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CENTRE ON MIGRATION, CITIZENSHIP AND DEVELOPMENT

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The Dark Side of International Student Mobility: Which Students Suffer from Loneliness?

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Abstract

For students, study abroad has its advantages but might also have unwanted adverse effects, such as social isolation and loneliness. We analyze the role of emotional support in understanding loneliness among Chinese international students in Germany, in comparison to local students, from a gender perspective. Based on a representative sample, our findings suggest that Chinese international students feel lonelier than local ones. Female Chinese international students are less lonely compared to male ones, whereas the opposite is true for local students. Contrary to our expectations, a higher number of emotionally supportive ties is associated with higher levels of loneliness for all the students. Our further analysis of the correlation between emotional support and loneliness separately for the four subgroups indicates that while for female local students having more emotionally supportive ties is associated with lower levels of loneliness, for female Chinese international students we find the opposite trend. For all male students, we find no significant effect of emotional support on loneliness. We recommend conducting a longitudinal study for examining the causality of the relationship between networks and loneliness in the future. Results have important implications for universities and higher education research in understanding the role of networks on loneliness.

Keywords: loneliness, personal networks, international student mobility, gender, emotional support

Introduction

The subjective construct of loneliness—in contrast to aloneness, i.e., objectively being alone—refers to a feeling that occurs as a result of subjective deficiency between the desired and actual social relationships one has (Peplau and Perlman 1982). It is acknowledged as a fundamental risk factor for health and well-being, for example in the forms of depression and anxiety (Hawkley and Cacioppo 2010). One group that is potentially at high risk of loneliness is international students (Chen and Chung 2007; Diehl et al. 2018). For some students, studying abroad and being away from home may be a liberating and intellectually inspiring experience, whereas for others separation from home, family, friends, and daily routines may function as major stressors. Such physical separation from loved ones, struggles to create new and meaningful relationships, management of their own lives, unfamiliarity with the local culture, lack of social support in a new setting, and feeling pressure to succeed in earning a degree might have negative effects on students' well-being by increasing feelings of loneliness. While international students strive to make new friendships, leaving their families and friends in their countries of origin may make them feel lonely. Such changes in personal ties have major consequences for international students' well-being and loneliness in a new social and academic environment (Sawir et al. 2008; Yan and Berliner 2009). To investigate challenges that are specific to international students, in this paper we compare loneliness levels of international and local students. Only through a comparison between local and international students can we better understand the effects of not only being away from home (as both groups of students might be leaving their parental home for the first time to study), but more so of studying in a new academic and social setting in another language, far away from their established personal ties.

The buffering effects of social relationships against loneliness are well established (Jackson et al. 2000; Small 2017). Notably, the number of personal ties (network size), but also socially supportive networks (indicating their quality), are important protectors (Kawachi and Berkman 2001). For international students, being able to rely on personal relationships that are supportive was found to be important for their well-being as well as for study performance (Beech 2015; Diehl et al., 2018). Against this background, drawing on a representative sample, we focus on the role of emotional support in explaining loneliness among international students in comparison to local ones.

In addition, we apply a gender perspective to our study of emotional support and loneliness between the two groups of students. The relationship between gender and loneliness is complex and ambivalent. Previous studies using general population groups have suggested potential gender differences in the prevalence of loneliness, although with mixed evidence

(Maes et al. 2019; Nicolaisen and Thorsen 2014). For the age cohort of interest in this paper (students mainly in their early 20s), a meta-analysis by Maes et al. (2019) reveals slightly higher levels of loneliness for males compared to females. In the context of international student mobility, there is evidence on gender differences for international students' decision-making (Salisbury et al. 2010), but for understanding their well-being gender is either completely neglected (cf. Sondhi and King 2017), or we are, again, left with mixed evidence (Sawir et al. 2008). Previous research indicates that in networks gender differences do exist (Moore 1990). Nonetheless, considering research on loneliness in the higher education context for both local and international students, and given gender differences in loneliness, an in-depth inquiry is very much needed. This paper is designed exactly to do so.

