



Allowing or fighting social anxiety: The role of psychological inflexibility in a non-clinical population

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Abstract: In an acceptance-based model of what maintains social anxiety, the focus is on counterproductive attempts to control unpleasant internal experiences through avoidance of them. An example of such an avoidance strategy, especially prominent among socially anxious women, is rumination. According to this model, the road to recovery for people suffering from social anxiety is through increased acceptance of internal experiences. This process is also referred to as decreasing an individual's 'psychological inflexibility'. The overall aim of the current study was to examine the relationship between psychological inflexibility and social anxiety in a non-clinical population. We used cluster analysis to examine subgroups with different individual profiles of symptoms of social anxiety/avoidance and psychological inflexibility. The clusters were examined in relation to depressive symptoms, rumination, and the moderating effect of gender. The design was cross-sectional and consisted of 219 university students (101 men, 118 women; $M_{\text{age}} = 23$ years). Four clusters were generated, whereof two (the Multidimensional Problem cluster and the No Problem cluster) reflected a strong positive relationship between social anxiety/avoidance and psychological inflexibility, however in different ways. Gender did not act as a moderator. However, people in the Multidimensional Problem cluster reported higher degree of depressive symptoms as well as higher levels of rumination compared to the other clusters. To conclude, psychological inflexibility seems to be related not only to symptoms of ill-health such as social anxiety and depressive symptoms but also to control strategies such as rumination

Keywords: Social anxiety, Psychological inflexibility, Depressive symptoms, Rumination, Non-clinical population

If something is uncomfortable, we instinctively move away from it and it is human nature for emotions to influence action. For example, when we are afraid, either triggered by external stimuli such as social situations or triggered by internal stimuli such as frightening intrusive thoughts, it is natural to want to escape from these threats and further avoid them (Allen, McHugh, & Barlow, 2008). On the other hand, it is also human nature to strive to achieve goals, creating a constant dilemma between goals and values on the one hand, and a desire to avoid what is

unpleasant on the other hand. This dichotomy has been coined 'the approach-avoidance conflict' (Miller, 1944). If avoidance dominates, it can cause major problems in career, education and social life, which could be said to characterize people with mental illness.

The approach-avoidance conflict is evident for people who suffer from social anxiety disorder (SAD), or social phobia. SAD is one of the most common psychiatric disorders with its lifetime prevalence ranging from 7 to 13 percent in the Western world (e.g., Furmark, 2002; Kessler,

Chiu, Demler, & Walters, 2005). The core problem in SAD is a fear of being negatively evaluated by others. The approach-avoidance conflict could for socially anxious people be described as on the one hand desiring to partake in social interactions while on the other hand wanting to avoid anxiety-provoking social situations and unpleasant inner experiences such as negative emotions and thoughts associated with approaching others. Hence, people who suffer from SAD have conflicting goals, specifically high levels of avoidance while confronted with anxiety-provoking social situations in combination with a wish to partake in these social interactions. However, avoidance strategies, both on an overt and on a covert level, have shown to be associated with maintenance and exacerbation of SAD, which in the long run leads individuals further away from valued social interactions (e.g., Harvey, Watkins, Mansell, & Shafran, 2004).

One theoretical model that tries to explain maintaining processes in social anxiety is an acceptance-based model (Herbert & Cardaciotto, 2005). This model explicitly includes not only the 'avoidance' arm but also the 'approach' arm. As a treatment goal, it aims, for example to teach patients to behave in accordance with their values despite the presence of inner experiences such as intense emotions or catastrophic thoughts. The focus of what maintains social anxiety is in Herbert and Cardaciotto's model put on literal interpretations of unpleasant internal experiences (e.g., intense emotions, physiological sensations and catastrophic thoughts) as well as on attempts to control these unpleasant internal experiences through avoidance ('experiential avoidance' or 'covert avoidance'). To interpret inner unpleasant experiences such as physiological sensations or catastrophic thoughts literally, as evidence of a real threat, is postulated to result in an increased risk to associate inner experiences with discomfort. For example, a socially anxious person may come to interpret intense emotions and catastrophic thoughts in and of themselves as frightening. Moreover, if a socially anxious person enters an anxiety-provoking social situation, anxious feelings and alarming thoughts instigate not only an elevated level of self-focused attention but also an increased risk of using control strategies during the social situation, in order to down regulate or avoid anxiety. Avoidant strategies to down regulate unpleasant inner experiences are in Herbert and Cardaciotto's acceptance-based model broadly referred to as 'experiential avoidance' or 'low degree of acceptance'. Concrete examples of control strategies with the function to down regulate or avoid unpleasant inner experiences that are generally high among socially anxious people, especially among socially anxious women, are worry and rumination (e.g., Harvey *et al.*, 2004; McEvoy, Watson, Watkins, & Nathan, 2013). While theoretically, concepts such as psychological inflexibility, lack of acceptance, social anxiety and rumination are thought to be related, there is a lack of empirical

research showing these interrelationships, not in the least in normal populations.

