

Research paper

Social inhibition, sense of belonging and vulnerability to internalizing problems

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ABSTRACT

Background: The aim of this study was to provide a conceptual test of how social inhibition, sense of belonging and internalizing problems are related, and whether sense of belonging moderates or mediates the relation between social inhibition and internalizing problems.

Methods: Data were used from two waves of the Dutch internet cohort LISS (Longitudinal Internet Studies of the Social Sciences; N = 511, M age = 52.09 years). Social inhibition was measured using the DS14 in 2012, sense of belonging (i.e., feeling cut off and having people to really talk to) was measured with the General Social Exclusion Index in 2012 and internalizing problems with the MHI-5 in 2015.

Results: Social inhibition was related to a lower sense of belonging and more internalizing problems. A low sense of belonging was related to more internalizing problems. Results indicated no moderation. However, evidence was found for partial mediation. That is, feeling cut off and having people to really talk to explained part of the link between social inhibition and internalizing problems. All analyses were controlled for sex, age and income.

Limitations: The items used to measure sense of belonging only cover part of the construct. The study was not fully prospective, as such, no conclusions can be drawn regarding causality.

Conclusions: Low sense of belonging is a key factor to consider when aiming at understanding individual differences in internalizing psychopathology related to social inhibition.

1. Introduction

Humans are inherently social. Research suggests that people are healthier when they experience a sense of belonging (Newman et al., 2007b). Unsurprisingly, a growing body of evidence suggests that a low sense of belonging and social exclusion are experienced as painful and related to psychological problems, among which anxiety and depression (e.g., MacDonald and Leary, 2005). Sense of belonging might be of particular importance in the context of certain trait characteristics. A notable trait in these may be social inhibition. As of yet, to the best of our knowledge no study has examined how the three constructs are related. The aim of this study was to examine how social inhibition, sense of belonging and internalizing problems are associated, and provide a conceptual test of whether sense of belonging either moderates or mediates the relation between social inhibition and internalizing problems.

Social inhibition can be defined as the “tendency to inhibit the expression of emotions/behaviors in social interactions to avoid disapproval by others” (Denollet, 2005, p. 89). Furthermore, it can be seen

as part of the behavioral inhibition construct, along with a non-social inhibition component (Dyson et al., 2011). Apart from inhibiting the expression of emotions and behaviors, individuals with high levels of social inhibition also generally feel uncomfortable around other people (Friedman and Booth-Kewley, 1987; Gest, 1997). In the literature, various terms and operationalizations have been used – often interchangeably – to describe inhibitory behaviors, such as social withdrawal and behavioral inhibition (Rubin and Asendorpf, 2014).

Since the early '80 of the 20th century, the concept of social inhibition has been studied in relation to a range of behaviors and (mental) health outcomes. For example, in children social inhibition was found to be related to shyness and behaviorally inhibited interaction patterns (Kochanska and Radke-Yarrow, 1992) and decreased facial expressiveness (Yarczower and Daruns, 1982). In adult samples, associations were found with avoidance (Leary et al., 1986), asking for help (Williams and Williams, 1983) and, more recently, achievement and social outcomes (Hughes and Coplan, 2010; Rubin et al., 2009). The literature on social inhibition got a scientific boost with the development of the Type D personality construct (Denollet et al., 1996).

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Type D personality is defined by a combination of social inhibition and negative affectivity. Initially, Type D was predominantly studied in the context of cardiovascular diseases (e.g., Denollet et al., 2000; Habra et al., 2003). Over the last years, however, increasing support was found for the link between Type D personality and mental health outcomes, and internalizing problems in particular.

1.1. Social inhibition and internalizing problems

Recently, there has been a gradual shift in research on social inhibition as studied in medical psychology, towards clinical and social psychology. This has particularly been the case with regard to related constructs, such as social withdrawal and shyness in children (Katz et al., 2011; Nelson et al., 2008), the Behavioral Inhibition System/Behavioral Approach System (Carver, 2004; Depue and Jacono, 1989; Johnson et al., 2000; Kasch et al., 2002; Meyer et al., 2001) and research on the Type D personality construct (van Dooren et al., 2016; Condén et al., 2013; De Fruyt and Denollet, 2002; Lee et al., 2012; Park et al., 2014). Few studies have focused on the construct of social inhibition itself, but some findings seem to support a relation between social inhibition and internalizing problems (Bohlin et al., 2000; Lukaschek et al., 2016). For example, Bohlin, Bengtsgard and Andersson found that higher levels of social inhibition were related to higher levels of internalizing problems in a sample of Swedish 7- and 8-year-old children. Taken together, these results suggest that although there is a gradual shift towards research with mental health outcomes, very little is still known when looking only at studies on social inhibition.