Earlier research found that international students—in particular from Asia—tend to experience loneliness significantly more than other student groups in the U.S. (Poyrazli et al. 2004; Yeh and Inose 2003). Chinese international students are found to be under stress and tend to experience loneliness and anxiety due to cultural distance, language barriers, and lack of social support (Ching et al., 2017; Yeh and Inose, 2002). The majority of studies focused on international students in English-speaking countries (e.g., Poyrazli et al., 2004; Yeh and Inose, 2003; Sawir et al., 2008). Our study aims to shed light on the German context. Among international students in Germany, those coming from China form the largest group, comprising 13.2 percent (Wissenschaft Weltoffen, 2020). Therefore, we focus on international students from China (in comparison to local students from Germany), drawing on a unique representative dataset.

Studying abroad is usually acknowledged to be an investment mainly to improve human capital and skills, while other expected benefits include wider and more diverse social networks as well as 'better' employment prospects upon graduation (Bilecen, 2014; Findlay et al. 2011). Recent studies identified not only some academic difficulties (Yan and Berliner 2009), but also socioemotional drawbacks such as loneliness or depression, particularly for Chinese international students (Tsai et al. 2017; Wei et al. 2007). The aim of this paper, therefore, is to illuminate potential predictors of students' loneliness, such as student status (international or local) and emotional support, also taking into consideration potential effects of the ambivalent factor of gender. To the best of our knowledge, no previous studies have investigated Chinese international students' loneliness in Germany with a representative sample and with specific personal network measurements such as emotional support, while at the same time applying a gender perspective.

Theoretical Background and Hypotheses

International Student Mobility and Loneliness

Typically, loneliness is defined as "the unpleasant experience that occurs when a person's network of social relationships is deficient in some important way, either qualitatively or quantitatively" (Perlman and Peplau 1981, 31). This conceptualization goes beyond an indication of mere lack of relationships and underlines the discrepancy between actual and desired social ties as well as their quality, not only their quantity. Such a mismatch accumulates into the negative feeling of loneliness, which is generally associated with adverse health consequences, both mental and physical (Cacioppo and Patrick 2008). Loneliness is acknowledged to be a common experience among international students, and Chinese international students are no exceptions (Lin and Kingminghae 2014).

Regardless of the country of education, transition to university is an important life event signifying a separation from supportive personal ties for both local and international students. Nonetheless, local students may be able to visit their parents and other significant others more frequently than international ones. Local students may not experience the additional stressors that their international peers do because they are in a familiar setting in terms of language and culture. Although international students keep in touch with their families and friends via Internet and communication technologies, they might not be able to visit or spend virtual time with them as much as they would like to. This separation from personal ties can be considered an additional stress factor increasing loneliness among international students (Diehl et al. 2018). Moreover, international students usually report a willingness to create new friendships, which takes time and effort, but might not in fact forge new friendships particularly with the local students as they had hoped to do (Bilecen, 2014, 2021; Spencer-Oatey et al. 2017). For instance, Gareis (2012) found that around 40 percent of the international students in the U.S. reported that they had no close local American friends although they would have liked some, and on average they were neither satisfied with their number of friends nor with the quality of these friendships. Thus, it is not only a separation from old ties but also the tension involved in forming new ones which adds to feelings of loneliness: a discrepancy between actual and desired social ties. Given the peculiarity of international students' personal ties together with other possible stressors, international students tend to be lonelier than their local peers (e.g., Grayson 2008; Yeh and Inose 2003). Against this background, we hypothesize:

(**H1**): Chinese international students experience higher levels of loneliness than local students in Germany.

Gender and Loneliness among International Students

Although the association between gender and loneliness has attracted ample scholarly attention, there is neither sufficient theorizing nor consistency in evidence (Nicolaisen and Thorsen 2014). According to a recent meta-analysis on gender differences and loneliness based on 600 studies across a variety of contexts, Maes and colleagues (2019) found that on average there were no gender differences in loneliness over the life span. However, they found evidence for children, adolescents, and young adults—the latter group being our focus in this study—that males tend to be lonelier than females. Taking into consideration potential measurement biases, previous research suggests that men experience more loneliness, but women tend to report more as they can acknowledge such feelings with fewer social consequences than men (De Jong Gierveld et al. 2006). It has also been argued that in general, women tend to have higher intimacy expectations from their social ties, and when their network size decreases, they experience more loneliness (Pinquart and Sörensen, 2001).

