



Revisiting a taxonomy of social anxiety and assertiveness in adolescence: evidence for a cognitive approach

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Abstract

This research explored a taxonomy combining social anxiety and assertiveness and further applied a cognitive approach for predicting those constructs in adolescents. Participants were 679 adolescents (mean age = 16.68; 61.3% female) who self-reported on interpersonal assertive schemas, negative automatic social thoughts, social anxiety, and assertive behavior. Social anxiety and assertive behavior were grouping variables in a cluster analysis, resulting in three groups: assertive, indifferent, and socially anxious adolescents. The moderator role of the groups was then studied within a structural equation model proposing both social anxiety and assertive behavior to be predicted by cognitive schemas and automatic thoughts. This model fitted all three groups, portraying assertive behavior as directly predicted by cognitive structures whereas social anxiety was directly dependent on automatic thoughts. Assertive deficit and social anxiety seem to co-occur and fit within a theoretical and practical cognitive approach, demanding careful consideration of specific symptomology in adolescent social anxiety.

Keywords Social anxiety · Assertiveness · Adolescence · Cognitive models · Structural equation modelling

Introduction

Social anxiety refers to intense emotional and physiological reactions to social events that persist over time. Such events may represent three core social fears: interaction, observation and performance (Kodal et al., 2017). Social anxiety increases in the transition from childhood to the beginning of adolescence (approximately ages 9 to 15; e.g., Miers, Blöte, de Rooij, Bokhorst, & Westenberg, 2013), and an adolescent beginning of social anxiety disorder predicts social anxiety and other psychiatric disturbances in adulthood (Essau, Lewinsohn, Olaya, & Seeley, 2014).

Social anxiety may be particularly detrimental to adolescents because of its impact on their social success, which is paramount for them to experience and define their personal and social identity. Socially anxious adolescents experience

negative interactions from their peers (Blöte, Kint, & Westenberg, 2007), which both them and their peers are aware of (Blöte & Westenberg, 2007; Miers, Blöte & Westenberg, 2010). These negative interactions may be a natural response to socially anxious adolescents being less socially skilled when evaluated by same-age and different-age confederates (Inderbitzen-Nolan, Anderson, & Johnson, 2007; Miers et al., 2010; Miers, Blöte, Bokhorst, & Michiel Westenberg, 2009). Hence, these adolescents may have reason to believe they are not socially skilled, thus expecting others to provide negative social outcomes (for a review see Miers, Blöte, & Westenberg, 2011) and, ultimately, engaging in a high social anxiety developmental trajectory (Miers et al., 2013).

Accordingly, Levitan and Nardi (2009) concluded that studies with socially anxious children and adolescents consistently found concomitant social skills deficits. Alternatively, social support and social skills may serve a compensatory function so as not to develop increasing levels of social anxiety (Miers et al., 2013).

Assertiveness is a social skill that is suggested to be associated with socially rewarding and long-term relationships (Marchezini-Cunha & Tourinho, 2010). It refers to self-expression and affirmation in interpersonal situations, while considering the right of others to self-express and affirm (Rakus, 1991). It can be applied to various social events, namely the expression of positive and negative feelings, the

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expression and management of personal limitations, and initiating assertiveness (Arrindell et al., 1990). According to Arrindell et al. (1990), high levels of assertiveness may combine with either low social anxiety (*i.e.*, assertive) or high social anxiety (*i.e.*, anxious performer), as well as low levels of assertiveness may be present with either low social anxiety (*i.e.*, doesn't care individual) or high social anxiety (*i.e.*, non-assertive or shy – socially anxious). Such four-group taxonomy has not, to our knowledge, been investigated, though it has *a priori* been considered to exist in adolescents (*i.e.*, socially anxious good Vs poor performers; Miers et al., 2009) and in adults (*i.e.*, reticent Vs non-reticent inpatients; Van Dam Baggen & Kraaimaat, 2000).

Moreover, no investigation has considered the underlying psychological mechanisms that may explain differences between those groups. Cognitive models have been proposed to explain both assertiveness (Vagos & Pereira, 2016) and social anxiety (Clark, 2005). Though acknowledging specificities in relation to the cognitive contents underlying each of these conditions (*i.e.*, assertiveness and social anxiety; see below), these cognitive models propose the same pathways as explicative of psychological functioning, namely that cognitive structures (*i.e.*, schemas) guide subsequent situation-based cognitive processes (*i.e.*, attention, interpretation, and memorization), resulting in automatic thoughts, which, in turn, elicit affective and behavioral reactions. As applied to adolescent assertiveness, Vagos and Pereira (2018) found positive interpersonal schemas (e.g., a sense that one is lovable) predicted assertive behavior, by feeling less distressed when acting assertively; the authors did not consider automatic thoughts. As for adolescent social anxiety, early interpersonal schemas predicted social anxiety, via negative automatic thoughts (Calvete, Orue, & Hankin, 2013). Moreover, both assertiveness and social anxiety were predicted (positively and negatively, respectively) by representing oneself as independent from others (Aoki, Mearns, & Kurpius, 2017).