As noted, according to the acceptance-based model of social anxiety (Herbert & Cardaciotto, 2005), a treatment goal is to get people to behave in accordance with their values by increasing their level of acceptance of unpleasant internal experiences. Interestingly, this acceptance-based model highlights 'acceptance' and tolerance of inner experiences, rather than only dealing with the avoidance behaviors by interrupting self-focused attention and correcting the negative content of thoughts as for example the prominent cognitive model of Clark and Wells (1995; Clark *et al.*, 2003) postulates. The process of acceptance and value based action is also referred to as increasing an individual's 'psychological flexibility'. From an acceptance perspective, psychological inflexibility is seen as a central and maintaining factor of SAD (Herbert & Cardaciotto, 2005), and studies investigating the efficacy of interventions designed to decrease psychological inflexibility in people with SAD have shown promising results (Dalrymple & Herbert, 2007; Kocovski *et al.*, 2009; Ossman *et al.*, 2006). However, research on the concept of acceptance or psychological flexibility is still in its infancy, and so far consists mostly of treatment studies where people who do not meet the criteria of SAD have been excluded. Problematically, the categorical classification system does not reflect the dimensionality of mental problems, which makes it difficult to get a comprehensive picture (e.g. Brown, 1996). A more dimensional view states that there is no distinct difference between sub-threshold anxiety and the different forms of anxiety disorders except in the frequency and/or severity of experienced symptoms (e.g., Brown, 1996). Indeed, social anxiety is a problem for a large proportion of the general population, even in people where the suffering is not sufficient for a clinical diagnosis. In line with the acceptance-based model, high levels of psychological inflexibility are central not only in persons qualifying for the diagnosis of SAD but also for individuals with subclinical social anxiety. To summarize, it is also important to study the relation between social anxiety and psychological inflexibility on a non-clinical level.

It is important to note that avoidance behaviors signaling psychological inflexibility have also been found to be maintaining factors for a variety of other psychiatric disorders that are commonly comorbid with SAD, such as depression (Hayes *et al.*, 2004). Further, development of SAD has been found in longitudinal studies to precede the development of depression (e.g., Beesdo *et al.*, 2007). Hence, psychological inflexibility could conceivably act as a mediating factor between social anxiety/avoidance and depression.

The overall aim of this study was to examine the relationship between psychological inflexibility, social anxiety, social avoidance, depressive symptoms, and rumination in a non-clinical population. In short, our aims were as fol-

lows: The first aim was to examine subgroups with different individual profiles of symptoms of social anxiety, social avoidance, and psychological inflexibility. In relation to the first aim our question was as follows: Can a subgroup of people high in social anxiety, social avoidance, and psychological inflexibility be identified? The second aim was to examine the subgroups in relation to depressive symptoms and rumination and investigate the moderating effect of gender. The third aim was to investigate these subgroups in relation to disabling social anxiety. Our final aim was to examine if psychological inflexibility could act as a mediator between social anxiety/avoidance and depressive symptoms. It is important to note that as this is a cross-sectional study we could only examine indications of mediating effects.

A first hypothesis for the current study was that it will be possible to distinguish a subgroup characterized by a high degree of psychological inflexibility, and high levels of social anxiety and social avoidance, as well as a subgroup characterized by low levels of psychological inflexibility, and low levels of social anxiety and social avoidance. Theoretically, according to the acceptance-based model (Herbert & Cardaciotto, 2005), people in the first subgroup should report higher levels of depressive symptoms and rumination, and the social anxiety would interfere more in their daily life compared to people in the second subgroup. Furthermore, we hypothesized that gender may moderate the relationship between degree of social anxiety, social avoidance, and psychological inflexibility and respectively depressive symptoms and rumination. This hypothesis was based on evidence that women suffer from both SAD and depression to a greater extent than men (Furmark, 2002; Ruscio et al., 2008), and that the co-morbidity between these two disorders is high (Kessler et al., 2005). Moreover, it has been found that women are more likely than men to make use of worry and rumination (Calmes & Roberts, 2007). A third hypothesis was that psychological inflexibility could mediate the relationship between social anxiety/avoidance and depressive symptoms. By studying these relationships a basis can be created for future longitudinal research and/or experimental research, and hence further developing the acceptance-based theories.

In the current study we used both person-oriented and variable-oriented statistical methods because we assume that if there exists, as we believe it does, a subgroup with high levels of psychological inflexibility and high levels of social anxiety and avoidance, then this subgroup should be quite small in a non-clinical population in comparison to a subgroup with low levels of psychological inflexibility and low levels of social anxiety and avoidance. If we only use variable-oriented analyses, there is a risk that the former subgroup of people could not be identified. Hence, we used a person-oriented analysis method for answering our first aim, and to answering the three other aims we used variable-oriented methods.