International student mobility literature also provides different findings regarding the relationship between gender and loneliness. For example, in their study of undergraduate students in Taiwan, Chen and Chung (2007) found that female students tended to experience less loneliness compared to their male peers. Moreover, they found that the extent to which their social connectedness significantly predicted their loneliness did not correlate with their gender. Focusing only on international students from a variety of backgrounds in Australia, Sawir and colleagues (2008) found that 67 percent of female and 62 percent of male students reported that they had experienced loneliness and social isolation.

As stated above, we find mixed evidence regarding the gender effect on loneliness. Since we used a direct loneliness measurement in this study ('In the past 30 days, how often did you feel lonely?'), we expected women to report higher levels of loneliness; thus, we hypothesize:

(**H2**): Female students report higher levels of loneliness than male students do.

Given the mixed evidence on gender and loneliness as well as the diversity of contexts and conditions in the framework of student mobility, it is necessary to focus on the interaction effects of student status and gender to test H1 and H2. Recently, Barreto and colleagues (2021) investigated different predictors of loneliness across the globe in 237 countries. One of the main conclusions was the necessity to study the interaction of age, gender, and culture to predict loneliness. Following this large-scale study, we also investigate the interaction of

student status (being an international or a local student) and gender to understand the loneliness levels of our sample.

Emotional Support and Loneliness

According to the convoy model of Kahn and Antonucci (1980), individuals are embedded within a *convoy*, a social network that is emotionally and instrumentally supportive, buffering against loneliness. To reduce loneliness, not only is having a large network considered to be important, but so also is the quality of those ties (Hawkley et al. 2008). In other words, an individual might have many social ties and still feel lonely as the quality of ties might not be right or not perceived as adequate by this person. Rather, having socially supportive ties, in whom an individual can confide, trust, and talk about personal matters, helps to alleviate feelings of loneliness.

In this study, we mainly focus on emotionally supportive ties, defined as those close alters with whom the respondents talk about their personal matters (Small 2017). We assume that having ties that students can confide in when they have personal issues or concerns can assist them in dealing with such issues and, therefore, decrease their loneliness. Consequently, we hypothesize:

(**H3**): Those students who have networks with a high number of emotionally supportive ties experience less loneliness.

Research Design

The data used in this article was collected for the Bright Futures Project, an international large-scale collaborative mixed-methods project with three teams located in China, Germany, and the UK. A two-stage stratified sample design was used to collect the data in Germany. German universities with more than 30 international students from China were stratified according to their status based on the QS World Ranking, because during the initial qualitative interviews for the project Chinese international students stated that they referred primarily to QS university rankings in their choice of where to study. Universities from each stratum were contacted randomly. For the 24 universities that agreed to participate, Chinese international students were contacted by the university administrators via email with our survey link in Qualtrics. Some universities additionally drew a random sample of German students, which

enabled us to compare Chinese international and local students in Germany. The questionnaire was approved by the Ethical Committee of Bielefeld University. The survey instrument for local and Chinese international students was generated in English by all the team members. Later, it was translated by multiple professional translators into German and Chinese. For the German translation, a native speaker team decided on the final wording, while for the Chinese version, a professional linguist was hired to merge all different translations to ensure that the meaning of the questions was maintained. The team in Germany also conducted cognitive interviews with Chinese international students to ensure that the survey questions were understood as initially intended. The fieldwork in Germany took place between March 2017 and April 2018.

Study Sample

The final sample (n = 792) contains international students from China and local students in Bachelor's and Master's level programs in Germany. We included only respondents who also filled in an additional network section (see below). Following the *listwise deletion* process, every observation with a missing value for the dependent variable or at least one of the independent variables was removed from the sample. For the four subgroups, the sample consisted of 259 female Chinese international students, 197 male Chinese international students, 198 female local students, and 138 male local students.

