Loneliness and Social Networks

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371A Foundations of Research Methods

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Abstract

Previous research has shown how social networks affect loneliness and the ways people cope with loneliness. We used a survey questionnaire of a random sample of students at a small, private liberal arts college in the upper Midwest. Our research tests the hypotheses that people who feel lonely feel more distant or disconnected from their friends than do those who do not, and that lonely men are more likely than lonely women to cope through solitary behavior. We found that social distance is indeed strongly correlated with loneliness. However, our results are inconclusive as to whether men use more solitary coping strategies than women.

Introduction and Review of Literature

Social context provides a framework through which modern American loneliness can be studied. Cultural context, individual characteristics, social networks, intimate relationships, ecological background, coping strategies, and gender differences are woven together to reveal multiple causes and experiences of loneliness. According to Ponzetti, "loneliness is a multifaceted phenomenon, [which is] often characterized by an unpleasant yearning for another person or persons" (pg. 336, 1990). The feeling of loneliness also includes negative emotions due to a "discrepancy" between expectations or desires for interpersonal affection and intimacy and what one actually experiences (Lauder, Siobhan, & Kerry 2004). Research links loneliness to a lack of social and emotional support by friendship networks and/or intimate relationships.

Feelings of loneliness are never independent of their cultural or contextual surroundings. Loneliness is experienced everywhere, but the ways in which it is experienced differs from culture to culture. Loneliness can be explained through various factors that occur at different times of life. One study in Canada and the Czech Republic found that loneliness in both cultures was at its highest among youth and decreased with age (Rokach

2007). Adults and seniors from Canada and the Czech Republic commonly experienced loneliness in the context of unfulfilling intimate relationships, relocation and significant separations and social marginality (Rokach 2007).

Loneliness in North American culture was found to result specifically from a lack of attention to interpersonal relationships and from reduced family ties (Rokach 2007). These weakened social networks were attributed to a modern, fast paced, hard working lifestyle. Life as a college student, in a transition to adulthood, often causes stress because young adults are in the process of constructing their own identity (Rokach 2007).

Another cause of loneliness in modern North America is a detachment from the individual's larger neighborhood and community. Since the 1960s, residential mobility has enhanced North American loneliness because people are less willing to invest in social relationships that might not last after moving to a different location (Rokach 2007). Additionally, residential mobility makes the formation of a solid social network difficult because the individual is not comfortable or familiar with the surroundings. The reluctance of people to interact and get involved with each other is enhanced in "large urban areas, with their apartment complexes, social

prejudice, and anxiety from crime" (Rokach, 2007). Ecological factors, therefore, largely impact the formation of social networks and the prevention of loneliness (Rokach 2007). Ironically, there is less interpersonal interaction in many highly populated areas where there are seemingly endless opportunities to interact (Rokach 2007).

Loneliness also differs cross-culturally depending on whether or not a person is involved in a romantic relationship (Seepersad 2008). While college students in both Korea and the United States reported decreased loneliness when romantically involved, American students showed a significant increase in loneliness without a significant other compared with Korean students (Seepersad 2008). In Korea, romantic relationships have less effect on loneliness than they do in the United States because family relations are more highly valued (Seepersad 2008). Since romantic relationships are often valued even higher than family relationships in the U.S., social pressure to find a romantic partner enhances loneliness (Seepersad 2008).

Seepersad's study (2008) of Korean and American students showed Korean students relied more heavily on their families to fulfill the social network role while American students received relied on friends and

significant others. Because relationships outside of the family are likely to change at some point throughout life, American students experienced more loneliness because their primary social networks are not as stable as the Korean family social network (Seepersad 2008). Likewise, those who are unsatisfied with their current social network experience show increased loneliness in contrast to those who are comfortable with the quantity and quality of their social support (Knox et al. 2007). Because North American men are socialized to be emotionally independent, they are less likely than their female counterparts to form social relations that they can turn to in times of loneliness (Knox et al. 2007). Ecological factors also contribute to loneliness by creating an enhanced feeling of isolation and unfamiliarity within the community at large (Rokach 2007).

