



Article

Moderation Effects of Autonomy and Personal Growth on the Association of Sociotropy and Different Types of Loneliness

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Abstract: Loneliness is one of the most widespread conditions that affect one's physical and mental health. Loneliness is found in all populations despite age, gender, ethnicity, religion, or socio-economic status. It is related to the quality and availability of social interactions and can be expressed in different social domains. While the negative effects of loneliness are well-established, mechanisms and moderators of loneliness still need more examination. In the present study, we approached loneliness from a multidimensional perspective. We focused on associations between sociotropy and different types of loneliness—family and non-family. Participants were 157 adults aged 35–55, 55% females. Methods were the Social and Emotional Loneliness Scale (SELSA-S), “Sociotropy—Self-Sufficiency” Questionnaire, and Psychological well-being scale (scales of Autonomy and Personal growth). To test moderation effects, we applied Hayes Process v.4 (models 1–3). Results confirmed that sociotropy predicted loneliness, both family and non-family, and autonomy and personal growth moderated this effect. We found two different moderation mechanisms for family and non-family loneliness: parallel negative moderation affected sociotropy—family loneliness association, and negative moderated moderation affected sociotropy—non-family loneliness association. Results suggested that the higher were scores on personal growth and autonomy, the less they affected the association of sociotropy and loneliness. Gender differences in moderation were found only for non-family loneliness.

Keywords: family loneliness; non-family loneliness; sociotropy; autonomy; personal growth; personality; adults



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1. Introduction

Loneliness is one of the widespread conditions that affect people despite age, sex, education, religion, or socio-economic status (Cacioppo and Cacioppo 2018). It is a complex phenomenon usually conceptualized as a subjective discrepancy between the actual and the desired social relationships in terms of closeness, intimacy, emotional support, and connectedness (Luo et al. 2012). The phenomenon of loneliness lies in the intersection of one's emotional sphere, social interaction, and individual characteristics. The two most common terms to describe loneliness are emotional loneliness, which refers to a lack of close relationships, and social isolation, which describes a lack of social environments to build and experience close relationships (Wolters et al. 2023). Another term somewhat related to loneliness is solitude (Larson 1990). Solitude describes a type of loneliness one, to some extent, initiates and needs; it refers to temporary periods when one appreciates being alone and can use these periods for self-reflection and self-analysis (Ost Mor et al. 2020).

Negative outcomes of social and emotional loneliness are well-established. It is closely related to depression (Cacioppo et al. 2006; Prizeman et al. 2023) and a risk factor for premature death (for review Holt-Lunstad et al. 2015; Lennartsson et al. 2022). While loneliness is a widespread condition, the mechanisms that increase chances or prevent from development of loneliness remain understudied. Mund et al. (2020) analyzed studies from 78 countries and concluded that loneliness was not directly associated with age. They argued that personal experiences could explain part of the loneliness variance. Meta-analysis of the effects of the

Big Five personality traits on loneliness (Buecker et al. 2020) suggested that extraversion, neuroticism, and agreeableness could, to some extent, predict the probability of experiencing loneliness. Moreover, loneliness, in a way, could be considered a trait-like characteristic, although it is still an open discussion that needs more investigation and analysis.

Aside from this, loneliness is a characteristic presented in all age populations; still, there is no clear data on loneliness dynamics throughout the lifespan. Böger and Huxhold (2018) argued that loneliness could be associated with age in terms of developmental tasks, age-specific resources, and roles. They revealed that loneliness was more likely to affect social integration, while the reverse path was much weaker.

