

THE FINAL PUBLICATION IS AVAILABLE AT
<http://dx.doi.org/10.1007/s10508-014-0268-4>

Explaining the Suicide Risk of Sexual Minority Individuals by Contrasting the Minority Stress
Model with Suicide Models

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ABSTRACT

Many studies have found elevated levels of suicide ideation and attempts among sexual minority (homosexual and bisexual) individuals as compared to heterosexual individuals. The suicide risk difference has mainly been explained by minority stress models (MSTM), but the application of established suicidological models and testing their interrelations with the MSTM has been lacking so far. Therefore, we have contrasted two established models explaining suicide risk, the Interpersonal Psychological Theory (IPT) (Joiner, 2005) and the Clinical Model (CM) (Mann et al., 1999), with the MSTM (Meyer, 2003) in a Bavarian online-sample of 255 adult sexual minority participants and 183 heterosexual participants. The results suggested that the CM and the IPT model can well explain suicide ideation among sexual minorities according to the factors depression, hopelessness, perceived burdensomeness, and failed belongingness. The CM and the IPT were intertwined with the MSTM via internalized homophobia, social support, and early age of coming out. Early coming out was associated with an increased suicide attempt risk, perhaps through violent experiences that enhanced the capability for suicide; however, coming out likely changed to a protective factor for suicide ideation by enhanced social support and reduced internalized homophobia. These results give more insight into the development of suicide risk among sexual minority individuals and may be helpful to tailor minority-specific suicide prevention strategies.

KEY WORDS: homosexuality; gay; lesbian; bisexual; sexual orientation; suicide

INTRODUCTION

Sexual minority individuals are at greater risk for attempted suicide compared to their heterosexual counterparts. An increased risk was found in nearly all studies and for all subgroups of sexual minorities (gays, lesbians, bisexual men and bisexual women, predominantly heterosexuals), for all dimensions of sexual orientation (behavior, attraction, identification), and for all forms of suicidality (suicide ideation, suicide attempts, suicide attempts with medical treatment) (Bagley & Tremblay, 2000; Haas et al., 2011; King et al., 2008; Lewis, 2009; Marshal et al., 2011; McDaniel, Purcell, & D'Augelli, 2001; Meyer, 2003; Plöderl, Sauer, & Fartacek, 2006; Russell, 2003). For suicide, the sparse available data suggest that sexual minority individuals are also at increased risk (Plöderl et al., 2013).

In this article, we use the term “sexual minority” by referring to non-heterosexual individuals, i.e., self-identified lesbian, gay, or bisexual (LGB) individuals or those unsure of their identification, those with non-heterosexual sexual behavior (men who have sex with men, women who have sex with women), or those with non-heterosexual sexual attraction.

Several theoretical models have been formulated to explain the increased suicide risk of sexual minorities (Hatzenbuehler, 2009; Meyer, 2003). They focus on the damaging role of “minority stress,” i.e., stress as a result of the minority status, such as discrimination or violent experiences caused by homophobia. Minority stress was originally used for racial or ethnic minorities and appeared in sexual minority health research in the last decades. Meyer (2003) formulated his minority stress model out of this research. Hatzenbuehler (2009) expanded the model by pointing out how minority stress alters general cognitive and interpersonal processes that are known to be associated with mental health problems. Minority stress models attempt to explain why minorities have an increased risk to develop all kinds of mental disorders in general.

In the words of Meyer (2010, p. 1218): “Minority stress does not predict a specific impact on, say, depression versus anxiety and substance use disorders.” However, there are crucial differences between the development of, for example, anxiety disorders and the development of suicide risk. Individuals with suicide ideation or suicidal behavior can be characterized by very specific risk and protective factors. In suicidology, several models try to explain exactly why people die by suicide. For example, hopelessness or the feeling of being a burden to others are important factors in suicide models and are assumed to predict the development of suicide related behavior and ideation within individuals with mental health problems (Joiner, 2005; Mann, Wateraux, Haas, & Malone, 1999). For the above mentioned example, internalized homophobia (as one form of minority stress) may increase the risk for depression. However, without the feeling of being a burden to others or marked hopelessness, an individual should not develop suicide ideation, even if there is a pronounced depression. Therefore, minority stress models are necessary, but likely not sufficient, in explaining the suicide risk of sexual minorities.

Surprisingly, established theoretical models from suicidology have not been applied in sexual minority research. In addition, studies designed specifically to test the available minority stress models are also sparse. Most existing studies only assessed one or two of the factors in the minority stress model, with one recent exception (Wong, Schrage, Holloway, Meyer, & Kipke, 2013). As a result, our understanding of how sexual minorities exactly develop their increased suicide risk remains limited.

It is important to know, for example, how homophobic harassment is related to the factors of suicide models. Is homophobic violence associated with the capability to die by suicide or rather with perceived burdensomeness, or with both? Which of the factors of the minority stress model are most strongly associated with factors that drive suicide ideation or

capability for suicide? Only by simultaneously applying both suicide models and the minority stress model is it possible to establish how the models interrelate with each other. This was the main goal of our article. Because this approach is new, we do not form specific hypotheses beforehand but examine the interrelationship between the models in an exploratory manner. Additionally, it is interesting to contrast how the models fit within sexual minority and sexual majority groups.

Suicide Models

For our study, we selected two rather recent suicide models that have received substantial empirical support and theoretical discussion: the Clinical Model (CM) by Mann et al. (1999) and the Interpersonal Psychological Model (IPT) by Joiner (2005).

Clinical Model

According to the CM of Mann et al. (1999), among individuals with suicidal behavior, similar levels of stressors (depression, psychosis, life-events) are associated with more hopelessness, subjective depression, and suicide ideation, compared with individuals without suicidal behavior. Increased impulsivity, as a disinhibitory factor, is necessary to act out suicide ideation and suicide planning. Impulsivity, in return, is associated with aggression and neurobiological traits related to low serotonergic activity.

This model should predict that suicide ideation and suicide planning are associated with hopelessness and depression, and suicide attempters should have higher levels of impulsivity and aggression as compared to non-attempters.

Interpersonal-Psychological Model

Joiner (2005) developed his IPT in order to find suicide risk factors that were more specific than the “usual verdicts” depression and hopelessness. The IPT has two components:

One component explains the desire to kill oneself and covers two factors: First, failed belongingness, which means a lack of interactions with others and a lack of feeling of being cared about. Second, the feeling of burdensomeness is a result of a sense of ineffectiveness and incompetence (Joiner, 2005, p. 96f). The other component of Joiner's model is the capability of committing suicide, which "involves fearlessness about confronting pain, injury, and indeed death" (p. 92) and is acquired through "repeated experience with painful or provocative stimuli, especially (but not limited to) deliberate self-harm" (p. 92). Meanwhile, psychometrically sound instruments have become available to assess factors of the IPT (Van Orden et al., 2008, 2012).

According to the IPT, it should be failed belongingness and burdensomeness that are most strongly associated with suicide ideation and that those who attempt suicide should have higher levels of acquired capability.