Method

Participants and Procedure

The study participants consisted of a convenience sample. All the participants were students at a university in a medium-sized town in Sweden with a total population of about 120,000. The questionnaires were distributed at lecture times where those students who were willing to complete them remained in the classroom. Information about the content and instructions for how the questionnaires should be completed was given orally and in a covering letter to the participants. The questionnaires were then filled in individually in the lecture hall and afterwards returned to two of the authors (Toll and Branting). The data collection took place on four occasions over six weeks in the spring, 2011. The participants were economics, nursing, social work or mathematics students. The total number of people who were registered in these courses was 469. All of these were not present at the time the questionnaires were distributed. However, the majority of those students who were present participated in the study. The final sample size was 219 students (101 men and 118 women; $M_{\text{age}} = 23$ years, $SD = 4.50$).

Measures

Liebowitz Social Anxiety Scale, the Self-Report version (LSAS-SR). LSAS is an instrument for the assessment of social fear/ anxiety and social avoidance (Baker, Heinrich, Kim, & Hofmann, 2002; Liebowitz, 1987). The instrument comprises 24 anxiety-provoking social situations and contains two different types of social situations where 13 are about performance and 11 are interaction situations. Each social situation is rated on a four-point scale with the response options ranging from: No fear or anxiety (0) to Strong fear or anxiety (3) on the subscale of social fear/anxiety. The total score on this subscale ranges from 0 to 72, where higher responses indicating higher social fear/anxiety. For the subscale of social avoidance the response options range from Never (0% of the time) to Usually (67-100% of the time), and the total score on this subscale ranges from 0 to 72, where higher scores indicate higher social avoidance. LSAS has good psychometric properties (Fresco et al., 2001). We used a Swedish translation of the LSAS which has been used in several treatment studies, and the psychometric properties of the Swedish version are considered good (see for example Andersson et al., 2006). In the current study the Cronbach's alpha for the subscale of social fear/anxiety was .90, for the subscale of social avoidance it was .85, and for the whole scale it was .93.

Disabling social anxiety. Disabling social anxiety was assessed with two yes/no questions: the participants were asked whether the social discomfort severely interfered

with or severely bothered the person in his/her occupational/academic function and social activities.

Action and Fusion Questionnaire for Youth (AFQ-Y). AFQ-Y is an instrument for the assessment of psychological inflexibility as measured by levels of experiential avoidance and cognitive fusion (Greco, Lambert, & Baer, 2008). The instrument consists of 17 items rated on a five-point scale with the response options ranging from *Not at all true* (0) to *Completely true* (4). The total score ranges from 0 to 68, with higher scores indicating higher psychological inflexibility. AFQ-Y is developed for youth up to 17 years, but was chosen to be used in the current study, although the participants were older. This decision was taken since the questions were considered to have good face validity regarding the current study's aims. In addition, the AFQ-Y is adapted from the Acceptance and Action Questionnaire for adults and should assess the same concepts as in the adult version (Hayes et al., 2004). Nevertheless, a pilot study was done to check the validity of the instrument for use in an adult population ($n = 9$; age ranging from 25 to 26 years). These participants were given the opportunity to provide feedback on the nature and the formulations of the items. All of the participants in the pilot study considered the items of the AFQ-Y as age-appropriate. AFQ-Y has been shown to have good psychometric properties with good validity and previously measured Cronbach's alpha ranging from .90 to .93 (Greco et al., 2008). A Swedish translation AFQ-Y was used. The AFQ-Y was translated to Swedish by Thomas Parling and Ata Ghaderi in 2005, and the back translation was done by Terry Hartig. In the current study the Cronbach's alpha for the whole scale was .88.

Montgomery Åsberg Depression Rating Scale, the Self-Rated version (MADRS-SR). MADRS is an instrument that measures the degree of depressive symptoms (Svanberg & Åsberg, 1994). The instrument consists of nine items that correspond to core symptoms of depression. Each item is rated on a seven-point scale (ranging from 0 to 6) with four defined scale steps and three intermediate. The total score ranges from 0 to 54 with higher scores indicating more of depressive symptoms. The Swedish version of the instrument has good reliability and validity. Cronbach's alpha has been ranging from .82 to .90 (Svanborg & Åsberg, 2001) in earlier studies. Item number nine in MADRS, in which participants are asked to grade suicidal ideation, was excluded due to the risk to generate responses that could not be followed up in an ethically correct way since the participants were anonymous. Therefore, the total score ranges from 0 to 48. In the current study the Cronbach's alpha was .81.

Rumination. Rumination about social situations was measured with the following item: "How often during the last week have you gone through social situations again in your mind". The item was rated on an 8-point scale with the response options ranging from: Not at all (0) to Always (8).

Ethical Considerations

The study followed the ethical guidelines as formulated by the American Psychological Association; the participants were informed about the study's purpose, and participation was voluntary and anonymous.