The current work investigated the existence of the groups proposed to present different combinations of assertiveness and social anxiety, and further validated them based on external variables, namely levels of social anxiety, levels of assertiveness, and gender. Girls were expected to be more prevalent in groups of high social anxiety, because girls typically state they feel more socially anxious than boys (Furmark, 2002). Alternatively, boys and girls were hypothesized to be similarly distributed in the normative/assertive group because practice of assertive behavior has not been meaningfully distinguished by gender in adolescents (Vagos et al. 2014a). This work also explored how a framework based on cognitive models accounted for the cognitive-affective-behavioral characteristics of each of those groups. This model was expected to fit all groups, even if groups' mean level differences were expected (e.g., the socially anxious group is expected to present higher scores on social

anxiety and on negative automatic thoughts and lower levels of positive beliefs and assertive behavior, in comparison with the assertive group); previous theoretical and empirical evidence does not allow for specific hypothesis for the indifferent and anxious performer groups, for which analyses will, hence, be exploratory.

Method

Sampling Procedures and Sample Description

Six urban public secondary schools in the Centre region of Portugal were selected according to their standing in the national ranking, which is based on each school's average student academic performance. Two schools were selected to represent the group of low, the group of medium and the group of high academic performance. One of the schools representing the middle academic performance group refused to participate and wasn't replaced for lack of timely authorization from the national ethics committee. Data was gathered in the five participating schools after authorization from the national ethics committee, the executive boards of the schools, parents, and students themselves. In order to preserve the confidentiality of families, no information was provided to the research team on which families refused their child's participation. There were no exclusion criteria; all students enrolled in the 10th through 12th grade were invited to participate in the investigation. They used about 30 to 45 minutes of class time to fill in the self-report instruments (see Instruments section), which were presented in a counterbalanced order. No rewards or incentives were offered to participants, who were told that their participation was voluntary, confidential, and anonymous.

Participants were 679 secondary school students, aged 15 to 20 years old. Regarding sex, 38.4% ($n = 261$) were male and 61.3% ($n = 416$) were female. This samples' mean age was 16.68 ($SD = 1.14$); boys and girls presented similar mean ages (for boys $M = 16.70$, $SD = 1.10$ and for girls $M = 16.68$, $SD = 1.15$; $t(673) = 0.29$, $p = .77$). Boys and girls were similarly distributed by school year [$\chi^2(2) = 0.488$, $p = .78$], but not by socioeconomic status [$\chi^2(2) = 30.76$, $p < .001$], where the vast majority of participants was female (see Table 1).

Instruments¹

Assertive Interpersonal Schema Questionnaire (AISQ; Vagos & Pereira, 2010) Consists of 21 items describing beliefs about interpersonal situations. Participants should rate each item on how much it resembles their usual way of thinking (from 1 = *not at all like me* to 5 = *completely like me*). It

¹ All instruments were used in their Portuguese versions.

Table 1 Demographic characteristics by sex and complete sample

	Male		Female		Complete sample	
	n	%	n	%	n	%
School year						
10 th grade	80	30.7	133	32	215	31.7
11 th grade	93	35.6	152	36.5	245	36.1
12 th grade	88	33.7	129	31	217	32
Socioeconomic status						
Low	40	15.3	146	35.1	186	27.4
Medium	139	53.3	188	45.2	328	48.3
High	66	25.3	70	16.8	137	20.2

Note: Two students did not state their sex nor their school year (0,3%); socioeconomic status could not be inferred for twenty-eight students because they did not provide interpretable information on their parents' profession (4,1%). Socioeconomic status was inferred according to the Portuguese professions classification, based on parents' reported professions. Examples of professions in the high SES group are judges, higher education professors, or MDs; in the medium SES group are nurses, psychologists, or school teachers; and in the low SES group are farmers, cleaning staff, or undifferentiated workers.

includes four subscales, namely outer emotional support (*i.e.*, believing others are suppliers of support, acceptance and affection); practical personal ability (*i.e.*, believing the self is capable of managing daily activities); interpersonal management (*i.e.*, believing that problem solving is part of reciprocal interpersonal encounters), and affective personal ability (*i.e.*, believing one to be lovable). All measures achieved adequate internal consistency values ($\alpha > .75$), and convergent validity in relation to assertive behavior and distress (Vagos & Pereira, 2010). This four-factor measurement model was a good fit to the current data (RMSEA = .048, 90% confidence interval for RMSEA = .043, .054; CFI = .92, SRMR = .058). Likewise, internal consistency values were good for all measures: $\alpha = .82$ for outer emotional support, $\alpha = .83$ for practical personal ability, $\alpha = .76$ for interpersonal management and $\alpha = .77$ for affective personal ability.