Minority Stress Model (MSTM)

The minority stress model of Meyer (2003) suggests that, in addition to general stressors that affect everybody, stressors that are unique for sexual minorities cause mental health problems, including suicidality. Such stressors are categorized into distal minority stressors, i.e., actual/objective discrimination and violence, and proximal stressors, such as hiding of one's sexual minority status, fear of coming out, or devaluing one's sexual orientation (internalized homophobia). The negative impact of these stressors can be buffered by social support and by coping abilities and also depends on contextual factors, such as prominence, valence or integration of one's minority identity.

According to the minority stress model, one would expect that all forms of mental health problems are associated with more proximal and distal minority stress as well as with lower social support and coping abilities.

Besides these specific hypotheses, testing the three models simultaneously allows us to find out how the models relate to each other, allowing insights into how the factors from the models relate to each other, thus shedding light on the developmental pathway of minority specific suicide risk.

METHOD

Participants

An electronic questionnaire was made public on websites of different LGB organizations in the Regensburg area of Bavaria. Sexual minority individuals were recruited via the popular social network www.gayromeo.com and with the gay or lesbian web-meeting forums www.gaychat.net and www.de.lesarion.com. Additionally, the link was put on the website of www.gay-web.de in the cities Bochum, Siegen, Regensburg, and on RESI, Regensburg's gay and lesbian organization (www.resi-online.de).

A heterosexual comparison group was recruited via the email list of the psychological department of the University of Regensburg, the popular online student network StudiVZ (www.studivz.net), and the personal social network of one of the authors of this paper. The heterosexual group was not designed to be a matched control group. Originally, the study was part of a research project where it was important to sample more individuals at increased risk for suicide (Sellmeier, 2011). Therefore, a link to the survey was placed in the suicide web-forums www.kinder-der-nacht-de and www.tod-forum.de. For the study at hand, however, participants from these platforms were excluded from the sample to avoid biasing the results, given that most participants from the suicide web-forum had high levels of suicide ideation.

The survey was divided into two parts (see below). Part one of the survey was completed by 485 participants. There was one item at the end of the survey asking if the survey was carried

out seriously or not (“I have completed the survey in a serious manner” vs. “I did not complete the survey seriously, for example, because I clicked through all items out of interest only”), leading to the exclusion of one participant who stated not having been serious. After exclusion of those who were younger than 18 or older than 39 years, 438 participants remained for analysis. Most of these participants ($n = 335$, 76%) also completed the second part of the survey that assessed depression, aggression and impulsivity.

The total sample ($N = 438$) consisted of 255 participants ($n = 55$ or 22% men) classified as a sexual minority (see below for details) and 183 heterosexual participants ($n = 95$ or 37% men). Compared to sexual minority participants, heterosexuals were younger: $M = 25.36$, $SD = 5.80$ vs. $M = 27.66$, $SD = 3.98$, $t(435.25) = -4.93$, $p < .01$, and had a higher degree of education 97% vs. 82% with Abitur or University, $\chi^2(1) = 45.58$, $p < .01$

Measures

Suicide Ideation and Attempts

Suicide ideation was solicited with Beck’s Scale for Suicide Ideation (Beck & Steer, 1991). We created separate scores for the suicidal desire and the suicidal planning subscales as suggested in Joiner et al. (2003), but the results were very similar for the subscales, so only the total score of the two subscales (17 items) was used for this paper. Each item was rated on a three-point scale from 0 to 2, graded according to the intensity of suicide ideation. The scale also included two additional items on suicide attempts and suicide intent. The item on suicide attempts had the response options 0 (no suicide attempt), 1 (one suicide attempt), and 2 (two or more attempts). We used this item to classify study participants as non-attempters and attempters. We slightly modified the item on suicide intent, i.e., the wish to die, by including an additional response option (no wish to die) in order to allow the distinction between suicide

related behavior and other self-injurious behavior suggested by Silverman et al. (2007). The other three response options were weak/medium/strong intent to die.

Factors of the CM

Hopelessness was assessed with the 10-item version of Beck's Hopelessness-Scale (Krampen, 1994). Each item was Likert-scaled ranging from 1 to 6. Depressive mood during the previous week was assessed with the Allgemeine Depressionsskala (ADS) (Hautzinger & Bailer, 1993), which is a German version of the Center for Epidemiologic Studies Depression (CES-D) scale, consisting of 12 Likert-type items ranging from 1 to 4. Impulsivity was assessed with the first 22 items (Likert scale, ranging from 1 to 4) of Barratt's Impulsivity Scale, version 11A (Barratt, 1994), which was translated by our research group. Aggression was assessed with 12 items from the German translation of Buss and Perry's Aggression questionnaire (Herzberg, 2003), with three items from each of the four subscales: physical aggression, verbal aggression, anger, and hostility. Each item was rated on a Likert-type scale with response options ranging from 1 (no aggression) to 6 (severe aggression). The shortened versions of the impulsivity and aggression scales correlated nearly perfectly with the total scores in a sample of 380 inpatients ($r = .96$ and $r = .94$, respectively) and has shown good internal consistencies ($r_\alpha = .83$ and $r_\alpha = .85$, respectively). We did not assess factors associated with low serotonergic activity, such as head injuries, substance abuse, smoking, or alcoholism, as suggested by the CM. However, according to the CM, these factors should all contribute to impulsivity, which was assessed. In the early stage of developing suicide risk, the CM also includes stressful life events or a psychiatric diagnosis, such as depression or psychosis. We did not assess these events except for violent experiences and other factors from the MSTM that may also count as life-events (e.g., coming out).

Factors of the IPT

The motivational component of the IPT was assessed with the Interpersonal Needs Questionnaire, which consists of two subscales: perceived burdensomeness and failed belongingness. Perceived burdensomeness was assessed with seven items (e.g., “These days I feel like a burden on the people in my life”). Failed belongingness was assessed with five items (e.g., “These days other people care about me”). The items of both subscales had a 7-point Likert type response option. Both subscales had high internal consistencies ($r_\alpha = .90$ and $r_\alpha = .85$, respectively). Acquired capability is the second component of the IPT and was assessed with five items (e.g., “I can tolerate more pain than most people,” “Things that scare most people don’t scare me”). The items were Likert-scaled with response options ranging from 1 to 5. In our sample, the internal consistency of the acquired capability scale was $r_\alpha = .71$. For detailed psychometric properties, see Van Orden et al. (2008). The items were translated and back-translated by Salzburg’s Suicide Prevention Research Program.