Statistical Analyses

The Statistical Package for Social Sciences, SPSS 19.0 for Windows was used in all statistical analyses (SPSS Inc., Chicago, IL). Both person-oriented and variable-oriented analyses were used. For the person-oriented analysis we used hierarchical cluster analysis to answer the study's first aim. Cluster analysis groups participants within a sample according to their individual profiles in order to create homogeneity within each subgroup and heterogeneity between the subgroups (Hair, Andersson, Tatham & Black, 1995). This approach allows an exploration of subgroups within the sample, known as clusters. To identify homogeneous subgroups of adolescents with social anxiety, social avoidance and psychological inflexibility, we conducted hierarchical cluster analyses using Ward's method and squared Euclidean distances. There are several criteria and guidelines for the number of clusters to be selected, but currently no selection procedure is generally believed to be more beneficial than others. Our final choice of cluster solution was based on a combination of the following four recommended criteria: (1) the cluster solution should be theoretically meaningful (Bergman, Magnusson, & El-Khoury, 2003; Hair, Andersson, Tatham, & Black, 1995); (2) clusters are considered reasonably homogenous with Explained Error Sums of Squares (EESS) values ideally around 67% and not less than 50 % (Bergman et al., 2003); (3) the cluster coefficient, i.e., the within-cluster sum of squares, percentage change to the next level should preferably not be less than 10 % (Hair et al., 1995), and 4) each cluster should contain at least 10 individuals (Hair et al., 1995). Z-scores above/below +/- .50 are considered high versus low.

The variable-oriented analyses consisted of a factorial ANOVA, Chi-square, Pearson's r , and a multiple regression analysis. To answer our second aim a two-way (Cluster x Gender) factorial analysis of variance (ANOVA) with post hoc tests was conducted, with depressive symptoms and rumination about social situations as the outcome variables. For the third aim we used chi-square analyses to examine the relation between the cluster solution and disabling social anxiety regarding occupational/academic function and social activity. Pearson's r was conducted to investigate whether relations existed between the variables social anxiety (the total scale), psychological inflexibility, and depressive symptoms. A multiple regression analysis as well as a bootstrapping analysis were used to test whether there was evidence that psychological inflexibility had a mediating effect (Baron & Kenny, 1986) between social anxiety/

avoidance and depressive symptoms, i.e., to answer the third and last aim. In the first step, multiple regression was used to investigate whether the prerequisites of mediation effects were met, using the traditional recommendations by Baron & Kenny (1986). In the second step, the significance of the indirect effects was assessed with a bootstrapping method ($n = 1000$ bootstrap resamples) (see Preacher & Hayes, 2008). Bootstrapping is a non-parametric resampling procedure that generates an approximation of the sampling distribution from the available data set. More specifically, the bootstrapping distribution is generated by taking a

sample (with replacement) of size n from the full data set. The indirect effects are then calculated in the resamples that result in point estimates, and 95% confidence intervals are estimated for the indirect effects. We considered point estimates of indirect effects to be significant if zero was not contained in the confidence interval.

In the third stage, the relationship between the longitudinal Big Five personality profiles and the identified types of occupational well-being was investigated with the χ^2 test and adjusted residuals. Adjusted residuals above ± 2 are considered to indicate statistically significant dependency.

Table 1

Explained Error Sums of Squares (EESS-values) and the change in percentage of the cluster coefficient to the next level for the cluster solutions from 2 to ten clusters

Number of clusters	2	3	4	5	6	7	8	9	10
EESS (%)	45	59	67	71	76	79	80	82	84
Coefficient (%)	81	38	18	17	14	17	7	10	8

Results

Can a subgroup of people with high levels of social anxiety, social avoidance and psychological inflexibility be identified in a non-clinical sample?

Table 1 shows the EESS-values and the change in percentage of the cluster coefficient to the next level for the cluster solutions from 2 to ten clusters. As can be seen in the table, and based on the criteria of the EESS-value being above 67%, all of the cluster solutions from 4 to ten clusters could be used. Regarding the third criteria and cluster coefficient percentage change, all of the cluster solutions from 2 to 7 clusters were above the recommended value of 10%. In addition, the fourth criterion was reached in the cluster solutions from 2 to 4 clusters, as the smallest cluster comprised 35 people, which was higher than the optimal limit of 10. The cluster solutions from 5 to ten clusters all contained a one-person cluster, which was below the optimal limit. Thus, due to fulfilled criteria and theoretical meaningfulness, the 4-cluster solution was chosen for further analyses.

