Running head: REVISITING MODERNISATION THEORY

Revisiting Cowgill's Modernisation Theory:

Perceived Social Status of Older Adults Across 58 Countries

Accepted for publication in Ageing & Society on 29.09.2022

Maksim Rudnev (corresponding author)

HSE University

Myasnitskaya str. 20,

101000 MOSCOW Russia

Email: maksim.rudnev@gmail.com

Christin-Melanie Vauclair

Instituto Universitário de Lisboa (ISCTE-IUL), CIS-IUL, Lisboa

Avenida das Forças Armadas, Ala Autónoma, Gabinete 113

1649-026 LISBOA Portugal

Email: Melanie.Vauclair@iscte-iul.pt

Conflict of interests

The authors declare no conflict of interest.

Statement of ethical approval

Ethical approval was not required

Author contributions

C.-M.V. suggested the idea of the paper, contributed to theoretical parts, and revised the paper.

M.R. conducted the statistical analysis, wrote the first draft, and contributed to further revisions.

Abstract

Cowgill's modernisation theory stipulates that older people's social status is lower in societies with higher societal modernisation. The few existing studies reveal conflicting results showing either negative or positive associations. The current study follows up seminal cross-national research on the perceived social status of people in their 70s (PSS70) in a diverse set of countries. PSS70 was defined as the relative status of people in their 70s compared to people in their 40s. Data were obtained by the World Values Survey (2010 to 2014) and included 78,904 respondents from 58 countries. Multilevel regressions showed that the level of modernisation had a strong and negative association with the PSS70 but mostly due to one component, namely the share of older people in society. The associations were more complex when considering cultural zones of which two stood out. Irrespective of level of modernisation, Muslim countries showed higher and Postcommunist countries showed lower levels of PSS70. In Muslim countries, modernisation had a near-zero association with PSS70, whereas it was strongly negatively associated with PSS70 in Postcommunist countries. This study generally supports Cowgill's theory in a large and diverse cross-sectional sample of countries, yet it also illustrates its cultural boundary conditions.

Keywords: perceived social status, modernisation, cross-national comparisons, older adults

Introduction

Modernisation theory has been classified as one of the core theories within the sociology of ageing (Vauclair and Rudnev 2019) which aims to explain why the status of older people decreases over time and differs across societies. In his theory, Cowgill (1974) proposed that traditional societies, which are usually associated with agricultural and craft production, assign an important role to older adults and, therefore, an elevated status in their families and communities. In contrast, when societies are modernised by industrial modes of production, there are predictable socioeconomic changes that diminish the status of the older people while increasing the status of younger age groups.

When Cowgill and Holmes (1972) developed their version of modernisation theory, they relied on evidence collected from 14 diverse societies, which revealed that the status of older people was indeed lower in more modernised societies. Ever though modernisation theory has become an integral part of the sociology of ageing theories (Aboderin 2004; Alley *et al.* 2010), only a modest number of empirical studies has put the theory to the test. The existing studies reveal conflicting results which may be due to different operationalisations of older people's social status.

Empirical research in the form of small-scale cross-cultural studies examining perceptions of ageing seemed to provide support to Cowgill and Holmes' main claims (e.g., Bengtson *et al.* 1975). However, in a more extensive study including 31 countries, Palmore and Manton (1974) found that the association between employment status of older people and the societal level of modernisation followed a curvilinear relationship instead of a linear negative association: Objective aspects of older people's status did indeed decline in the early stages of modernisation; however, they seemed to increase again in more advanced stages of modernisation. A more recent study examining the perceived social status of older people

with data from 25 European countries also showed that there is a positive association between modernisation and the perceived social status of older adults in countries that have progressed beyond the early stages of modernisation (Vauclair *et al.* 2015). One of the explanations offered for this finding is that the funds and efforts allocated to support older people (e.g., in the form of retirement benefits, policies against age discrimination in employment) increase in more advanced stages of modernisation, which allow older people to maintain their status at higher levels.

In sum, these studies suggest that the link between modernisation and older people's status may be affected by country specifics related to its culture and history. These so-called boundary conditions (Busse, Kach and Wagner 2017) need to be considered to arrive at a more accurate and refined version of modernisation theory. Yet the afore-mentioned studies did not examine these boundary conditions on a large scale, they employed a small number of countries, outdated data, or relied on data from the European region (which is highly modernised in general and where differences may often occur due to a cleavage between Postcommunist and all other countries in the sample). Moreover, the literature is inconsistent in the operationalisation of older people's social status with some studies examining older people's objective status (e.g., Palmore and Manton 1974) and other studies confusing social status with related constructs, such as perceptions and attitudes to ageing (De Tavernier, Naegele and Hess 2019), whereas perceived social status itself was only occasionally studied. Hence, the aim of the current study is to follow up on Vauclair et al.'s (2015) seminal study on the perceived social status of older people and explore whether the tenets of modernisation theory apply in a much more diverse cross-sectional sample of countries, with a particular focus on whether the theory holds in different cultural regions.

Background

Social status is a composite characteristic of the hierarchical position of a group in society, or "perceived, and in some degree accepted, social [inequality] among individuals that reflects not their personal qualities but rather the 'social honour'" (Chan and Goldthorpe 2010: 11). It is customary to measure social status through subjective evaluations by the general population (see, e.g., occupational prestige research [Ganzeboom, De Graaf and Treiman 1992]). Developed as a fundamental idea in classical sociology (e.g., Weber 1978), the concept of social status is still useful, in particular to describe the general position of the older adults in a society.

Modernisation involves a number of societal processes that have been in force throughout the 20th century and continue to affect social statuses of various groups across most countries in the world today. Cowgill (1986: 191) identified several processes that happened in the course of modernization which he considered to be the most important factors determining the social status of older adults. These included the level of economic development, urbanisation, education, and development of health technology. Note that this understanding of modernisation deviates from the mainstream (e.g., by Inglehart, 1997) and represents a composite of a specific subset of modernisation-related phenomena. Modernisation is used in this narrow sense hereafter.