Social Thoughts and Beliefs Scale (STABS; Turner, Johnson, Beidel, Heiser, & Lydiard, 2003; Portuguese Version by Vagos, Pereira, & Beidel, 2010) Uses 21 items to assess if the respondent's thoughts are similar to those associated with social anxiety (from 1 = *never characteristic* to 5 = *always characteristic*). Within non-clinical adults, it has shown excellent internal consistency ($\alpha > .89$), convergent validity in relation to depressive and anxious symptoms, loneliness, and fear of negative evaluation; it also showed divergent validity in relation to friendship quality (Fergus, Valentiner, Kim, & Stephenson, 2009). Within clinical samples, excellent internal consistency ($\alpha > .93$) and 1 to 4 week test-retest reliability ($pr > .93$) were also found; the scale also

seemed to be able to distinguish between participants presenting social phobia, other anxiety disorders, and normal controls (Turner et al., 2003).

The Portuguese version of the STABS considers two subscales: discomfort in social interactions and discomfort in public performance. Both showed good internal consistency values ($\alpha > .82$) and convergent validity in relation to social anxiety and social avoidance in a sample of community late adolescents (Vagos et al., 2010). That two-factor measurement model fitted acceptably to the current data (RMSEA = .053, 90% confidence interval for RMSEA = .048, .058; CFI = .92, SRMR = .041) and internal consistency values were also very good: $\alpha = .91$ for social interaction and $\alpha = .83$ for public performance.

Social Anxiety and Avoidance Scale for Adolescents (SAASA; Cunha, Pinto-Gouveia, & Salvador, 2008) Includes 34 items that represent social experiences typical of adolescence. Each item is evaluated concerning anxiety (SAASA anxiety; from 1 = *none* to 5 = *very much*) and avoidance. In line with the goals of the current work, only the anxiety measure was used, which is organized into six dimensions (*i.e.*, interaction with the opposite sex, assertive interaction, observation by others, interaction in new social situations, performance in formal social situations, and eating and drinking in public). These dimensions showed acceptable internal consistency values ($\alpha > .63$; Cunha et al., 2008; Vagos, Pereira, & Cunha, 2013), 5 week test-retest reliability ($r = .74$ for SAASA anxiety), and construct validity in relation to social anxiety, anxiety, depression (Cunha et al., 2008), and negative social thoughts (Vagos et al., 2013).

In order to allow conclusions based on the three core fears of social anxiety in adolescence (Kodal et al., 2017), an interaction dimension (*i.e.*, interaction with the opposite sex, assertive interaction² and interaction in new social situations), an observation dimension (*i.e.*, eating and drinking in public and observation by others), and a performance dimension (*i.e.*, performance in formal situations) were considered for the current work³. This measurement model was a very good fit to the current data (RMSEA = .038, 90% confidence interval for RMSEA = .034, .042; CFI = .94, SRMR = .045). Furthermore, good internal consistency values were found for interaction ($\alpha = .89$), observation ($\alpha = .84$), and performance ($\alpha = .78$).

² Even though the items addressing the assertive interaction dimension resemble those used for assessing assertive performance (see Scale for Interpersonal Behavior below), this dimension was kept in the current work because it relates to an affective (and not a behavioral) aspect of the construct.

³ The observation and interaction dimensions were tested as higher order factors, composed by three and two first order factors, respectively, whereas the performance dimension was taken as a first order factor.

Short Scale for Interpersonal Behaviour (S-SIB; Arrindell, Sanavio, & Sica, 2002, Portuguese Version by Vagos Et al, 2014a) Consists of 25 items used to measure both discomfort felt when acting assertively and the frequency of enacting assertive behaviors (s-SIB behavior, ranging from 1 = *never do* to 5 = *always do*). Given the goals of the current work, only the s-SIB behavior scale was used. It is organized into four subscales (i.e., display of negative feelings, expressing and dealing with personal limitations, taking initiative, and display of positive feelings) that have achieved acceptable internal consistency values ($\alpha > .67$) and convergent validity in relation to social fears, self-esteem, neuroticism and extraversion (Arrindell et al., 2002).