Operationalization of the Variables

Loneliness: Loneliness is the dependent variable and is measured via self-assessment using an item asking the respondents how often they felt lonely during the past 30 days. This common way of operationalizing the extent of different feelings can also be found in the German Socio-Economic Panel (GSOEP). Response options on a fully verbalized five-point scale are 'none of the time (1),' 'a little of the time (2),' 'some of the time (3),' 'most of the time (4),' and 'all of the time (5).' This variable is treated as interval scaled (quasi-interval scale).

Gender and Student Status: Variables of both gender (1=female, 0=male) and student status (being an international student from China and being a local student from Germany) (1=Chinese international students, 0=local students) are dichotomous.

At the end of the main survey, we incorporated a network section that was further incentivized when students continued the survey. The respondents were asked the following name-generator question: 'Other than your parents, who are the people you would consider important to you?' By asking this question, our aim was to elicit strong ties that are perceived to be important by the respondents. The respondents could name up to eight persons (known as *alters*). Later, they were asked detailed questions about their alters including their gender, age, educational level, nationality, geographical location, type and duration of their relationship, frequency of contact, mobility experience, and their supportive functions (emotional support, education information).

Emotional Support: Once alters were elicited by the name-generator question, we asked each alter: 'Have you talked about your personal and private matters with this person in the past year?' The answer was dichotomous (1=yes, 0=no). We then added up the number of alters who were emotionally supportive, minimum of three to maximum of eight emotionally supportive alters for each respondent.

Control variables: We control for the location of alters because we expected that Chinese international students' networks would be more geographically scattered than those of the local students. This variable is dichotomized to distinguish between alters living in Germany and alters living in countries other than Germany. Again, we added up the total number of alters living in Germany (3 to 8). We control for being in a relationship (1=in a relationship and 0=not in a relationship) as one strong intimate tie, and overall life satisfaction (from very dissatisfied [1] to very satisfied [5]), because lonely individuals report lower levels of life satisfaction (Goodwin et al. 2001). Moreover, we control for network size because we do not have a fixed network size design. Ego's network ranges from a minimum of three to a maximum of eight alters.

Analytical Approach

We used STATA 14 to analyze our data. First, we ran four different linear regression models, stepwise adding our predictor variables and the aforementioned interaction effect. Models 1–3 aim to test our hypotheses 1–3 on the relationship between loneliness and student status

(H1, Model 1), gender (H2, Model 2), and emotional support (H3, Model 3). In Model 4, we added the interaction effect of student status and gender in order to depict the complexity of contexts and conditions. We adjusted for heteroscedasticity by specifying robust standard errors using Stata's vce(robust) option as suggested by Bittmann (2019).

Based on the findings of this first step, we decided to add a more explorative second step. Therefore, we calculated linear regression models for Chinese international female and male students as well as for female and male local students to examine the effect of emotional support on loneliness for each group separately. These models contain all control variables and emotional support as the main predictor.

Results

Descriptives

Table 1 provides an overview of the descriptive results for each of four subsamples separately (female Chinese international students, male Chinese international students, female local students, male local students). We observe that male Chinese international students are the loneliest and male local students are the least lonely subgroup. The difference between these two subgroups is highly significant ($p<.001$). In addition, female local students are significantly less lonely compared to their Chinese international counterparts ($p<.001$). Among Chinese international students, women are significantly less lonely than men are ($p<.05$), whereas there is no significant difference between male and female local students.

