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Understanding perceived COVID-19 changes, collectivism, and social exclusion: A cross-cultural study in 32 countries

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ABSTRACT

This cross-cultural study examines the relationship between perceived COVID-19 changes due to the impacts on everyday life by the pandemic with social exclusion and across 32 cultures and their levels in collectivism. With data from the start of the first outbreak from March 2020 to June 2020 ($N = 9245$), multilevel analysis indicated that as individuals perceive greater daily life changes induced by the pandemic, they experience heightened levels of social exclusion, with this association being particularly pronounced in less collectivistic cultures. These findings underscore the importance of considering cultural context in understanding responses to crises such as the COVID-19 pandemic, with implications for culturally sensitive interventions aimed at promoting social inclusion across diverse cultural contexts.

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Understanding perceived COVID-19 changes, collectivism, and social exclusion in the aftermath of the pandemic

Social isolation was a universal challenge during the COVID-19, but how individuals from different cultures experienced this phenomenon remains a crucial question for future public health emergencies. The contagious nature of the virus necessitated stringent measures which induced the feelings of social exclusion, particularly pronounced in certain cultural contexts where public health measures (e.g., lockdowns) were more stringent (Lu et al., 2021). This study aims to investigate how the perceived change of COVID-19 and cultural collectivism, relate to social exclusion across 32 cultures.

The relationship between perceived COVID-19 changes and social exclusion

The COVID-19 pandemic has posed not only serious health risks but also profound social and psychological challenges that have led to widespread feelings of social exclusion (English et al., 2023). Globally, governments mandated physical distancing and stay-at-home orders to control the virus's spread (Lu et al., 2021). These essential adjustments have reshaped individuals' perceptions of their relationships and social roles, and thus, their sense of inclusion (Kitayama et al., 2022).

Beyond immediate social distancing measures, COVID-19 has driven an array of life changes that collectively affect people's sense of belonging and inclusion (Counted et al., 2021; Zhang et al., 2023). For instance, heightened focus on personal hygiene practices and altered sleep patterns often contribute to the feelings of social isolation, while changes in practicalities like transportation and shopping reduce casual social encounters (Altena et al., 2020; Blume et al., 2020). Research highlights that sleep disturbances are linked to poorer emotional functioning, which can further exacerbate feelings of social alienation (Altena et al., 2020). Consequently, disruptions across various life aspects contribute to diminished opportunities for meaningful interaction, amplifying perceived exclusion.

Moreover, changes in family dynamics, eating practices, and social norms can significantly impact social cohesion. Reduced family closeness, adjustments in communal eating, and new public behaviors disrupt shared routines that are often central to a person's sense of belonging (Giacalone et al., 2020; Prime et al., 2020). Diverging societal values have also intensified societal divisions (e.g., discrimination against Asians) and contributed to exclusionary experiences (Jetten, 2020). Collectively, these pandemic-induced lifestyle changes can foster feelings of alienation and disconnect within the broader social world (Banerjee & Rai, 2020).

In light of these multidimensional shifts, the current study aims to capture the full breadth of how perceived COVID-19 changes—whether in personal relationships, daily practices, or social environments—may relate to social exclusion. This comprehensive approach allows us to examine the wide-ranging social and psychological implications of the COVID-19 pandemic, enhancing existing knowledge of how individuals across diverse cultural contexts experienced isolation and exclusion during this global crisis.

The moderating role of collectivism

Socio-ecological theories emphasize how ecological conditions shape psychological and cultural traits, offering an important theoretical foundation for understanding how environmental pressures—such as pandemic-related disruptions—interact with cultural orientations like collectivism. For instance, Berry's ecocultural framework suggests ecological contexts influence cultural practices and psychological functioning through adaptive mechanisms (Berry, 1976). Similarly, latitudinal psychology (Van de Vliert, 2013) and rice–wheat theory (Talhelm et al., 2014) highlight how climatic and agricultural conditions foster regional differences in collectivism, cooperation, and social norms. These frameworks collectively justify the analysis of cultural variation as dynamic adaptations to the COVID-19 crisis.

The impact of perceived COVID-19 changes on feelings of social exclusion may differ in strength across cultures. Specifically, the current research believes that the positive relationship may be more pronounced in less collectivistic cultures. First, individuals from less collectivistic societies tend to value positive social interactions. In cultures with high relational mobility, typically found in individualistic societies, people can easily end unsatisfactory relationships and form new ones. As a result, there is a strong emphasis on cultivating positive social interactions to maintain and establish new connections (Kito et al., 2017). In contrast, collectivistic cultures emphasize strong bonds within ingroups, even if relationships become problematic. This fosters a higher tolerance for negative interactions (Li et al., 2015). Empirical evidence supports this difference, showing that individualistic societies, such as the United States, often experience higher levels of positive interactions, gratitude, and emotional support within ingroups compared to collectivistic societies like China (Liu et al., 2021). Consequently, disruptions to positive social interactions, such as those brought about by the pandemic, might provoke stronger negative reactions in individualistic cultures.