Using a Portuguese adolescent sample, Vagos et al. (2014a) found an acceptable fit for that four-factor measurement model, with all measures achieving close to acceptable internal consistency values ($\alpha > .68$) and showing convergent validity in relation to another measure of assertive behavior. That measurement model was a good fit to the current data (RMSEA = .058, 90% confidence interval for RMSEA = .054, .062; CFI = .84, SRMR = .054). Also, internal consistency values were adequate for all measures: $\alpha = .68$ for displaying of negative feelings; $\alpha = .77$ for expressing and dealing with personal limitations; $\alpha = .71$ for taking initiative; $\alpha = .76$ for displaying of positive feeling.

Data Analyses

Preliminary analyses on the instruments as valid representations of the intended constructs consisted of confirmatory factor analysis using the Mplus v7.4 software (Muthén & Muthén, 2012); these results were provided in the Instruments' section. The *Maximum Likelihood Robust* estimator was used because data taken from each instrument was not multivariate normal, based on Mardia's Test as made available by Korkmaz, Goksulik, and Zararsiz (2014). The models' fit was considered acceptable when achieving a *Comparative Fit Index* (CFI) $\geq .92$ combined with either a *Standardized Root Mean Square Residual* (SRMR) $\leq .08$ or with a *Root Mean Square Error of Approximation* (RMSEA) $\leq .07$ (Hair, Black, Babin, & Anderson, 2014). Internal consistency based on the Cronbach Alpha was computed using the IBM SPSS 21 Statistics software; values were considered acceptable if $\geq .70$ (Nunnally, 1978).

To accomplish the first goal of this study, a two-step cluster analysis was conducted using IBM SPSS Statistics 21, which groups participants within a sample according to their individual profile, boosting within-groups homogeneity and between-groups heterogeneity (Hair et al., 2014). The log-likelihood was used as a similarity measure between cases within each cluster. We considered the Schwarz's Bayesian Criterion statistic to determine the number of clusters to be retained and ascertain how well that solution applies to the

data. The cluster variates were the total social anxiety and total assertive behavior scales. To investigate the validity of the resulting clusters, one-way ANOVAs were used for between-group comparisons on social anxiety and assertiveness; further t-tests compared each groups' scores to those found using other community samples. Also, chi-square distribution tests were carried out to verify the (un)even distribution of participants in each group by gender. The standardized residuals were considered as indicative of where (un)even distributions may statistically be present.

A structural equation modelling approach was used to fulfil the second goal of this research, using MPlus v7.4 (Muthén & Muthén, 2012). Specifically, assertive interpersonal schemas were set to predict negative thoughts on social interaction and public performance. These thoughts, in turn, stood to predict 1) social anxiety in interaction, observation, and performance social situations and 2) assertive behavior when displaying negative and positive feelings, expressing and dealing with personal limitations, and taking initiative. So, schemas would have an indirect impact on social anxiety and assertive behavior via automatic thoughts. The fit of this model was judged based on a two-index criteria (Hair et al., 2014; see above). Because this was an exploratory model, and looking for the most parsimonious solution, theoretical justifiable modification indices were added to improve its fit.

Considering the goodness of fit of the measurement models used in the current work, an all-item facet-representative parceling strategy was applied (Little, Rhemtulla, Gibson, & Schoemann, 2013) to improve the sample to model size ratio. So, total scores for each first order factor were averaged and then used to represent latent variables, by using the formula suggested by Matsunaga (2008). The most statistically significant and theoretically relevant model was analyzed for structural invariance by clusters, in patterns (i.e., unrestricted model), loadings (i.e., loading constraint model), pathways (path constraint model), and factor means (i.e., mean constraint model); invariance is established if successive equality constraints do not significantly worsen the chi-square values.