1.2. Social inhibition and sense of belonging

The link between social inhibition and internalizing problems may be especially apparent within the context of social problems, and in particular the feeling that one belongs to a social group. Sense of belonging is defined by Hagerty et al. (1992) as “the experiences of personal involvement in a system or environment so that persons feel themselves to be an integral part of that system or environment” (Hagerty et al., 1996, p. 173). Increasing evidence suggests a link between social inhibition and social problems. For example, Nelson and colleagues (2008) found that shy individuals experience a poorer relationship quality with important others. Moreover, social inhibition has been associated with social impairment (Bohlin et al., 2000). Lastly, a study on Type D personality – as indicated by a combination of social inhibition and negative affect – and psychosocial stressors found that Type D personality was strongly associated with feelings of social isolation (Michal et al., 2011).

1.3. Sense of belonging and internalizing problems

Social functioning by itself has also been related to internalizing problems. Hagerty et al. (1996) found that sense of belonging was closely related to psychological functioning. Furthermore, Hall-Lande et al. (2007) found that social isolation was associated with an increased risk for depressive symptoms, suicide attempts, and low self-esteem. Newman et al. (2007a) found that adolescents who reported a higher sense of peer group belonging experienced fewer internalizing problems than their peers with low sense of belonging. In a similar vein, Flook et al. (2005) found that among children, a lack of peer acceptance predicted (among others) more internalizing symptoms (i.e., shyness, loneliness and negative emotions such as sadness and anxiety) two years later. Lastly, a high sense of belonging has also been linked to a greater sense of well-being (Jose et al., 2012) and less psychological pathology (Baumeister and Leary, 1995).

Apart from each having their own, unique effect, risk factors can also have combined effects on the development of psychological problems. Exactly how social inhibition, internalizing problems and a sense

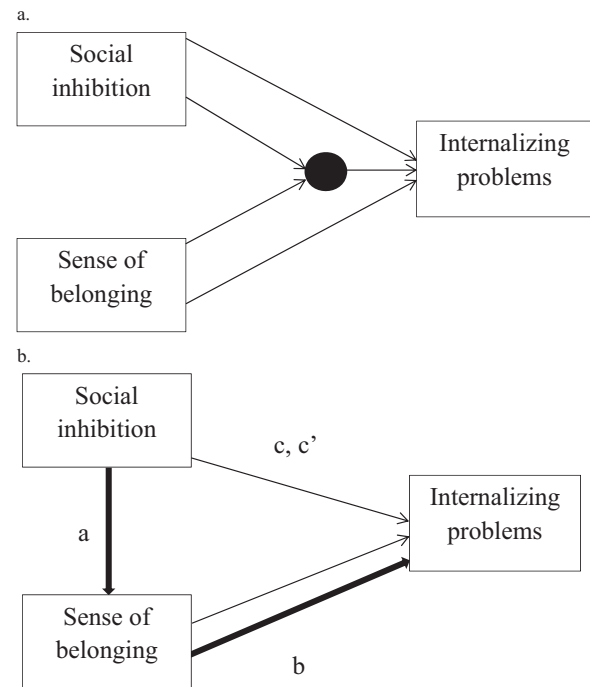


Fig. 1. In Fig. 1a, a theoretical moderation model of the prospective effect of social inhibition on internalizing problems moderated by feeling cut off from other people and having people around to really talk to is depicted. In Fig. 1b, a theoretical mediation model of the prospective effect of social inhibition on internalizing problems divided over direct effects and mediation via feeling cut off from other people and having people around to really talk to is presented. The mediation effect is illustrated by the arrow in bold.

of belonging are linked is as of yet unclear. Nonetheless, examination of the links between these constructs has the potential to integrate knowledge from multiple disciplines, such as personality, medical and clinical, and social psychology. Specifically, we hypothesize that sense of belonging may either have a mediating or moderating effect, or both, in the relation between social inhibition and internalizing problems.