Although loneliness is a social phenomenon, it is also expressed and lived through individual emotional attributes. Shyness and assertiveness, for example, can cause and perpetuate loneliness among college students (Ponzetti 1990). Loneliness is higher among students who "report poorer self-evaluations and lower self admiration" and have "negative evaluations" of their own bodies and behavior (Ponzetti 1990). Lower self-esteem results in many symptoms of loneliness, which include emptiness, hopelessness, restlessness, alienation, anxiety, and the feeling of being

unloved. Low self-esteem and loneliness perpetuate and re-enforce each other in the cultural context in which they were created (Ponzetti 1990).

Low self-esteem, low extroversion, shyness, social anxiety, and neuroticism also have a positive relationship with the degree of an individual's loneliness (Kraus et al 1993). These individual characteristics hinder the number of socially satisfying experiences and thus restrain the individual from forming close social ties. Cognitive bias, occurring when an individual views themselves and the world in a negative way can cause further ostracism from the social group (Kraus et al 1993). This second circular relationship shows how individual characteristics relate to loneliness.

Emotional support from intimate relationships also diminishes loneliness. However, the intensity and energy required by such a close relationship can have a negative impact on the larger social network (Gilmartin 2005). Contrary to Rezan's work (2008) which states that women have larger social networks, Gilmartin (2005) found that women with romantic companions reported less need for friendships outside of their romantic relationships because they felt that their partner provided for all of their emotional and social needs (Gilmartin 2005). In addition, women involved

in romantic relationships had fewer opportunities to strengthen and expand their social networks because they spent so much time with their boyfriends. When the intimate relationship came to an end, females experienced a loss in emotional support because they had no social network to fall back on. Further research among mostly first and second year college students found that women were more likely to be involved in an emotional or romantic relationship than men (53.8% compared to 36.1%) (Knox et al 2007). This supports the claim that college-aged men are more likely to be lonely than women and that men's lower average involvement in romantic relationships is part of a more general lack of social skills (Knox et al. 2007).

Research has consistently found that social networks are negatively associated with loneliness (Kraus et al. 1993; Gilmartin 2005; Knox et al. 2007; Ponzetti 1990). Social learning theory and social scripting theory have been used to explain why loneliness is more prevalent among college aged males than females (Knox 1993). Knox uses social learning theory to explain that men tend to lack qualities that allow them to maintain friendships (1993).

Social scripting theory adds that masculinity means being alone because

needing friends shows weakness, and that alcohol consumption shows one's maleness (Knox 1993). Therefore, while women often have a strong social network of close friends to rely upon for emotional support, 9.3% of men surveyed report that they do not know how to make friends compared to 2.3% of women (Knox 1993). Notably, the ability to make friends and form social networks is imperative to preventing loneliness.

Conversely, Kraus et al. (1993) found that college students who lived off-campus were more likely to be lonely than those who lived on campus because they did not have the opportunity to participate in as many on-campus social activities and felt separated from the group. Ecological surroundings heavily influence the individual's involvement in social networks, which affect affects the degree of loneliness. Shy individuals who express a higher level of social support were less likely to feel lonely then those who reported a low level of social support (Jackson et al. 2000). Levels of support from close relationships such as family, friends, and significant others were associated with the experience of loneliness on college campuses (Jackson et al. 2000).

Lack of a desired partner was cited as one reason for being lonely. According to Gilmartin (2005), establishing a romantic relationship in

American society is seen as more important than maintaining same-sex friendships. Many women sacrifice the support of their larger social network in order to deepen their romantic relationships because it is considered the norm for same-sex friendships to eventually fade while romantic relationships might continue into marriage (Gilmartin 2005). Other women both expected and accepted (albeit with malcontent) that their same-sex friends will ultimately prioritize romantic relationships over their friendship because the former have potential permanency (Gilmartin 2005). Therefore, it is not surprising that women with same sex social networks consider themselves lonely when not involved with a significant other (Gilmartin 2005). They have internalized the social expectation of having a significant other.