While, in most studies, loneliness is considered from a unidimensional perspective, some authors suggest that it could be multidimensional (Buecker et al. 2020). Particularly, social context could play an important role. Our study conducted during the Pandemic (Strizhitskaya et al. 2021b) showed differences in experiencing loneliness during Pandemic isolation. Using the SELSA-S scale (social and emotional loneliness scale for adult and aging people), we focused on different social spheres—family (parents, siblings, etc.), non-family (colleagues and friends), and romantic relationships. Induced isolation worldwide was expected to affect experiences of loneliness (Norbury 2021; Killgore et al. 2020). Our results showed (Strizhitskaya et al. 2021b) no signs of an increase in family loneliness; on the contrary, people were made to remain with their families and were experiencing an unusual and overwhelming amount of interaction. But for non-family loneliness, we found a significant increase for middle adults. Even though people were able to call their friends and colleagues, they were unable to meet them in person. Thus, experiences of loneliness differed depending on social context. These results confirmed the basic idea that loneliness can be experienced as a generalized feeling (I am lonely in whatever environment), but loneliness could also be differentiated in terms of the type of social network.

Research on loneliness and well-being has shown contradictory results. On one hand, loneliness is related to poor physical and mental health and, as such, is supposed to affect psychological well-being. On the other hand, some dimensions of psychological well-being, such as autonomy and personal growth, were reported to have a protective effect on loneliness and a supporting effect on solitude (Kim et al. 2021). Some research suggests (Nguyen et al. 2022) that solitude could have two motivational strategies: strive to have time alone for some personal activities and strive not to be with other people. They supposed that these two types of solitude could use different mechanisms of self-regulation and probably strive for “personal time for activities” that would require more autonomy. The importance of autonomy for experiences of solitude was shown by Nikitin et al. (2022); they demonstrated that, despite predictions, autonomy had similar predictive power across the lifespan.

From any perspective, loneliness is associated with the social environment: its quality, quantity, and availability. Thus, it would be consistent to suggest that social-related characteristics could affect the intensity of loneliness. Sociotropy, defined by Beck (1983) as an overemphasized need to maintain social relationships, reflects one’s connectedness to the social environment (Craven 2007). It refers to a need and interest in social interaction and affiliation to social networks in general. Overall, sociotropy is associated with higher personality dependence, vulnerability to losses, and a greater need for love and affiliation (Marfoli et al. 2021). Similar to loneliness, sociotropy has a well-established association with depression (Robins et al. 1994). A meta-analysis of gender differences in sociotropy (Yang and Girgus 2019) confirmed the higher scores on sociotropy for women but underlined culture as an important moderator. They found that in collectivist countries in which the overall importance of interpersonal relationships was higher, there were less gender differences in terms of sociotropy. Although sociotropy describes the phenomenon as being closely related to one’s behavior in society, it is mainly studied within clinical samples (Marfoli et al. 2021) in relation to depression, mental and physical health problems, violence, etc. Its mechanisms, predictors, and effects in general samples remain understudied.

In the present study, we approached loneliness from a multidimensional perspective. We focused on associations between sociotropy and different types of loneliness—family

and non-family. In our previous studies, we found that sociotropy predicted general loneliness. We grounded on the idea that sociotropy as a personality trait (Marfoli et al. 2021) is formed at earlier developmental stages, while loneliness is more situation-specific. Even if we consider loneliness as a trait-like characteristic (Buecker et al. 2020); nevertheless, it would be secondary to basic traits such as sociotropy. We also supposed that one's psychological well-being, which is not limited to social interactions, could moderate the association between sociotropy and loneliness. In our previous research, we found that general loneliness was moderated by autonomy and personal growth (Strizhitskaya et al. 2024). We were interested if these effects will remain for the social domain-specific loneliness, particularly estimated with a different instrument.

2. Materials and Methods

2.1. Data Collection and Research Design

The study was conducted in Saint Petersburg, Russia, from May to November 2023. Participants were middle adults ($n = 160$) aged 35–55 ($M = 45.4$, $SD = 5.95$, 55% females), 81.3% had university degree, 60.6% were married, 11.3% reported living with a partner, 16.9% were divorced, 10% were single. Participants came from different professional backgrounds: education, medicine, management, accounting, engineering, etc. Three participants were excluded due to missing data. The final sample was 157 middle-aged adults (Table 1).

Table 1. Demographic characteristics of the sample ($N = 157$).