In line with Cowgill, the central role in defining the status of social groups is their position in the labour market. A developed economy yields new requirements in the labour market in which mobility and flexibility are favoured, thereby, giving younger people an advantage. Mass education affects mostly younger people rendering older adults less competitive. Moreover, compared to an illiterate society where older adults are the main source of knowledge, this role is lost in more educated societies. The development of health technologies caused the demographic transition towards decrease in mortality which was

strikingly universal across countries and manifested itself in a series of large social changes (Casterline 2003). Most importantly, countries that in addition experienced decline in fertility showed a growing share of older adults which in turn increased competition for jobs. The competition can be partially resolved via social policies such as legal retirement ages, yet this further diminished older adults' status by excluding them from the labour market. Finally, urbanisation loosens family ties and, for example, excludes older adults from the support of their extended families. A review of all these modernisation processes strongly suggests that modernisation adversely affects the status of older adults.

The initial version of the theory stated that the relation between modernisation and the status of older adults is strictly negative, but later accounts suggested that it can be curvilinear: The status is low in pre-agrarian societies, comes to its peak in agrarian societies, then falls at its lowest during industrial ages, and recovers somewhat in the post-industrial context (Cowgill 1986; Palmore and Manton 1974; Williamson, Evans and Powell 1982). Indeed, in a sample of post-industrial European countries, Vauclair and colleagues (2015) demonstrated that the association between modernisation and social status of older adults is positive. Yet, this study did not account for the cultural factors that could also affect the perceived social status of older people.

The literature offers only few insights into cultural aspects of ageism. In their meta-analysis, North and Fiske (2015) concluded that attitudes toward older people were more negative in "the East" compared to countries of "the West". Confirming this result, Peterson and Ralston (Peterson and Ralston 2017) found with data from the World Values Survey (WVS) that respondents in East Asian and Middle Eastern countries viewed older people as being a higher burden to society and receiving an unfair share from their government compared to respondents from "Western" countries. Using survey data from students in the UK and Taiwan, Vauclair and colleagues (2017) provided a more nuanced picture: Normative

perceptions, such as the social status of older people as well as perceived competence and admiration were more positive in Taiwan. However, personal attitudes tapping into prejudice towards older people were also stronger in Taiwan.

This suggests that attitudes toward older people, stereotypes, and their social status might intermingle in different ways across cultures. Consequently, when studying the social status of older adults, culture can play an important role. At the same time, a study in Chinese cities demonstrated that modernization was negatively associated with expressions of filial piety and material support of older parents suggesting that modernisation can overrule cultural differences (Cheung and Kwan 2009).

Although studies of attitudes and stereotypes are interesting in the context of ageing studies, they tell us very little about the social status of older adults across the world (see also De Tavernier, Naegele and Hess 2019). A literature search with the keywords "*social status & (aging|ageing) & (aged|older|old) & countries & meta-perceptions*" in Google Scholar showed 105 results, however when we filtered them by the presence of empirical cross-national comparisons and a relevant measure of social status (meta-perceptions), there were only seven left. With a few exceptions the topic was basically abandoned since the 1970s and 80s. Hence, modernisation theory was put to a test rarely and even less so were its potential cultural boundary conditions.

Current Study

In the current study, we rely on a large cross-sectional dataset that includes responses of participants from all the continents. Cowgill theorized that modernisation has a causal effect on the status of older adults and that contemporary differences in levels of modernization between different societies can actually provide a glimpse into societal changes over time. However, our data is cross-sectional and we are only able to test correlational associations

between country modernisation and the perceived social status of older people. Nevertheless, this study makes an important contribution to the literature by putting Cowgill's theory to the test with a large-scale cross-national dataset.

Due to the scarcity of empirical studies on this topic, we build our hypotheses directly on Cowgill's theory (1974; 1986) and the recent evidence at hand (Vauclair *et al.* 2015). Following Cowgill's theory of modernisation, we expected that:

> H1a. Country-level modernisation is generally negatively related to the social status of older adults.

> H1b. There is a curvilinear association where the link with the social status of older people becomes less negative or even positive among the most modernised countries.

The second general hypothesis derives from previous evidence that culture also plays a role in shaping perceptions of older people. Yet, the dearth of cross-cultural studies on ageism as well as the heterogeneity in the conceptualization and operationalization of ageist perceptions render the literature rather inconclusive. Hence, we abstained from making specific predictions and just proposed a general cultural moderation hypothesis:

> H2. Deviations from the general association between modernisation and the social status of older adults can be attributed to distinct cultural zones.

Data and methods

Data

The analyses are based on the sixth wave of the WVS with data collected between 2010 and 2014 in 60 countries (Inglehart *et al.* 2014). WVS is a multinational survey that measures attitudes and values across the world with more than hundred questions and uses large representative national samples. So far, the sixth wave was the only one that included

questions on the perceived social status of age groups. The analyses excluded Hong Kong

and Taiwan for which country-level data were not available. Sample sizes, average age,

percent female and percent missing by country are listed in Appendix A. After excluding

13.7% of cases due to missing values, the sample included 78,026 individual responses from

58 countries.

Individual-Level Measures

The key outcome variable is perceived social status of people in their 70s (hereafter referred

to as PSS70) measured with the following question: "How [do] you think most people in this

country view the position in society of people …over 70?" The response scale ranged from 1

(*Extremely low position in society*) to 10 (*Extremely high position in society*). As mentioned

above, this method is typically applied for measuring social status (Ganzeboom, De Graaf

and Treiman 1992).

Since the social status indicates the relative position in a society, it is important to ensure that

evaluations of PSS70 are indeed relative. Hence, we included the perceived social status of

people in their 40s (measured in the same way as PSS70 but referring to people in their 40s)

as a covariate in the regression analyses. In a similar vein, the descriptive analysis included

an adjusted PSS70 computed as residuals of the PSS70 regressed on the evaluation of status

of people in their 40s. All the regression models controlled for respondents' age, gender,

education (nine categories), as well as income (within-country decile groups). All the

individual-level variables were standardized at the whole sample.