Factors of the MSTM

The MSTM includes a variety of factors, but, in order to keep the survey short enough, we restricted our analysis to the main factors. *Distal minority stress* consisted of 12 items with yes/no response options on discrimination and violence as suggested by Herek (1990) with additional items on more subtle forms of discrimination as suggested by Plöderl and Fartacek (2009). Example items are: “Which of the following experiences have you made in your life?”, “Been spat upon,” “Been sexually harassed.” The items were coded with 0 (no violence) and 1 (violence occurred). Follow up items assessed if the experience in question was related to one’s sexual orientation, coded with 0 (no violence) or 1 (presence of violence). The internal consistency of the scale was $r_\alpha = .84$ (general violence) and $r_\alpha = .98$ (sexual orientation based

violence). *Proximal minority stress* included internalized homophobia which was assessed with a German version of the 20-item Internalized Homophobia Scale (Wagner, 1998, $r_\alpha = .98$). Two examples are “I am glad to be gay” and “Life as a homosexual is not as fulfilling as life as a heterosexual.” Each item was Likert-scaled, ranging from 1 to 5, with higher values indicating more internalized homophobia. Disclosure of sexual orientation was solicited with the item “How many persons are informed about your sexual orientation?” separately for family, friends, and the workplace, with the Likert-scaled response options 1 (nobody), 2 (few), 3 (about half), 4 (most), and 5 (nearly all or all). A mean score was created for the three coming out variables ($r_\alpha = .85$). Age of awareness of one’s homosexuality/bisexuality and age of coming out was assessed with two additional items. One participant responded with zero to the item about age of coming out. This was corrected by the participants age of awareness plus the total sample mean difference between age of coming out and age of awareness (3.27 years).

Social support was assessed with the 14-item short version (K-14) of the Fragebogen zur sozialen Unterstützung (Fydrich, Sommer, & Brähler, 2007, $r_\alpha = .92$). The items were Likert-scaled ranging from 1 to 5. We also used a slightly modified version of the *gay community involvement* scale by Vanable et al (1998), with an additional item on frequenting online-platforms, resulting in a total of 8 items ($r_\alpha = .73$) that had response options ranging from 1 to 5. Minority specific social support was assessed with the item “How many homosexual or bisexual persons that you consider as personal friends do you have?” with Likert-type response options ranging from 1 (none) to 5 (five or more).

Coping abilities are part of the protective factors in the MSTM, but were not assessed due to limited space. There are no established questionnaires to assess prominence, valence, and integration of sexual minority identity. However, we assumed that religion and education may be

relevant. Religious communities often promote homophobic values, which may be challenging to sexual minority individuals and may reduce the known protective effect of religion on suicide risk (Kralovec, Fartacek, Fartacek, & Plöderl, 2012). We solicited religious affiliation with a binary variable (yes/no) and assessed the degree of attachment to the religious community with the Likert-type item “Do you feel a sense of belonging to your religious community?” (very/probably/probably not/no). We then created an ordinal variable ranging from 0 to 4 (not affiliated/not attached/probably not attached/probably attached/very attached). Education may also be relevant because coming out is less likely a problem to university students than in individuals in other educational settings. We assessed the highest degree of education with a Likert-scaled item ranging from 1 (not finished school) to 5 (University).

Sexual Orientation

We assessed sexual orientation based on the recommendations of Saewyc et al. (2004), using several dimensions of sexual orientation: Sexual identity was assessed with the item “What describes your sexual orientation best?” with the response options heterosexual (sexually interested in the other sex)/predominantly heterosexual/bisexual (sexually interested in men as well as in women)/homosexual, gay, lesbian (sexually interested in the same sex), asexual (no interest in sexual interaction)/other label/I am not sure. The two items on sexual behavior were (“With how many men/women did you have sex already?”) and the item on sexual attraction was “To whom are you sexually attracted to?” (men/women/men and women/neither to men nor to women). Participants were categorized as sexual minority members if they either identified as bisexual or homosexual or if they reported same-sexual attraction or same-sex behavior. This included 6 of 164 (4%) heterosexually identified, 11 of 22 (50%) predominantly heterosexually

identified, one of two (50%) asexually identified, 12 of 13 (92%) otherwise identified, and 11 of 13 (85%) participants who were not sure of their sexual identity.

Procedure

A web link to Part 1 of the survey was made available online. The survey was divided into two parts. The instruments for the first part were needed for a different research project (Sellmeier, 2011), where a maximal participation rate was important, and so the additional instruments that were necessary for this study were given separately as Part 2. Part 1 included the assessment of sociodemographic information and all other factors described above except depression, aggression, and impulsivity, which were assessed in Part 2. Only those participants who completed Part 1 were invited to proceed to Part 2 of the survey. In order to assure anonymity and to be able to merge the two parts of the study results, participants were asked to provide a personal code that they had to use in the second part of the survey. Participants who completed Part 1 and 2 were significantly more hopeless than participants who only completed Part 1, with a small to medium effect size ($d = .37$). Participants of both parts did not differ significantly in any other variables. The percentage of sexual minority members was significantly higher in those who completed Part 1 only (80%) compared to those who completed both parts (55%).

Statistical Analysis

Data analysis was conducted with R 3.0.2 (R Developmental Core Team, 2013). Most analyses were based on Spearman rank correlations. Gender differences were explored with interaction terms in regression analysis with suicide attempts or suicide ideation as dependent variable and the risk/protective factor with gender and their interaction term as predictors.

The main analysis of our study was the inspection of how the MSTM, the IPT, and the CM were interrelated with each other. To visualize the interrelations between the variables, we used R's qgraph package (Epskamp, Cramer, Waldorp, Schmittmann, & Borsboom, 2012) by creating a network out of the intercorrelation matrix which is graphically depicted. In addition, we conducted a cluster analysis as suggested by Harrell (2000) with a similarity matrix based on the squared Spearman rank correlations with the varclus function of R's Hmisc package (Harrell, 2013).

Standardized mean differences (Cohen's d) or correlational effect sizes were used, as suggested by Rosenthal, Rosnow, and Rubin (2000): large effects $r = .50$ ($d = 0.8$), medium effects $r = .30$ ($d = 0.50$), and small effects $r = .10$ ($d = 0.20$). We used a Bayesian version of Cohen's d for the comparison of two groups as suggested by Rouder et al. (2009) and also reported the related two-sided Bayes Factor (BF), according to the procedure suggested by Rouder et al. (2009), with 100,000 resamples and 5,000 burn-in samples, and by using the Cauchy prior distribution.

RESULTS

Suicide Ideation and Attempts

Among sexual minority participants, 14% ($n = 35$) attempted suicide at least once in their lifetime (12% among men and 15% among women), compared with 5% ($n = 10$) among heterosexual participants (7% among men and 5% among women), $OR = 2.72$, 95% $CI = 1.35$ - 5.97 . Similar results were found for suicide attempts with some intent to die (14 vs. 5%, $OR = 3.03$, 95% $CI = 1.47$ - 6.92). Sexual minority participants had marginally significantly higher levels of suicide ideation, $M = 2.54$, $SD = 5.32$ vs. $M = 1.68$, $SD = 4.80$, $t(413.71) = -1.77$, $p =$

.08. These comparisons should be interpreted with caution because the samples were not matched.

Associations with Suicide Ideation

For sexual minority participants, suicide ideation most strongly correlated ($r > .50$) with two factors from the CM: depression and hopelessness (Table 1, Fig. 1a), followed by the factors from the IPT: burdensomeness and failed belongingness. In terms of effect size, all these associations were large. For the factors from the MSTM, only social support correlated substantially with suicide ideation ($r = -.44$); the effects were of medium size for internalized homophobia, general violence, and coming out, and small for other factors in the MSTM. No significant gender interactions effects were found, except for the protective effect of attachment to religious community, which was larger among women ($r = .32$) than among men ($r < .15$).