In addition, individuals from less collectivistic may interpret negative interactions as more personally threatening to their unique identity. Research has been showed that within individualistic cultures, exclusion may be more threatening as it's seen as a rejection of the unique individual and their personal successes and failures (Markus & Kitayama, 1991; Pfundmair et al., 2015). Similarly, German participants experienced elevated heart rates when subjected to exclusion, whereas Chinese participants displayed no significant change in heart rate under similar circumstances (Pfundmair et al., 2015). In contrast, a more interdependent self-concept can help individuals deal with social exclusion by making it seem less personally threatening, as it doesn't challenge the core identity rooted in the strong connections with others. Previous research suggests that individuals with a high level of interdependent self-construal demonstrate greater resilience when faced with social exclusion compared to those with a low level (Over & Uskul, 2016; Ren et al., 2013; Uskul & Over, 2017).

It is important to acknowledge that collectivistic cultures, characterized by lower relational mobility, may also foster heightened sensitivity to social rejection due to their emphasis on maintaining stable ingroup relationships (Kito et al., 2017; Sato et al., 2014).

However, such rejection is typically viewed as a disruption to group harmony rather than a threat to individual identity. During crises like the COVID-19 pandemic, collectivistic cultures provide mechanisms—such as strong adherence to social norms (e.g., mask-wearing, social distancing)—that may buffer feelings of exclusion and promote social cohesion, as observed in societies like South Korea and Singapore (Kitayama et al., 2022; Lu et al., 2021). Gelfand et al. (2021) noted that individuals in "tight" cultures—typically collectivist cultures that emphasize strict adherence to social norms—may view COVID-19 measures, such as mask-wearing and social distancing, not as negative social interactions but as essential norms for managing the pandemic. This perception reduces the likelihood of viewing these adjustments as exclusionary or isolating. Therefore, we theorized that *collectivism moderates the positive link between perceived COVID-19 changes and perceived social exclusion. Specifically, the positive link will be more salient in less collectivistic regions.*

Method

Participants

This research is affiliated with a larger project that received ethical approval from the affiliated University. The current research recruited participants from around the world through a Global COVID-19 Online Survey. It was conducted in collaboration with researchers around the world during the first wave of the pandemic. Participants joined this study through Qualtrics. Participation in this research was voluntary. At first, we recruited 9686 participants from 99 countries from March 2020 to June 2020. We followed traditional practice for handling missing data (Osborne, 2013) by excluding participants who had missing responses on 75 % or more of the scale items. To follow the General Data Protection Regulation (GDPR), we excluded the participants who were under 18 years old. Additionally, to ensure valid results, we included only those countries with a minimum of 30 participants (Kreft,1996), valid collectivism scores from the Global Collectivism Index (GCI), and records of daily COVID-19 cases at the time of data collection. In the end, 9245 participants ($M_{age} = 30.92$, $SD_{age} = 12.51$, 63.95 % female) from 32 cultures (see Fig. 1) were included in the final analyses. The details about the demographic information by culture are presented in Table S2 in supplemental materials.

Measurements

The perceived social exclusion scale

It adapted from Geeraert and Demoulin (2013), comprises five items designed to assess individuals' feelings of social exclusion