As can be seen in Table 2 and Figure 1, and as we expected, one cluster was observed with high levels of social fear/anxiety, social avoidance, and psychological inflexibility (cluster 4). This cluster was named the *Multidimension-*

al Problem cluster (19%). In this cluster, the scores from the social fear/anxiety subscale as well as from the social avoidance subscale were almost comparable with scores from a Swedish clinical sample of SAD before treatment (Fear/Anxiety: $M = 36,9$ (12,1), Avoidance: $M = 31,6$ (11,3); Andersson et al., 2006). Also, the scores on psychological inflexibility were in line with an American clinical sample of anxiety disorders ($M_{age} = 16$ years) with a mean score of 33 (Venta, Sharp, & Hart, 2012). Furthermore, we identified a cluster with the opposite characteristics, cluster 1, consisted of low levels of social fear/anxiety, social avoidance and psychological inflexibility (45%). This was also an expected finding according to our hypothesis and was named the *No Problem* cluster. Cluster 2 was high on social avoidance and somewhat higher than the other clusters on social fear/anxiety. We therefore named this cluster the *Socially Avoidant and Anxious* cluster (25%). Lastly, cluster 3 was characterized by high scores of psychological inflexibility and low scores of social fear/anxiety and social avoidance, and we named it the *Psychological Inflexibility* cluster (11%). In summary, we could conclude that our findings were in line with our hypotheses, that is we observed both a subgroup consisting of high levels of social fear/anxiety, social avoidance, and psychological inflexibility (the *Multidimensional Problem* cluster) as well as a subgroup comprised of the opposite pattern (the *No Problem* cluster) in a non-clinical sample.

Table 2
Means (Standard Deviations) in Z-scores and raw-scores for a 4-Cluster Solution

Clusters	Social fear/anxiety	Social avoidance	Psych inflex	N (Men), %
1. No Problem	-.71 (.53)	-.84 (.45)	-.66 (.57)	97 (51), 45
2. Socially Avoidant and Anxious	9.56 (5.39)	8.97 (4.17)	12.88 (6.16)	55 (21), 25
3. Psychological Inflexibility	.30 (.53)	.49 (.40)	17.05 (4.21)	24 (11), 11
4. Multidimensional Problem	15.00 (5.95)	17.21 (4.33)	32.25 (3.84)	41 (16), 19
	31.10 (9.07)	28.93 (8.22)	33.73 (9.35)	