Coping strategies for dealing with loneliness vary by gender and degree of loneliness (Knox 2007; Rezan 2008). While women primarily fall back on social networks (Gilmartin 2005), men are more likely to use alternate forms of coping, such as alcohol consumption and solitary coping strategies which are recognized as more manly (Knox 2007; Rezan 2008). Those with a lesser degree of loneliness may have some access to social support while those with severe loneliness may feel completely isolated and resort to less successful coping strategies.

While individual personality and emotional attributes may display and perpetuate loneliness, lack of social networks and interpersonal relationships are at the root of loneliness and its manifestations. Loneliness depends on culturally valued types of relationships. Our research, building on the aforementioned literature, examines the effect of gendered social networks and strategies for coping with loneliness within the cultural context of a modern, industrialized United States, and a small liberal arts college experience in the upper Midwest. We hypothesized that 1) people who feel lonely feel more distant or disconnected from their friends than do those who do not, and 2) lonely men are more likely than lonely women to cope through solitary behavior.

Method

Participants and Procedures

Data were collected through an online survey questionnaire sent to students through the Form Creator program in fall of 2008 at a small, private liberal arts college in the Upper Midwest United States. As part of several research groups we used an online survey questionnaire in order

to investigate multiple hypotheses. Also, web survey provided the advantages of low cost, high speed, increased possibilities for confidentiality, and high response rate relative to mail questionnaire. The survey explored subtopics of student interpersonal relationships and related attitudes, including sex and virginity, dating and hook-ups, marital timing, loneliness and social networks, lesbian gay bisexual trans-gendered and questioning, interracial dating, and long distance dating. Our section focused on the subtopic of loneliness and social networks by addressing the relationship between loneliness and emotional distance from friends as well as gender differences between solitary and social coping strategies.

Measurement

We, as researchers, tested the first hypothesis (loneliness correlates with distance from social networks) partly through a listing of statements to be checked by the participant. Following research done by Knox et al. (2007) and Jackson and Weiss (2000), we used the Likert scale (strongly agree, somewhat agree, somewhat disagree, strongly disagree) and excluded the neutral option because participants could be reasonably expected to have

an opinion on the given statements, however slight. Also, we feared that including a neutral option might provide a way for participants to avoid fully addressing the questions. Statements alternated between positive and negative: "I can go to my friends for anything," "I often do not feel included in my friend group," "My friends are always there when I need them," and "I feel like I have to change in order to fit in with my friends." The questions focused on participants' experiences of trust, exclusion, reliability, and acceptability towards their social network. Loneliness was measured with the statement "In general, I think of myself as a lonely person."

To test our second hypothesis (students' coping strategies vary by gender), we asked participants to indicate what they do when they feel lonely, from a balanced list of social and solitary actions and behaviors. The responses provided feedback on the range of coping strategies students used but not the frequency. Actions and behaviors included: "I sleep," "I consume alcohol alone," "I stay in my room by myself," "I call my family/friends/boyfriend/girlfriend," "I talk online with family/friends/boyfriend/girlfriend," and "I try to find friends." We directed participants to check all that applied. This allowed us to appropriately evaluate, through indirect means (since participants were not blatantly asked whether they engage in solitary or social behavior when lonely), the

range of individual students' social and solitary coping strategies.

Measures were taken to assure face, content, and criterion validity (Neuman, 2007). Face validity, validity in the judgment of others in the scientific community was achieved through reviews and critiques by the advising professor and researchers from other subtopics, (Neuman, 2007). We ensured content validity, which is to represent all aspects of our concepts, by making sure the questions addressed all areas of the conceptual definition (Neuman, 2007).