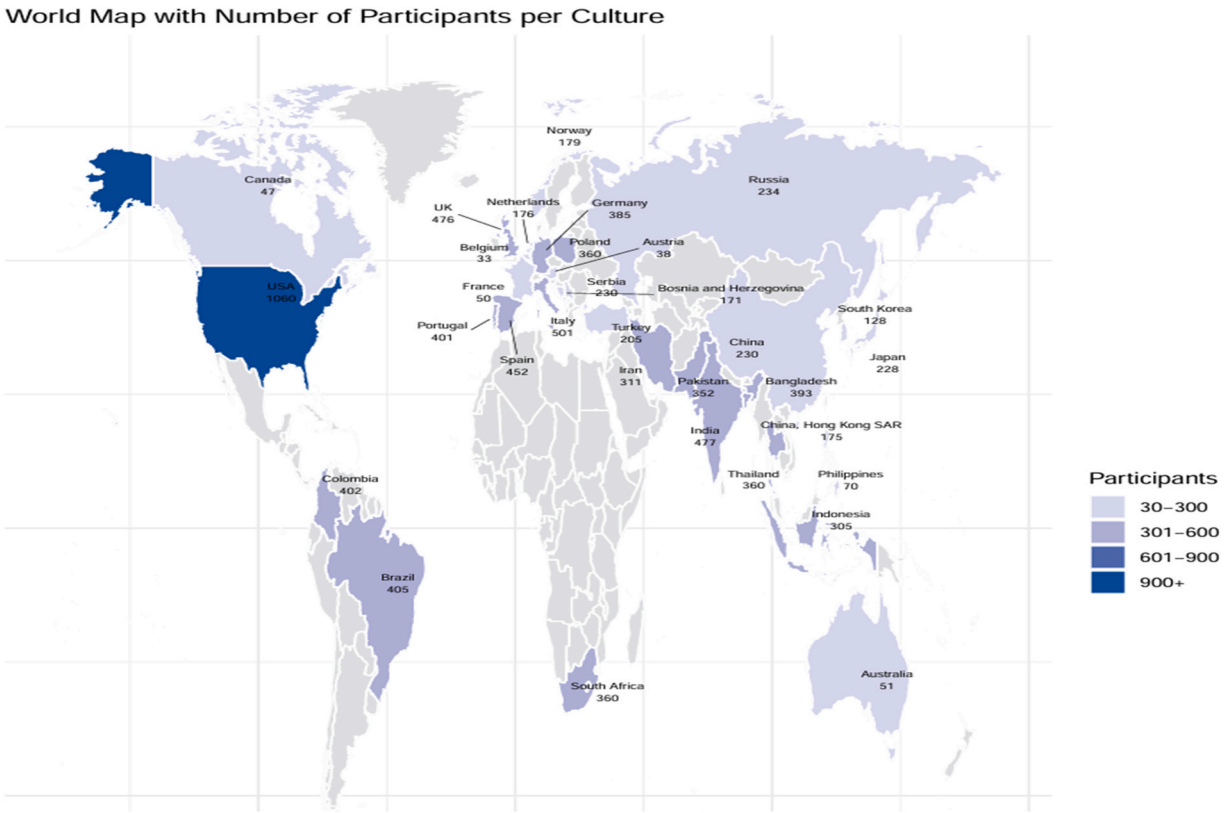

Fig. 1. The map of 32 cultures involved in formal analyses.

within this pandemic. An example item from the scale is: "I feel like most people in this country prefer to avoid me," with response options ranging from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). The scale has good reliability (Cronbach's alpha is 0.76). Measurement invariance is essential for cross-cultural studies (Fischer et al., 2025; Fontaine et al., 2008; Poortinga., 1989; van de Vijver and Leung, 2011). We used multi-group confirmatory factor analysis to test the scale's measurement invariance across cultures. We achieved partial scalar invariance, with at least two items showing invariance per construct (Byrne et al., 1989; Cieciuch & Davidov, 2016; Steenkamp & Baumgartner, 1998). Specifically, item 3 ("I think most people in this country do not care for me") failed to meet both metric and scalar invariance, while item 1 ("I feel like most people in this country don't want to mix with me") and item 5 ("I feel like most of the people in this country are very kind to me.") did not meet scalar invariance (please refer to Table S7 in supplementary materials). Despite their non-invariance, we chose to retain these items, as excluding them could diminish the scale's ability to capture the full construct of social exclusion.

The perceived COVID-19 changes scale

This nine-item instrument adapted from the Cultural Distance Scale in Demes and Geeraert (2014), seeks to capture individuals' perceptions of the alterations in society, lifestyle, and personal environments since the advent of the COVID-19 outbreak pandemic (English et al., 2022). It covers aspects such as hygiene practices, sleep patterns, and family life. Responses are gauged on a scale from 1 (*Extremely Different*) to 7 (*Extremely Similar*). This scale with a Cronbach's alpha of.66 showed acceptable reliability (Taber, 2018).

The global collectivism index (GCI)

We operationalized collectivism using the GCI (Pelham et al., 2022), a national-level index derived from ecological and structural indicators (e.g., fertility rates, family structures, religiosity). While distinct from traditional measures of collectivism, the GCI aligns theoretically with socio-ecological frameworks positing that enduring structural conditions shape psychological tendencies (Berry, 1976; Talhelm et al., 2014). Moreover, compared to traditional self-report scales (e.g., Hofstede et al., 2010), the GCI offers greater global coverage, includes objective behavioral indicators, and minimizes confounding factors such as GDP and modernity, facilitating robust cross-cultural comparisons (Pelham et al., 2022). As introduced by Pelham et al. (2022), GCI represents a comprehensive measure that encompasses most of the world's population, offering insights into the level of collectivism across 188 nations. The index is underpinned by six meticulously chosen indicators: total fertility rate, living arrangements, stability of marriage, religiosity, collective transportation, interdependent attitude, and entrepreneurship. These indicators collectively provide a nuanced understanding of the multifaceted nature of collectivism. The GCI assigns raw scores and rankings to each nation, ranging from −1.85 (Monaco) to 1.92 (Somalia), with higher scores indicating a greater degree of collectivism.