Table 1. Descriptives of All Variables by Four Subgroups

	Female Chinese international students	Male Chinese international students	Female local students	Male local students
	N = 259	N = 197	N = 198	N = 138
Loneliness (range 1-5), M (SE)	2.42 (0.08)	2.72 (0.09)	2.07 (0.07)	2.00 (0.10)
% none of the time	28.19	22.84	36.36	45.65
% a little of the time	30.12	22.84	27.78	23.19
% some of the time	21.24	24.87	30.81	18.84
% most of the time	12.36	18.78	3.03	10.14
% all of the time	8.11	10.66	2.02	2.17
% in a Relationship	43.24	46.70	62.12	50.72
Life Satisfaction (range 1-5), M (SE)	3.92 (0.05)	3.84 (0.05)	4.17 (0.07)	3.93 (0.09)
% very satisfied	21.62	19.29	43.43	36.23
% satisfied	51.35	48.22	39.90	36.96
% neither satisfied nor dissatisfied	24.71	29.44	8.08	13.04
% dissatisfied	1.93	3.05	7.07	11.59
% very dissatisfied	0.39	0.00	1.52	2.17
Network Size (range 3-5), M (SE)	6.88 (0.12)	6.70 (0.15)	6.80 (0.13)	6.39 (0.17)
3 alters	13.51	19.29	11.62	16.67
4 alters	5.79	5.58	6.57	10.14
5 alters	4.25	2.03	6.57	8.70
6 alters	2.70	2.54	5.05	3.62
7 alters	2.70	0.51	6.06	3.62
8 alters	71.04	70.05	64.14	57.25
Number of Alters Living in Germany (range 0-8), M (SE)	2.17 (0.13)	1.34 (0.11)	6.16 (0.15)	5.98 (0.18)
Number of Emotionally Supportive Alters (range 0-8), M (SE)	3.51 (0.13)	3.15 (0.16)	6.05 (0.14)	5.07 (0.20)

While female local students have the highest likelihood of being in a romantic relationship, the opposite is the case for female Chinese international ones. Female Chinese international and male local students on average report the same level of life satisfaction, although the percentages for the different response options are more equally distributed for male local students. In comparison, female local students are more satisfied with their overall life, while Chinese international male students are less satisfied. Chinese international students in our sample, both men and women, show a significantly lower number of alters living in Germany. Local students' personal networks are clearly oriented toward local ties. We observe a similar average number of alters living in Germany for the male and female local students and therefore do not find a significant difference among the locals. However, among the Chinese international students, women have a significantly higher average number of alters living in Germany compared to men. Chinese international students report a lower average number of alters with whom they discussed personal matters during the past year, and, therefore, a lower level of emotional support, while local students have much more emotionally supportive ties. Interestingly, female and male Chinese international students do not differ significantly in their average number of emotionally supportive ties, whereas among male and female local students we find a significant gender effect in the sense that female local students have significantly more supportive ties than male local students do.

Effects of Student Status (International/Local), Gender, and Emotional Support on Loneliness

We hypothesized a higher level of loneliness for Chinese international students compared to local students (H1). To test our hypothesis, we computed a linear regression model using student status as the independent variable (Table 2, Model 1). In our model, we control for relationship status, overall life satisfaction, network size, and number of alters living in Germany. In support of our first hypothesis, we find that Chinese international students are significantly lonelier than local students are ($b = 0.33$, $p < 0.05$). Despite controlling for network-related variables such as being in a relationship or number of alters living in Germany, Chinese international students show a higher level of loneliness compared to local ones. Hence, for students with, for instance, the same number of alters living in Germany, their own student status (international or local) still matters. It seems that the quality of personal ties is more important than the quantity of ties for explaining loneliness among international Chinese students.

Focusing on the relationship between gender and loneliness, the literature revealed mixed evidence. Due to our loneliness measurement—using a single direct question—we hypothesized that female students would report to be more lonely than male students (H2). We computed a linear regression model using gender as the main independent variable and included all of the aforementioned control variables and student status (Table 2, Model 2). However, the variable gender has no significant effect at all on loneliness, which leads to the rejection of H2.

Our third hypothesis refers to the impact of emotional support on loneliness. We hypothesized that a larger number of emotional supportive ties correlates with a lower level of loneliness. Our model contains the control variables, student status, gender, and the number of emotionally supportive alters as a predictor for loneliness (Table 2, Model 3). Indeed, we find a weak but significant effect of emotional support on loneliness. However, the tendency of this effect is contradictory to our hypothesis. Surprisingly, a higher number of emotionally supportive ties correlates with a higher level of loneliness (b= 0.05, $p < 0.05$). This unexpected finding might be explained by the idea that those students who are lonely tend to talk more about their personal and private matters within their networks to remedy such negative feelings. Because of the cross-sectional nature of the dataset, we can neither claim the direction of this association nor make causality assumptions. For this part of the analysis, we can only state that there is no support for H3 in our data.