Neuman (2007) advocates four ways of assuring reliability in which we (1) carefully construct ideas for a research purpose (2) use specific levels of measurement, (3) use multiple indicators, and (4) use pilot-tests (Neuman, 2007). To achieve reliability, we clearly constructed the conceptual definition of loneliness as "the feelings of an individual when internalized social relationship expectations are not met" and used the Likert scale to achieve a precise level of measurement. Multiple indicators were used to measure emotional distance from social networks, coping strategies, and the overall loneliness of the participant. Following a pilot test, questions received clarifying adjustments.

Sampling Procedure

The accessible target populations were college students of class 2009 to 2012. We excluded students who fell in a special population of children under the age of 18 (Neuman, 2007). We also excluded students who participated in the focus groups held to formulate our questions, students who were currently studying abroad, students who were not full-time students, and the statistics fellows who provided consultation. These students could not be used within our research. St. Olaf Office of Institutional Research used a computer system to generate a simple random sample representative of the larger student population in race/ethnicity, class year, age, and gender.

The sample size for our research was 540 students within the college population. We had a return of a 315 respondents, a percentage of 58%. Of all respondents, 61.7% were female and 38.3% were male, with a negligent response of "other." 91.2% of participants identified themselves as Caucasian while 3.2% were Asian, 3% Native American, 1% African American and 1% Hispanic. 24.7% were freshmen, 26% sophomores, 23.1% juniors, and 21.5% seniors, while 4.8% identified themselves as others.

Ethics

The sensitive nature of the survey questionnaire material requires ethical precautions. The ethical issues we confronted consisted of confidentiality and informed consent. The IRB, a "board of members that research, oversee, monitor and review the impact of research on procedures concerning human participants" (Neuman 2007) approved our research at the preliminary stage in order to confirm confidentiality, and check adherence to all ethical guidelines.

To protect each participant's privacy and well-being, we provide informed consent through an email invitation to take part in our research. Within the letter, we told possible participants the criteria of the project, its purpose and what happens during the survey. The subjects had a choice to not take part in the research (the online survey) and/or have the right to back out of the research if they felt threatened or uncomfortable. We attained anonymity by not having any knowledge of respondents' identifiable information such as name, student I.D number, home address or residential location. The only information known to the researchers is class, year, race/ethnicity, age and gender. We also avoided the inclusion

of special populations, such as minors in our research.

Results

Univariate Results:

Distance & Loneliness

In our study, we found that over 20% of respondents agreed (4.2% strongly agreed, 16.7% somewhat agreed) with the statement "I generally consider myself a lonely person." Figure 1 details the reported percentages of general loneliness.

Figure 1: Frequency of General Loneliness

By creating an index of seven items (see Table 1), we were able to combine all seven measurements of social distance into an overall

numerical score for perceived distance from social networks. We changed the worded Likert scale into a numeric scale (ranging from 7 to 28, with a score of 7 being the least lonely) which allows us to compare perceived social distance to reported loneliness (see Figure 2). The mean score of perceived distance was 13.1 and the median score was 13.

Figure 2: Frequency of Distance Index

Table 1 presents descriptive statistics on how distant students feel from their friend group(s). The values in Table 1 were adjusted for reverse wording on the survey questionnaire. While the questions remain the same in Table 1 as they were in the survey questionnaire, we changed the measurement titles to indicate closeness and distance as gathered from the original Likert scale (Strongly Agree, Somewhat Agree, Somewhat Disagree, and Strongly Disagree). Of these results, 42.8% somewhat agreed with the statement "I often wish I had more friends," indicating that they feel somewhat unsatisfied with their current social network. Only a very small percentage of respondent (4.8% somewhat agree, 1.3% agree)

agreed that they could not trust their friends. Over 85% of respondents agreed with the statement "My friends are like family to me" (44.7% agree, 41.5% somewhat agree) showing that the majority of respondents feel close to their social networks. Only 18.7% of respondents somewhat agreed and 4.2% agreed with the statement "I often feel excluded from my friend group(s)" which indicates over 1/5 of respondents, a sizable minority, experience some level of alienation and distance from social networks. Over 76% of respondents disagreed (31.9% strongly disagreed, 45.2% somewhat disagreed) with this statement showing that the majority of respondents do not feel excluded from their friends.