Covariates

Since previous research has found that age, gender, education level, national tightness, and financial resources, were related to one's social relationship (Liu et al., 2018), this study collected such data and analyzed them as covariates. While our theoretical framing acknowledges tightness–looseness theory in contextualizing behavioral responses to COVID-19, we emphasize that tightness and collectivism are conceptually distinct. To reflect this distinction empirically, national-level tightness was explicitly controlled for in our multilevel analyses. Additionally, we controlled for the stringency index, historical pathogens, the number of people in the household, and population density because they may be related to the spread and severity of COVID-19 (Wong & Li, 2020). The stringency index gauges the strictness of governmental COVID-19 policies, such as travel bans and school closures. It is controlled for because countries differ in policy strictness, as well as collectivism since it is known to be associated with mask-wearing behaviors (Lu et al., 2021). Historical pathogens measure a population's long-term infectious disease prevalence, which was controlled for to exclude its effects when analyzing contemporary reactions to COVID-19. These are common covariates in previous COVID research (Zhou et al., 2024). The details about the covariates are presented in Table S1 in supplemental materials.

Results

Table 1 presents the descriptive statistics. Pearson correlation was used to assess correlations between continuous variables, while Spearman correlation was used for correlations involving gender (coded 0 = male, 1 = female) with other variables. Additional descriptive statistics by culture can be found in Table S3 in the supplemental materials.

Given the hierarchical structure of our data, which includes both individual- and culture-level variables, we examined the suitability of a multilevel modeling approach. We calculated the intraclass correlation (ICC) for the perceived social exclusion score using a model with a random intercept only. The ICC was.08, indicating that 8 % of the variation in social exclusion scores was attributable to cultural differences, which, based on the guidelines by LeBreton and Senter (2008), supports the use of multilevel modeling (ICC >.05). Accordingly, we conducted multilevel analyses using the *nlme* package in R.

To examine the hypothesis, we tested a multilevel model with the predictor as perceived COVID-19 change, cultural collectivism, and their interaction term, and the outcome as social exclusion. This model allows us to analyze the main effect of perceived COVID-19 changes on social exclusion across the entire sample. Additionally, the cross-level interaction between perceived COVID-19 changes and collectivism tests our hypothesis regarding the moderating role of collectivism, examining whether the relationship between perceived COVID-19 changes and social exclusion varies based on the level of collectivism across different cultures. All individual-level variables were centered around the mean for each culture, while culture-level variables were centered around the grand mean (Hox et al., 2017). The regression coefficients for these analyses are summarized in Table 2.

Results showed that the main effect of perceived COVID-19 changes was significant, $B = .17$, $SE = .01$, 95 %CI = [.15,.20], $p < .001$.

Table 1
Means, Standard Deviations, and Correlations among Variables (N = 9245).

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Social exclusion	3.03	1.27	(.76)											
2.Perceived COVID−19 changes	4.43	.96	.12 * *	(.66)										
3. Collectivism	−.44	.71	.08 * *	.16 * *	–									
4. Gender	.64	.48	−.01	0.02	−.06 * *	–								
5. Age	30.92	12.51	−.11 * *	−.03 * *	−.21 * *	.02 *	–							
6. Education level	4.46	1.57	−.10 * *	.01	−.06 * *	.00	.23 * *	–						
7.People in your household	3.62	1.89	.03 * *	.07 * *	.38 * *	−.01	−.23 * *	−.09 * *	–					
8. Stringency index	78.68	14.74	.02 *	.15 * *	.43 * *	−.02 *	.01	.04 * *	.00	–				
9. Cultural Tightness	7.05	2.35	−.04 * *	.04 * *	.56 * *	−.01	−.08 * *	.24 * *	.00	.31 * *	–			
10. Gini	38.29	7.80	−.06 * *	.17 * *	.24 * *	−.01	−.07 * *	−.14 * *	.00	.05 * *	−.37 * *	–		
11. GDP per capita (US$)	27372.66	16842.75	−.03 * *	−.15 * *	−.89 * *	.04 * *	.13 * *	.03 * *	.00	−.48 * *	−.50 * *	−.28 * *	–	
12. Pathogens per culture	.22	1.89	−.05 * *	.13 * *	.62 * *	−.01	−.16 * *	−.05 * *	−.01	.23 * *	.13 * *	.60 * *	−.67 * *	–
13. Population density	332.23	967.50	.03 * *	−.01	.06 * *	.04 * *	−.08 * *	.05 * *	.10 * *	.17 * *	.02	−.35 * *	−.23 * *	−.08 * *

Note. Gender: 0 = male, 1 = female. Education: 1 = below high school to 7 = doctoral or equivalent. Pearson correlation was used to the correlation between continuous variables. Spearman correlation was used to the correlation between gender and the rest variables. The reliability was reported in the diagonal line.
* $p < .05$, * * $p < .01$.