Country-Level Measures

Following Cowgill's (Cowgill 1986) definition of modernisation, the key independent

variable was the level of modernisation operationalised by its relevant consequences, namely

a country-level index composed of national economic development, urban population, levels of education, and health technology development.

Economic development was indicated by a logarithm of gross domestic product per capita measured as purchasing power parity in current international dollars (GDPpc). Level of urbanisation was the percentage of urban population in country. Average schooling level was indicated by the school life expectancy in tertiary education. It reflects an estimated number of years that country nationals of a specific age are expected to spend in tertiary education. Health technology development was measured by its consequences as the percentage of population aged 65+. There is some controversy in measuring the consequences of health technology development. In contrast to Vauclair et al. (2015) who used life expectancy, the share of older people corresponds more closely to Cowgill's more recent understanding of this pillar: "Modernized societies have older populations, that is, higher proportions of old people… The status of the aged is highest when they constitute a low proportion of the population and tends to decline as their numbers and proportions increase" (Cowgill 1986: 189).

This approach is similar to the United Nation's human development index, which also combines data on economic development, educational involvement, and demographic modernisation (UNDP 2020).

All country indicators are from 2012 or the closest year available, to correspond roughly to the year of data collection for the WVS. They were obtained from the World Bank database (World Bank 2021) and standardized before the analyses. A principal component analysis detected a single strong component explaining 93 per cent of total variance based on which a corresponding summative index was calculated. Both Cronbach's alpha and McDonalds' omega were .83.

To examine cultural differences, we categorised countries into cultural zones as indicated in

Inglehart (1997), but due to a smaller set of available countries, some zones were combined,

resulting in seven groups: Latin America, New World, South-East Asia, Sub-Saharan Africa,

Muslim and Postcommunist countries (excluding Slovenia),[1] as well as Non-Postcommunist

Europe. Some countries were part of more than one cultural zone (see Appendix A).

Analytical Strategy

First, we describe the bivariate relations between country PSS70 and country-level

modernisation. Next, we applied regressions in order to examine associations between

country-level modernisation and its components with PSS70. Given the nested structure of

the data, multilevel regressions were run (Hox, Moerbeek and van de Schoot 2017). Such

models correct standard errors for non-independence among respondents within each country.

More specifically, we applied a random intercept model. Since the main interest was at the

country level, we did not include random slopes. We tested the overall effect of the

modernisation index as well as each of its components as predictors of PSS70 separately in

order to gauge whether different components vary in their associations with PSS70. Finally, a

set of additional analyses tested the robustness of the results. The data used in this analysis is

available from the WVS website. The R code is available at the Open science directory

https://osf.io/g2kh5/?view_only=386a193e34c04bcc98bdd206fe67c7d6.

Results

Bivariate Relations

1

Figure 1 illustrates the relations between the PSS70 and country's level of modernisation.

The PSS70 is here indicated by country means of residuals as obtained from a regression

model which predicted social status of people in their 70s with the social status of people in

their 40s. The scatterplot already points to cultural specificities: first, it shows that the highest

PSS70 is in the cultural zone comprised of predominantly Muslim countries, including

countries as diverse as Kuwait, Malaysia, and Uzbekistan. In contrast, the lowest PSS70 is

found in Postcommunist countries, with Estonia, Russia, and Ukraine occupying the bottom

of the graph. Second, the figure also demonstrates that the overall association between the

modernisation index and PSS70 is clearly negative, $r(56) = -.57$, $p < .001$. Yet, there are also

clear differences in the association across cultural zones. Among Muslim countries the PSS70

does not seem to be associated with their modernisation level, $r(18) = -.03$, $p = .910$,

whereas the association found in Postcommunist countries is even more strongly negative

than the average, $r(10) = -.91$, $p < .001$.

< Insert Figure 1 about here >

Multilevel regressions

As indicated by the intraclass correlation coefficient, 14 per cent of the total variance of

PSS70 is due to differences between countries. This value is relatively high pointing to the

importance of considering country differences when examining the perceived social status of

older people.

First, we tested the role of modernisation in explaining country differences in PSS70. The

analytical strategy consisted of examining the modernisation index as a predictor, then each

of its components, its squared terms, and finally all components together to inspect their

predictive power and determine if earlier results were confounded by each other's effects.

Table 1 shows that the modernisation index had a strong and highly significant negative

effect on PSS70 (M1). Moreover, the components of this index (except for urbanisation) showed substantial negative associations with PSS70 when entered into the model separately (M2-M5). The squared term of the modernisation index was small and non-significant; however, the squared terms of GDPpc, percentage of population aged 65+, and level of urbanisation, when entered separately, had significant and positive coefficients which suggests the presence of a curvilinear association in which the negative link with modernisation becomes weaker among the most modernised countries.

When all four components of the modernisation index were entered together in the same model (M6), most of them became non-significant except for the share of people 65+. Moreover, its squared term remained significant as well (M7). Bayesian and Akaike information criteria are the smallest for model M3 confirming that the share of people 65+ is mostly responsible for the significant effects of modernisation.[2]

The predictive power differed widely across predictors. GDPpc and urbanisation made the smallest contributions (R^2 = .24 and .25, respectively) whereas years of schooling explained 44 per cent of between-country variance, and the share of people aged 65+ explained 60 per cent of variance. The latter two surpassed the predictive power of an overall modernisation index (R^2 = .40).

To sum up, the results supported H1a, but mostly due to a single component of the modernisation index, the share of population 65+. Its association with PSS70 was strong and negative and only weakly curvilinear, becoming slightly less negative across countries with the highest shares of older adults in the population.