1.4. Sense of belonging: moderator or mediator?

If sense of belonging *moderates* the relation between social inhibition and internalizing problems, sense of belonging either enhances or weakens the effect of social inhibition on internalizing problems. This would be in accordance with the stress-vulnerability model (Zubin and Spring, 1977), which proposes that person characteristics (i.e., social inhibition) interact with social or environmental factors (i.e., lack of belonging) and that this interaction results in an increased or decreased risk of subsequent psychological problems (i.e., internalizing problems). Specifically, socially inhibited individuals may be more likely to experience internalizing problems if they experience a low sense of belonging. For a graphical representation of this moderation model, see Fig. 1a. As of yet, only some suggestive evidence has been found with regard to the moderating role of sense of belonging. The stress-vulnerability model (Zubin and Spring, 1977) has a long history of validation (e.g., Harter, 1996), supporting a model in which person characteristics and environmental risk factors interact, resulting in an accumulative effect where 1 plus 1 equals 3. As such, socially inhibited individuals are expected to experience more internalizing problems when they have a low sense of belonging. However, to the best of our knowledge, such a model has not been tested yet.

Mediation can be found if sense of belonging explains (part of) the association between social inhibition and internalizing problems. That is, social inhibition is related to a low sense of belonging, which in turn is associated with internalizing problems. See Fig. 1b for a

representation of the mediation model. Some empirical evidence has already been found to support this mediational role. In a longitudinal study on an Australian community sample, Katz and colleagues (2011) found that early childhood social withdrawal was a predictor of social impairment at age 15. Social impairment at age 15 in turn predicted depression at age 20. These results suggest that social impairment explains part of the association between social withdrawal and depression later in life. Moreover, research on cascade models, traditionally studied in the fields of emotion (e.g., Linehan, 1993) and developmental psychology (e.g., Masten and Cicchetti, 2010), also suggest a mediation relationship. Cascade models may account for the pathways by which person- and environmental characteristics affect each other over time and as such, contribute to the development of psychopathology. Cascades may best be examined using multiwave, reciprocal models, but traditional mediation may be an (less sophisticated but often more feasible) alternative. As such, examining the mediating role of sense of belonging can touch upon pathways as proposed with the cascade models and provide insight in the sequences by which social inhibition and sense of belonging contribute to internalizing problems.

1.5. Current study

The constructs of social inhibition, internalizing problems and a sense of belonging are only just starting to be explored in relation to each other and much is still unclear about how they are connected. Moreover, apart from being directly linked to each other, sense of belonging might either partially enhance (moderate) or explain (mediate) the relation between social inhibition and internalizing problems. In the current study, we will provide a conceptual test of the relations between the three concepts. To do so, two components of sense of belonging are distinguished: feeling cut off from other people and having people around to really talk to.

Five hypotheses are tested. Firstly, the hypothesis that individuals high on social inhibition report more internalizing problems will be examined. Secondly, it is expected that higher levels of social inhibition are related to a lower sense of belonging. Thirdly, a lower sense of belonging is hypothesized to be related to more internalizing problems. Fourthly, a moderation model will be examined, assuming that a low sense of belonging can enhance the effect of social inhibition on internalizing problems. Lastly, in line with a mediation model, it is expected that sense of belonging explains part of the link between social inhibition and internalizing problems. That is, social inhibition is expected to be related to a lower sense of belonging, which in turn is linked to more internalizing problems.

2. Method

2.1. Sample and data collection

For this study we have used data of the LISS (Longitudinal Internet Studies of the Social Sciences) panel, which is administered by CentERdata (Tilburg University, the Netherlands). The LISS panel consists of a sample of Dutch individuals drawn from the population register and can therefore be seen as a representative sample of the general population. Data were used from two waves: social inhibition and sense of belonging data were collected in 2012, data on internalizing problems in 2015. Excluding all participants for whom a scale score of one of the key constructs could not be calculated, resulted in a respondents pool of 511. All LISS panel projects have been approved by the local ETC. Our sample consisted of 294 females (58%), with ages ranging from 17 to 88 (Mean = 52.09, *SD* = 16.26). The mean income was 4499.51 euros per month (*SD* = 3755.40) and of the sample, 36 participants (7%) only finished primary school. Furthermore, 199 respondents (39%) indicated secondary school as their highest level of education and 247 (48%) said to have finished any form of higher education.