The results from the cluster analysis (Fig. 2a) showed that suicide ideation clustered, as predicted, with the variables from the CM (depression and hopelessness), as well as with burdensomeness from the IPT. The only factor from the MSTM clustering with suicide ideation was social support, which seemed to form one underlying factor with belongingness. A similar cluster was observed among the heterosexual participants (Figs. 1b, 2b).

Associations with Suicide Attempt Status

Surprisingly, suicide attempt status was not significantly associated with aggression and impulsivity from the CM but was associated with acquired capability from the IPT (Table 2 and Fig. 1a). Suicide attempters also had significantly higher levels of current depression, hopelessness, suicide ideation, failed belongingness, and perceived burdensomeness. With respect to the MSTM, participants who attempted suicide had significantly higher levels of general violence, sexual orientation based violence, degree of coming out, and coming out to the

family. Suicide attempters also came out earlier, had an earlier awareness of their minority status, and also had less social support. Overall, the effects were largest ($d > .50$ or $BF < .33$) for acquired capability, depression, suicide ideation, failed belongingness, social support, general violence, age of coming out/awareness, coming out to family, and social support. There were no significant interaction effects with gender.

The cluster analysis revealed that suicide attempt status clustered mostly with acquired capability and also with age of coming out/awareness (Fig. 2a). Similar interrelations were also found among heterosexuals, but with aggression and impulsivity as additional variables (Figs. 1b, 2b).

MSTM in relation to the CM and the IPT

The graphical depiction of the intercorrelations (Fig. 1a, 1b) and the cluster analyses (Fig. 2a, 2b) visualize how the models were interrelated to one another. The CM, the IPT, and the MSTM were highly interrelated with the factors depression, hopelessness, perceived burdensomeness, failed belongingness, and social support. Suicide ideation was located within this cluster. Failed belongingness and social support appeared to form one underlying factor. Similar clusters were found among heterosexuals and could be described as a depression/isolation factor.

Suicide attempt status, early coming out, violent experiences, acquired capability, and religiousness formed another cluster, but, unexpectedly, aggression and impulsiveness from the CM were not within this cluster; instead, they formed a separate cluster. Early coming out and early awareness of one's sexual minority status were most strongly associated with sexual orientation based violent experiences and negatively with membership in a religious community (Fig. 1a). Among heterosexual participants, suicide attempt status clustered broadly with

education, acquired capability, impulsivity, aggression, violent experiences, and religiousness (Fig. 2b).

Among sexual minority participants, another separate cluster was formed by the three factors from the MSTM: internalized homophobia, degree of openness, number of sexual minority friends, and gay community involvement. The inspection of the correlation matrix (Fig. 1a) indicated that the MSTM, the CM, and the IPT were intertwined most prominently with social support, internalized homophobia, and degree of coming out.

DISCUSSION

This study examined how the MSTM was interrelated with two established suicide models: the CM and the IPT. Suicide ideation was, as expected, most strongly associated with depression and hopelessness from the CM and with failed belongingness and perceived burdensomeness from the IPT. Failed belongingness (IPT) and social support (MSTM) clustered together and may form one underlying construct.

Lack of social support had the strongest association with suicide ideation within the MSTM. Other factors from the MSTM, namely internalized homophobia, general violence, and degree of openness correlated less strongly, but still with medium effect size with suicide ideation and could be targets for minority specific suicide prevention efforts. Gay community involvement or number of gay friends did not or only very weakly correlate with suicide ideation and, surprisingly, not with social support, contrary to what is discussed in pertinent literature (e.g., Herek & Garnets, 2007). However, our finding was consistent with those of other studies which also reported no or weak correlations of gay community involvement with social support (Bowleg, Craig, & Burkholder, 2004; Plöderl, 2004), perhaps also due to decreased participation in the gay community (Zablotska, Holt, & Prestage, 2011). Still, some studies found a protective

effect of gay community involvement against depression (Lewis et al., 2001; Mao et al., 2009; Mills et al., 2001).

Degree of openness was a protective factor against suicide ideation and those with higher openness reported more social support and less internalized homophobia. However, degree of openness was a risk factor for having attempted suicide. We will discuss below that coming out to others may first be a risk factor and then become a protective factor. Internalized homophobia and social support were those two factors from the MSTM which were associated most prominently with risk factors from the CM and the IPT and could be conceptualized as bridging variables between sexual minority specific factors and general suicide related factors.

Internalized homophobia was, besides social support, the one variable of the MSTM with the strongest association with suicide related risk and protective factors and the only factor from the MSTM that correlated significantly with suicide ideation. Internalized homophobia is extensively discussed as a cause of mental health problems in the clinical literature, but a recent meta-analysis found only small to moderate associations (Newcomb & Mustanski, 2010). Nonetheless, in order to judge the importance of a risk factor, effect size is not sufficient, but contrasting the risk factor to other established risk factors is necessary. Thus, despite only medium effect size, internalized homophobia seems to be the most important minority specific risk factor.

Interestingly, internalized homophobia did not correlate with minority specific violent experiences, but with failed belongingness and perceived burdensomeness, and negatively with social support, gay community involvement, and degree of openness. Perhaps lacking a validating environment does impact internalized homophobia more than violent or discriminating experiences which may be specific events that are easier to cope with.

With respect to suicide attempt status, as predicted by the IPT, suicide attempters had higher levels of acquired capability than non-attempters. Capability, in return, correlated with early awareness of one's sexual minority status and early coming out. This is in line with other studies that found an increased suicide risk with a younger age of coming out (D'Augelli et al., 2005; Remafedi, Farrow, & Deisher, 1991; Wichstrom & Hegna, 2003). In our study, early coming out was associated with more general and sexual orientation based violence and these violent experiences were associated with higher risk for suicide attempts. Possibly, those who come out early are still part of more hostile environments such as schools where homophobia is common: they may be exposed more to homophobia, have less control over their environments, or have lower social support or coping abilities than later on in life, or even may experience an involuntary coming out. As a result, the acquired capability for suicide that correlated with younger age of coming out may result from violent or painful experiences related to coming out. These experiences, in return, may be exactly those provocative experiences as described in the IPT that enhance the capability for suicide. A closer inspection of the violence variables revealed, as expected, that only the physical violent experiences were most strongly and significantly associated with acquired capability. In related regression analysis (not reported here) with acquired capability as the predicted variable, early coming out to others lost its significant contribution once physical violence was controlled for. In addition, the cluster analysis showed that acquired capability, age of coming out, and violence form one broader cluster. The mixed finding for coming out, i.e., increasing the risk for lifetime suicide attempts and decreasing the risk for current suicide ideation indicates that coming out likely changes from being a risk factor via violent/discriminatory experiences to being a protective factor afterwards via social support.

