is possible that unpleasant interactions with significant others (e.g., peers, teachers) or exposure to coercive parental practices may contribute to the development, exacerbation and/or maintenance of the symptoms of these psychopathological conditions.

The current study aimed to develop and examine the psychometric properties of a self-report questionnaire to measure histories of social punishment in interactions with significant others (i.e., peers, parents, and teachers) in a Greek sample. We first sought to construct and evaluate the psychometric properties of a measure that assesses personal experiences of social punishment by utilizing both traditional and alternative validating methods. A second goal of the study was to explore the relationship between social punishment experiences and psychological conditions. We included measures of obsessive-compulsive disorder and depression, given the already established linkages between these disorders and experiences of physical punishment or trauma (Afifi et al. 2006; MacMillan et al. 1999). Last, and in line with previous research suggesting that males are more prone to receiving harsh physical punishment than females (Afifi et al. 2012), we aimed to examine whether males would report more adverse social experiences than females, and whether such reports will be linked to more symptoms of psychopathology. Study 1 provided a first sample to examine the psychometric properties of the scale. In Study 2, we further evaluated the psychometric properties to verify the factor structure and explore construct validity. In Study 3, we combined study samples 1 and 2 to investigate the relationships between the scale, its sub-scales, and measures of psychological conditions, and the role of gender.

Method

General Procedure

Participants were recruited from a university sample (via classroom presentations and on-campus recruitment) and from the larger community by visiting local businesses (e.g., coffee shops, cinemas) and were approached by the first author and research assistants. As all information was written in Greek, potential participants had to speak Greek fluently in order to participate in the study. Those who agreed to participate were first asked to read and sign an informed consent form, after which they were asked to complete a number of self-report measures (described below) assessing symptoms that characterize obsessive-compulsive disorder and depression as well as the newly developed scale that measures personal histories of social punishment. In addition to these scales, participants also reported information on demographic characteristics (i.e., age, gender, occupation, socio-economic status). Completion of the study's measures required approximately 20–30 min. Participants did not receive money, credit, or other incentives for their participation. All participants were debriefed regarding the purposes of the study on completion of the questionnaires.

Study 1: Factor Structure, Test-Retest Reliability and Inter-Factor Correlations

Participants

This sample consisted of 498 adults (96 males, 402 females) aged between 18 and 63 years old ($M = 25.59$, $SD = 9.71$). As detailed in Table 1, more than half of the study sample (60.7%) were employed members of the community, whereas 33.4% were university students at the time of data collection. With regard to education, 55.2% of the non-student sample had received university education, whereas 11% had only

Table 1 Descriptive characteristics of the study samples

	Study 1*		Study 2**			
	N	%	*N*	%	X^2 (*df*)	*P*
Gender						
Male	96	19.3	305	39.2		
Female	402	80.7	474	60.8	55.71 (1)	<0.001
Place of Residence						
Athens	471	94.6	741	95.2		
Outside Athens	25	5.0	36	4.6		
Outside Greece	2	0.4	1	0.1	1.03 (2)	0.58
Occupation						
Student	166	33.4	375	48.1		
Employed	303	60.7	341	43.8		
Unemployed	16	3.2	42	5.4		
Retired	13	2.7	21	2.7	36.45 (3)	<0.001
Educational Level						
None	1	0.2	2	0.2		
Secondary	55	11.0	209	26.9		
Undergraduate Degree	227	45.6	150	19.3		
Postgraduate Degree	49	9.8	43	5.5		
Student at Data Collection	166	33.4	375	48.1	131.56 (4)	<0.001
Socio-economic Status						
0–900 €	43	8.6	108	13.8		
901–2100 €	213	42.8	400	51.4		
2101–2700^{+} €	242	48.6	271	34.7	26.10 (2)	<0.001
	M	*SD*	*M*	*SD*	*t*	*P*
Age	25.59	9.71	29.16	11.31	−5.81	<0.001
HoSP	14.86	9.69	15.72	10.39	−1.46	0.15
Aversive control from peers	6.88	5.75	7.25	6.38	−1.06	0.29
Aversive control from parents	6.06	4.41	6.01	4.28	−0.17	0.86
Aversive control from teachers	1.98	2.36	2.41	2.72	−2.89	<0.001

HoSP = History of Social Punishment; *M* = Mean; *SD* = Standard Deviation, * *N* = 498, ** *N* = 779

received secondary education. Less than half of the participants (42.8%) declared an average household income ranging from 901 to 2100 euros per month (indicating a low to middle class socioeconomic standing), whereas 48.6% declared an average income higher than 2100 euros per month (indicating a middle to high socioeconomic standing). Only 8.6% declared an income lower than 901 euros per month.