Results

Cluster Analysis

A three cluster solution fairly adjusted the data (average silhouette value = 0.5; see Table 2). The clusters were: 1) assertive individuals, who frequently practice assertive behavior while experiencing low levels of social anxiety ($n = 306$, 45.1%); 2) indifferent individuals, who *do not care* about expressing themselves assertively or consider assertiveness irrelevant, while feeling rather comfortable in social events ($n = 201$, 29.6%), and 3) socially anxious individuals, who

Table 2 Cluster characterization

	Complete sample	Assertive	Indifferent	Socially anxious
Gender				
Male	261 (38.4)	123 (40.2)	95 (47.3)	43 (25.0)
Female	541 (61.3)	182 (59.5)	105 (52.2)	129 (75.0)
Social anxiety	51.17 (15.81)	42.07 (7.43)	46.62 (8.54)	72.69 (12.97)
General Interaction	28.48 (9.05)	23.54 (5.04)	26.11 (5.26)	40.02 (7.94)
General Observation	13.87 (5.27)	11.30 (2.46)	12.26 (2.89)	20.31 (5.75)
Performance in formal social situations	8.83 (3.43)	7.23 (2.41)	8.24 (2.69)	12.37 (3.18)
Assertive performance	74.64 (14.98)	85.72 (10.30)	59.77 (9.79)	72.31 (10.16)
Display negative feelings	19.35 (4.72)	22.25 (3.78)	15.09 (3.35)	19.17 (3.62)
Express and manage personal limitations	20.18 (4.59)	23.02 (3.33)	16.24 (3.81)	19.73 (3.75)
Take initiative	17.78 (3.97)	20.44 (3.24)	14.67 (3.04)	16.69 (2.80)
Display positive feelings	17.33 (4.61)	20.00 (4.06)	13.79 (3.14)	16.71 (3.91)

Note: Assertive = cluster 1; Indifferent = cluster 2; Socially anxious = cluster 3. Results for gender distribution are presented as n (%); results for scores on self-report measures are presented as M (SD). Between group differences were always significant at $p < .001$, except for the mean difference between clusters 1 and 2 for the general observation measure

report low frequency of assertive behavior combined with high anxiety in social events ($n = 172, 25.3\%$).

These groups differed significantly for social anxiety ($F(2,678) = 612.7, p < .001$) and assertive behavior ($F(2,678) = 404.56, p < .001$); the same was found for the three dimensions of social anxiety and the four measures of assertive behavior. All post-hoc pairwise comparisons were significant at $p < .001$. For social anxiety, the assertive group had the lowest values, followed by the indifferent, and then the socially anxious group; for assertive behavior, the indifferent group had the lowest scores, followed by the socially anxious, and then the assertive group (see Table 2).

To further validate the characterization of these three groups, its descriptive values were compared with those same values as previously found for similar samples. In comparison with the validation sample for the social anxiety measure (Vagos et al., 2013; $M = 51.32, SD = 15.86$ for SAASA anxiety), participants from the assertive and indifferent groups scored significantly lower ($t(305 \text{ and } 200) = -27.76 \text{ and } -4.70$, respectively, $p < .001$); inversely, participants in the socially anxious group scored significantly higher ($t(171) = 21.38, p < .001$). In comparison with the validation sample for the assertiveness measure (Vagos et al., 2014a; $M = 74.79, SD = 15.09$ for total assertive behavior), participants from the indifferent and socially anxious group scored significantly lower ($t(200 \text{ and } 171) = -15.01 \text{ and } -2.48$, respectively, $p < .001$); alternatively, participants from the assertive group scored significantly higher ($t(305) = 10.93, p < .001$).

Boys and girls were not evenly distributed by these groups ($\chi^2(2) = 20.50, p < .001$). Standardized residuals show that boys were significantly more prevalent than expected in the indifferent group ($STR = 2.0, p < .05$); they were also less prevalent than expected in the socially anxious group ($STR =$

$2.9, p < .01$) where girls were significantly more frequent ($STR = 2.3, p < .05$; Table 2). Boys and girls were evenly distributed in the assertive group.

Structural Equation Modelling

The baseline model consider assertive schemas as predicting negative social thoughts, which in turn were proposed to predict social anxiety and assertive behaviour; an indirect effect between schemas, on the one hand, and social anxiety and assertiveness, on the other, was also considered via negative social thoughts (see procedure section). Such model was not an acceptable fit for the complete sample (Table 3). Its standardized results and modification indices were analysed in order to: 1) delete non-significant pathways and 2) add theoretically relevant pathways. Modifications indices suggested that some schemas should directly (and not indirectly via automatic thoughts) predict assertive behavior and social anxiety; no pathway was suggested between assertive behavior and social anxiety. This direct impact of schemas in affect and behavior is in line with the theorization of schemas in relation to both adaptive and maladaptive functioning (Steffen, Elliot, Lassen, Olsen, & Smith, 2016). Hence, those modification indices were included in the model.

The resulting model included the outer emotional support and the affective personal ability schemas as direct predictors of different dimensions of social anxiety and of assertiveness, while the interpersonal management and practical personal ability schemas had direct and indirect effects on those dimensions. This modified model achieved excellent fit indicators (Table 3), with all direct (cf. Fig1a) and indirect effects (Fig 1b) being significant.