2.2. Measurements

2.2.1. Social inhibition

Social inhibition was measured in 2012 with the DS14 (Denollet, 2005). The DS14 consists of 14 items which measure the Type D construct; seven of which measure social inhibition. Participants were asked to indicate how well items described them and their responses were rated on a 5-point scale (0–4). An example of a social inhibition item is: “I often feel inhibited when interacting with other people”. Reliability was found acceptable in earlier studies for the social inhibition subscale with a Cronbach's alpha of .86 (Denollet, 2005). Validity was found to be good as well. In this study a Cronbach's alpha of .87 was found.

2.2.2. Internalizing problems

Internalizing problems were measured in 2015 with the MHI-5 (McHorney and Ware, 1995), which is the shorter version of Veit and Ware's (1983) Mental Health Inventory. Participants had to give answers on 5 items on a 6-point Likert scale. An example of an item is: “I felt depressed and gloomy”. Cronbach's alpha for the short form was .89 (McHorney and Ware, 1995). Validity was also found to be good. Cronbach's alpha in our study was .90.

2.2.3. Sense of belonging

Sense of belonging was measured in 2012 using two items from the General Social Exclusion Index (Vrooman and Hoff, 2013). This list, designed for the social exclusion construct (Jehoe-Gijsbers, 2004) consists of four dimensions and a total of 15 items. Reliability and validity of the entire scale were found to be acceptable in previous studies (van Bergen et al., 2014). For this study, items were used of the limited social participation subscale likely to reflect (low) sense of belonging. The two items used were: “There are people around that I can really talk to” and “I feel cut off from other people”. Items were scored on a three-point scale. However, because of the low frequencies of the highest response category, both items were transformed into dichotomous items by merging the smallest answer categories into a 0 (no) to 1 (yes) scale.

2.3. Statistical analyses

All data preparation, as well as the moderation analyses were conducted in IBM SPSS version 20.0. Mediation analysis was carried out in Mplus (Muthén and Muthén, 1998–2012). Descriptive statistics in terms of means, standard deviations and frequencies were calculated, and correlations were calculated between all main study variables.

2.3.1. Direct effects and moderation

To test whether the hypothesized direct relations between social inhibition, sense of belonging and internalizing problems existed, we conducted regression analyses. To examine whether sense of belonging moderated the relation between social inhibition and internalizing problems, a hierarchical linear regression analysis was conducted. Gender, age and household income were entered in the first step as control variables and social inhibition in the second step. In the third step the two items of a sense of belonging were included. In the last step interaction variables for social inhibition and each of the sense of belonging items were entered.

2.3.2. Mediation

The association between social inhibition and sense of belonging was analyzed using logistic regression analyses. The relations between sense of belonging and internalizing problems and between social inhibition and internalizing problems were analyzed using linear regression analysis. All analyses were controlled for gender, age, household income and the sense of belonging variable not included in that analysis (i.e., in the analyses with feeling cut off we added having

Table 1
Descriptive statistics (N = 511).

	% (n)	Mean (standard deviation)
Age (years)	–	52.09 (16.26)
Gender (female)	58 (294)	–
Gross household income	–	4499.49 (3755.40)
Highest level of education		
(Primary school)	7 (36)	–
(Secondary school)	39 (199)	–
(Any form of higher education)	48 (247)	–
Social Inhibition	–	9.83 (5.53)
Internalizing problems	–	11.61 (4.65)
People to talk to (yes)	83 (424)	–
Feel cut off (yes)	34 (172)	–

people to really talk to as a covariate, and vice versa).

The theoretical models of the relation between social inhibition, sense of belonging and internalizing problems are shown for moderation and mediation in Fig. 1a and b, respectively. Fig. 1a illustrates the moderation model, where both social inhibition and sense of belonging are introduced as independent variables. The arrows to internalizing problems via the black dot illustrate the interaction effect. Fig. 1b shows a total effect of social inhibition on internalizing problems (path c) and a direct effect after controlling for the indirect path (path c'). Furthermore, the associations between social inhibition and the two mediators are labelled path a_1 and a_2 . The effects of the two mediators on the dependent variable, internalizing problems, are represented through path b_1 and b_2 . The total indirect path from social inhibition to internalizing problems is the sum of the two mediators.

3. Results

Descriptive statistics of the study's main variables, as well as background variables, can be found in Table 1. Correlations are reported in Table 2. Most important, individuals high on social inhibition scored lower on the sense of belonging items and reported more internalizing problems (small to medium effects). Furthermore, low sense of belonging was related to more internalizing problems (small to medium effect sizes).