Scale Development

A six-stage process was followed in the development of the scale (e.g., Worthington and Whittaker 2006): (a) definition of the construct to be measured, (b) item formulation & determination of the scale's format, (c) review of the items by a panel of experts, (d) agreement on the inclusion/exclusion of the different social groups, (e) item modification and selection, and (f) second review of the remaining social groups and their corresponding items by a new panel of experts.

(a) *Definition of the construct to be measured*: A committee comprised of two experts in the field and two undergraduate students specified the construct to be measured as the *personal history of social punishment*. The term *social* refers to the personal interactions of an individual with other people, including peers, parents/caregivers, teachers, and colleagues. According to the extant literature of punishment in the behavioral sciences (e.g., Azrin and Holz 1966; Dinsmoor 1954, 1955), *punishment* was defined in procedural terms as the delivery of aversive stimuli during social interactions with the significant others, or the loss of access to previously pleasant events,

(b) *Item formulation & determination of the scale's format*: Following a review of the existing literature relating to the effects of punishment on humans, free association was the primary method used to create and collect the scale's items (see, DeVellis 2003). Thus, an initial pool of items reflecting adverse practices of behavioral control

from four social groups, which are considered representative of an adult person's life, namely peers, parents/guardians, teachers/professors and employers/colleagues, was formulated. Each category comprised at least 30 different items, which were considered to reflect sufficiently a personal history of social punishment. All answers were graded on a 5-grade scale, ranging from 0 = *totally disagree* to 4 = *totally agree*,

(c) *Review of the items by a panel of experts*: A panel of experts in the field comprised of six psychologists initially assessed the appropriateness of the social groups and their corresponding items in measuring a personal history of social punishment, as specified by the definition above. A 5-point Likert scale, ranging from 0 = *irrelevant* to 4 = *very relevant* was utilized. As a result, the items that reflected clinical symptoms of psychological disorders as well as other less relevant items (e.g., items that did not fit adequately the definition of social punishment) initially were indicated and subsequently excluded from the final item selection,

(d) *Agreement on the inclusion/exclusion of the different social groups*: A consensus was reached among the members of the committee that peers should be the focus of the scale development. This decision was based on two reasons: First, peers are a fundamental source of personal contact among people of various ages (e.g., children, adolescents, adults). Second, this social group refers to all kinds of interpersonal relationships that people develop (e.g., amicable, sexual, professional). However, two additional categories, parents and teachers, were included in the final scale development as they were judged as important in a person's life. Employers/colleagues was removed from the final version of the scale to account for people who did not or had never worked,

(e) *Item modification and selection*: Only items that were scored as either 3 = *relevant* or 4 = very relevant by all the three experts were included in the final scale. Initially, the category of "peers" retained 11 items, the category of "parents/caregivers" retained 6 items and the category of "teachers" retained 4 items,

(f) *A second review of the remaining social groups and their corresponding items by a new panel of experts*: A new panel of experts comprised of three experts reviewed the final scale development and provided feedback on its appropriateness to capture the construct to be measured. During this process, 3 additional items from the category of "peers", 1 item from the category of "parents", and 1 item from the category of teachers were excluded as they were rated as *less* relevant. The final scale retained 16 items in total (aversive control from peers = 8 items; aversive control from parents = 5 items; aversive control from teachers = 3 items). The instructions were as follows: "*Please read the following items and choose the answers that describe closely your personal experiences that you used to have with your significant others*". This scale was called the History of Social Punishment (HoSP).

Statistical Analyses

IBM SPSS® (version 23.0) statistical package was used for data analyses. All variables were tested for normality by assessing the measure of skewness for every item. Analyses revealed normal distributions. We then employed an explanatory factor analysis (EFA) with promax rotation due to the strong correlations of the HoSP scale variables. To examine test-retest reliability, the HoSP was re-distributed to 105 participants (48% of the sample was comprised of undergraduate students) 30 days after its initial administration. Pearson product-moment correlation coefficients were calculated together with intraclass correlation coefficients to examine test-retest reliability of the HoSP and its sub-scales.