Sex	Females (%)	54.1
	Males (%)	45.9
Age	Range	35–55
	M	45.31
	SD	5.96
Education	10 years or less (%)	3.8
	10 to 15 years (%)	15.3
	15 years and more (%)	80.9
Marital status	Single (%)	10.2
	Married (%)	60.5
	In a relationship (%)	12.1
	Divorced (%)	16.6
	Widow (%)	0.6

Participants were recruited via community and social networks. There was a preliminary talk where participants were explained the aims and the scope of the study and asked to sign informed consent. During preliminary talk, participants were asked if they had severe mental or physical conditions that could affect their participation in the study. Study was anonymous, and no personal data, such as names, phone numbers, or addresses, were collected. No incentives were given to the participants. Questionnaires were distributed in person and via online forms (Google Forms). Links to Google Forms were sent only to participants who had completed the preliminary talk and given their consent to participate in the study. The research design, procedures, measures, and sampling were approved by the review board of the Russian Science Foundation (project No. 23-28-00841) and the Ethical Committee (IRB) of St. Petersburg Psychological Society (protocol No. 22, 25 May 2023). Informed consent was obtained from all participants, and the Helsinki Declaration was adhered to.

Our research questions were as follows:

- (1) Are there differences in associations of sociotropy, loneliness and characteristics of psychological well-being if we approach loneliness from family and non-family perspectives?
- (2) Would the moderation mechanisms for family and non-family loneliness be similar?
- (3) Would gender affect moderation results?

Our hypotheses were as follows:

- (a) In our previous studies, we found that sociotropy was associated with general loneliness and psychological well-being (Strizhitskaya et al. 2024), particularly with autonomy and personal growth, so we expected to find moderation effects for association between sociotropy and family and non-family loneliness as well;
- (b) We supposed that moderation mechanisms for associations of sociotropy and family and non-family loneliness could differ;
- (c) Finally, we hypothesized that men and women could differ in terms of the effects.

2.2. Measures

Our study was grounded in the idea that loneliness is a complex phenomenon, in particular, that loneliness could manifest itself differently in different social contexts. For example, one could feel lonely within family context but connected and affiliated in a working setting or among friends. So, for the present study, we used the Social and Emotional Loneliness Scale (SELSA-S) for Adults and Older Adults (Russian adaptation: Strizhitskaya et al. 2020). The scale consisted of 19 items that were scored on a Likert Scale from 1 to 5. For the present study, we used scales “Family loneliness” (7 items, α -Cronbach 0.898) and “Non-family loneliness” (6 items, α -Cronbach 0.890). Family loneliness assessed loneliness in the broad family context, including parents and siblings. Non-family loneliness was related to loneliness among colleagues and friends.

To assess sociotropy, we used “Sociotropy—Self-Sufficiency” Questionnaire (Russian adaptation: Strizhitskaya et al. 2021a). The questionnaire consisted of 39 items that were scored on a Likert Scale from 1 to 5 (α -Cronbach 0.896). For the present study, we used general scale “Sociotropy”. We also used short version of the Psychological well-being scale (Russian adaptation: Zhukovskaya and Troshihina 2011) to study autonomy and personal growth; each scale had 6 items scored on a Likert Scale from 1 to 5.

2.3. Statistical Analysis

Data were processed using the statistical program Statistical Package for Social Sciences SPSS (v20.0, SPSS Inc., Chicago, IL, USA). We used Hayes Process macro v.4 (Hayes 2018). For moderation analysis, we used models 1 (simple moderation), 2 (parallel moderation), and 3 (moderated moderation). The models were set for 95% confidence intervals with bootstrap for 5000 samples.

To estimate sample size, we used G*power analysis (G*power v. 3.1.9.7; Faul et al. 2009). To calculate sample size, we used effect size 0.15 (medium), probability level 0.05, power 0.8, and number of predictors—3 (personal growth, autonomy, personal growth * autonomy). Minimum sample size for our analysis was 77 subjects. Thus, our sample of 157 subjects was sufficient for the analysis.