< Insert Table 1 about here >

Next, we tested H2 by regressing PSS70 on the seven cultural zones and the modernisation index. The results are presented in Table 2. Model M9 included only the cultural zones as predictors and showed that the lowest PSS70 was in the Postcommunist countries, the highest

in the Muslim zone and Sub-Saharan Africa, and the remaining cultural zones did not differ from each other. Model M10 added the modernisation index which showed again a significant negative association with PSS70. The differences between cultural zones, except for the Muslim and Postcommunist ones, became non-significant. It implies that modernisation did not account for all the differences between countries; the cultural differences of the Muslim and Postcommunist countries have an independent link with PSS70. In models M11 and M12, we only used these two cultural zones and merged all the others into a single reference group.

Figure 1 suggested different associations of PSS70 with modernisation across cultural zones. We formally tested this by introducing an interaction term between the two cultural zones and the modernisation index as well as its components. The respective model M11 shows that the interaction effect between the modernisation index and Postcommunist cultural zone was significant and negative implying that modernisation had a stronger negative association with PSS70 within this group than in most other countries in the sample. The interaction between the Muslim cultural zone and modernisation was positive meaning that the association of PSS70 with modernisation was weaker in this cultural cluster. Figure 2 illustrates these differences: the modernisation index had a weak negative link in Muslim countries ($\eta^2 = .14$), whereas there was a strong negative link in Postcommunist countries ($\eta^2 = .51$), and a moderate negative association was present in the remaining countries ($\eta^2 = .30$). Additionally, we tested interaction effects of cultural zones with each of the components of the modernisation index separately controlling for the share of the population aged 65+ (see Appendix C). None of the interaction effects were highly significant.

< Insert Figure 2 about here >

Finally, model M12 tested if the coefficient of the share of population aged 65+ reported above remained significant after controlling for the two cultural zones. Although the squared

1

term of the share of population 65+ vanished, its main effect remained significant.

Interestingly, the coefficients of the two cultural zones also decreased substantially,

indicating that at least some of the differences between them were due to differences in the

share of older adults. The other indicators of modernisation were tested in the same manner

(see Appendix D), and the linear associations of all the predictors were negative and

significant, but their squared terms were relatively low and became non-significant. At the

same time, the coefficient of the two cultural zones remained significant suggesting that the

general trend of the association is linear and adjusted by specificities of the Muslim and

Postcommunist countries. This confirms both H1a and H2.

< Insert Table 2 about here >

Robustness tests

To ensure that the associations we found were not the result of some confounding factors, we

ran several robustness tests which are detailed in Appendix E. Alternative indicators of

economic development (namely gross national income measured as purchasing power parity

and with the Atlas method) were significant predictors when entered separately but had a

zero effect when entered together with the share of population aged 65+. Likewise,

alternative indicators of country's level of education (population enrolment in secondary and

tertiary education, government spending on secondary and tertiary education as percentage of

GDP) were non-significant after controlling for the share of population aged 65+.

The coefficients of the country share of employed older adults which was found to interact

with modernization measures across countries in the European region (Vauclair *et al.* 2015)

did not show significant associations with the status of older people - neither before nor after

controlling for the components of the modernisation index and the two cultural zones.

Government spending on older adults as percentage of GDP had a negative and significant

coefficient when entered by itself, with the GDPpc, or with the two cultural zones but lost its

significance when entered together with the modernisation index, the population aged 65+, or

the level of education. Country life expectancy (as an alternative to population aged 65+) was

not significant when controlling for the modernisation index or its components.

Earlier we mentioned that Slovenia was excluded from the Postcommunist zone as an

influential outlier. Including this country to the Postcommunist zone only slightly changed

the main effects of the Postcommunist zone, however, its interactions with modernisation

index became substantially smaller.

Finally, we excluded other potential outliers, namely Germany and Japan identified in the

descriptive analysis (Figure in Appendix B). This increased the correlation between PSS70

with the modernisation index from $-.57$ to $-.59$; with the share of people 65+ from $-.70$ to $-$

.76. The multilevel regression results without these two countries showed virtually the same

results. To summarise, we found that the robustness tests fully confirmed the results

described above.

Discussion and conclusion

Cowgill's modernisation theory (1974; 1986) provided powerful explanations for the decline

in the social status of the older adults around the world. Still, only few empirical studies

directly addressed the main claims of the theory. The current study provided a correlational

large-scale test of the theory by examining the relative social status of people over the age of

70 across 58 countries from different regions of the world.

In line with Cowgill's theory and our hypothesis H1a, PSS70 was strongly and negatively

related to the level of modernisation. Different controls did not change this result. The

curvilinear association was not supported for the overall modernisation index, and only

marginally supported for some of its components, and completely vanished when two specific cultural zones (Muslim and Post-communist) were considered. Thus, an overall curvilinear relation between modernisation and PSS70 as claimed by our hypothesis H1b and Palmore and Manton (1974) was not supported. One reason for the differences in results might be the differences in operationalizing older people's status. In particular, Palmore and Manton measured observed status, including participation in workforce and attained level of education, whereas our study focused on the subjectively perceived social status of older adults by individuals from the same country. Even though these two ways to measure social status are complimentary, the subjective approach better reflects overall prestige and social status and is not necessarily limited to education and occupation.

Another reason for the discrepancy in results might be due to the fact that the current study accounted for cultural differences, which was not considered in previous studies. Moreover, there was a relatively high proportion of less developed countries in our sample and only a few highly developed countries, especially from Europe, which might have rendered it more difficult to detect the curvilinear associations as has been proposed previously. This might also explain why the current study results are different to Vauclair and colleagues' (2015) findings which detected a positive association between modernisation and PSS70 in European countries. When considering a subset of the WVS European countries, the association was indeed positive but non-significant, $r(10) = .17$, $p = .611$. Thus, the lack of a curvilinear relation might have occurred simply because there were too few highly developed European countries in the WVS dataset. This emphasises that the negative association between modernisation and PSS70 currently dominates in the world, and it might be overturned only in a few highly modernised countries. Therefore, although Cowgill's theory is a weak explanation of the status of the older adults within Europe, it is well supported globally.