Results

Factor Structure of the Scale

We performed an EFA on the 16 items with the promax rotation method due to strong inter-factor correlations. The Kaiser-Meyer-Olkin measure of sampling adequacy was found to be as high as 0.89, exceeding the recommended value of 0.6. Bartlett's test of sphericity also was significant (x^2 (120) = 3028.67, $p < 0.001$), demonstrating sufficiently large correlations between the items of the scale to perform such an analysis. This solution produced three independent factors based on eigenvalues, which exceeded Kaiser criterion (< 1; Kaiser 1960) and in combination explained 57.75% of total variation. The inspection of the scree plot clearly supported the extraction of three components for this scale. Table 2 presents the factor loadings of the items of HoSP, after a promax rotation was performed. The items that are grouped around the same components suggest that component 1 represents aversive control from peers, component 2 aversive control from parents, and component 3 aversive control from teachers. The application of EFA also supported the construct validity of the HoSP scale, which yielded a three-factor solution conforming to the initial conceptualization of the scale (i.e., aversive control from peers, parents and teachers as three distinct categories).

Internal Consistency of HoSP and its Sub-Scales

All the sub-scales, namely aversive control from peers, aversive control from parents and aversive control from teachers demonstrated an excellent internal consistency (all

Table 2 Summary of exploratory* and confirmatory** factor loadings from the HoSP

	Rotated factor loadings			Confirmatory factor loadings
	Aversive control from peers	Aversive control from parents	Aversive control from teachers	
1. I have felt rejection by my peers, acquaintances or family.	**0.80**	−0.10	0.04	**0.79**
2. Friends or acquaintances have cut me off.	**0.76**	−0.08	0.06	**0.75**
3. I have experienced negative comments concerning characteristics of my body or face.	**0.76**	0.02	−0.04	**0.65**
4. Peers have turned violent towards me.	**0.74**	0.03	−0.03	**0.78**
8. I have been bullied by my peers.	**0.74**	0.03	−0.02	**0.80**
9. People have made fun of my behavior in public.	**0.74**	−0.06	−0.02	**0.71**
14. I was a wallflower at school.	**0.63**	−0.16	0.07	**0.64**
15. I have experienced bad things because of running late.	**0.54**	0.14	−0.04	**0.64**
6. My parents were quite strict with me.	−0.01	**0.92**	0.14	**0.67**
7. My parents could often be quite bossy.	0.13	**0.80**	0.12	**0.79**
12. My parents didn't forgive my mistakes easily.	0.11	**0.80**	0.09	**0.67**
13. My parents used to punish me often as a child.	0.13	**0.71**	−0.12	**0.72**
16. My parents used to reprimand me.	0.15	**0.62**	0.03	**0.74**
5. My relations with my teachers were usually bad.	0.02	0.03	**0.87**	**0.79**
10. My teachers usually underestimated me.	0.12	0.05	**0.83**	**0.82**
11. My teachers often used to scold me.	0.12	0.09	**0.78**	**0.73**
Eigenvalues	5.59	2.11	1.54	–
% of variance	34.91	13.21	9.62	–
a	0.86	0.83	0.79	–

Factor loadings over **0.50** appear in bold. *$N = 498$, ** $N = 779$

coefficients exceeding 0.79). Further, the internal consistency of the overall scale was high, Cronbach's $\alpha = 0.87$.

Test-Retest Reliability

As shown in Table 3, test-retest reliability for the overall HoSP and its sub-scales was high, ranging between 0.82 and 0.88. The intraclass correlation coefficients (ICCs) also were very good or excellent for the total HoSP, ICC = 0.88, with 95% confident interval ranging from 0.81 to 0.93; for the aversive control from peers, ICC = 0.82, with 95% confident interval ranging from 0.72 to 0.88; for the aversive control from parents, ICC = 0.88, with 95% confident interval ranging from 0.81 to 0.93; and for the aversive control from teachers, ICC = 0.86, with 95% confident interval ranging from 0.79 to 0.91.

Inter-Factor Correlations

All sub-scales were strongly correlated with the overall scale (r ranges from 0.86 to 0.64), revealing that all factors represent a similar theoretical concept (i.e., social punishment). The inter-correlations among the sub-scales ranged from $r = 0.39$ to 0.31 suggesting that they measure similar but not same concepts (see Table 6).