3. Results

First, we separately assessed simple moderation effects of autonomy, personal growth, and gender on the association between sociotropy and family and sociotropy and non-family loneliness. From a theoretical perspective, sociotropy is usually conceptualized as a stable personality characteristic (Marfoli et al. 2021), while loneliness is more situation-dependent. Thus, we assumed that sociotropy should predict any type of loneliness, including family and non-family loneliness. We also tested the effect of sociotropy on loneliness for men and women.

So, we analyzed six models, as follows:

- (1) Sociotropy predicted family loneliness and was moderated by autonomy.

- (2) Sociotropy predicted family loneliness and was moderated by personal growth.
- (3) Sociotropy predicted non-family loneliness and was moderated by autonomy.
- (4) Sociotropy predicted non-family loneliness and was moderated by personal growth.
- (5) Sociotropy predicted family loneliness and was moderated by gender.
- (6) Sociotropy predicted non-family loneliness and was moderated by gender.

We analyzed simple moderation effects using the Hayes Process and found significant moderation effects for models 1, 2, and 4; the results are presented in Table 2.

Table 2. Statistics for moderation effects for models 1–4.

Models	Coefficient	se	t	p	LLCI	UPCI
Model 1	−0.023	0.011	−2.100	0.037	−0.045	−0.001
Model 2	−0.025	0.010	−2.593	0.010	−0.044	−0.006
Model 3	−0.017	0.010	−1.746	0.083	−0.036	0.002
Model 4	−0.002	0.009	−2.337	0.021	−0.037	−0.003
Model 5	−0.0649	0.0528	−1.2284	0.222	−0.1693	0.0395
Model 6	−0.0729	0.0457	−1.5944	0.113	−0.1633	0.0174

LLCI—lower limit of confidence interval; UPCI—upper limit of confidence interval.

We confirmed negative moderation effects of autonomy and personal growth for associations of sociotropy and family and non-family loneliness consistent with our predictions. But, no significant effects of gender were found.

Secondly, we tested if autonomy and personal growth had combined moderation effects on sociotropy and loneliness. We tested two conceptual models:

- (1) Parallel moderation (Figure 1);
- (2) Moderated moderation (Figure 2).

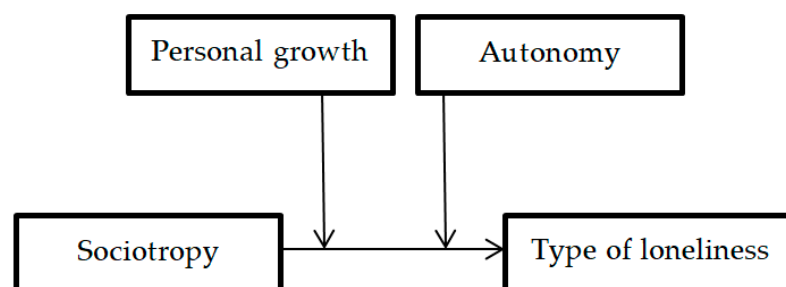


Figure 1. Conceptual model for parallel moderation. Sociotropy—-independent variable, type of loneliness—dependent variable, personal growth—moderator 1, autonomy—moderator 2.

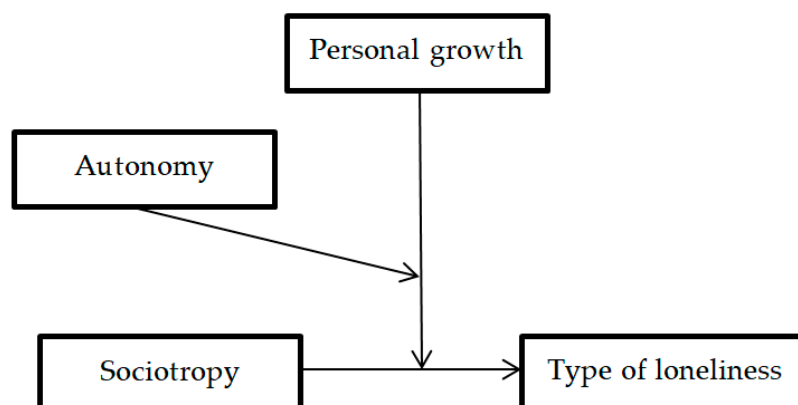


Figure 2. Conceptual model for moderated moderation. Sociotropy—-independent variable, type of loneliness—dependent variable, personal growth—moderator 1, autonomy—moderator 2.