Note. Psych inflex = Psychological inflexibility

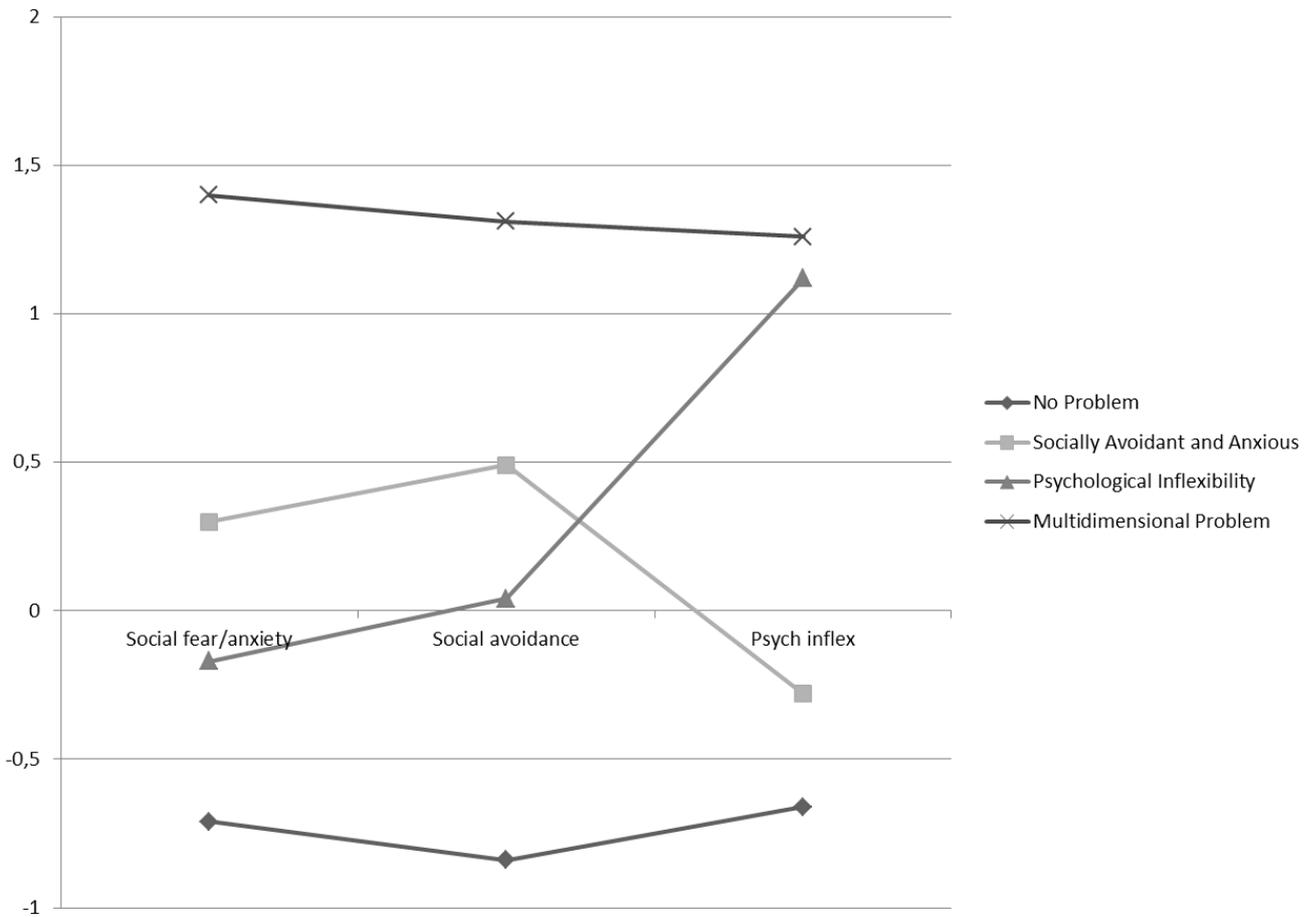


Figure 1
Z-scores for the 4-Cluster Solution

Table 3

Mean Depressive Symptoms and levels of Rumination by Cluster from Two-Way ANOVAs with Hochberg's Post Hoc Tests

Cluster	Mean (SD)
<i>Depressive Symptoms</i>	
No Problem (a)	5.50 (4.06) ^{b, c, d}
Socially Avoidant and Anxious (b)	8.04 (5.00) ^{a, c, d}
Psychological Inflexibility (c)	13.92 (6.81) ^{a, b}
Multidimensional Problem (d)	14.77 (6.08) ^{a, b}
<i>Rumination</i>	
No Problem (a)	3.14 (1.87) ^d
Socially Avoidant and Anxious (b)	3.84 (1.88) ^d
Psychological Inflexibility (c)	4.17 (1.93)
Multidimensional Problem (d)	4.95 (1.88) ^{a, b}

Note. Superscript letters indicate which cluster means differed from the current mean at $p < .05$ or below according to Hochberg's post hoc tests.

Examination of the clusters in relation to depressive symptoms and rumination as well as investigating the moderating effect of gender

We answered the question about cluster differences and moderation effects of gender through two-way factorial ANOVAs with Hochberg's post hoc tests. We compared people in all of the clusters on depressive symptoms and levels of rumination about social situations. The means and group differences are shown in Table 3. The main effect of cluster was significant in both models ($F(3, 205) = 37.48, p < .001$ for depressive symptoms and $F(3, 209) = 7.85, p < .0001$ for rumination). The main effect of gender was neither significant regarding depressive symptoms ($F(1, 205) = 0.14, ns$) nor regarding rumination ($F(1, 209) = 2.06, ns$). Further, in the Gender x Cluster interactions, gender did not show evidence of moderation in either model ($F(3, 205) = 1.26, ns$ for depressive symptoms and $F(3, 209) = 1.69, ns$ for rumination).

As Table 3 shows, the Multidimensional Problem and the Psychological Inflexibility clusters were both showing significantly higher levels of depressive symptoms than the other two clusters (the No Problem and the Socially Avoidant and Anxious clusters). The levels of the depressive scores in these two clusters both indicated mild de-

pression (Svanberg & Åsberg, 1994). Regarding rumination about social situations people in the Multidimensional Problem cluster showed higher levels compared with the No Problem and the Socially Avoidant and Anxious clusters, but not compared with the Psychological Inflexibility cluster. Hence, we found partial support for our hypothesis to find a higher degree of depressive symptoms as well as higher levels of rumination in the Multidimensional Problem cluster compared to the other clusters.

Examination of the clusters in relation to disabling social anxiety

We found a significant relation between the four-cluster solution and disabling social anxiety, both regarding occupational/academic function $\chi^2(3, N = 213) = 27.34, p < .0001$ and social activities $\chi^2(3, N = 212) = 60.78, p < .0001$. To be able to examine which clusters contributed to this relation we compared the standardized residuals for each cluster. The group of people who experienced disabling social anxiety was overrepresented in the Multidimensional Problem cluster (occupational/academic function $z = 3.4$, social activities $z = 6.0$) and underrepresented in the No Problem cluster (occupational/academic function $z = -2.9$, social activities $z = -3.6$)

Table 4

Correlations between Social Anxiety (comprised of the two subscales of social fear/anxiety and social avoidance), Psychological Inflexibility, and Depressive Symptoms

	Social anxiety	Depressive symptoms	Psychological inflexibility
Social anxiety	1	49* (n =217)	.59* (n =217)
Depressive symptoms	.-	1	.66* (n =217)
Psychological inflexibility	-	-	1

Note. * $p < .01$

Table 5

Multiple Regression Analysis to test if Psychological Inflexibility acted as a Mediator between Social Anxiety and Depressive Symptoms

Outcome variable	Model	B	Standard error	β	95 % CI for B	
					Lower bound	Upper bound
Depressive symptoms	1. Constant	3.19	.79			
	Social anxiety	.17	.02	.49*	.13	.21
	2. Constant	.39	.75			
	Social anxiety	.06	.02	.17*	.01	.10
	Psych inflex	.32	.04	.55*	.25	.40

Note. * $p < .01$; Psych Inflex = Psychological inflexibility; R^2 for Model 1 = .24; R^2 Adjusted for Model 1 = .23; R^2 for Model 2 = .44; R^2 Adjusted for Model 2 = .44; R^2 Change between Model 1 and 2 = .20

Could psychological inflexibility act as a mediator between social anxiety/avoidance and depressive symptoms?