Table 3 Fit indicators for each model and by sample

	χ^2	df	RMSEA	90% CI for RMSEA	CFI	SRMR
Baseline model	458.29**	66	0.094	0.096; 0.102	0.883	0.066
Modified model	117.071**	72	0.030	0.020; 0.040	0.987	0.036
1: Assertive	80.30 ^{ns}	72	0.019	0.000; 0.040	0.987	0.041
2: Indifferent	88.70 ^{ns}	72	0.034	0.000; 0.056	0.970	0.055
3: Socially anxious	102.88*	72	0.050	0.025; 0.071	0.926	0.055
Unconstraint model	271.97*	216	0.034	0.019; 0.046	0.965	0.049
Loading constraint	282.66*	222	0.035	0.021; 0.046	0.962	0.051
Path constraint	327.95*	254	0.036	0.023; 0.047	0.954	0.065
Mean constraint	1137.89**	284	0.115	0.108; 0.122	0.467	0.337

** $p < .001$, * $p < .01$, ^{ns} non-significant

The model was a good fit for all three groups tested separately (Table 3). Structural invariance across groups was then studied, to ascertain for the moderating role of group. The unrestrictive, loading constraint, and path constraint model were a good fit for the data; the mean constraint model was not (Table 1). The chi-square difference test further indicates full invariance of loadings ($\Delta\chi^2(6) = 10.69$, $p = .09$) and of pathways ($\Delta\chi^2(32) = 44.93$, $p = .06$) across groups. In turn, constraining equality of factor means between groups significantly worsened the fit of the model ($\Delta\chi^2(30) = 806.24$, $p < .001$), alike the significant between-group mean differences presented above.

Discussion

The goals of the current work were to investigate a taxonomy of assertiveness-social anxiety combinations in an adolescent community sample and to test for a cognitive model applied to that taxonomy. Even if cognitive models for social anxiety and assertive behavior in adolescence have been advanced (Calvete et al., 2013; Hodson, McManus, Clark, & Doll, 2008; Vagos & Pereira, 2016, 2018), they have not been investigated in relation to groups of adolescents who potentially present with diverse combinations of social anxiety and assertiveness.

In fact, one controversy lingering for socially anxious individuals is whether or not they have social skills deficits (Levitan & Nardi, 2009; Stravynski et al., 2010). We proposed that some socially anxious individuals may be socially skilled while others may not (e.g. Arrindell et al., 1990; Van Dam Baggen & Kraaimaat, 2000). Still, our findings suggest all socially anxious adolescents infrequently practice assertive behavior. This socially anxious group was further validated by expressing above average social anxiety and below average assertiveness, in addition to being mostly constituted by girls (Furmark, 2002). So, the (lack of) engagement in various social interactions cannot be overlooked when intervening with socially anxious adolescents, namely resorting to exposure-