Religiosity is known to be a protective factor against suicide risk in the general population and, indeed, we could replicate this for the heterosexual group. Among sexual minority participants, religion was not directly protective against suicidality; however, those who were religiously affiliated came out later and had lower levels of violent experiences. Thus, religion might have an indirect protective effect via an older age of coming out and/or fewer violent experiences. However, related interaction terms in regression analysis (not reported here) were not significant, but this may also be the result of too low cell counts. As known from other studies, religiosity might also be associated with more internalized homophobia and less minority specific social support (Kralovec et al., 2012), which could have diminished the protective effect in our study.

To sum up, the CM and the IPT model can powerfully explain suicide ideation among sexual minorities via an overall depression/isolation factor (depression, hopelessness, perceived burdensomeness, and failed belongingness). The CM and the IPT are most likely intertwined with the MSTM via internalized homophobia and social support. Early coming out may increase suicide risk via violent experiences which enhance the capability to attempt suicide. Later coming out is likely more protective against suicide ideation by enhanced social support and reduced internalized homophobia. Gay community involvement seems to be less important, and religion likely has a less protective role among sexual minority individuals than among heterosexuals.

There were several limitations in our study that may have influenced the results: The sexual minority sample was not matched to the heterosexual sample and there were significant differences with respect to age and education; thus, between-group comparisons should be made with caution. For example, compared with the general German population (Weissman et al.,

1999), the heterosexual participants in our study had high rates of suicide attempts. However, we think that testing the models within the sexual minority group and the heterosexual group was justified. We did not assess coping abilities from the MSTM and neurobiological factors from the CM; thus, the models could not be applied in their complete forms. Moreover, we did not assess childhood gender nonconformity, an important minority specific suicide risk factor (Friedman et al., 2006; Harry, 1983; Plöderl & Fartacek, 2009) that is also absent in the MSTM. Another caveat is that our study was cross-sectional and causal directions cannot be inferred from correlations. In addition, the assessed factors of the models were targeted at different lifetime periods: Suicide attempts and violent experiences were based on lifetime; impulsivity and aggression were assessed as traits without a given time-frame whereas suicide ideation and depression were assessed for the current time. This approach is quite common in sexual minority research and also in suicide research (e.g., Mann et al., 1999), but of course this has to be kept in mind when interpreting the associations. On the other hand, restricting all measurements to recent time would cause other problems: First, there would be a suicide attempt rate too low to analyze. Second, some suicide related critical life-events remain not assessed. For example, some individuals may have experienced strong harassment years ago in school, may have attempted suicide as a result, but do not experience any harassment or suicidality anymore. Nonetheless, these experiences likely increase the capability for suicide.

The reliabilities of the instruments were generally high but not perfect and may have led to underestimations of the true correlations. Moreover, some variables were of retrospective nature with possible related recall biases. In addition, our sample was too small to give separate analysis for predominantly heterosexuals, bisexual individuals or those who were not sure of their sexual identity. However, levels of suicide ideation and attempts were comparable among

the subgroups. Furthermore, “[f]or the study of minority stress, therefore, the groups compared ought to be all sexual minorities—men and women—versus all heterosexuals.” (Meyer, 2010, p. 1217). Related to that, failures to detect interactions of risk factors with gender may be Type II errors. Of course, it would be beneficial to replicate our findings in a random sample to eliminate potential recruitment biases; however, gay community involvement was only weakly correlated with other variables and was not associated with suicidality in a previous study (Plöderl, 2004). It should be acknowledged that there is no gold-standard sampling method for researching sexual minorities (Meyer, 2009).

Despite these limitations, our study was the first that explored how established suicide models intersect with the minority stress model of Meyer (2003). Results might help to understand the development of suicide risk and may guide suicide prevention in sexual minority individuals.

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Table 1

Correlations with Suicide Ideation and Descriptive Results

	Range	Descriptive Results		Suicide Ideation – BSI	
		Sexual Minority <i>M (SD)</i>	Heterosexual <i>M (SD)</i>	Sexual Minority <i>n = 255</i>	Heterosexual <i>n = 183</i>
CM					
Depression ^a	12-46	23.63 (7.31)	21.93 (6.70)	.55*	.45*
Hopelessness	11-60	27.89 (8.36)	25.61 (8.18)	.51*	.45*
Aggression ^a	12-63	30.53 (10.58)	29.14 (9.36)	.22*	.21
Impulsivity ^a	29-66	47.46 (7.28)	46.84 (7.06)	<	<
IPT					
Failed Belongingness	5-34	12.76 (6.83)	11.38 (5.86)	.43*	.29*
Burdensomeness	7-46	14.70 (8.30)	13.60 (7.73)	.42*	.42*
Acquired Capability	5-25	14.49 (4.06)	14.01 (4.42)	.17*	.19*
MSTM					
Internalized Homophobia ^b	20-80	36.81 (13.13)	-	.25*	-
General Violence	0-12	4.28 (3.55)	-	.18*	.28*
Orientation based Violence ^b	0-12	1.24 (2.35)	-	<*	-

Table 1 (continued)

	Range	Descriptive Results		Suicide Ideation – BSI	
		Sexual Minority <i>M (SD)</i>	Heterosexual <i>M (SD)</i>	Sexual Minority <i>n = 255</i>	Heterosexual <i>n = 183</i>
Age of Awareness ^b	5-38	15.71 (5.33)	-	<	-
Age of Coming Out ^b	0-39	18.87 (5.52)	-	<	-
Coming Out – Mean ^b	1-5	3.62 (1.21)	-	-.17*	-
Coming Out Family ^b	1-5	3.75 (1.45)	-	-.17*	-
Coming Out Friends ^b	1-5	4.21 (1.20)	-	-.20*	-
Coming Out Job ^b	1-5	2.89 (1.47)	-	<	-
Community Involvement ^b	8-38	23.02 (4.99)	-	<	-
Number Minority friends	1-5	3.85 (1.28)	-	<	<
Social Support	18-70	58.93 (9.47)	60.81 (8.51)	-.44*	-.23*
Religiousness	0-4	1.22 (1.24)	1.73 (1.21)	<	-.16*
Education	1-5	3.86 (0.86)	4.29 (0.52)	-.14*	-.20*

Notes. Correlations smaller than .15 are denoted with “<” in the table. All correlations are Spearman rank correlations.

^a*n* = 335 (182 sexual minority and 153 heterosexual participants) since the variable was assessed in part two of the study which was not completed by all participants. ^b*n* = 214 because this variable was only assessed among those who identified as sexual minority members. Sexual minority and heterosexual participants should be compared with caution as both samples are not matched.

* *p* < .05.

Table 2.