The correlations between social anxiety (the total scale, i.e., including the two subscales of social fear/anxiety and social avoidance), psychological inflexibility, and the outcome variable depressive symptoms are shown in Table 4. We decided to use the total scale of LSAS both in the bivariate correlations (see Table 4) as well in the multiple regressions analysis (see Table 5) since the same pattern was shown when we ran these analyses with each of the two subscales. (These data can be sent to an interested reader upon request.) Further, since both social anxiety and psychological flexibility showed relations with the outcome variable depressive symptoms, a multiple regression analysis was used to test whether there was evidence that psychological flexibility had a mediating effect (Baron & Kenny, 1986) between social anxiety/avoidance and depressive symptoms (see Table 5). The results showed that the beta coefficient of social anxiety was significantly reduced when psychological inflexibility was included in the second model since the confidence intervals for social anxiety/avoidance did not overlap between the first and the second model. However, the unique contribution of social anxiety upon the outcome variable depressive symptoms was still significant. The bootstrap analysis reaffirmed these results, showing the same pattern. Hence, this indicates that psychological inflexibility could be seen as a partial mediator between social anxiety/avoidance and depressive symptoms.

Discussion

The overall aim of the current study was to examine the relationships between psychological inflexibility, social anxiety, social avoidance, depressive symptoms, and rumination about social situations in a non-clinical population. There was a strong positive relationship between social fear/anxiety, social avoidance, and psychological inflexibility. A cluster analysis generated four clusters, where two (the Multidimensional Problems and the No Problem clus-

ters) reflected this relationship, albeit in different ways, which was in line with our first two hypotheses. Additionally, the No Problem cluster consisted of nearly half of all participants which also mirrored what we should expect. In summary, the results of the present study indicate that psychological inflexibility could be of importance not only for people with SAD but also for people with subclinical levels of social anxiety.

It also appears that psychological inflexibility may be relevant for other forms of subclinical mental ill-health such as depressive symptoms. People in clusters characterized by high levels of psychological inflexibility (the Multidimensional Problems and the Psychological Inflexibility clusters) reported higher depressive symptoms, consistent with clinical levels of mild depression (Svanberg & Åsberg, 1994), than those in the other two clusters characterized with lower levels of psychological inflexibility. This too was in line with our hypotheses. It is also worth mentioning that people in the Multidimensional Problems cluster reported levels of social anxiety on a clinical level (Andersson *et al.*, 2006). Hence, psychological inflexibility seems to be related to symptoms of mental illness, whether or not it is expressed in the form of social anxiety or depressive symptoms.

Further, people in the Multidimensional Problems cluster reported a higher degree of rumination around social situations than those in the Socially Anxious and Avoidant cluster (who scored high on social avoidance and somewhat higher on social anxiety, but not on psychological inflexibility). The Socially Anxious and Avoidant cluster is also of interest in comparison to the Multidimensional Problem cluster since people in this cluster, as we just mentioned, are characterized by a relatively low level of psychological inflexibility. A subgroup of people characterized by social anxiety and low levels of psychological inflexibility should be expected based on the acceptance model (Herbert & Cardaciotto, 2005), given that the social anxiety does not create a great deal of suffering. Also, the Socially Avoidant and Anxious cluster did not experience their social anxiety as disabling, whereas the people in the Multidimensional Problem cluster did. These results may indicate that low

levels of psychological inflexibility could act as a protective factor for individuals with subclinical social anxiety. Hence, taken together this is in accordance both with our third hypothesis and what we know from previous research. Namely that the use of dysfunctional control strategies, such as rumination, or covert avoidance, in the long term maintain mental illness as well as bringing with it disability in everyday life (Harvey et al., 2004).

Interestingly, people in the Socially Avoidant and Anxious cluster reported low levels of depressive symptoms, which further distinguishes them from the individuals in the Multidimensional Problems cluster who reported levels of social anxiety and depressive symptoms on a clinical level. Taken together, this indicates that low levels of psychological inflexibility could also be a protective factor against elevated levels of depressive symptoms. The latter indication is further strengthened by the fact that we, in line with our last hypothesis, found indications that psychological inflexibility partially mediated the relationship between social anxiety and depressive symptoms.