There was no significant evidence of an association between collectivism and social exclusion ($p = .168$). Importantly, the interaction effect between cultural collectivism and perceived COVID-19 changes was significant, $B = -.14$, $SE = .02$, 95 %CI = [-.18, −.10], $p < .001$. This suggests that an increase in perceived COVID-19 changes interacted with the level of collectivism, affecting individuals' social exclusion. Specifically, according to the simple slope analysis, when collectivism was lower (1 *SD* below the mean), perceived COVID-19 changes was positively associated with participants' social exclusion: $B = .27$, $SE = .02$, 95 %CI = [.24,.31], $p < .0001$. When collectivism was higher (1 *SD* above the mean), perceived COVID-19 changes was positively associated with participants' social exclusion in a relatively weaker degree: $B = .08$, $SE = .02$, 95 %CI = [.04,.12], $p = .0001$. The simple slope pattern illustrating this interaction is displayed in Fig. 2.

Overall, these findings support our hypothesis. Additional analyses, including those with covariates and alternative models, are reported in Table S4 in the supplementary materials.

Discussion

This study explores the intricate dynamics between perceived COVID-19 changes, collectivism, and social exclusion across 32 diverse cultures. The GCI serves as a robust measure that captures the cultural nuances of collectivism across 188 nations. We caution against interpreting these findings through simplistic binary distinctions (e.g., individualistic vs. collectivistic countries), instead framing collectivism as a continuous, multidimensional construct. This approach enhances construct validity and aligns with recent critiques urging more nuanced cultural analysis (Akaliyski et al., 2022; Minkov et al., 2017; Van de Vijver & Leung, 2021). By employing the GCI, our study assesses how varying levels of collectivism influence the relationship between perceived COVID-19 changes and social exclusion. This approach enhances the validity of our cross-cultural comparisons and contributes to a deeper understanding of cultural dynamics in crisis contexts. Our findings highlight the profound impact of the pandemic on individuals' experiences of social exclusion and underscore the importance of considering cultural contexts in understanding and addressing these challenges. Our results indicate that as individuals perceive greater COVID-19 changes, they are more likely to experience heightened levels of social exclusion. Particularly, our study reveals that this positive association is more pronounced in less collectivistic cultures, where individuals exhibit heightened sensitivity to social exclusion. These results align with previous research highlighting the role of individualistic versus collectivistic cultural orientations in shaping responses to social exclusion (Kitayama et al., 2022; Uskul & Over, 2017). Notably, individuals from collectivistic cultures tend to be somewhat more accustomed to negative interactions within their social groups, whereas those from less collectivistic cultures are more sensitive to experiences of exclusion.

Limitations

To ensure robustness, supplementary analyses excluded cultures with fewer than 100 participants and those with reliabilities below .60, yielding consistent results. Nevertheless, we acknowledge that small sample sizes and low reliabilities in some cultures could introduce noise, a limitation warranting caution in interpreting cross-cultural comparisons. Despite the insights gleaned from this study, several limitations warrant consideration. First, the cross-sectional nature of our data precludes causal inferences about the relationships examined. Future research employing longitudinal designs could elucidate the temporal dynamics of perceived COVID-19 changes and social exclusion. Second, while our study encompassed a diverse array of cultures, the generalizability of our findings may be limited to the specific cultural contexts included in our sample. Future research should strive to incorporate a broader range of cultural contexts to enhance the generalizability of findings. Third, to comprehensively capture the constructs of perceived COVID-19 changes and social exclusion, we included all items across both scales, which achieved partial scalar invariance. To enhance generalizability and ecological validity, we also included cultures with lower reliability scores, which may introduce measurement bias and impact the validity of our findings. Future research should focus on developing culturally invariant and reliable measures. Forth, our focus on collectivism as a cultural variable may overlook other important classifications that could influence social exclusion, such as geographic regions, WEIRD classifications, and alternative cultural scores like Minkov's dimensions. Future studies could incorporate these variables to enhance the robustness and generalizability of the findings. Furthermore, our operationalization of culture via the GCI, though comprehensive, may not fully reflect within-country heterogeneity or dynamic social conditions. Future research should incorporate individual-level cultural measures, such as relational mobility, to better capture participants' direct social experiences and

Table 2
Regression model for social exclusion.

	Model 1 *B (SE)*	**Model 2** *B (SE)*
(Intercept)	3.02 * ** (.06)	3.02 ***(.06)
Perceived COVID−19 changes$_{\text{culture-mean centered}}$	0.18 * ** (.01)	0.18 ***(.01)
Collectivism$_{\text{grand-mean centered}}$	0.12(.09)	0.12(.09)
Perceived COVID−19 changes$_{\text{culture-mean centered}}$ × Collectivism$_{\text{grand-mean centered}}$	/	−0.14 ***(.02)
Conditional R^2	0.09	0.10
Observations	9245	9245
Cultures	32	32

Note. Unstandardized regression coefficients are displayed, with standard errors in parentheses.
*** $p < .001$.