Table 2. Linear Regression Models

	Model 1 (N=792)		Model 2 (N=792)		Model 3 (N=792)		Model 4 (N=792)	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Constant	4.37***	.25	4.38***	.25	4.36***	0.25	4.22***	.26
Student status (1=int.)	.33*	.14	.33*	.14	.39**	.15	.71***	.18
Gender (1=fem.)			-.05	.08	-.07	.08	.22*	.11
Emotional support					.05*	.02	.04	.02
Life satisfaction	-.45***	.05	-.45***	.05	-.45***	.05	-.46***	.05
In a relationship (1=yes)	-.57***	.08	-.57***	.08	-.57***	.08	-.59***	.08
Network size	-.02	.02	-.02	.02	-.04	.03	-.04	.03
Number of alters living in Germany	-.01	.03	-.01	.03	-.02	.03	-.01	.03
Gender*Student status							-.50**	.16
R^2	0.21		0.21		0.22		.23	

* p < 0.05 / ** p < 0.01 / *** p < 0.00

Disentangling the Role of Gender and Student Status

Up until this point in our analyses, we find significant effects of student status that are in line with our assumption, and significant effects of emotional support that are contrary to our assumption. We do not find a significant effect of gender on loneliness. In order to investigate a potential interaction effect, we calculated an additional model containing all predictors, all control variables, and, in addition, the interaction effect of gender and student status (Table 2, Model 4). Model 4 shows no significant effect of emotional support but we find a significant interaction effect of student status and gender on loneliness ($p < 0.01$). Regarding their loneliness levels, being an international student compared to being a local student has a significantly stronger effect on male ($b = 0.71$, $p < 0.001$) than on female students ($b = 0.21$) (not shown in Table 1). At the same time, being female affects the loneliness levels of international and local students differently: For international students, being female is accompanied

by reduced loneliness (b = -0.28); for local students, being female is accompanied by increased loneliness (b = 0.22, $p < 0.05$). To put it differently: In the case of local students, female students are significantly lonelier than males; in the case of Chinese international students, male students are significantly lonelier than females. When controlling for life satisfaction, relationship status, network size, and number of alters living in Germany, Chinese international female students are less lonely compared to their male counterparts, whereas for the local students the opposite is true—men are less lonely than women are. To sum up, there is a significant gender effect when considering gender in interaction with student status for both Chinese international and local students, although this effect is reversed.

Separate Models for the Four Subgroups

In order to gain a deeper understanding of the impact of emotional support on Chinese international and local students' loneliness, we computed a separate model for every subgroup (Table 3). Every model contains all of the control variables and emotional support as predictors of loneliness. At first, we find large discrepancies in the R^2 values. For male local students, our model explains 29 percent of variance, whereas for male Chinese international students it is only 18 percent. Female students show R^2 values between 24 and 25 percent. Therefore, we can conclude that of all groups our model is best suited to explain loneliness levels among male local students. For female Chinese international students, we find an unexpected association between emotional support and loneliness which was already indicated in the first step of our analysis. For female Chinese students, a high level of emotional support is significantly associated with a high level of loneliness. However, it is the opposite for female local students. In other words, for female local students a lower level of loneliness is associated with a high level of emotional support. While the case for emotional support for female local students is in line with our expectations based on previous studies, it does not hold for female Chinese students. This might be explained by the idea that, for female Chinese students, talking to their personal ties about personal and private matters perhaps puts more burden on them rather than functioning as a relief mechanism. Such conversations might cause homesickness. Some overseas conversations with friends and family might put more burden on female Chinese international students as there might be more demands from the ties located in China. For male students—locals and Chinese internationals alike—we do not find a significant effect of emotional support on loneliness at all. Therefore, we only find support for H3 among female local students.