Results showed different mechanisms for associations between sociotropy and family loneliness and sociotropy and non-family loneliness (Table 3).

Table 3. Moderation effects of autonomy and personal growth on association between sociotropy and family loneliness and sociotropy and non-family loneliness.

Interactions	R ² Change	F	p
Association between sociotropy and family loneliness: parallel moderation			
Sociotropy (X) × Autonomy (W)	0.016	2.942	0.089
Sociotropy (X) × Personal Growth (Z)	0.032	5.907	0.016
Both	0.052	4.774	0.010
Association between sociotropy and non-family loneliness: moderated moderation			
Sociotropy (X) × Personal Growth (W) × Autonomy (Z)	0.050	9.246	0.003

Thus, we found that sociotropy predicted family loneliness, and a dual effect of autonomy and personal growth negatively moderated this effect (Figure 3). We found that for people with high scores on autonomy and personal growth, the effect of sociotropy on family loneliness was minor, while lower scores on autonomy and personal growth were shown for people with a stronger association between sociotropy and family loneliness. Based on our results, we could speculate that if one had high autonomy and personal growth, these two parameters did not affect the association of sociotropy and loneliness. Our results suggest that participants with low or average personal growth and autonomy were more sensitive to the effects of sociotropy on family loneliness. We could hypothesize that those who had low personal growth and/or autonomy scores were seeking psychological support within their families.

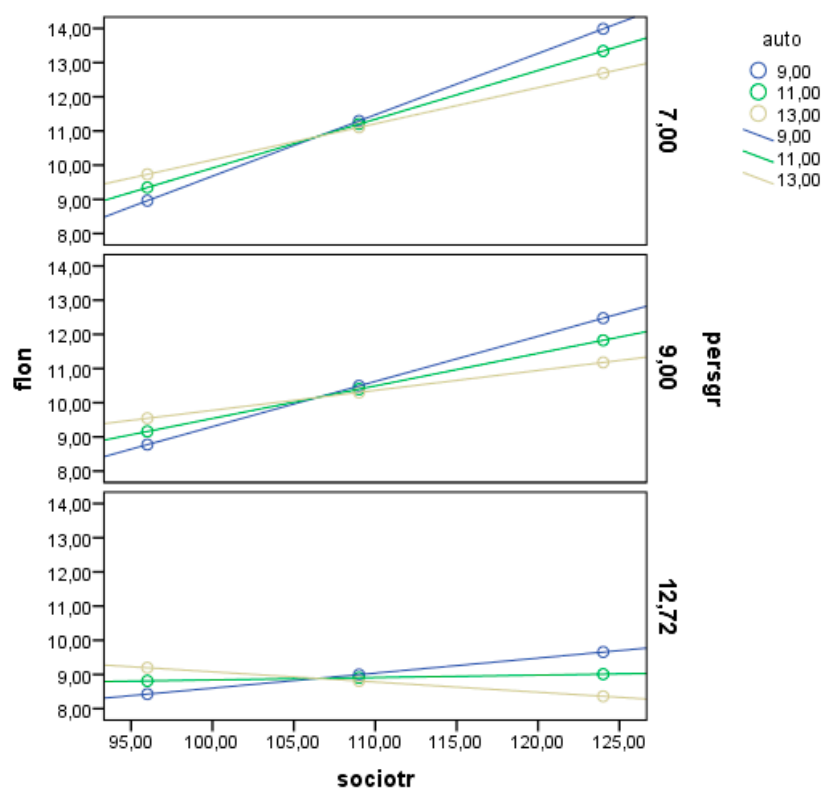


Figure 3. Parallel moderation in general sample. Sociotr—sociotropy; flon—family loneliness; persgr—personal growth; auto—autonomy.