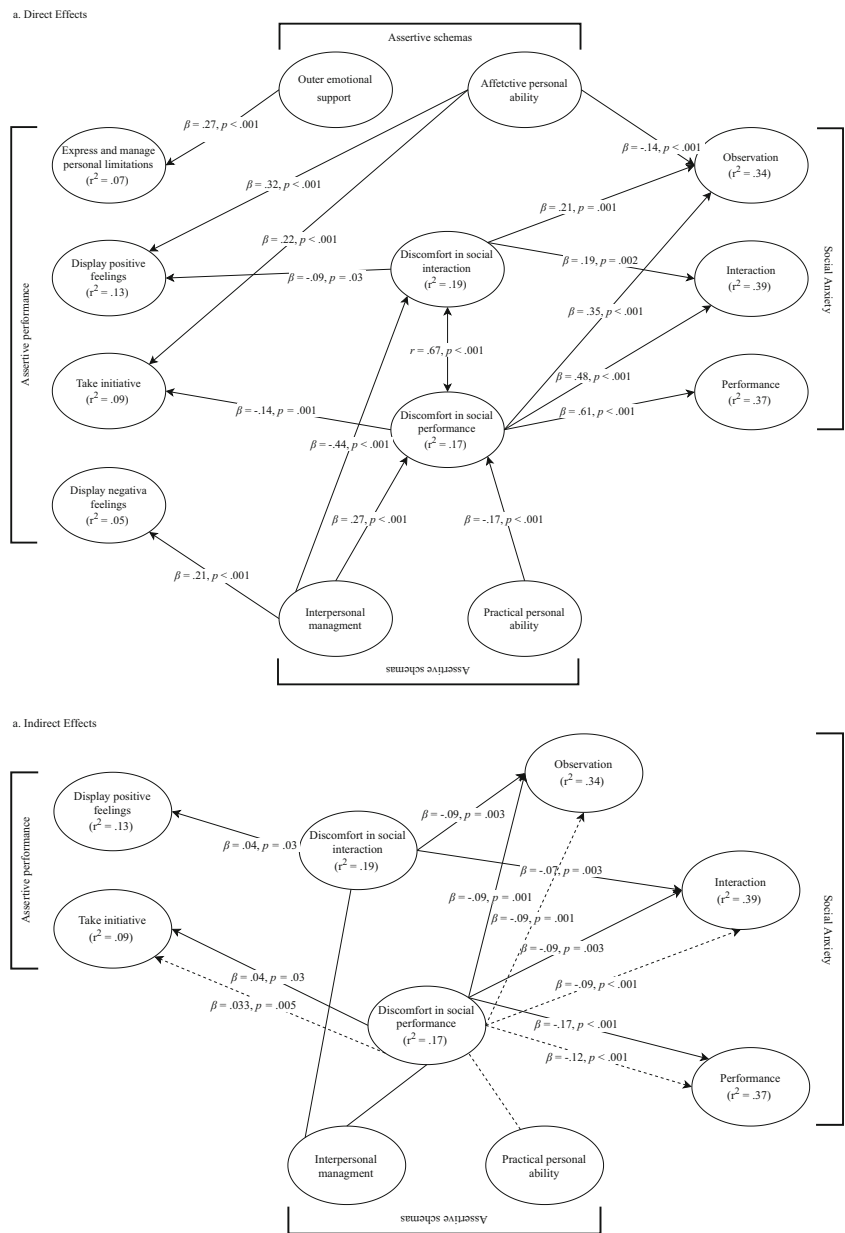
based methodologies. Such methodologies are part of most cognitive-behavioral interventions for social anxiety (e.g. Albano & DiBartolo, 2007; Masia-Warner, Fisher, ShROUT, Rathor, & Klein, 2007) intending to further discredit biased cognitions. We would suggest that they should also be considered as a primary tool in dealing with the (un)frequent practice of assertiveness via systematic desensitization and/or contingency management.

In turn, no group of adolescents who behaved assertively despite feeling anxious (i.e., anxious performers) was found. It may be argued that this result represents a biased self-perception on ones' social behavior on the part of the socially anxious adolescents (Miers et al., 2011), whereas observation methodologies, for instance, might have distinguished the anxious performers. Observing such a group would, nevertheless, signify the presence of some lack of (qualitative) social skills (i.e., noticeable anxious symptoms in social performance, as previously found by Miers et al., 2010), again reporting to the concomitance of social anxiety and assertiveness deficit.

Concurring with our hypotheses, two other groups emerged from cluster analysis: the assertive group and the indifferent group. The assertive group had the highest prevalence, with boys and girls being equally represented, as expected based on previous findings comparing adolescent boys and girls (Vagos et al. 2014a). Given the personal, social (Marchezini-Cunha & Tourinho, 2010), and even academic advantages associated with assertiveness (Frymier, 2005), this may be the reference group, towards which other vulnerable or at risk groups should gravitate.

Adolescents in the indifferent group may pose particular concerns. If they don't care to act assertively or fear what others think about them, how do they act in social events? Boys were more prevalent in this group, and the literature tells us that boys score higher on measures of uncaring and unemotional traits (Essau, Sasagawa, & Frick, 2006) and of reactive aggression, which is a form of self-protection against perceived threat (Vagos, Rijo, Santos, & Marsee, 2014b). So, could this indifference be some form of self-protection based on "better safe than sorry" or an expression of uncaring and

Fig. 1 Path analysis on a cognitive model for social anxiety and assertive behavior



unemotional traits? Further works may shed light on these questions; all we can advance at this time is that adolescents in this group don't seem to comply with the traditional investment in social relationships, especially with peers, that is considered an important developmental marker in adolescents (Erwin, 2002).