3.1. Direct effects

Results indicated that individuals who scored high on social inhibition reported more internalizing problems than individuals low on social inhibition. A model with social inhibition and the control variables explained ca. 3% more of the variance in internalizing problems ($R^2 = .068$; $F(4494) = 17.98$ $p < .001$) than a model with merely the control variables ($R^2 = .034$, $F(3495) = 5.89$, $p = .001$). Secondly, higher scores on social inhibition were related to agreement to the statement “I feel cut off from other people” ($\chi^2(1) = 45.80$ (Wald test), $p < .001$). Additionally, individuals who scored high on social inhibition agreed to a lesser extent with the statement “There are people around that I can really talk to” ($\chi^2(1) = 5.62$ (Wald test), $p = .018$). Thirdly, both of the sense of belonging items were related to internalizing problems. Specifically, feeling cut off from other people was

Table 2
Correlation coefficients.

	Social inhibition	Internalizing problems	Cut off
Internalizing problems	.20**		
Feel cut off	.33**	.34**	
People to talk to	-.16**	-.22**	-.15**

Note. * $p < .05$, ** $p < .01$.

Table 3
Hierarchical moderation analysis.

	B	SE	Beta	p
Model 1				
Social inhibition	.16	.04	.19	< .001
Model 2				
People to talk to	–2.26	.51	–.19	< .001
Feel cut off	2.74	.43	.28	< .001
Model 3				
Social inhibition X People to talk to	.04	.09	.05	.694
Social inhibition X Feel cut off	–.04	.08	–.05	.660

Note. All hierarchical regression analyses were controlled for gender, age and household income.

linked to more internalizing problems, meaning that those individuals experienced more psychological problems. Conversely, individuals who indicated having people to really talk to on average reported fewer internalizing problems. A model with the two sense of belonging items added, explained 11% of the total variance in internalizing problems ($R^2 = .113$, $F(6492) = 33.84$, $p < .001$).

3.2. Moderation

Adding the interaction variables did not significantly improve the model ($R^2 = .182$, $F(8490) = .22$, $p = .800$). In other words, no evidence was found for an interaction effect between social inhibition and either of the sense of belonging items on internalizing problems. Parameters from the moderation analysis are reported in Table 3.

3.3. Mediation

Results from the mediation analysis showed that the association between social inhibition and internalizing problems could be partly explained by feeling cut off from other people and not having people around to really talk to. More specifically, there was an indirect effect via feeling cut off, which signified that social inhibition is associated to feeling cut off, which in turn is related to experiencing more internalizing problems. The pathway via having people around to really talk to was less strong, but still significant as well, and indicates that social inhibition is linked to having less people around to really talk to, which in turn is related to experiencing more internalizing problems. Path coefficients and confidence intervals for the various associations are reported in Table 4.

4. Discussion

The aim of this study was to examine how social inhibition, sense of belonging and internalizing problems are connected. Apart from looking at the direct pathways, we aimed to provide a conceptual test of the potential moderating or mediating role of sense of belonging in the relationship between social inhibition and internalizing problems. Our findings support the existence of linkages between the three constructs and indicate that sense of belonging partly mediates the effect of social inhibition on internalizing problems, even after controlling for sex, age and household income. No evidence was found for a moderation model. The various findings will be discussed in turn.

Traditionally, social inhibition in adults – and the concept of Type D personality in general – has been studied mainly in the field of medical psychology. Specifically, social inhibition has often been linked to health outcomes such as long term mortality (Denollet et al., 1996), quality of life (Pedersen and Denollet, 2003) and the prediction of new cardiac events (Denollet et al., 2000) in coronary heart disease patients. Over the last years, there has been increasing support for the importance of Type D in the context of mental health (e.g., De Fruyt and Denollet, 2002; Lee et al., 2012). Lee and colleagues (2012) for

Table 4
Direct and indirect relationships of the various associations.

	B	SE	p	LLCI	ULCI
Feeling cut off					
Social inhibition → Feeling cut off (a ¹ path)	.40	.05	< .001	.309	.496
Feeling cut off → Internalizing problems (b ¹ path)	.56	.06	< .001	.437	.688
Direct effect social inhibition → Internalizing problems (c' path)	.05	.04	.145	-.018	.124
Indirect effect social inhibition → Internalizing problems	.23	.04	< .001	.153	.299
Having people to really talk to					
Social inhibition → People to talk to (a ² path)	-.22	.06	.001	-.342	-.094
People to talk to → Internalizing problems (b ² path)	-.20	.04	< .001	-.270	-.128
Direct effect social inhibition → Internalizing problems (c' path)	.05	.04	.145	-.018	.124
Indirect effect social inhibition → Internalizing problems	.04	.02	.004	.014	.073

Note. All linear and logistic regression analyses were controlled for age, gender, household income and the sense of belonging item not of interest in the analysis.