Associations with Suicide Attempts Among Sexual Minority Women and Men (n = 255)

	Range	Nonattempters		Attempters		<i>t</i> (<i>df</i>)	<i>d</i> ^c	<i>BF</i> ^c
		<i>M</i> (<i>SW</i>)	(<i>SW</i>)	<i>M</i> (<i>SW</i>)	(<i>SW</i>)			
CM								
Suicide Ideation	0-22	1.81	(4.39)	7.11	(7.88)	-3.89 (37.43)**	0.99 (0.44, 1.53)	0.01
Depression ^a	12-46	23.15	(7.00)	26.79	(8.60)	-1.977 (27.82)	0.46 (-0.03, 0.95)	0.89
Hopelessness	12-60	27.45	(8.21)	30.69	(8.89)	-2.02 (43.73)*	0.37 (0.00, 0.74)	1.00
Aggression ^a	12-63	30.32	(10.38)	31.88	(12.00)	-0.60 (28.46)	0.13 (-0.34, 0.60)	4.50
Impulsivity ^a	29-66	47.73	(7.38)	45.71	(6.40)	1.41 (33.06)	-0.26 (-0.65, 0.12)	2.55
IPT								
Failed Belongingness	5-34	12.24	(6.57)	16.06	(7.55)	-2.82 (42.58)**	0.54 (0.15, 0.93)	0.17
Burdensomeness	7-46	14.22	(8.01)	17.69	(9.51)	-2.04 (42.01)*	0.40 (-0.01, 0.80)	0.95
Acquired Capability	5-25	14.23	(4.11)	16.09	(3.36)	-2.94 (51.72)**	0.45 (0.14, 0.76)	0.15
MSTM								
Internalized Homophobia ^b	20-80	36.91	(13.39)	36.15	(11.34)	0.32 (37.31)	-0.06 (-0.41, 0.30)	6.61
General Violence	0-12	3.95	(3.47)	6.37	(3.40)	-3.90 (45.96)**	0.67 (0.30, 1.03)	0.01
Orientation based Violence ^b	0-12	1.12	(2.22)	2.00	(2.98)	-1.68 (40.19)*	0.35 (-0.08, 0.78)	1.59

Table 2 (continued)

	Range	Nonattempters		Attempters		$t(df)$	d^c	BF^c
		$M (SW)$	(SW)	$M (SW)$	(SW)			
Age of Awareness ^b	5-38	16.10	(5.46)	13.04	(3.36)	4.03 (48.65)**	-0.57 (-0.87, -0.28)	0.01
Age of Coming Out ^b	5-39	19.42	(5.47)	15.74	(3.13)	5.08 (52.53)**	-0.69 (-0.98, -0.40)	0.00
Coming Out - Mean ^b	1-5	3.55	(1.22)	4.09	(1.01)	-2.51 (37.92)*	0.43 (0.08, 0.78)	0.40
Coming Out Family ^b	1-5	3.66	(1.48)	4.33	(1.00)	-3.03 (44.54)**	0.45 (0.15, 0.76)	0.12
Coming Out Friends ^b	1-5	4.17	(1.22)	4.56	(1.01)	-1.88 (37.85)	0.31 (-0.05, 0.66)	1.58
Coming Out Job ^b	1-5	2.82	(1.46)	3.37	(1.50)	-1.80 (33.57)	0.35 (-0.05, 0.76)	1.40
Community Involvement ^b	8-38	22.91	(5.14)	23.78	(3.73)	-1.06 (41.74)	0.17 (-0.16, 0.49)	4.58
Number Minority friends	1-5	3.83	(1.28)	3.97	(1.27)	-0.62 (45.75)	0.11 (-0.24, 0.45)	5.92
Social Support	18-70	59.69	(9.32)	54.14	(9.10)	3.34 (46.10)**	-0.57 (-0.93, 0.22)	0.04
Religiousness	0-4	1.26	(1.24)	1.00	(1.26)	1.13 (45.10)	-0.19 (-0.55, 0.15)	3.86
Education	1-5	3.89	(0.85)	3.69	(0.90)	1.26 (44.14)	-0.23 (-0.60, 0.14)	3.17

Notes:

^a $n = 182$ since the variable was assessed in part two of the study which was not completed by all participants. ^b $n = 214$ because this variable was only assessed among those who identified as sexual minority members. ^cBayesian estimation of the standardized population mean difference (Median, 2.5% and 97.5% quantiles in brackets), using a Cauchy prior, and the related two-sided Bayes Factor (BF), according to the procedure suggested by Rouder et al. (2009), with 100000 resamples and 5000 burn-in samples. A BF ranging between 1 and 3 can be interpreted as *anecdotal* evidence in favor of H_1 (zero group difference), from 3 to 10 as *substantial* evidence in favor of H_1 . A BF between 0.33 and 1 can be interpreted as *anecdotal* evidence in favor of H_0 (nonzero group difference), from 0.10 to 0.33 as *substantial* evidence, from 0.03 to 0.10 as *strong*, and below 0.03 as *very strong to extreme* evidence in favor of H_0 (e.g., Jeffreys, 1961).