Table 3. Linear Regression Models, Separated Models of the Four Subgroups

	Loneliness							
	Female Chinese international students		Male Chinese international students		Female local students		Male local students	
	Model A		Model B		Model C		Model D	
	(N=259)		(N=197)		(N=198)		(N=138)	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Constant	5.84***	0.43	5.09***	0.54	3.85***	0.38	3.44	0.44
Emotional Support	0.09*	0.04	0.03	0.04	-.14**	0.06	0.10	0.05
Life Satisfaction	-0.76***	0.09	-0.51***	0.13	-0.26***	0.07	-0.34***	0.09
In a Relationship (1 = yes)	-0.44**	0.14	-0.71***	0.18	-0.49***	0.13	-0.78***	0.17
Network Size	-0.08	0.04	-0.03	0.04	0.16*	0.07	-0.07	0.08
Number of Alters Living in Germany	-0.02	0.04	0.04	0.07	-0.10	0.05	0.04	0.08
R^2	0.24		0.18		0.23		0.29	

* p < 0.05 / ** p < 0.01 / *** p < 0.001

Conclusion and Discussion

This study is among the first to examine the relationship between emotional support and gender differences in loneliness among Chinese international and local students in Germany. We contribute to the literature by not only investigating gender differences, but also through our analysis of network explanations for differences in loneliness between Chinese international and local students. Using the representative dataset from the Bright Futures Project, we estimated linear regression analysis to understand in detail the reasons for differences in loneliness levels between local and Chinese international students. In addition, we examined within-group differences by analyzing the relationship between emotional support and loneliness for male and female students separately. Furthermore, we contribute to the international student mobility literature by investigating loneliness among Chinese international and

local students in a non-English study context. Given that the majority of studies took place among international students located in English-speaking countries (e.g., Poyrazli et al. 2004; Yeh and Inose 2003; Sawir et al. 2008), ours is a novel one in Germany and confirms the high levels of loneliness for Chinese international students.

Given the findings of previous research (e.g. Grayson 2008), we assumed that Chinese international students would experience higher levels of loneliness in comparison to local ones. We expected Chinese international students to have personal ties more geographically dispersed, causing separation from family and friendship ties, but also to have particular stressors associated with study abroad such as difficulties in new social and academic environments, which would lead them to feel lonelier (Lin and Kingminghae 2014; Ching et al. 2017; Sawir et al. 2008). In addition to the differential status of being an international or local student, given the way we measure loneliness we expected women to report a higher level of loneliness than men. Besides, we assumed that having a large number of emotionally supportive ties in the students' networks would work as a buffering mechanism alleviating their loneliness. Given the mixed evidence regarding gender differences in loneliness, we also integrated an interaction effect of gender and students' status in our analyses.

In line with our first assumption, we found a higher level of loneliness among Chinese international students compared to local ones. Further research might benefit from exploring the composition of such personal ties as well as expectations regarding friendships and emotional support separately for international and local students. Such research could be the basis for universities to adjust, specify, and diversify how they address students' loneliness and what kind of interventions they can design to buffer loneliness.

Our results also showed that gender alone does not predict the level of loneliness. However, gender becomes a meaningful explanation when analyzed together with student status. In other words, gender explanations of loneliness only make sense when we also consider whether a student is an international or a local one. While for Chinese international students, male students are lonelier, for local, female students are, which signals an opposite trend. This conclusion is in line with findings on male Chinese international students in Thailand, who are significantly lonelier than their female counterparts are (Lin and Kingminghae 2014). However, an important question still remains: why do we see an opposite trend of gender between local and international student groups in explaining loneliness? One explanation might be related to gender-specific parental expectations. There are still effective gender norms that can potentially put pressure on young people, usually related to marriage and having children. To conform to gender roles, young women might feel more under pressure than young men as they are usually expected to form a family at a certain age. Studying

abroad can function as a period when such expectations and norms are put on hold, when students can distance themselves both geographically and mentally from parental pressures to conform to gender norms. International Chinese female students have a greater geographical distance from their parents, who may exert this pressure, than local female students do. Thus, one explanation for our finding might be that for female international Chinese students, studying abroad means escaping the pressure of marriage and having children, at least temporarily, because "their migration status serves as important resources for these women to resist fixed gender norms expected from them at home" (Tu and Xie 2020). Feelings of homesickness might thus be lower among female Chinese international students than among male Chinese international students. To what extent different gender norms and family-related expectations of men and women in fact influence feelings of loneliness among international students remains speculative at this point. Future research can examine the effects of parental pressures and gender norms for Chinese international students in greater depth.