Study 2: Further Exploration of the Construct Validity of the HoSP Scale

Participants

This sample was comprised of 779 participants (305 males, 474 females) aged between 18 and 67 years old ($M = 29.16$, $SD = 11.32$). As shown in Table 1, university students comprised 48.1% of this sample, whereas 43.8% of the participants were employed members of the community. With regard to their education, 24.78% of the non-student sample had received university education, whereas 26.9% had only received secondary education. More than half of the participants (51.4%) declared an average household income that ranged from 901 to 2100 euros per month, meaning that most were from middle class backgrounds. More than one third of the sample (34.7%) declared an average household income between 2100 to 2700 euros per month or higher, meaning that they came from a middle or higher socioeconomic class. Only 13.8% declared an average household income lower than 901 euros per month.

Statistical Analyses

IBM AMOS® (version 23.0) statistical package was used for data analyses. All the variables to be included for analyses

Table 3 Test-retest reliability for overall HoSP and its sub-scales (N = 105)

	Pearson's Correlation Coefficient (r)
Aversive control from peers	0.82
Aversive control from parents	0.88
Aversive control from teachers	0.86
Total HoSP	0.88

All correlations are significant in level $p < 0.001$, HoSP = History of Social Punishment, N = Total number of participants

were tested for skewness. The variables did not differ from a normal distribution. To assess whether the data fit the hypothesized factor structure produced by applying an EFA in study sample 1, we employed a confirmatory factor analysis (CFA) utilizing the maximum likelihood estimation method. Structural equation modeling (SEM) methods also were applied to explore further HoSP's reliability and validity. In particular, we examined convergent validity by calculating Average Variance Extracted (AVE) scores, discriminant validity by computing square roots of AVE, and internal consistency for HoSP's sub-factors by calculating Composite Reliability (CR) scores.

Results

Descriptive Statistics

Table 1 presents the descriptive characteristics of the two study samples separately. The study samples differed on age, gender, occupation, educational level and socioeconomic status. In addition, participants from study 2 reported having experienced more aversive control from teachers ($M = 2.41$, $SE = 0.11$) than participants who comprised sample 1 ($M = 1.98$, $SE = 0.10$), $t(1275) = 2.98$, $p < 0.001$, $d = 0.18$. However, the calculation of the effect size revealed that this difference was small.

Construct Validity

The CFA showed that the model had a significant Chi-square, $x^2(101) = 416.85$, $x^2/d.f. = 4.13$, $p < 0.001$. However, due to the inherited problems of this method, our evaluation of the goodness of fit of the scale was based exclusively on the rest indices. The model was found to have a GFI of 0.94, a CFI of 0.94, a RMSEA of 0.05, a RMR of 0.06 and a SRMR of 0.05. These indices suggest that the three-factor structure of the scale provided a good conceptual fit to the data. As shown in Table 4, a one-factor model also was tested but data failed to fit the model.

Table 5 Average Variance Extracted (AVE) and Composite Reliability (CR) indexes of HoSP's sub-scales (N = 779)

	AVE (above 0.5)	CR (above 0.6)
Aversive control from peers	0.52	0.99
Aversive control from parents	0.52	0.93
Aversive control from teachers	0.61	0.91

Note: HoSP = History of Social Punishment, N = Total number of participants

Internal Consistency of HoSP's Sub-Scales

We examined internal consistency of the HoSP's sub-scales by calculating CR indexes for each of the individual constructs. CRs for all the sub-scales exceeded the recommended value of 0.6 for all the three sub-scales, as shown in Table 5.

Convergent Validity

Table 5 also presents the calculations of the AVE indexes for all the three factors. All indexes exceeded the recommended value, which is 0.5, suggesting that the HoSP scale achieved convergent validity.

Discriminant Validity

As detailed in Table 6, square roots for AVE indexes (diagonal values in bold) were higher than the values in the rows and columns, indicating that the HoSP scale achieved discriminant validity.