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

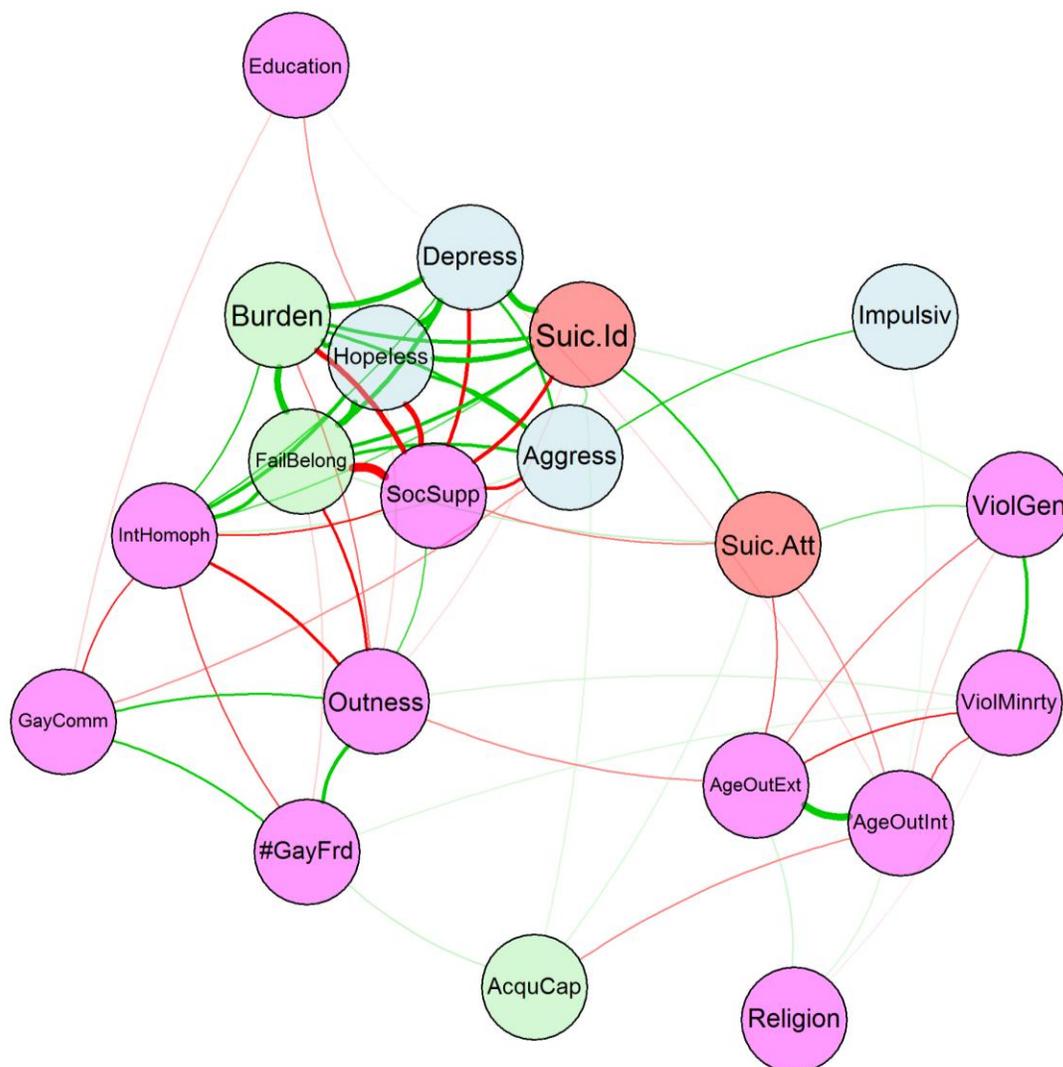


Figure 1a. Associations of the three models among sexual minority participants.

Red nodes are suicidality outcome variables, pink nodes refer to variables from the MSTM; green and blue nodes to the IPT and the CM, respectively. The graphical locations of the variables were calculated with the algorithm proposed by Fruchterman and Rheingold implemented in R's qgraph package (Epskamp et al., 2012). Green lines are positive correlation, red lines are negative ones. The width of the line refers to the strengths of the associations. All correlations are Spearman rank-correlations and only those exceeding $> .15$ are depicted. Abbreviations: *AcquCap* acquired capability for suicide, *AgeOutExt* age of coming out to others, *AgeOutInt* age of coming out to self, *Aggress* aggression, *Burden* perceived burdensomeness, *Depress* depression, *FailBelong* failed belongingness, *GayComm* gay community involvement, *#GayFrd* number of sexual minority friends, *Hopeless* hopelessness, *Impulsiv* impulsiveness, *Outness* degree of openness, *Religion* religiousness, *Suic.Att* suicide attempt status, *Suic.Id* suicide ideation, *ViolGen* general violence experiences, *ViolMinrty* sexual minority specific violence experiences.

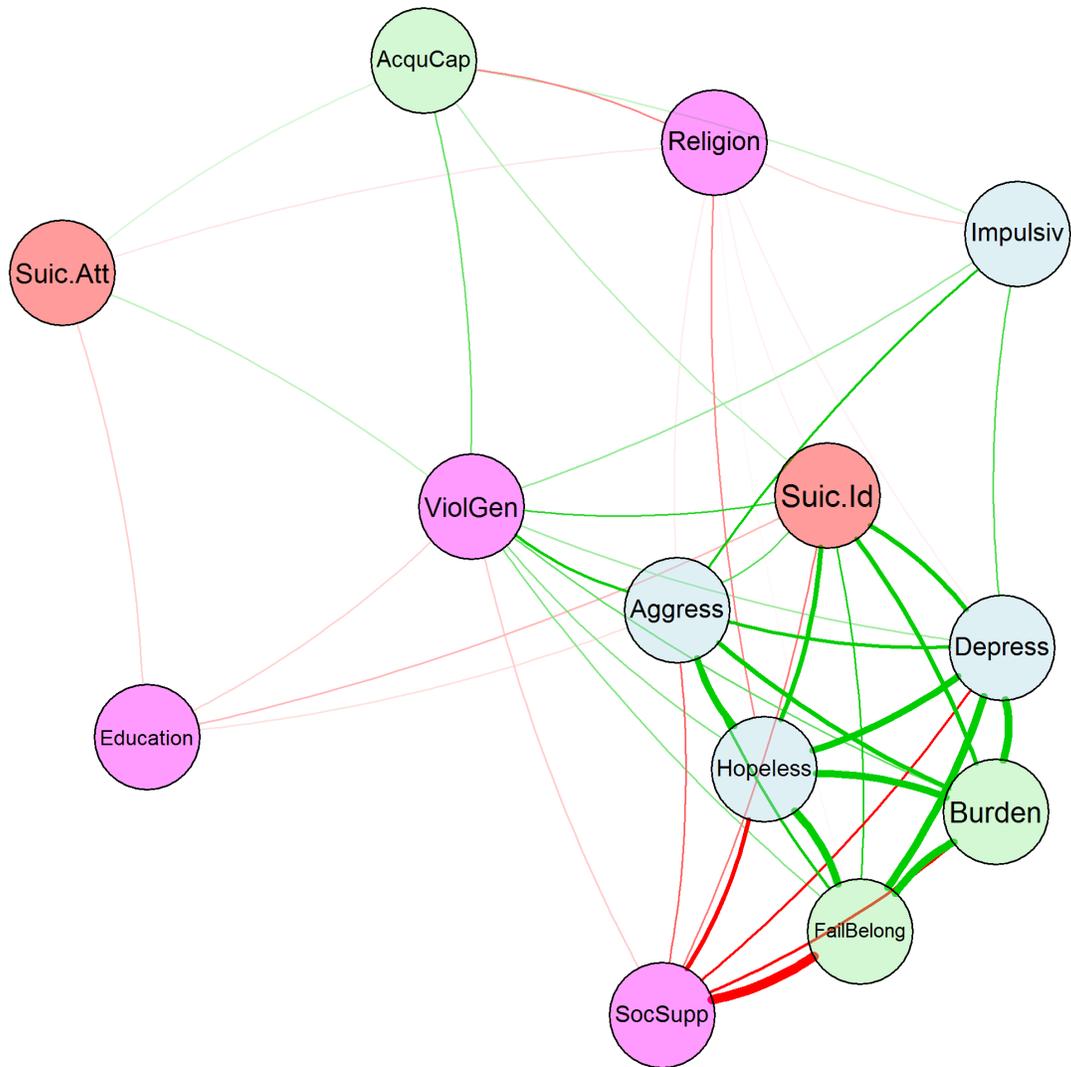


Figure 1b. Associations of the three models among heterosexual participants.

See Figure 1a for explanations.