We could also mention that when both personal growth and autonomy were high, there was a slight shift in the moderation effect: while low and average scores increased the effects of sociotropy on family loneliness, high scores slightly decreased this effect.

Simple moderation (Table 2) showed no significant effect of autonomy on sociotropy—non-family loneliness association, so our prediction was that there could be moderated moderation, i.e., personal growth moderate sociotropy—non-family loneliness, and autonomy moderated the effect of personal growth (Figure 4).

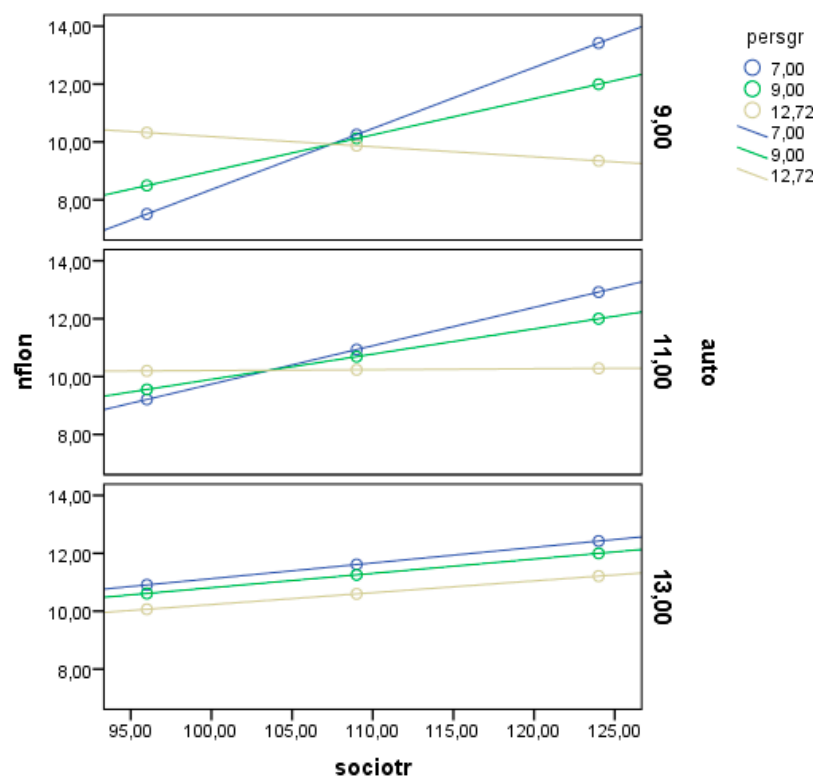


Figure 4. Moderated moderation in general sample. Sociotr—sociotropy; nflon—non-family loneliness; persgr—personal growth; auto—autonomy.