Study 3: Relationship Between Social Punishment and Specific Psychological Disorders

Participants

Participants from Studies 1 and 2 comprised the sample for Study 3. The combined sample consisted of 1.277 adults with

Table 4 Goodness-of-fit indicators of HoSP (N = 779)

Model	X^{2*}	df	x^2/df	GFI	CFI	RMR	RMSEA	SRMR
One-Factor	4603.79	324	14.21	0.76	0.57	0.11	0.10	0.10
Three-Factor	416.85	101	4.13	0.94	0.94	0.06	0.05	0.05

N = Total number of participants

*$p < 0.001$

Table 6 Square root of AVE indexes and pearson inter-correlations between the overall HoSP and its sub-scales ($N = 779$)

	Aversive control from peers	Aversive control from parents	Aversive control from teachers	HoSP
Aversive control from peers	**0.72**			0.86
Aversive control from parents	0.36	**0.72**		0.75
Aversive control from teachers	0.39	0.31	**0.78**	0.64

All correlations are significant in level $p < 0.001$, *HoSP* = History of Social Punishment; N = Total number of participants

a mean age of 27.77 (SD = 10.85; 31.4% Males). Of those, 42.4% were university students. Almost half of the sample (50.4%) was employed members of the community and 48% reported an average household income that ranged from 901 to 2100 euros per month, indicating middle class SES.

Additional Measures

Obsessive-Compulsive Inventory Revised (OCI-R; Foa et al. 2002) OCI-R is an 18-item self-report questionnaire assessing the whole range of the symptoms that are encountered in patients suffering from obsessive-compulsive disorder. It comprises six different sub-scales, namely, washing, checking, orderliness, hoarding, neutralization and obsessions. The answers are rated using a 5-point scale, ranging from 0 = *never* to 4 = *very much*. Several studies have reported very good to excellent psychometric properties (Angelakis et al. 2017). In this study, the alpha coefficient was 0.89.

Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff 1977) CES-D is a self-report questionnaire consisting of 20 items measuring the severity of depressive symptoms during the past week in the general population. Answers are rated in a 4-point scale, ranging from 1 = *rarely* to 4 = *most of the time*. CES-D has found to have good to very good psychometric properties (Fountoukakis et al. 2001). In this study, the alpha coefficient was 0.85.

Statistical Analyses

Partial correlations adjusting for gender and age were performed to examine relationships between HoSP, its sub-scales, and OCI-R and CES-D. We calculated z scores to assess the equality of the correlation coefficients. Independent-samples t-tests were calculated to investigate any potential differences between males and females in reporting adverse social experiences. Last, we performed hierarchical regression analyses separately for males and females adjusting for age to investigate whether reporting more adverse social experiences lead to also declaring more symptoms of psychopathology.

Results

As detailed in Table 7, significant positive correlations were found between HoSP and OCI-R ($r = 0.40$, $p < 0.001$), and HoSP and CES-D ($r = 0.48$, $p < 0.001$). Significant correlations also were depicted between aversive control from peers and OCI-R ($r = 0.36$, $p < 0.001$), or CES-D ($r = 0.44$, $p < 0.001$). Aversive control from parents correlated moderately with OCI-R ($r = 0.30$, $p < 0.001$) and CES-D ($r = 0.33$, $p < 0.001$). Weaker associations were found between aversive control from teachers and OCI-R ($r = 0.24$, $p < 0.001$), or CES-D ($r = 0.26$, $p < 0.001$).

Comparisons between HoSP/OCI-R and HoSP/CES-D ($z_{Difference} = -3.74$, $p < 0.001$) demonstrated a significant difference. Comparisons between the three sub-scales and OCI-R demonstrated that aversive control from peers was associated higher with OCD symptoms compared to aversive control from parents ($z_{Difference} = 2.05$, $p = 0.02$) and aversive control from teachers ($z_{Difference} = 4.14$, $p < 0.001$), whereas aversive control from parents was superior to aversive control from teachers ($z_{Difference} = 1.92$, $p = 0.03$). Aversive control from peers was associated more strongly with depressive symptoms as compared to either aversive control from parents ($z_{Difference} = 3.88$, $p < 0.001$), or aversive control from teachers ($z_{Difference} = 6.40$, $p < 0.001$). Aversive control from parents was associated more strongly with depression compared to aversive control from teachers ($z_{Difference} = 2.27$, $p < 0.001$).