The share of older people

Our analysis demonstrated that the significance of the modernisation index was mostly due to the share of older adults in population. The share of older adults had the strongest association with PSS70 even compared with the modernisation index itself. On the contrary, urbanisation, economic development, and education were not significant when controlling for the share of older adults.

The questions remain why the importance of the share of older people is the main predictor of the perceived status of older people in society. One explanation might be derived from threat-based theories of prejudice (e.g., Stephan and Stephan 2000): countries with higher numbers of older adults also have higher levels of competition between generations. This can create perceptions of threat for in-group resources or processes, for instance in the form of economic burdens to provide for the increasing share of older people, which then translates into a hostile form of ageism (North and Fiske 2015) and, therefore, a devaluation of older people in the form of lower perceived social status. Yet we cannot be sure about the proposed relations between stereotypes, attitudes, and social status of older adults at the country level which is yet to be examined.

Interestingly, the share of older people as a predictor remained significant even after controlling for overall life expectancy, whereas life expectancy itself was not significant. It means that the status of older people is specifically associated with population ageing and is not a matter of people on average living longer life.

These results might also be interpreted in terms of the theory of diminishing marginal utility. It is conceivable that any society demands a contribution from older adults. The scarcity of older adults renders them more valuable to the labour market as well as increases their symbolic capital. Hence, they are awarded higher social status. It is also evident that the

"supply" of older people differs across countries and time but seems to grow faster than the "demand". Given our results, it is conceivable that the status of older people is determined mostly by the higher "supply" rather than by a low demand. In other words, a higher number of older adults is inconsistent with the relatively stable societal need for them. This highlights a disproportion between the global and rapid processes of ageing and societal structures that effectively accommodate the population of older adults, failing their integration into the workforce and missing opportunities for their potential contribution. As a result, it affects older people's social status and consequently, most likely, their well-being (cf. Demakakos *et al.* 2018).

Although Cowgill hinted to "an element of supply and demand" of older people in his theory, he nevertheless considered other aspects of modernisation to be more important (1986: 194). In contrast, our results suggest that the share of older adults has the strongest association with their social status. In some way, this calls Cowgill's version of modernisation theory into question. It might be that the supply/demand model is self-sufficient even without considering other pillars of modernisation. One might even speculate that the social status of older adults, determined by the supply/demand disproportion, causes the perceptions of threat, burden, or spread of stereotypes, whereas these perceptions and stereotypes function to reproduce and reinforce an already existing social order (rather than determine status change). Future research could aim to examine these causal pathways.

Cultural differences

Our results also demonstrate the explanatory role of culture in country differences in PSS70. It has been argued before that ageist perceptions are inextricably linked with cultural values (North and Fiske 2015; Vauclair *et al.* 2017) and our results provide evidence that this is also true for PSS70. Even though most differences across cultural zones were due to differences in

modernisation, the predominantly Muslim and Postcommunist countries demonstrated a substantial deviation from the global trend. In particular, in Muslim countries the status was higher than in most countries, and higher than the modernisation level would predict it to be. Moreover, the association between modernisation and the status of the older adults was much weaker across Muslim countries. One reason for that might be a higher overall religiosity among Muslims and a literal interpretation of the Quran that puts a moral obligation on children to provide material support and respect for their parents and older relatives (Elsaman and Arafa 2012), which means that the older adults are reserved a special place in the family and are afforded higher spiritual status with advancing age (Johnson 2005). This cultural imperative is also known as filial piety but has been mostly associated with East Asian cultures. In contrast, our results indicated that PSS70 in East Asian countries was well aligned with their corresponding level of modernisation, and this concurs with existing evidence from China (Cheung and Kwan 2009). In fact, all major religions recognise filial obligation as an important moral virtue, but more traditional cultures in which religious doctrines play a greater role may be more likely to continue cherishing filial piety despite the effects of societal modernisation. Some indirect evidence supports this reasoning in regard to Islam in particular (e.g., Abdulrahim, Ajrouch and Antonucci 2015; Latif, Ali and Zafar 2019). Given the scarcity of literature on the status of older adults across Muslim and non-Muslim countries, we consider it an important new finding that requires further investigation. On the other hand, Postcommunist countries have shown a consistent deviation from the modernisation trend in the direction of lower PSS70. It can be explained by the rapid societal changes that have deteriorated the social and human capital of older generations. Cohn (1982) had already pointed out that the *speed* of social change might be even more important for the status of older people than the level of development. The fall of the communist regimes harshly affected human and financial capital of the then-middle-aged and older

people, who by the time of the survey in 2014 became those in their 70s or older. The change in economic and political systems made many of their professional and social abilities obsolete, a situation which brought them to the lower steps of the social status hierarchy.

Limitations

One of the limitations of this study is the measurement of social status with a single item and the possibility of different meanings across countries. It is possible that respondents from different cultures might have interpreted "social status" differently, for example, some thinking of their symbolic capital whereas others might have thought of their access to material wealth. Another limitation is related to convenience sampling of countries, which allows conclusions to be made for only the 58 countries in the sample. Moreover, we closely followed Cowgill's understanding of modernisation which is unusual, as it only involved the aspects that might affect older population. This limits the generalization of our results across other modernisation studies. In particular, percent of population aged 65 and higher is definitely a characteristic of modernised societies, but it might not be part of the driving force of modernization. Therefore, it has a questionable association with a more common understanding of modernisation (e.g., by Inglehart, 1997). Yet, inclusion of this aspect allowed us to find an important association with status of older people. Finally, although the hypothesised causal relations are theory-driven, our study does not provide evidence for temporal or causal changes from modernisation toward the status of older adults. There is a possibility that both modernisation and the decrease of status of older people occurred due to some common cause.

Despite these limitations, the study provided rare empirical evidence of the validity of Cowgill's modernisation theory as well as its cultural boundary conditions. We demonstrated the strong link of the share of older people with their social status, and emphasised cultural

2

specificities related to Muslim and Postcommunist cultural zones. Future studies should further investigate the specific features of the Muslim and Postcommunist countries that are associated with higher or lower social status of older adults. The suggested theoretical explanation involving supply and demand of older adults and their implications for status perceptions should also be developed and validated in the future research.