Table 1: Measurement of Distance from Social Network

	Very Close	Somewhat Close	Somewhat distant	Very Distant
I am generally satisfied with my relationship status (regardless of whether I have a boyfriend/girlfriend	38.9%	37.3%	19.6%	4.2%

or am single)

I feel like I have to change in order to fit in with my friends	45.8%	41.0%	12.3%	1.0%
My friends are always there when I need them	35.7%	47.9%	13.8%	2.6%
I often feel excluded from my friend group(s)	31.9%	45.2%	18.7%	4.2%
My friends are like family to me	44.7%	41.5%	10.3%	3.5%
I generally cannot trust my friends	58.8%	35.0%	4.8%	1.3%
I often wish I had more friends	11.3%	34.7%	42.8%	11.3%

*Measurement labels were adjusted for reverse wording to show closeness or distance from social network as indicated by each question.

Solitary & Social Coping Strategies

In order to measure the average of overall responses for solitary and

social coping strategies, we created an index for each category (ranging from 0-5). A score of 0 indicated that the respondent reported using no solitary or social coping strategies, while a score of 5 indicated that the respondent reported using all of the listed solitary or social coping strategies (See Figures 3 and 4). The mean score for solitary and social coping strategies was 1.9 and 2.6 respectively. The median score for solitary and social coping strategies was 2.00 and 3.00 respectively.

Table 2 shows the distribution of students who use particular solitary coping strategies. 83.1% of respondents (we omitted one non-response) reported using at least one solitary coping strategy. Of these respondents, a mere 4.1% consumed alcohol alone as a coping strategy for loneliness while 95.9% did not. Fewer students (35.6%) used working out alone as a coping strategy than those who did not (64.4%). Only about half of students engaged in "Sleep", "Staying in my room by myself" and "Do homework alone."

Table 2: Solitary Coping Strategies

	% that do
Sleep	52.4%
Consume alcohol alone	4.1%
Stay in my room by myself	48.6%
Do homework alone	49.2%
Work out alone	35.6%

Figure 3: Frequency of Total Solitary Coping Strategies

Of the total respondents, 98.7% reported using at least one social coping strategy (one non-response was omitted). Table 3 provides the results for social coping strategies. It is interesting that only 23.5% call their family, friends, or boyfriend/girlfriend as a way to address their loneliness, while 45.7% talk with friends and/or boyfriend/girlfriend online. In addition,

72.7% of respondents make plans with friends and 70.8% actively try to find their friends. When lonely, 27.6% of respondents reported playing games or videogames with their friends.

Table 3: Social Coping Strategies

	% that do
Call family and/or friends/boyfriend/girlfriend	23.5%
Make plans with friends	72.7%
Talk with friends and/or boyfriend/girlfriend online	45.7%
Play games/video games with friends	27.6%
Try to find friends	70.8%

Figure 4: Frequency of Total Social Coping Strategies

Bivariate Results

Hypothesis #1: People who feel lonely feel more distant or disconnected from their friends than do those who do not.

In order to compare reported loneliness to distance from social network, we condensed the four, mutually exclusive Likert scale measurements of loneliness into binary variable. Therefore, those who "strongly agreed" and "somewhat agreed" to the statements "I generally think of myself as a lonely person" were included in the category "Lonely" while those who answered the question with "somewhat disagree" or "strongly disagree" were included in the category "NOT Lonely."