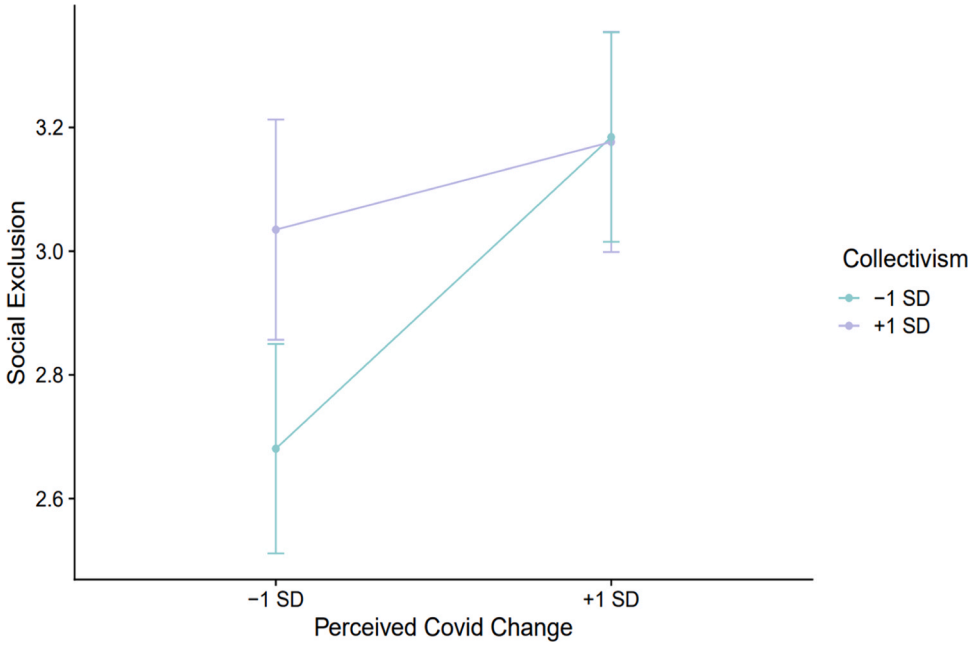

Fig. 2. The interaction effect between perceived COVID-19 changes and collectivism on perceived social exclusion. Error bars represent 95 % confidence Interval.

flexibility in relationship formation. Finally, we recognize that low collectivism does not necessarily equate to high individualism, as collectivism and individualism are distinct constructs with unique cultural implications. Exploring individualism as a separate factor might yield further insights into the nuances of social exclusion across cultures.

Conclusion

While the cross-sectional nature of our data limits causal inferences, our findings still suggest valuable directions for public health interventions and policy initiatives aimed at mitigating social exclusion during crises such as the COVID-19 pandemic. Specifically, our results underscore the importance of considering cultural context when interpreting psychosocial impacts of global crises, while also highlighting the need for future longitudinal and experimental studies to guide culturally responsive interventions.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ijintrel.2025.102198.

References

Akaliyski, P., Minkov, M., Li, J., Bond, M. H., & Gehrig, S. (2022). The weight of culture: Societal individualism and flexibility explain large global variations in obesity. *Social Science Medicine, 307*, 1–13. https://doi.org/10.1016/j.socscimed.2022.115167

Altena, E., Baglioni, C., Espie, C. A., Ellis, J., Gavriloff, D., Holzinger, B., Schlarb, A., Frase, L., Jernelöv, S., & Riemann, D. (2020). Dealing with sleep problems during home confinement due to the COVID-19 outbreak: Practical recommendations from a task force of the European CBT-I Academy. *Journal of Sleeping Research, 29* (4). https://doi.org/10.1111/jsr.13052

Banerjee, D., & Rai, M. (2020). Social isolation in Covid-19: The impact of loneliness. In (Vol. 66, pp. 525-527): SAGE Publications Sage UK: London, England.