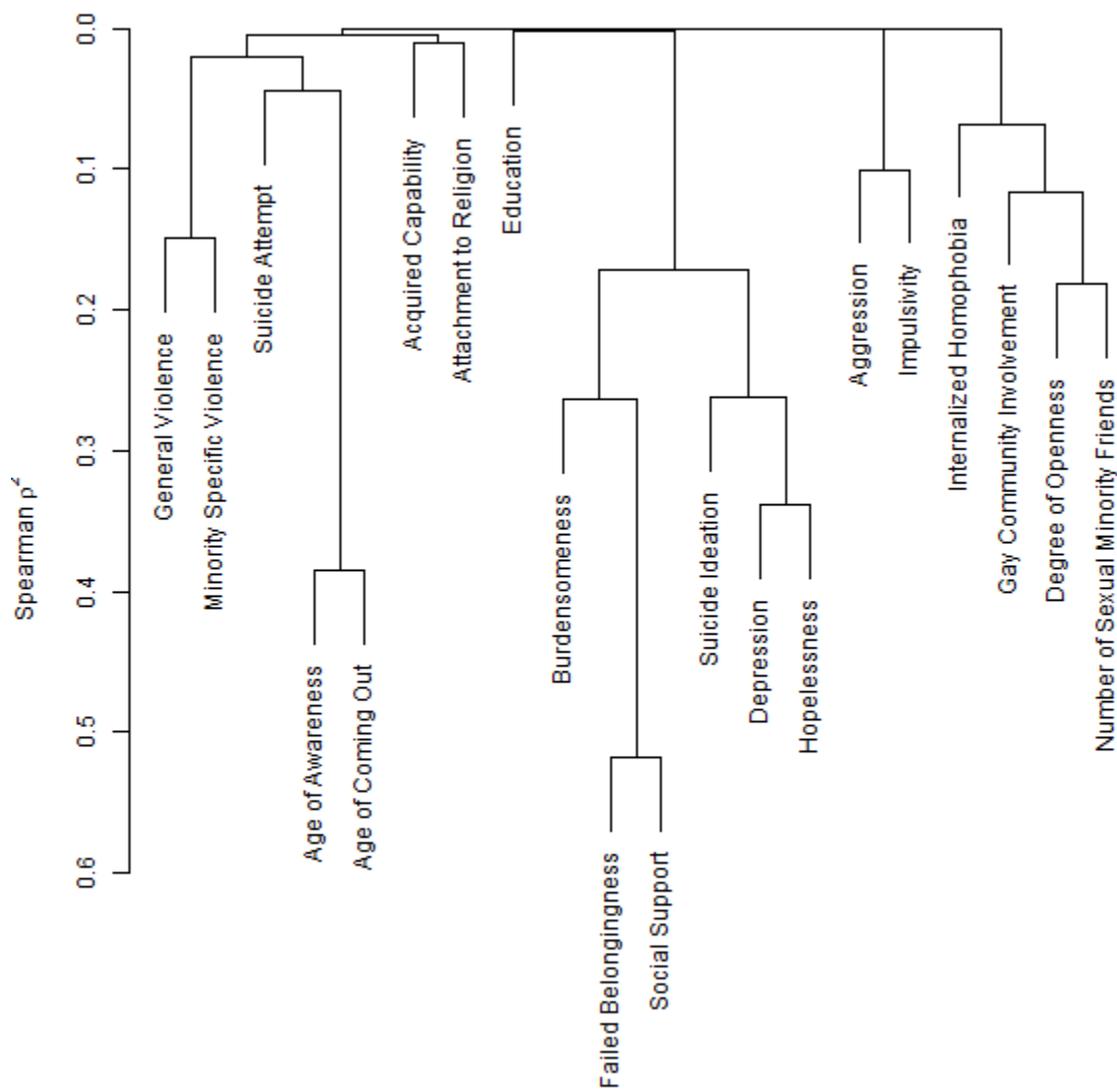


Figure 2a. Cluster analysis of the sexual minority participants.

See method section for details.

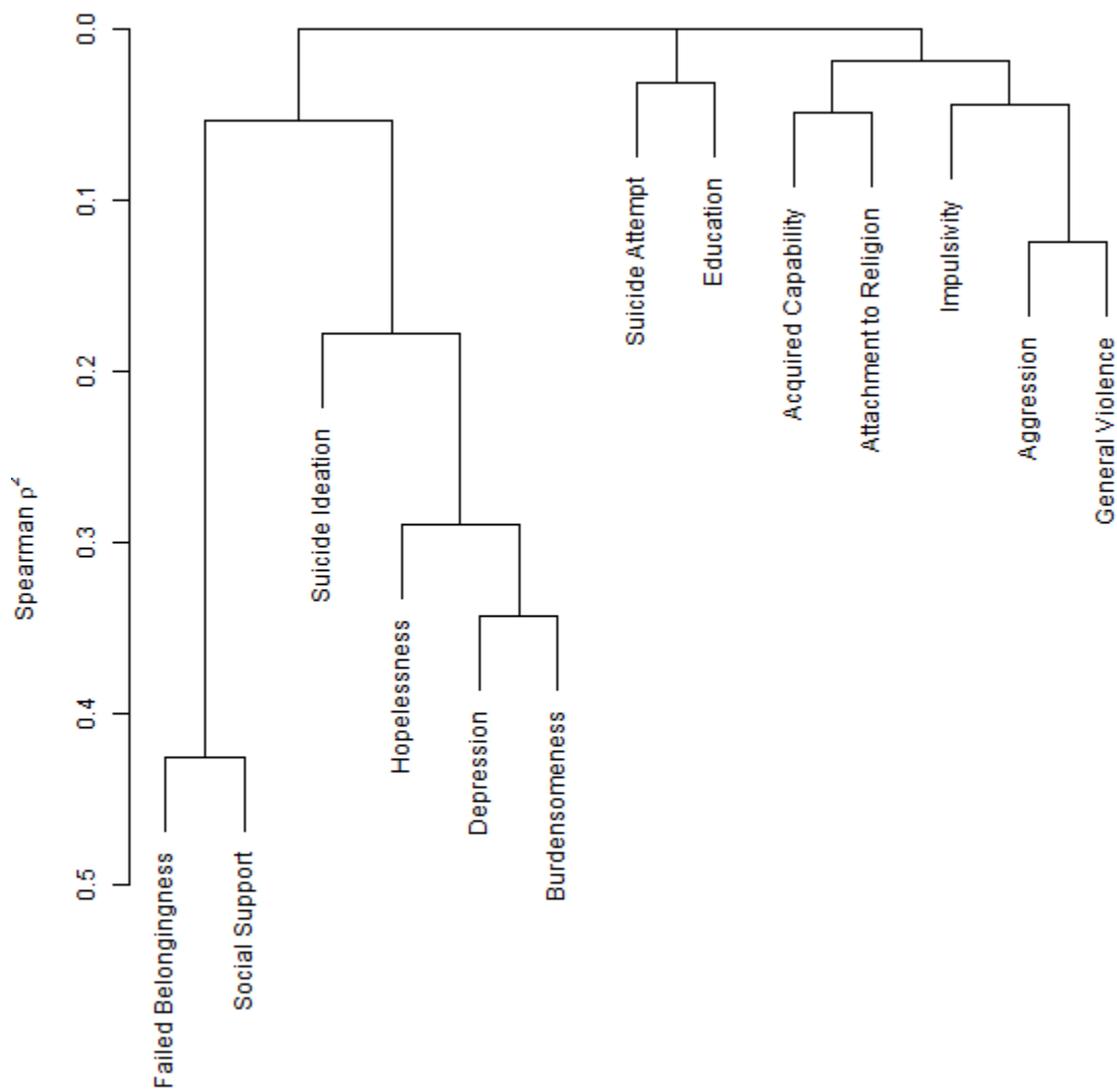


Figure 2b. Cluster analysis of the heterosexual participants.

See method section for details.