On average, men stated that they had experienced a more aversive social environment ($M = 17.49$, $SE = 0.52$) than women ($M = 14.45$, $SE = 0.33$), $t(1275) = 5.02$, $p < 0.001$, $d = 0.30$. Men also reported more aversive control from their peers ($M = 8.40$, $SE = 0.34$) than women ($M = 6.52$, $SE = 0.19$), $t(1275) = 5.12$, $p < 0.001$, $d = 0.30$, as well as experiencing more aversive control from their teachers ($M = 2.98$, $SE = 0.15$) than women ($M = 1.92$, $SE = 0.08$), $t(1275) = 6.87$, $p < 0.001$, $d = 0.40$.

The outcomes from the regression analyses demonstrated that HoSP significantly predicted obsessive-compulsive, $b = 0.47$, $t(399) = 10.50$, $p < 0.001$, and depressive symptoms in men, $b = 0.55$, $t(399) = 13.32$, $p < 0.001$. HoSP explained a significant proportion of variance in obsessive-compulsive scores, $R^2 = 0.23$, $F(1, 399) = 110.24$, $p < 0.001$, and in depression scores, $R^2 = 0.31$, $F(1, 339) = 177.36$, $p < 0.001$. As

Table 7 Partial correlations between HoSP and its sub-scales, and OCI-R and CES-D adjusting for gender and age ($N = 1277$)

	HoSP	Aversive control from peers	Aversive control from parents	Aversive control from teachers
OCI-R	0.40	0.36	0.29	0.24
CES-D	0.48	0.44	0.31	0.26

All correlations are significant in level $p < 0.001$, *HoSP* = History of Social Punishment; *OCI-R* = Obsessive-Compulsive Inventory-Revised; *CES-D* = Centre for Epidemiologic Studies Depression Scale; *N* = Total number of participants

shown in Tables 8 and 9, HoSP's sub-scales, namely aversive control from peers, parents and teachers, also significantly predicted obsessive-compulsive, and depressive symptoms in men. Further, HoSP significantly predicted obsessive-compulsive, $b = 0.38$, $t(873) = 12.07$, $p < 0.001$, and depressive symptoms in women, $b = 0.44$, $t(873) = 14.26$, $p < 0.001$. HoSP explained a significant proportion of variance in obsessive-compulsive scores, $R^2 = 0.17$, $F(1, 873) = 145.67$, $p < 0.001$, and in depression scores, $R^2 = 0.20$, $F(1, 873) = 203.34$, $p < 0.001$. While aversive control from peers and parents significantly predicted obsessive-compulsive and depressive symptoms in women, aversive control from teachers did not (see Tables 8 and 9).

General Discussion

Whilst previous research has examined the effects of traumatic events, such as sexual, emotional or physical abuse, on later psychological well-being (e.g. Barnow et al. 2001; Levitan et al. 2003; Molnar et al. 2001), the effects of personal histories of social punishment that occur in everyday interactions has received considerably less (if any) attention. Measurement of such histories may significantly expand research examining the link between common aversive social events and the subsequent development or worsening of psychological conditions. This study demonstrated that the HoSP is a psychometrically sound instrument for measuring these types of events.

The EFA showed that the HoSP had a structure consisting of three factors: (a) aversive control from peers; (b) aversive control from parents; and (c) aversive control from teachers. The CFA demonstrated a good conceptual fit of this three-factor solution to the data, supporting further the construct validity of the HoSP scale. Cronbach's alpha calculations revealed that all the sub-scales were characterized by very good to excellent internal consistency and the overall scale had excellent internal consistency. Further, computation of composite reliability indexes verified that HoSP's sub-scales had excellent internal consistency.

Table 8 Results from the regression analyses adjusted for age and conducted separately for males and females, examining the HoSP, and its sub-scales as predictors of symptoms that characterize obsessive-compulsive disorder as measured by OCI-R ($N = 1277$)

Gender	Step	Variable entered	*B*	*SE*	β	Total $R^2(f^2)$	$\Delta R^2(f^2)$
Males	1	Age	0.11††	0.05	0.11	0.01†† (0.00)	
	2	Age	0.11††	0.04	0.11	0.23† (0.30)	0.22† (0.28)
		HoSP	0.42†	0.04	0.47		
	1	Age	0.10††	0.05	0.11	0.01 (0.00)	
	2	Age	0.11††	0.04	0.11	0.23† (0.30)	0.22† (0.28)
		Peers	0.45†	0.07	0.31		
		Parents	0.30††	0.12	0.13		
		Teachers	0.65†	0.14	0.20		
Females	1	Age	0.13†	0.04	0.16	0.03† (0.03)	
	2	Age	0.11†	0.03	0.12	0.17† (0.20)	0.14† (0.16)
		HoSP	0.45†	0.04	0.38		
	1	Age	0.17†	0.05	0.16	0.03† (0.03)	
	2	Age	0.13†	0.05	0.11	0.17† (0.20)	0.14† (0.16)
		Peers	0.54†	0.07	0.26		
		Parents	0.42†	0.09	0.16		
		Teachers	0.23	0.20	0.05		