Notes

[1] Descriptive analysis revealed Slovenia to be an outlier. Slovenia can be considered the most de-communised country among Postcommunist states (Inglehart 2021: 76).

 [2] Appendix B reports an additional analysis demonstrating that the effect of the share of population 65+ is robust to one-by-one inclusion of other predictors.

References

Abdulrahim, S., Ajrouch, K. J. and Antonucci, T. C. (2015). Aging in Lebanon: Challenges and opportunities. *The Gerontologist*, **55**, 511–18.

Aboderin, I. (2004). Modernisation and ageing theory revisited: current explanations of recent developing world and historical Western shifts in material family support for older people. *Ageing and Society*, **24**, 29–50.

Alley, D. E., Putney, N. M., Rice, M. and Bengtson, V. L. (2010). The Increasing Use of Theory in Social Gerontology: 1990–2004. *The Journals of Gerontology: Series B*, **65B**, 583–90.

Bengtson, V. L., Dowd, J. J., Smith, D. H. and Inkeles, A. (1975). Modernization, modernity, and perceptions of aging: A cross-cultural study. *Journal of Gerontology*, **30**, 688–95.

Busse, C., Kach, A. P. and Wagner, S. M. (2017). Boundary conditions: What they are, how to explore them, why we need them, and when to consider them. *Organizational Research Methods*, **20**, 574–609.

Casterline, J. (2003). Demographic Transition. In P. Demeny and G. McNicoll (eds), *Encyclopedia of Population*. Thomson & Gale, New York, 210–16.

Chan, T. W. and Goldthorpe, J. H. (2010). Social status and cultural consumption. In T. W. Chan (ed), *Social Status and Cultural Consumption*. Cambridge University Press, 1–27.

Cheung, C.-K. and Kwan, A. Y.-H. (2009). The erosion of filial piety by modernisation in Chinese cities. *Ageing and Society*, **29**, 179–98.

Cohn, R. M. (1982). Economic development and status change of the aged. *American Journal of Sociology*, **87**, 1150–61.

Cowgill, D. and Holmes, L. (eds) (1972). *Aging and modernization*. Appleton-Century-Crofts, New York.

Cowgill, D. O. (1974). Aging and modernization: a revision of the theory. In J. F. Gubrium (ed), Thomas, Springfield, 123–46.

Cowgill, D. O. (1986). *Aging around the world*. Wadsworth Publishing, Belmont.

De Tavernier, W., Naegele, L. and Hess, M. (2019). A critical perspective on ageism and modernization theory. *Social Inclusion*, **7**, 54–57.

Demakakos, P., Biddulph, J. P., Oliveira, C., Tsakos, G. and Marmot, M. G. (2018). Subjective social status and mortality: the English longitudinal study of ageing. *European journal of epidemiology*, **33**, 729–39.

Elsaman, R. S. and Arafa, M. A. (2012). The rights of the elderly in the Arab Middle East: Islamic theory versus Arabic practice. *Marq. Elder's Adviser*, **14**.

Ganzeboom, H. B., De Graaf, P. M. and Treiman, D. J. (1992). A standard international socio-economic index of occupational status. *Social science research*, **21**, 1–56.

Hox, J. J., Moerbeek, M. and van de Schoot, R. (2017). *Multilevel analysis: Techniques and applications*. Routledge.

Inglehart, R. F. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies*. Princeton University Press.

Inglehart, R. F. (2021). *Religion's sudden decline: what's causing it, and what comes next?* Oxford University Press, USA.

Inglehart, R. F., Haerpfer, C., Moreno, A., Welzel, C., Kizilova, K., Diez-Medrano, J., Lagos, M., Norris, P., Ponarin, E. and Puranen et al (eds) (2014). *World Values Survey: Round Six - Country-Pooled Datafile*. JD Systems Institute, Madrid.

Johnson, M. (2005). The social construction of old age as a problem. In V. L. Bengtson, T. Kirkwood, and M. Johnson (eds), *The Cambridge handbook of age and ageing*. Cambridge Handbooks in Psychology. Cambridge University Press, Cambridge, 563–71.

Latif, A., Ali, S. and Zafar, Z. (2019). Modernization and status of the aged people in South
Asia: a mixed methods investigation from Pakistan. *Journal of Indian Studies*, **5**, 77–
90.

North, M. S. and Fiske, S. T. (2015). Modern attitudes toward older adults in the aging world:
A cross-cultural meta-analysis. *Psychological bulletin*, **141**, 993.

Palmore, E. B. and Manton, K. (1974). Modernization and status of the aged: International
correlations. *Journal of Gerontology*, **29**, 205–10.

Peterson, L. and Ralston, M. (2017). Valued elders or societal burden: Cross-national
attitudes toward older adults. *International Sociology*, **32**, 731–54.

Stephan, W. G. and Stephan, C. W. (2000). An integrated threat theory of prejudice.
Reducing prejudice and discrimination, 23–45.

UNDP (2020). Human Development Report. Available online at
https://hdr.undp.org/en/2020-report [Accessed 21 February 2022].

Vauclair, C. M., Hanke, K., Huang, L. L. and Abrams, D. (2017). Are Asian cultures really
less ageist than Western ones? It depends on the questions asked. *International
Journal of Psychology*, **52**, 136–44.

Vauclair, C. M., Marques, S., Lima, M. L., Bratt, C., Swift, H. J. and Abrams, D. (2015).
Subjective social status of older people across countries: The role of modernization
and employment. *Journals of Gerontology Series B: Psychological Sciences and
Social Sciences*, **70**, 650–60.

2

Vauclair, C.-M. and Rudnev, M. (2019). Modernization Theory. In D. Gu and M. E. Dupre (eds), *Encyclopedia of Gerontology and Population Aging*. Springer International Publishing, Cham, 1–6.