Berry, J.W. (1976). Cross-cultural research and methodology series: III. Human ecology and cognitive style: Comparative studies in cultural and psychological adaptation. Sage.
Blume, C., Schmidt, M. H., & Cajochen, C. (2020). Effects of the COVID-19 lockdown on human sleep and rest-activity rhythms. *Current Biology, 30*(14), R795–R797. https://doi.org/10.1016/j.cub.2020.06.021
Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*(3), 456–466. https://doi.org/10.1037/0033-2909.105.3.456
Cieciuch, J., & Davidov, E. (2016). Establishing measurement invariance across online and offline samples. A tutorial with the software packages Amos and Mplus. *Studia Psychologica: Theoria et Praxis, 15*(2), 83–99. https://doi.org/10.21697/sp.2015.14.2.06
Counted, V., Cowden, R.G., & Ramkissoon, H. (2021). Place and post-pandemic flourishing: Disruption, adjustment, and healthy behaviors. Springer. https://doi.org/10.1007/978-3-030-82580-5.
Demes, K. A., & Geeraert, N. (2014). Measures matter: Scales for adaptation, cultural distance, and acculturation orientation revisited. *Journal of Cross-Cultural Psychology, 45*(1), 91–109. https://doi.org/10.1177/0022022113487590
English, A. S., Sun, J., Xu, S., Zheng, L., Zhang, Q., & Talhelm, T. (2023). COVID-19 non-death loss and acceptance coping: A 3-wave cross-lagged panel analysis. *Social and Personality Psychology Compass, 17*(12), Article e12911. https://doi.org/10.1111/spc3.12911
English, A. S., Torres-Marín, J., & Navarro-Carrillo, G. (2022). Coping and anxiety during lockdown in Spain: The role of perceived impact and information sources. *Psychology Research and Behavior Management, 15*, 1411–1421. https://doi.org/10.2147/PRBM.S362849
Fischer, R., Karl, J. A., Luczak-Roesch, M., & Hartle, L. (2025). Why we need to rethink measurement invariance: The role of measurement invariance for cross-cultural research. *Cross-Cultural Research*, 1–33. https://doi.org/10.1177/10693971241312459
Fontaine, J. R., Poortinga, Y. H., Delbeke, L., & Schwartz, S. H. (2008). Structural equivalence of the values domain across cultures: Distinguishing sampling fluctuations from meaningful variation. *Journal of Cross-Cultural Psychology, 39*(4), 345–365. https://doi.org/10.1177/0022022108318112
Geeraert, N., & Demoulin, S. (2013). Acculturative stress or resilience? A longitudinal multilevel analysis of sojourners' stress and self-esteem. *Journal of Cross-Cultural Psychology, 44*(8), 1241–1262. https://doi.org/10.1177/0022022113478656
Gelfand, M. J., Jackson, J. C., Pan, X., Nau, D., Pieper, D., Denison, E., Dagher, M., Van Lange, P. A. M., Chiu, C.-Y., & Wang, M. (2021). The relationship between cultural tightness-looseness and COVID-19 cases and deaths: A global analysis. *The Lancet Planetary Health, 5*(3), e135–e144. https://doi.org/10.1016/S2542-5196(20)30301-6
Giacalone, D., Frøst, M. B., & Rodríguez-Pérez, C. (2020). Reported changes in dietary habits during the COVID-19 lockdown in the Danish population: The Danish COVIDiet study. *Frontiers in Nutrition, 7*, Article 592112. https://doi.org/10.3389/fnut.2020.592112
Hofstede, G., Hofstede, G.J., Minkov, M. (2010). Cultures and organizations: Software of the Mind, 3rd ed. McGraw-Hill, New York Revised.
Hox, J., Moerbeek, M., & Van de Schoot, R. (2017). Multilevel analysis: Techniques and applications. Routledge.
Jetten, J. (2020). Together apart: The psychology of COVID-19. Sage.
Kitayama, S., Camp, N. P., & Salvador, C. E. (2022). Culture and the COVID-19 pandemic: Multiple mechanisms and policy implications. *Social Issues and Policy Review, 16*(1), 164–211. https://doi.org/10.1111/sipr.12080
Kito, M., Yuki, M., & Thomson, R. (2017). Relational mobility and close relationships: A socioecological approach to explain cross-cultural differences. *Personal Relationships, 24*(1), 114–130. https://doi.org/10.1111/pere.12174
Kreft, I.G. (1996). Are multilevel techniques necessary? An overview, including simulation studies. Unpublished manuscript, California State University, Los Angeles.
LeBreton, J. M., & Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organizational Research Methods, 11*(4), 815–852. https://doi.org/10.1177/1094428106296642
Li, L. M. W., Adams, G., Kurtiş, T., & Hamamura, T. (2015). Beware of friends: The cultural psychology of relational mobility and cautious intimacy. *Asian Journal of Social Psychology, 18*(2), 124–133. https://doi.org/10.1111/ajsp.12091
Liu, P., Chan, D., Qiu, L., Tov, W., & Tong, V. J. C. (2018). Effects of cultural tightness–looseness and social network density on expression of positive and negative emotions: A large-scale study of impression management by Facebook users. *Personality and Social Psychology Bulletin, 44*(11), 1567–1581. https://doi.org/10.1177/0146167218770999