One thing that was not in accordance with our expectations is that gender did not act as a moderator either between the clusters and depressive symptoms or between the clusters and rumination. Also no main effect of gender was observed. However, a main effect of cluster emerged. Hence this implies that which cluster a participant belongs to is central, rather than which gender they are. This is not in line with earlier research since women more than men have been found both to suffer more from depression and to use control strategies like worry and rumination to a greater extent (e.g., Calmes & Roberts, 2007). One explanation could be that psychological inflexibility has not earlier, to our knowledge, been investigated at the same time in relation to gender, social anxiety, social avoidance, depressive symptoms and rumination or by using person-oriented methods. Hence, our results may point in the direction that combinations of factors that predict ill-health, such as psychological inflexibility and rumination, may especially increase the risk for social anxiety and depressive symptoms becoming disabling. However, our cross-sectional design makes it impossible to draw conclusions about causality.

Still, we can discuss how the relationship between social anxiety and psychological inflexibility can be explained on a theoretical level. In accordance with the previously described theoretical model (Herbert & Cardaciotto, 2005), high levels of psychological inflexibility is a key factor in maintaining social anxiety. Further, previous treatment studies suggest that a reduction of psychological inflexibility can predict a reduction of social anxiety (Herbert & Cardaciotto, 2005; Kocovski et al., 2009; Ossman et al., 2006), which suggests that psychological inflexibility could be important to explain variation in social anxiety. Based on the process described in the acceptance-based model (Herbert & Cardaciotto, 2005), a vulnerability to social anxiety is required to evoke physiological arousal and cata-

strophic thoughts in association with anxiety-provoking social situations. The model further implies that cognitive fusion of inner experiences exists. Together this could be said to increase the risk of a person trying to avoid inner unpleasant experiences. One way to do this is by using control strategies such as worry and rumination, which in turn have been found to be associated with a less flexible ability to solve problems and hence a more narrow behavior repertoire, that is, psychological inflexibility (Stöber & Borkovec, 2002; Watkins, 2008). Our results provide partial support for this, since people in the Multidimensional Problems cluster reported higher levels of rumination around social situations than people in both the No Problem and the Social Avoidance and Anxious clusters. Furthermore, psychological inflexibility should in turn generate augmented social anxiety and reduced functional capacity. Here too, our results are in line with this way of reasoning since people in the Multidimensional Problems cluster, who were characterized by high levels of psychological inflexibility, social anxiety and social avoidance, reported more depressive symptoms as well as lower level of function in everyday life than those belonging to clusters who reported a lower level of psychological inflexibility. To conclude, the relationship between psychological inflexibility and social anxiety could be of a bi-directional nature. Further research is required, however, to sort out the direction of this relationship.

Limitations and strengths

Some limitations of the current study should be mentioned. First, the recruitment of study participants was done by a convenience sample. This means that we cannot automatically generalize our results either to the entire student population or to the general population. However, the questionnaires regarding social anxiety, depressive symptoms and psychological inflexibility all have good psychometric properties and have been normed in clinical populations. Because of that we have the advantage of being able to compare people in our various profiles/clusters with those in clinical populations so that we can draw stronger conclusions. Second, the concepts of rumination and disabling social anxiety were only measured by one item respectively two items, which probably lower both the reliability and validity, and hence results should be interpreted with caution. Third, we only used self-report measures. Nonetheless, previous research has demonstrated that people's own reports of internalizing problems quite accurately measure subjective experiences. Lastly, the design of the current study is cross-sectional which means that we cannot say anything about causality.

Despite these limitations, our study has several strengths. First, we used both variable- and person-oriented approaches to answer our research questions. Second, except for the measures of rumination about social situations and disab-

ling social anxiety, all of the scales used in the study showed good psychometric properties. Third, we also mainly used dimensional instead of categorical measures, which increases the variance and thus the power in our analyses. Fourth, we analyzed several of the variables that theoretically are of interest in the same study. Finally, we used both MRA and bootstrapping to examine if psychological inflexibility mediates the relation between social anxiety/avoidance and depressive symptoms, hence strengthening the conclusion that the result we observed by the MRA was not only a random finding.

Conclusion

To summarize, two of the clusters that emerged were characterized by relatively elevated levels of psychological inflexibility. People in these clusters also reported the relatively highest levels of depressive symptoms and rumination. This suggests the importance of psychological inflexibility in relation to social anxiety and depressive symptoms as well as in relation to the use of dysfunctional control strategies like rumination. Taken together, the pattern of these two clusters which both consisted of high levels of psychological inflexibility appeared to be associated with psychological symptoms on a clinical level.

Authors' contribution

MT, CT, and MB planned the design of the study and analyzed the data. CT and MB collected the data. MT was primarily responsible for writing the first draft of the manuscript. MJF, KB, CT and MB took part in reading the manuscript and approved of the final version of the manuscript. KB and MJF made major contributions to the manuscript. All authors read and approved the final manuscript.

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