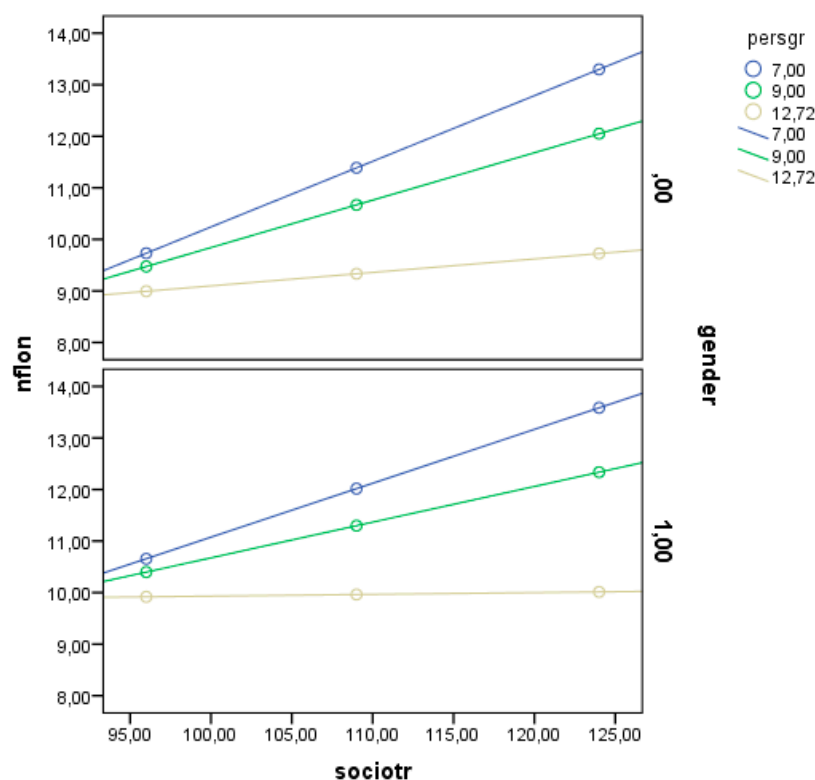
The overall pattern can be described as follows: negative moderation effect of autonomy on personal growth increased positive moderation effect of personal growth on association sociotropy—non-family loneliness. Results showed that for participants with high scores on autonomy, the positive moderation effect of personal growth was similar for all levels of personal growth. The lower autonomy was, the stronger the effects of personal growth on the association of sociotropy and non-family loneliness were found. It is important to mention that participants with high scores on personal growth showed the same effects at all levels of autonomy. The moderation effects of autonomy on personal growth were most significant for participants with average and low scores of autonomy. We could speculate that autonomy revealed differences when both autonomy and personal growth were average or low. We can assume that low to average autonomy and personal growth could make our participants more vulnerable to the effects of sociotropy on non-family loneliness.

Finally, we tested if gender, autonomy, and personal growth had combined effects on association sociotropy—loneliness (family and non-family). We found no significant effects for family loneliness and one significant effect for non-family loneliness (Table 4). Results presented in Table 4 showed that the effect of dual moderation of personal growth and gender was small.

Table 4. Moderation effects of gender, autonomy, and personal growth on association sociotropy—non-family loneliness (parallel moderation).

Interactions	R ² Change	F	p
Sociotropy (X) × Personal Growth (W)	0.017	2.905	0.090
Sociotropy (X) × Sex (Z)	0.010	0.178	0.673
Both	0.033	2.831	0.062

Overall differences in effects were small, but females demonstrated slightly more contrast effect than men (Figure 5).

**Figure 5.** Parallel moderation in general sample. Sociotr—sociotropy; nflon—non-family loneliness; persgr—personal growth; gender 0—males, gender 1—females.

Results showed that for both males and females with high personal growth scores, sociotropy did not significantly predict non-family loneliness. Both males and females showed that high scores of personal growth did not affect the association of sociotropy and non-family loneliness. At the same time, average and low scores of personal growth increased the negative moderation effect: the lower personal growth, the stronger was effect. Slight differences between males and females could be somewhat explained from a cultural perspective. After World War I, followed by the Revolution, women in Soviet Russia, the then Soviet Union, were given broad rights and opportunities; moreover, they had to join the workforce as many men died during World War I. So, we could speculate that in non-family backgrounds, males and females behave in similar ways as gender differentiation outside the family context is not that strong.

4. Discussion

Our results were consistent with previous findings (Strizhitskaya et al. 2024), showing that sociotropy predicted loneliness. An important note is that though previous studies and the current study used different instruments to assess loneliness, the association of sociotropy—loneliness remained consistent.