Liu, S. S., Shteynberg, G., Morris, M. W., Yang, Q., & Galinsky, A. D. (2021). How does collectivism affect social interactions? A test of two competing accounts. *Personality and Social Psychology Bulletin, 47*(3), 362–376. https://doi.org/10.1177/0146167220923230
Lu, J. G., Jin, P., & English, A. S. (2021). Collectivism predicts mask use during COVID-19. *Proceedings of the National Academy of Sciences, 118*(23), Article e2021793118. https://doi.org/10.1073/pnas.2021793118
Markus, H. R., & Kitayama, S. (1991). Cultural variation in the self-concept. *The self: Interdisciplinary approaches* (pp. 18–48). Springer.
Minkov, M., Dutt, P., Schachner, M., Morales, O., Sanchez, C., Jandosova, J., & Mudd, B. (2017). A revision of Hofstede's individualism-collectivism dimension: A new national index from a 56-country study. *Cross Cultural Strategic Management, 24*(3), 386–404. https://doi.org/10.1108/CCSM-11-2016-0197
Osborne, J. W. (2013). *Best practices in data cleaning: A complete guide to everything you need to do before and after collecting your data.* Sage Publications.
Over, H., & Uskul, A.K. (2016). Culture moderates children's responses to ostracism situations [doi:10.1037/pspi0000050]. American Psychological Association.
Pelham, B., Hardin, C., Murray, D., Shimizu, M., & Vandello, J. (2022). A truly global, non-WEIRD examination of collectivism: The global collectivism index (GCI). *Current Research in Ecological and Social Psychology, 3*, Article 100030. https://doi.org/10.1016/j.cresp.2021.100030
Pfundmair, M., Aydin, N., Du, H., Yeung, S., Frey, D., & Graupmann, V. (2015). Exclude me if you can: Cultural effects on the outcomes of social exclusion. *Journal of Cross-Cultural Psychology, 46*(4), 579–596. https://doi.org/10.1177/0022022115571203
Poortinga, Y. H. (1989). Equivalence of cross-cultural data: An overview of basic issues. *International Journal of Psychology, 24*(6), 737–756. https://doi.org/10.1080/00207598908247842
Prime, H., Wade, M., & Browne, D. T. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist, 75*(5), 631–643. https://doi.org/10.1037/amp0000660
Ren, D., Wesselmann, E.D., & Williams, K.D. (2013). Interdependent self-construal moderates coping with (but not the initial pain of) ostracism [doi:10.1111/ajsp.12037]. Wiley-Blackwell Publishing Ltd.
Sato, K., Yuki, M., & Norasakkunkit, V. (2014). A socio-ecological approach to cross-cultural differences in the sensitivity to social rejection: The partially mediating role of relational mobility. *Journal of Cross-Cultural Psychology, 45*(10), 1549–1560. https://doi.org/10.1177/0022022114544320
Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research, 25*(1), 78–90. https://doi.org/10.1086/209528
Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education, 48*, 1273–1296. https://doi.org/10.1007/s11165-016-9602-2
Talhelm, T., Zhang, X., Oishi, S., Shimin, C., Duan, D., Lan, X., & Kitayama, S. (2014). Large-scale psychological differences within China explained by rice versus wheat agriculture. *Science, 344*(6184), 603–608. https://doi.org/10.1126/science.1246850
Uskul, A. K., & Over, H. (2017). *Culture, social interdependence, and ostracism.* Sage Publications. https://doi.org/10.1177/0963721417699300
Van de Vliert, E. (2013). Climato-economic habitats support patterns of human needs, stresses, and freedoms. *Behavioral and Brain Sciences, 36*(5), 465–480. https://doi.org/10.1017/S0140525X12002828
van de Vijver, F. J. R., & Leung, K. (2011). Equivalence and bias: A review of concepts, models, and data analytic procedures. In In. D. Matsumoto, & F. J. R. van de Vijver (Eds.), *Cross-cultural research methods in psychology* (pp. 17–45). Cambridge University Press.
Van de Vijver, F. J., & Leung, K. (2021). *Methods and data analysis for cross-cultural research.* Cambridge University Press.. Vol. 116.

Wong, D. W., & Li, Y. (2020). Spreading of COVID-19: Density matters. *PLoS One, 15*(12), Article e0242398. https://doi.org/10.1371/journal.pone.0242398
Zhang, X., English, A. S., Li, X., Yang, Y., Stanciu, A., & Shuang, W. (2023). International students' collective resilience in crisis: Sense of community reduced anxiety via social contact and social support during lockdown. *Heliyon, 9*(4). https://doi.org/10.1016/j.heliyon.2023.e15298
Zhou, X., English, A. S., Kulich, S. J., Zheng, L., Alves, T., Aquino, S. D., Batić Očovaj, S., Belen, H., Biddle, A., & Boonroungrut, C. (2024). COVID-19 cases correlate with greater acceptance coping in flexible cultures: A cross-cultural study in 26 countries. *Social and Personality Psychology Compass, 18*(2), Article e12919. https://doi.org/10.1111/spc3.12919