Weber, M. (1978). *Economy and society: An outline of interpretive sociology*. G. Roth and C. Wittich (eds). University of California Press, Berkeley.

Williamson, J. B., Evans, L. and Powell, L. A. (1982). *The politics of aging: Power and policy*. Charles C. Thomas Publisher.

World Bank (2021). World Development Indicators. Available online at https://datatopics.worldbank.org/world-development-indicators/ [Accessed 15 July 2021].

2

Table 1. Standardised fixed effects of multilevel regression of perceived social status of people in their 70s on facets of modernisation

	M1	M2	M3	M4	M5	M6	M7	M8
Modernisation index	-.21*** [-.29, -.12]							
Modernisation index^2	-.01 [-.09, .06]							
Log GDPpc		-.09* [-.17, .003]				.07 [-.04, .18]	.09 [-.01, .20]	.08 [-.03, .18]
Log GDPpc^2		.07* [.01, .13]					-.06 [-.15, .02]	
Population aged 65 and higher			-.30*** [-.37, -.22]			-.20*** [-.29, -.11]	-.30*** [-.42, -.17]	-.28*** [-.39, -.15]
Population aged 65 and higher^2			.08** [.02, .15]				.09* [.004, .17]	.07* [.0005, .14]
Tertiary schooling				-.21*** [-.28, -.13]		-.09 [-.19, .001]	-.04 [-.14, .07]	-.04 [-.15, .06]
Tertiary schooling^2				.01 [-.05, .08]				
Urbanisation					-.07 [-.16, .02]	-.04 [-.15, .09]	-.07 [-.18, .05]	-.06 [-.16, .05]
Urbanisation^2					.09* [.01, .16]		.07 [-.04, .16]	
Absolute deviance	197,615	197,629	197,594	197,612	197,628	197,603	197,610	197,603
N parameters	10	10	10	10	10	12	15	13
AIC	197,574	197,587	197,551	197,570	197,587	197,556	197,555	197,553
BIC	197,728	197,741	197,706	197,724	197,740	197,737	197,779	197,750
R^2 (country-level)	.40	.24	.60	.44	.25	.57	.60	.60

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. M stands for model.
* $p < .05$; ** $p < .01$; *** $p < .001$.

2

Table 2. Standardised fixed effects of multilevel regression of perceived social status of people in their 70s on facets of modernisation

	M9	M10	M11	M12
Non-Postcommunist Europe (reference group)				
Latin America	.12	.02		
	[-.09, .32]	[-.17, .21]		
New World	.25	.24		
	[-.03, .51]	[-.01, .48]		
South-East Asia	.22*	.12		
	[.005, .42]	[-.06, .32]		
Sub-Saharan Africa	.51***	.13		
	[.25, .75]	[-.20, .43]		
Muslim	.54***	.37***	.30***	.19*
	[.38, .71]	[.19, .55]	[.18, .41]	[.05, .34]
Postcommunist	-.23***	-.30***	-.32***	-.24**
	[-.40, -.06]	[-.46, -.14]	[-.45, -.19]	[-.40, -.10]
Modernisation index		-.14***	-.16***	
		[-.22, -.07]	[-.22, -.09]	
× Muslim			.16*	
			[.004, .32]	
× Postcommunist			-.24**	
			[-.41, -.05]	
Population aged 65 and higher				-.20***
				[-.28, -.10]
Population aged 65 and higher^2				.05
				[-.02, .10]
Absolute deviance	197,521	197,509	197,504	197,518
N parameters	14	15	13	12
AIC	197,549	197,538	197,530	197,542
BIC	197,749	197,753	197,723	197,723
R^2 (country-level)	.64	.70	.73	.67

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* p<.05; ** p<.01; *** p<.001.
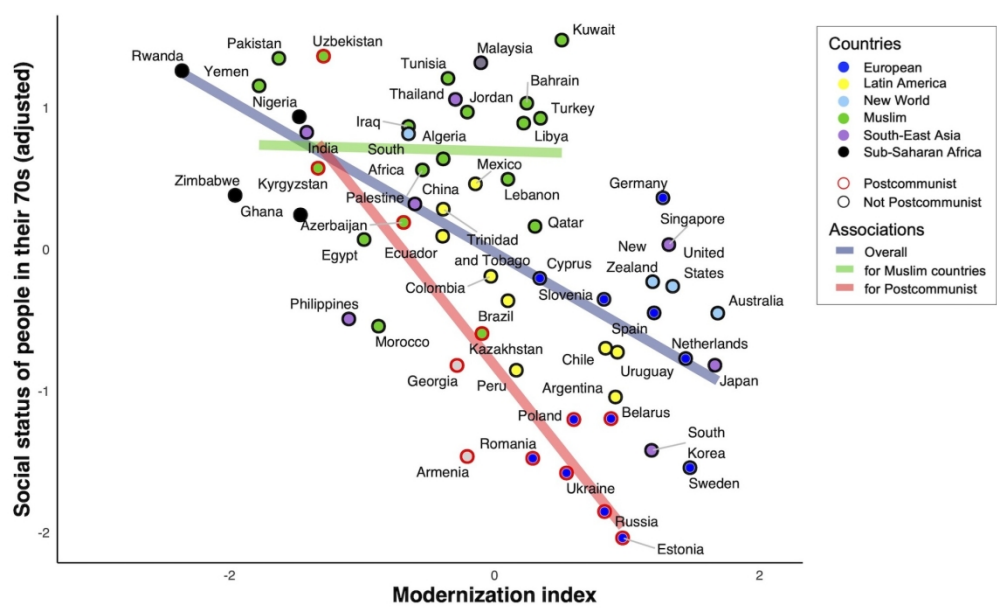
Figure 1. Association of modernisation index and the relative perceived social status of people in their 70s (PSS70) compared to the status of people in their 40s.