The same explicative model was a good fit for predicting social anxiety and assertive behavior in three diverse groups (i.e., socially anxious, assertive, and indifferent). This model considered the various types of assertive behavior to be directly (and not indirectly) predicted by assertive schemas. Those predictions seem theoretically consistent: one will probably feel more inclined to display negative feelings to others if one believes problems are a solvable part of interpersonal relationships (i.e., interpersonal management schema); one will likely engage

in expressing and managing personal limitations if expecting others to provide a supportive feedback to that self-disclosure (i.e., outer emotional support schema), and one will possibly be more disposed to display positive feelings to others and take the initiative in approaching them if one considers oneself as lovable (i.e., affective personal ability schema). Still, similarly to previous findings (Vagos & Pereira, 2018), little variance of assertive behavior was predicted by this model; perhaps a social information processing framework to assertiveness (Vagos & Pereira, 2016) will shed some light into this subject. Moreover, current findings do not replicate the relevance of the interpersonal management schema for predicting assertive behavior (Vagos & Pereira, 2018). Presently, assertiveness was associated more strongly with expecting positive social outcomes (i.e., outer emotional support and affective personal ability schemas),

the absence of which is paramount in social anxiety (Hirsch & Clark, 2004), and so may have gained relevance in the current combined model.

Social anxiety, in turn, was predicted directly by social thoughts, and only indirectly by assertive schemas. Similarly, previous work ascertained that the association between schemas and social anxiety is mediated by automatic thoughts (Calvete et al., 2013). Performance anxiety was predicted only by negative thoughts on being uncomfortable about one's performance, which is in line with specific core fears associating with specific related concerns (Kodal et al., 2017); in this specific case, that concern proved to be thinking of oneself as (not) capable of performing on everyday tasks (i.e., practical personal ability). Alternatively, observation and/or interaction based-anxiety was founded on both types of negative thoughts, which in turn were predicted by a more generalized negative perception about relationships (i.e., interpersonal management schema). If one believes relationships cannot survive misunderstandings and conflicts, one would probably navigate through social encounters by focusing on other people's needs and wishes; in other words, one would be other-directed, which was found to be particularly relevant for social anxiety in adolescence (Calvete et al., 2013).

Looking at the variables directly predicting assertive behavior, on the one hand, and social anxiety, on the other, it seems that assertive behavior is more trait based whereas social anxiety is more state elicited. In other words, assertive behavior has to do with how one is able to adapt to a diverse range of social situations (Alberti & Emmons, 2008; Rakus, 1991). So, one is predisposed to be assertive before approaching any situation, and only adapts the type of assertive expression based on the social demands of that situation. Social anxiety, on the other hand, may be elicited by the expected social costs arising from each specific situation where one predicts to fail (Hirsch & Clark, 2004). So, one is not always socially anxious, but rather becomes so when facing a feared social situation that elicits situation-specific automatic thoughts.

Limitations should be noticed to the current work, namely the fact that the cluster analysis method is highly dependent on specific constructs evaluated by grouping measures. Nevertheless, the fact that the measures used in the present work have shown psychometric quality and construct validity, in addition to the validation of the groups based on external variables, lends some support to our findings. Another aspect is the sole reliance on self-report instruments gathered from a community sample via a cross-sectional study design. Self-reports are liable to social desirability and insight deficits; then again, observers' rating of behaviors may also be biased, leading to diverse findings on the social skills of socially anxious individuals when considering different observers (Miers et al., 2010). So, contrasting self and other reported information may be the optimal choice for future research. Another concern is

that no causal associations can be established between the variables, and so the doubt remains on whether it is being assertively unskilled that elicits anxiety or is it being anxious that detracts assertive performance. The fact that no (consistent) associations were found between social anxiety and assertiveness may indicate that social anxiety and assertive deficit simply co-occur and not necessarily associate or provoke one another.

As such, current findings reinforce the necessity of assertive training being a part of effective interventions with socially anxious adolescents. Moreover, they point to several particularities relevant for such interventions. For instance, cognitive schemas cannot be overlooked when training assertiveness with socially anxious adolescents, though they may be targeted in accordance with the specificities of the social encounters adolescents will be facing. Also, interventions for social anxiety should consider the specificity of cognitive vulnerabilities underlying different core fears. It would be advisable for clinicians to take the time to get to know the symptomology of each socially anxious adolescent, as to provide the best tailored treatment approach.

Availability of Data and Material The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Compliance with Ethical Standards

All procedures performed in this study that involved human participants were in accordance with the ethical standards of the University of Coimbra and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The study was approved by the national ministry for education. Informed consent was obtained from all individual participants included in the study and, for underage participants, from their parents and/or legal guardians.

Conflict of Interest/ Competing Interest On behalf of all authors, the corresponding author states that there is no conflict of interest. Though funding was received for this research it could not have influenced the outcomes of the research. The sponsor had no role in the design of the study, data collection, analysis and interpretation of data, writing of the report, and decision to submit the article for publication. This manuscript is based on data also used on the doctoral dissertation of the first author.

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