The reporting effects in surveys can also explain such mixed findings. First, as mentioned earlier, in our sample, men might have reported their loneliness less than women (De Jong Gierveld et al. 2006), which can explain our findings only for the local students, but not for the Chinese internationals. Second, in our survey we asked directly about feelings of loneliness, with one item, which might have affected responses. In previous research measuring loneliness with one or multiple survey items, women tend to disclose such feelings when asked directly, whereas men respond only with multiple questions (Pinquart and Sörensen 2001). Further studies can incorporate more items on measuring loneliness for local and international students while being culturally sensitive in the way the questions are posed.

Our results have implications for investigating intersections of various categories methodologically and theoretically. In terms of methods, interaction analysis of different categories has recently been acknowledged as an 'inter categorical' way of operationalizing an intersectionality approach, which is mainly used for the comparative analysis of manifold inequalities experienced by different groups (McCall 2005). One major criticism of such an analysis concerns aggregating individual-level experiences to a group level and underplaying their agency (Choo and Ferree 2010). Our findings can be taken as a first step and used to further theorize gender differences in loneliness for different groups of international students. Together with their cultural background and social class positions from an intersectional perspective, a more nuanced understanding of the experiences of loneliness can be attained.

Our assumption that having a large number of emotionally supportive ties in one's network would explain lower levels of loneliness found mixed support. We observed confirmation of this assumption among female local students, while the opposite was the case for female

Chinese international students. And finally, for male students—Chinese internationals as well as locals—we found no evidence at all for a relationship between emotional support and loneliness. We see several potential explanations for these different associations between emotional support and loneliness. First, we should take into account the way the survey question on emotional support was formulated and what it could mean. While the respondents were asked whether they talked about their personal and private matters with their designated personal ties, this question might have been interpreted as an exchange relationship in which they also listen to other persons' private matters rather than the unidirectional emotional support they receive. It is even possible that respondents only provide emotional support and do not receive support at all. If such respondents perceive themselves as the main confidantes for their personal ties, indicating that they listen and support their personal ties, this might have been an additional factor in increasing their emotional burden, and thus their loneliness. Second, the observed association between emotional support and loneliness can also be explained by the idea that those students who had higher levels of loneliness might have been talking about such issues with their personal ties and therefore have more ties giving them emotional support. Feelings of loneliness, in this case, require increasing emotional support. It is important to keep in mind that we cannot make claims as to the direction of causality regarding the relationship between emotional support and loneliness due to the cross-sectional nature of the dataset. Causal mechanisms can be unearthed in future studies by longitudinal designs.

Third, on the one hand, having ties that students can confide in when they have personal issues or concerns can assist them in dealing with such issues and, therefore, decrease their loneliness. On the other hand, following the reasoning that "lonely individuals are not inclined to provide intimate disclosures, because they believe that friends will respond critically and not maintain confidentiality of disclosure" (Hamid and Lok 2000: 48), those students who are lonely tend not to talk about their personal matters with their interpersonal ties, i.e., family, friends, and, acquaintances. It seems that loneliness can be experienced as a stigma; thus, individuals tend to disclose such feelings less often to others. However, given the cross-sectional data at hand, it is not possible to indicate the direction of this reasoning. In other words, causality can work in both ways: talking to friends can decrease loneliness of students, but also those who already feel lonely might be less likely to talk to their friends.

The main limitation of our study was that the network section was conducted right after the main questionnaire, perhaps causing an inconsistency of understanding as well as respondent fatigue. While we used a single name-generator, we asked support questions later including one about the emotional support respondents actually received from their named

alters. This question contained a discussion of personal and private matters, which could have also been understood as the alters' personal and private matters. This misunderstanding of the direction of the emotional support question could have caused the unexpected finding of the inverse association between having a large emotionally supportive network and lower levels of loneliness. In addition, this study is based on representative yet cross-sectional data, which makes it impossible for us to deduce any causal mechanisms between network indicators and loneliness levels. Nevertheless, our study is a pioneer one investigating personal networks in understanding local and Chinese international students' loneliness levels through a gender lens in Germany.

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