LLCI = Lower Level Confidence Interval (95%).

ULCI = Upper Level Confidence Interval (95%).

example, found that Type D personality was related to more internalizing problems in a sample of Korean adolescents. Our study corroborates these findings by demonstrating that socially inhibited individuals reported more internalizing problems.

Furthermore, our study found that socially inhibited individuals experience not only psychological, but social problems as well (e.g., Hagerty et al., 1996; Nelson et al., 2008). This has previously been suggested by a study by Michal et al. (2011), who theorized that the Type D participants' feelings of social isolation may be explained by their social inhibition hindering an adequate communication of their feelings and needs to others. Our findings bolster this previous work by showing a link between social inhibition and sense of belonging. Specifically, socially inhibited individuals reported stronger experiences of feeling cut off and having less people to really talk to. These findings demonstrate that social interaction is a key factor in the context of social inhibition. This is new to the literature and seems to validate the inherently social nature of the social inhibition construct.

Subsequently, links were explored between sense of belonging and internalizing problems. Results showed that individuals who experienced a low sense of belonging reported more internalizing problems than individuals who experienced a higher sense of belongingness. This was the case both with regard to experiencing feeling cut off and experiencing having no one to really talk to. Although these links have not been examined before in the context of sense of belonging as operationalized in the current study, the findings seem to corroborate the findings by earlier studies. For example, Newman et al. (2007a) found that peer group belonging was associated with fewer behavior problems in a sample of adolescents. Our findings confirm the overall links demonstrated by Newman and colleagues but extend them substantially by using a more general rather than a peer-related measure of belonging, internalizing rather than behavioral problems and an adult rather than an adolescent cohort. Seemingly, sense of belonging plays a major role in mental health, regardless of the operationalization of constructs, psychopathology domain or sample under study.

The lack of support for a moderation effect of sense of belonging disproves our hypothesis of sense of belonging enhancing the association between social inhibition and internalizing problems. Moreover, it seems to contradict the stress-vulnerability model (Zubin and Spring, 1977), which proposes that the interaction between person and environment characteristics may decrease or enhance mental health problems. Possibly, sense of belonging reflects a merely subjective

experience of social isolation rather than characteristics of the individual's environment. However, given how little is still known about the links between social inhibition, sense of belonging and internalizing problems, more research is needed to adequately test the stress-vulnerability model in the context of these three constructs.

Apart from the main effects reported above, evidence was found for a mediation effect of sense of belonging in the link between social inhibition and internalizing problems. This was true for both of the items we used in our study to measure sense of belonging (i.e., feeling cut off and having people to really talk to). This finding supports and extends earlier research done by Katz and colleagues (2011) in an Australian community sample. In this study, social withdrawal in early childhood was found to be related to social impairment in adolescence, which in turn predicted depression in early adulthood. Our study's findings add to this by showing that social inhibition is related to a reduced sense of belonging, which was related to more internalizing problems. This finding underscores the idea that it might not be the inhibition itself that has negative outcomes, but an indirect route via feeling isolated that has detrimental mental health outcomes. Furthermore, the mediation effect of sense of belonging found in the current study fits well with what is already known from research on cascade models (e.g., Linehan, 1993; Masten and Cicchetti, 2010). Cascade models describe how person and environment affect each other and, in time, contribute to the development of psychopathology. Although the current study may point into the direction of a cascade model in which social inhibition, sense of belonging and internalizing problems affect each other over time, it is important to keep in mind that the findings cannot be interpreted causally and thus provide only a conceptual test of the potential causal linkages between the constructs. Moreover, and as previously suggested by Steger and Kashan (2009), internalizing problems may also predict sense of belonging and maybe also social inhibition. A longitudinal study would be needed to provide more conclusive evidence of such sequences. As with social inhibition, our finding on sense of belonging highlights the usefulness in studying sense of belonging outside its usual field of social psychology. As of yet, few studies have focused on linking sense of belonging to mental health outcomes (e.g., Newman et al., 2007a; Jose et al., 2012; Flook et al., 2005; Baumeister and Leary, 1995). Although our findings fit nicely into the Type D personality research field, similar relations might be found for other personality aspects, such as low extraversion and high neuroticism.