HoSP = History of social punishment; *Peers* = Aversive control from peers; *Parents* = Aversive control from parents; *Teachers* = Aversive control from teachers; *OCI-R* = Obsessive-Compulsive Inventory-Revised; *SE* = Standard Error

† $P < 0.001$, †† $P < 0.05$

Table 9 Results from the regression analyses adjusted for age and conducted separately for males and females, examining the HoSP, and its sub-scales as predictors of symptoms that characterize depression as measured by CES-D ($N = 1277$)

Gender	Step	Variable entered	*B*	*SE*	β	Total $R^2(f^2)$	$\Delta R^2(f^2)$
Males	1	Age	0.01	0.04	0.01	0.00 (0.00)	
	2	Age	0.01	0.04	0.01	0.31† (0.45)	0.31† (0.45)
		HoSP	0.49†	0.04	0.55		
	1	Age	0.01	0.04	0.01	0.00 (0.00)	
	2	Age	0.02	0.04	0.02	0.31† (0.45)	0.31† (0.45)
		Peers	0.56†	0.06	0.42		
		Parents	0.46†	0.11	0.21		
		Teachers	0.31††	0.14	0.10		
Females	1	Age	0.09†	0.03	0.11	0.11†† (0.12)	
	2	Age	0.05††	0.03	0.06	0.20† (0.25)	0.19† (0.23)
		HoSP	0.28†	0.02	0.44		
	1	Age	0.09†	0.03	0.11	0.11†† (0.12)	
	2	Age	0.05††	0.03	0.06	0.20† (0.25)	0.19† (0.23)
		Peers	0.46†	0.06	0.29		
		Parents	0.40†	0.07	0.20		
		Teachers	0.20	0.13	0.06		

HoSP = History of social punishment; *Peers* = Aversive control from peers; *Parents* = Aversive control from parents; *Teachers* = Aversive control from teachers; *CES-D* = Centre for Epidemiologic Studies Depression Scale; *SE* = Standard Error

† $P < 0.001$, †† $P < 0.05$

Test-retest reliability was found to be excellent between the two measurements of the overall HoSP and its sub-scales within a one-month period. The calculation of intraclass correlation coefficients also verified the very good or excellent reliability of the scales. As an individual's personal history of social punishment is not expected to change significantly over the short term, the test-retest reliability method offers a very good assessment of the reliability of this scale (see, Fleiss 1986).

Due to the absence of a scale that measures a similar construct, both convergent and discriminant validity of the HoSP scale were assessed by calculating average variance extracted scores as well as square roots for average variance extracted scores according to structural equation modeling (Kline 2005). These calculations, which are considered to be more conservative compared to classical methods (e.g., Bagozzi et al. 1991), fully supported that the HoSP scale achieved convergent and discriminant validity, suggesting that this measure reliably assesses the construct of social punishment history.

Strong correlations were found between the HoSP and its sub-scales, namely aversive control from peers, parents and teachers, indicating that social negative experiences are reported similarly independent of the source of the perpetrator. HoSP's sub-scales were correlated moderately with one another, suggesting that they may measure similar, but not identical concepts.

In this study, both classical (e.g., based on EFA and Cronbach's alpha) and modern (e.g., based on structural equation modeling) methods were utilized to examine the psychometric properties of the HoSP scale, which verified the very good or excellent properties of this measure. An additional core strength is the utilization of two large groups of participants from the community. Even though the samples were demographically diverse, both EFA and CFA supported a three factor solution, suggesting very good or excellent psychometric properties across the different samples. We also consider the utilization of a relatively under-studied population (i.e., Greeks) to be an additional strength of the study.