In our study, we concentrated on the association of sociotropy and loneliness but did not focus on other factors that could possibly affect loneliness. This design was used because, on the one hand, sociotropy is a personality characteristic that is correlated with one's behavior in society, communication, and, most importantly, the need for such communication. So, we supposed that it should affect the experience of loneliness. On the other hand, data on sociotropy within non-clinical samples and its effects are limited. So, we found it reasonable to concentrate on its pure effects before adding other factors that could be affecting loneliness.

In the present study, we focused on loneliness in different social contexts—family and non-family. Our studies during the COVID-19 Pandemic ([Strizhitskaya et al. 2021b](#)) revealed differences in experiencing loneliness within family and non-family contexts, so we hypothesized that those differences could be caused by different mechanisms, particularly by moderation.

Our results supported hypothesis a. We confirmed simple moderation effects of personal growth on sociotropy—family loneliness association and sociotropy—non-family loneliness association. We also revealed a simple moderation effect of autonomy on sociotropy—family loneliness association but not for sociotropy—non-family loneliness. This result highlights that although autonomy, to some extent, can be considered part of or the opposite of sociotropy, the very phenomenon of autonomy is not limited to autonomy in social relationships.

Our results suggest that both autonomy and personal growth affected the predictive power of sociotropy on loneliness. But, mechanisms of this effect were different for the family and non-family social domains. So, hypothesis b was also confirmed. Differences in these domains could origin from the nature of these domains. Family domain, to a great extent, is pre-determined; in other words, we are born in a certain family (or adopted into a certain family), and from a developmental perspective, attachment to family members is formed in the early stages and is deepened in our mental structures. The non-family domain is, in many ways, self-determined. It is much more flexible, changeable, and replaceable. Thus, our results suggest that dependence on social interactions, orientation, and seeking for these interactions would increase family loneliness. This effect was pronounced for those who had low or average scores on autonomy and personal growth, but the effect nearly disappeared for those who had high scores on autonomy and personal growth. We could hypothesize that for people with a combination of low to average scores in autonomy and personal growth, social interactions, to a great extent, could be limited to the family domain and/or the importance of the family domain could be overwhelming.

For the non-family domain, we found that personal growth was an important moderator of the predictive power of sociotropy on loneliness. This effect, in turn, was negatively moderated by autonomy. In our sample for people with high autonomy, there was no significant effect of personal growth on sociotropy—loneliness association; moreover, there was generally no effect of sociotropy on loneliness. For average and low autonomy, we found that the lower the autonomy, the greater the negative moderation effect on personal growth. Thus, our results suggest that highly autonomous people did not experience non-family loneliness, whether they were or were not socially oriented. For those who were not that autonomous, personal growth could be a sort of resource. Personal growth implies learning, self-development, and new experiences. We can assume that these components, on the one hand, could replace the need for social interaction and affiliation outside the family environment or become a source for new acquaintances that could replace relationships that caused non-family loneliness.

Overall, our results suggest that moderation effects were not gender specific. Thus, hypothesis c was not confirmed. This is, to some extent, consistent with the findings of [von Soest et al. \(2020\)](#), who reported some gender differences based on direct measures but no differences based on indirect measures. We can hypothesize that while the manifestation of autonomy and personal growth could be gender-specific, and sociotropy and loneliness

have well-established correlations with gender (Yang and Girus 2019); still, the way these characteristics moderated sociotropy and loneliness could be more universal.

Our study has several limitations. First, the sample size: the sample size was relevant for the study purposes, but the bigger sample would allow us to analyze demographic data in more detail. More specifically, we could focus on the qualitative characteristics of the relationships our participants were involved in. Second, our participants were from one of the biggest cities in the country, so our results could be affected by the socio-economic status and cultural specifics of the big city. Finally, most of the sample a university degrees that could affect such characteristics as autonomy and personal growth. However, high rates of possession of a university degree are common and generation-specific for people aged 35–55 in Russia. We consider these limitations for future directions of our study, as well as a qualitative approach to understanding the mechanisms of loneliness in different social domains.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethical Committee (IRB) of St. Petersburg Psychological Society (protocol No. 22, 25 May 2023).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available upon a reasonable request from the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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