4.1. Strengths and limitations

Some strengths and limitations of the current study should be addressed. To our knowledge, no study before has attempted to combine social inhibition, sense of belonging and internalizing problems, as well as tried to link the three by means of mediation and/or moderation. In this sense, our study adds to the existing literature new insights on how internalizing problems might be caused by being socially inhibited and our study therefore has not only theoretical, but practical value as well. Secondly, the large, representative sample that was used in this study also adds to the generalizability of the findings and gives us confidence that the results found in this study can be used to better understand the pathways connecting social inhibition, sense of belonging and internalizing problems in other populations. Lastly, having identified an underlying mechanism explaining how social inhibition leads to internalizing problems has clinical value. This new information might help us to identify individuals who are vulnerable to internalizing problems and to design better intervention programs.

Some limitations need also be mentioned. Although having data on internalizing problems from a later measurement time, a truly longitudinal design with all constructs measured at different measurement times would have been preferred to gain more insight in sequences of the various constructs over time and possible mutual relationships between the constructs. However, although a fully prospective design

would have been necessary to provide a full test of developmental cascade (i.e., bidirectional relationships across time), a sense of the sequences typical for cascade models can also be obtained by means of examining mediation processes (Masten and Cicchetti, 2010). As it is, the current study provides a preliminary test of the potential causal pathways that link social inhibition, sense of belonging and internalizing symptoms. Future research should aim to test the mediation model of the current study using a fully prospective design: in longitudinal data with at least three waves. This would allow to fully extricate the individual effects of social inhibition, sense of belonging and internalizing problems, and to determine the direction of the effects found in the current study (see also Steger and Kashdan, 2009).

Additionally, a more elaborate scale for measuring sense of belonging would increase the reliability of the study's findings. In the future, it might be interesting to see what other aspects of sense of belonging are important in the association. As only two aspects were investigated in this study, it is important that we examine whether the effect of sense of belonging is limited to these two specific aspects, or if more aspects might play a role. Future research might also focus on distinguishing between different kinds of internalizing problems, as to see if the findings of our study hold and might be especially important in predicting specific disorders.

Furthermore, the various constructs in this model may be considered part of the same (internalizing) spectrum, which may raise questions regarding a tautological model. However, correlations between the constructs suggest reasonably separate constructs and also looking at the item level suggests that our measures of social inhibition and internalizing symptoms do capture two constructs. Whereas our internalizing items are based on emotions (e.g., "I felt depressed and gloomy"), the social inhibition items reflected the more interpersonal part of inhibition (e.g., "I find it difficult to strike up a conversation"). Moreover, it is unlikely that the strength of the correlation between social inhibition and internalizing symptoms can be completely explained by the three-year interval as personality is considered to be relatively stable in adulthood (e.g., Costa et al., 2000).

Lastly, it could and indeed has been argued that individuals differ in their need to belong (Kelly, 2001). For some people, the need to belong might be a stronger motivator of behavior. For these people, then, we would expect that having the feeling that one does not belong – that is, having a low sense of belonging – might be especially painful and would therefore be more likely to experience internalizing problems as a consequence. Future research should therefore aim to include individual differences in the need to belong when studying sense of belonging as a mediator of the effect of social inhibition on internalizing problems.

5. Conclusion

Although some studies have pointed into the direction of associations between social inhibition and internalizing problems (e.g., Lee et al., 2012; Bohlin et al., 2000), and between social functioning and internalizing problems (e.g., Newman et al., 2007a; Jose et al., 2012), to date only one attempt has been made to integrate the three constructs (Katz et al., 2011). Our study confirms and extends previous findings by providing support for associations between social inhibition and internalizing problems, as well as between social inhibition and sense of belonging and sense of belonging and internalizing problems. Moreover, our study provides a conceptual test for a mediation effect of sense of belonging. That is, feeling cut off and having people to really talk to explained part of the link between social inhibition and internalizing problems. All the reported effects were controlled for sex, age and household income. Our findings enhance our understanding of the intricate pathways leading from social inhibition to internalizing problems. More work, however, is needed examining the sequences in further detail. As such, the current study is only a first step in disentangling the links between social inhibition, sense of belonging and

internalizing problems.

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We confirm that we have given due consideration to the protection of intellectual property associated with this manuscript and that there are no impediments to publication. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

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