An independent-samples *t* test comparing the mean scores of the distance between lonely and *not* lonely groups found a significant difference between the means of the two groups ($t(308) = -10.966$, $p < .05$) (See

Tables 4 and 5). The mean of the "Lonely" group was significantly higher (m = 16.8, sd = 3.76) than the mean of the "NOT Lonely" group (m = 12.1, sd = 2.86) (See Figure 5). Overall perceived distance from friends and loneliness are positively correlated and have profound significance (p-value = .002). This allows us to reject the null hypothesis in favor of the alternative hypothesis that students who feel lonely are more likely to feel distant from their friends.

Table 4: Group Statistics for Loneliness & Distance

Table 5: Independent Samples t-Test of Loneliness & Distance

Figure 5: Boxplot of Distance and Loneliness

Hypothesis #2: Lonely men are more likely than lonely women to cope through solitary behavior.

To compare social coping strategies and gender we used an independent samples *t*-test ($t(309) = 3.094$, $p < .05$) (See Tables 6 and 7). The mean for women was significantly higher ($m = 2.74$, $sd = 1.08$) than that of men ($m = 2.32$, $sd = 1.30$). This allows us to reject the null hypothesis in favor of the alternative hypothesis that women use more social coping strategies than men (See Figure 6).

Figure 6: Social Coping Strategies and Gender

Table 6: Group Statistics for Social Coping Strategies and Gender

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Total Social Coping Strategies	Female	192	2.74	1.076	.078
	Male	119	2.32	1.295	.119

Table 7: Independent Samples *t*-Test for Social Coping Strategies and Gender

And independent-samples *t*-test was calculated comparing the mean scores of men and women who use solitary coping strategies. No significant difference was found ($t(238.63) = -.810$, $p > .05$) (See Tables 8 and 9). The mean of women ($m = 1.87$, $sd = 1.24$) was not significantly different from the mean of men ($m = 1.99$, $sd = 1.32$). In this case, we cannot reject the null hypothesis because our measurement did not adequately address it. Therefore, the results are inconclusive as to whether men use more solitary coping strategies than women (See Figure

7).

Figure 7: Solitary Coping Strategies and Gender

Table 8: Group Statistics for Solitary Coping Strategies and Gender

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Total Solitary Coping Strategies	Female	192	1.87	1.240	.08
	Male	119	1.99	1.318	.12

Table 9: Independent Samples *t*-Test of Solitary Coping Strategies and Gender

Discussion

Our data provided a better understanding of the effects of loneliness and the ways students' coping strategies differ at St. Olaf. Our first hypotheses, "people who think of themselves as lonely are more likely to feel distant from their friends" was supported by our collection of data. The outcome of our results was expected because previous research indicated that people with less social skills have less of an ability to create fulfilling social networks. Consistently, throughout the literature, the possession of social networks was negatively associated with loneliness (Kraus et al. 1993; Gilmartin 2005; Knox et al. 2007; Ponzetti 1990). The ability to create meaningful relationships and form social networks is imperative to preventing loneliness. A minority of our respondents felt they were lonely, whereas the majority did not. Considering the environment college students are placed in, being surrounding by thousands of peers in their community, our data was not shocking. Although our findings showed only a small percentage of respondents suffer from loneliness, a possible increase of loneliness among the student body should be considered for study in future research.

Our second hypothesis, "men are more likely to use solitary coping strategies whereas women are more likely to use social coping strategies" was not supported by our data. The reason for this incongruity is the measurement we used did not answer the second hypothesis completely. We wished to measure how often men and women engaged in solitary coping strategies, but we instead asked about the range of these mechanisms rather than the frequency. Even though we used the wrong measurement, our findings showed women do have a tendency to use a wider range of social coping mechanisms which helps support hypothesis 2. However, hypothesis 2 must remain inconclusive because although women marked a greater range of social coping mechanism than men, this does not necessarily indicate a higher frequency of using these particular coping mechanisms.

Our results showed that students did not choose to physically work out as a solitary coping strategy for loneliness. We must consider that there are students who do not work out in general, and therefore would also not work out when they are lonely, compared to students who do have a regular work-out schedule. These students do not necessarily skew our data.