The current study explored the relationship between social adverse experiences and psychopathology, including obsessive-compulsive disorder and depression. We found positive associations between individual experiences of social punishment and the behaviors that characterize these psychological conditions. The positive association between a history of substantial social punishment and OCD features, and even stronger associations with depression, supported previous findings suggesting that depressed patients are more sensitive to social-related aversive stimuli compared to OCD sufferers, who seem to be more sensitive when exposed to general threats of punishment (e.g., germs, fire; Parrish and Radomsky 2010). Ultimately, the fact that the full scale score correlated highly with measures of psychopathology indicates that experiencing adverse social events from multiple significant others (i.e., peers, parents, teachers) increases the likelihood of suffering from anxiety or depressive mental health conditions.

Aversive control from parents was strongly associated with depression and obsessive-compulsive symptoms. Although the exact mechanisms remain to be explored by future studies, these findings suggest that aversive parental practices may be linked to the development of maladaptive behaviors (i.e., checking, cleaning), potentially due to the fact that threat of punishment evokes more OCD-like behaviors (i.e., safety behaviors; Angelakis and Austin 2015) and consequently this creates a negative environment that elicits depressed-related feelings or behaviors (e.g., feelings of helplessness, Nickerson et al. 2013).

Significant correlations also were found between these two psychological conditions and aversive control from teachers. In line with previous research that has found associations between corporal punishment and development of problematic behavior later in life (e.g. antisocial behavior; Hyman 1995; Hyman and Perone 1998), the current findings suggest that milder forms of punishment by teachers might also affect later behavior and adjustment. This may be a fruitful area of additional research in investigating how the interactions with teachers may affect children's experiences later in life by identifying the exact mechanisms that contribute to the development of various psychological conditions.

When compared to outcomes for social punishers delivered by parents and teachers, aversive control by peers had slightly stronger associations with OCI-R and CES-D. These associations suggest an important link between the peer-mediated social punishers and the development of these psychological conditions. Previous research has demonstrated that children who are rejected by their peers are at greater risk for externalizing and internalizing behavior problems in adolescence (Coie et al. 1995). Given that rejected children are likely to be the victims of the social punishers assessed by the HoSP, the current findings have implications for future measurement of social punishment and its impact later in life.

The current study also examined gender differences in reporting adverse social experiences, and whether these differences would predict more psychopathological symptoms. Our findings demonstrated differences between men and women with regard to their personal histories of social punishment, with men stating that they had experienced more aversive events in their lives compared to women. These results are consistent with the existing literature, which suggests that men are generally more likely than women to experience harsher forms of corporal punishment (Afifi et al. 2012; Gershoff et al. 2015). We found that reporting more adverse social experiences with important others was a significant predictor of symptoms of obsessive-compulsive disorder and depression. Specifically, the males of our sample reported more obsessive-compulsive and depressive symptoms. Similarly, and consistent with the literature (e.g., Gershoff et al. 2015), for the female sample, who did not report having disadvantageous experiences at school, aversive control from teachers was not identified as a significant predictor of psychopathology.

Despite the strengths of the current investigation, some limitations should be noted. As with any cross-sectional study, causality cannot be inferred and results should be interpreted with caution. It also may be important to note that the weaker association between the aversive control from teachers and the features of OCD and depression might have resulted from exclusive recruitment of an adult population ($M_{age} = 27.77$; $SD = 10.85$). This means that the potential effects of the aversive interactions with teachers may have been obscured by the more recent adverse social experiences with significant others (e.g., peers, parents). Therefore, it would be interesting for future studies to compare these results to those of a younger sample. Another potential issue with the sample was that it was comprised predominantly by females. Future research should explore the psychometric properties of the HoSP scale with a more gender balanced sample. It also would be interesting to test the psychometric properties of the scale in clinical populations, where adverse social experiences may be more prevalent.

Demonstrating that the HoSP scale is a sound psychometric tool for measuring the experiences of adverse social interactions with significant others is potentially significant to both researchers and clinicians. We anticipate that the current study will stimulate further research to refine the psychometric properties of the scale, as well as validating those properties in other cultures or among the diverse clinical settings (e.g., hospitals, mental health clinics). The utilization of such a scale will be beneficial as it will provide clinicians with a quick and immediate measure of potentially important social interactions with significant others.

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Compliance with Ethical Standards

Conflict of Interest Ioannis Angelakis, Jennifer L. Austin, Charlotte Slater and Gareth Roderique-Davies declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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