In regards to social coping strategies, we found it surprising that students were more likely to talk online with family, friends, or boyfriend/girlfriends than call them on the phone. Even though online chatting is considered a direct form of communication, making a phone call takes much more effort and time and it may bring people into close contact. It may be that communicating online allows for the lonely individual to contact multiple people whereas talking on the phone is limited to a one-on-one conversation. A lonely person might choose to go online to contact people and affirm that they have a large social network of people who care about them. It could also be that we have more control online.

Conclusion

Our research provides insight on loneliness at a small college campus, whereas most prior research took place at larger universities. It also provides further updated evidence that people who think of themselves as lonely feel more distant from their friends. Although our research cannot add to the body of knowledge in regards to the frequency of solitary or social coping and gender due to measurement errors, we did discover that women from our sample use a wider range of social coping mechanisms

than do men. Our results can be used by the college to better inform wellness programs about the existence of loneliness on campus and to promote more student awareness of the causes and influences surrounding loneliness.

Strengths of this research include a high response rate and fairly representative sample of the larger population in regards to race, class year, and gender. Limitations of this research include a largely homogenous population, which makes it difficult to generalize our results, and the time constraints in completing the study.

Findings provided valuable information but both hypotheses could be studied more extensively in the future to provide an even better understanding of the effects of loneliness and the strategies men and women use to cope with loneliness. Suggestions for future research are to examine the frequency of solitary and social coping behaviors as opposed to the range. We would like to examine the range of loneliness among class years.

Appendix: Additional Data Analysis for *Loneliness and Social Networks*

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In the current sociological study, we found that perceived social distances of St. Olaf College students had a strong association with generally feeling lonely. In addition to this analysis, we provide a two-way plot below that shows the curve from a logistic regression model that predicts the expected probability of generally feeling lonely based on the perceived level of distance score on the Likert summation scale from 0-32.

Logistic Regression Model

Log (odds of being lonely) = B_0 + B_1*Distance level + B_2*Intimacy level + B_3*Class Year + B_4*number of hook-ups

Residual Deviance = 22.4

Predictor	Coefficient Est.	Standard Error	Z-statistic	P-value
B 0	-51.24	20.86	-2.46	1.40E-02

B 1	1.82	0.67	2.74	6.17E-03
B 2	0.86	0.43	2.01	4.53E-02
B 3	-1.03	0.66	-1.56	0.12
B 4	0.05	0.04	1.09	0.28

We used a further logistic regression model to examine the relationship between the odds of being lonely and perceived social distances, levels of intimacy in couples, class year, and number of hook-ups at St. Olaf College (see table below). If we hold the perceived social distance level, class year, and number of hook-ups constant, we find that every additional level of intimacy in couples on the 0-32 Likert summation scale is associated with an increase of 2.4 times the odds of feeling lonely (Z-statistic=2.01, P-value=0.045). In fact, we are 95% confident that for every additional level of intimacy on the 0-32 Likert summation scale there was an increase of between 101% and 512% in the odds of being lonely at St. Olaf College, after controlling for perceived social distances, class year, and the number of hook-ups. It is also interesting to note that if we do not

hold these variables constant, the levels of intimacy in couples do not significantly predict the odds of being lonely in a simple logistic regression model (Z-statistic=0.58, P-value=0.56).

In conclusion, we have statistically significant evidence that for every additional level of perceived social distance on the 0-32 Likert scale summation, there was an estimated increase of 617% in the odds of feeling lonely at St. Olaf College after controlling for Likert scale intimacy levels, class year, and the total number of college hook-ups (Z-stat=2.74, P-value=6.17E-3). Class year and the total number of college hook-ups are not associated with generally feeling lonely in this logistic regression model (Z-stats = -1.56 & 1.09, P-values = 0.12 & 1.28, respectively).

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