170x101mm (300 x 300 DPI)
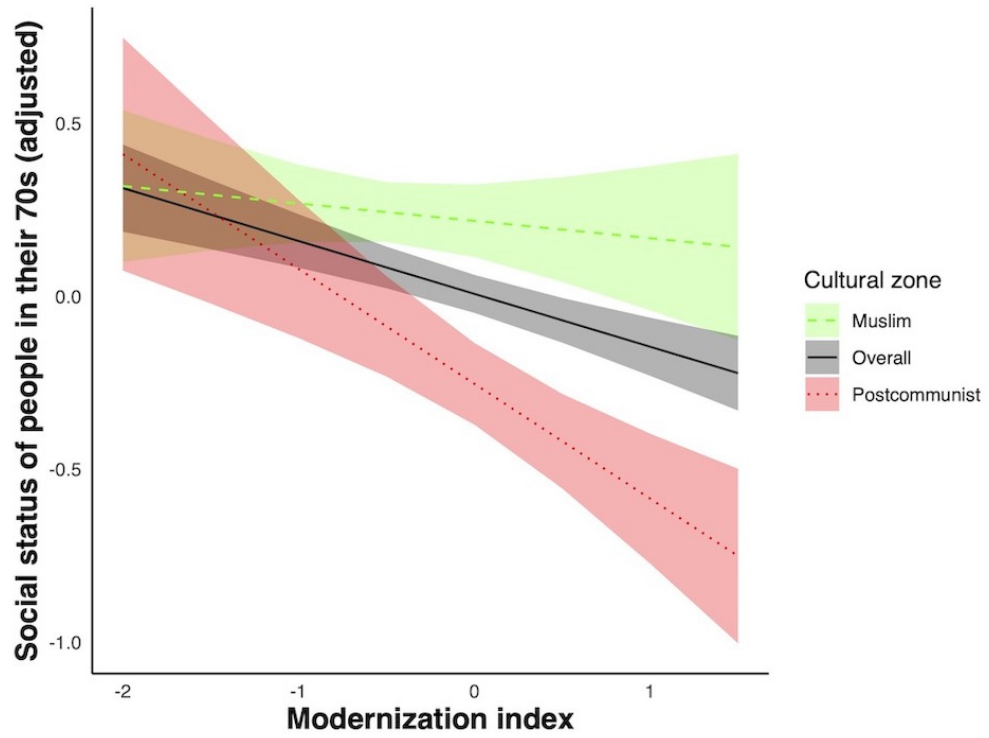
Figure 2. Interaction between the two cultural zones and the modernisation index in their effects on social status of people in their 70s (predicted by model M11)

80x59mm (300 x 300 DPI)

APPENDICES

Revisiting Cowgill's Modernization Theory: Perceived Social Status of Older People Across 58 Countries

Contents

Appendix A. Sample characteristics by country and cultural zones

	Sample size (missing values removed)	Percent female	Percent missing	Mean age	Cultural Zone
Algeria	1103	.49	.08	37.5	Muslim
Argentina	948	.53	.08	43.2	Latin America
Armenia	1040	.66	.05	46.3	Post-communist
Australia	1012	.55	.31	50.8	New World
Azerbaijan	998	.50	.00	41.2	Muslim, Post-communist
Bahrain	959	.45	.20	39.1	Muslim
Belarus	1392	.55	.09	44.1	Post-communist
Brazil	1374	.61	.08	42.3	Latin America
Chile	916	.51	.08	44.2	Latin America
China	1752	.50	.24	43.4	South-East Asia
Colombia	1458	.50	.04	40.4	Latin America
Cyprus	918	.53	.08	42.6	Other Europe
Ecuador	1193	.51	.01	39.7	Latin America
Egypt	1492	.67	.02	40.5	Muslim
Estonia	1480	.55	.03	48.3	Post-communist
Georgia	1155	.54	.04	44.6	Post-communist
Germany	1921	.50	.06	49.5	Other Europe
Ghana	1537	.50	.01	31.0	Sub-Saharan Africa
India	1362	.38	.76	39.8	South-East Asia
Iraq	1167	.47	.03	36.5	Muslim
Japan	1682	.48	.31	51.1	South-East Asia
Jordan	1188	.50	.01	39.9	Muslim
Kazakhstan	1382	.61	.08	40.0	Muslim, Post-communist

2

	Sample size (missing values removed)	Percent female	Percent missing	Mean age	Cultural Zone
Kuwait	1072	.34	.18	36.5	Muslim
Kyrgyzstan	1338	.51	.11	38.9	Muslim, Post-communist
Lebanon	1137	.51	.05	38.1	Muslim
Libya	1768	.48	.17	38.2	Muslim
Malaysia	1272	.49	.02	40.0	Muslim, South-East Asia
Mexico	1911	.50	.04	37.2	Latin America
Morocco	979	.49	.18	36.9	Muslim
Netherlands	1453	.51	.24	54.7	Other Europe
New Zealand	677	.58	.20	50.1	New World
Nigeria	1719	.49	.02	31.1	Sub-Saharan Africa
Pakistan	1185	.48	.01	34.4	Muslim
Palestine	952	.50	.05	36.4	Muslim
Peru	1156	.49	.04	39.2	Latin America
Philippines	1175	.50	.02	42.6	South-East Asia
Poland	865	.54	.10	47.7	Post-communist
Qatar	1031	.54	.03	37.8	Muslim
Romania	1357	.56	.10	48.2	Post-communist
Russia	2250	.55	.10	45.8	Post-communist
Rwanda	1382	.50	.09	33.8	Sub-Saharan Africa
Singapore	1738	.55	.12	41.9	South-East Asia
Slovenia	944	.58	.12	48.9	Other Europe
South Africa	3224	.50	.09	36.5	New World
South Korea	1068	.50	.11	43.2	South-East Asia
Spain	1022	.50	.14	46.5	Other Europe

	Sample size (missing values removed)	Percent female	Percent missing	Mean age	Cultural Zone
Sweden	1110	.52	.08	48.1	Other Europe
Thailand	1036	.47	.14	45.3	South-East Asia
Trinidad and Tobago	917	.53	.08	45.4	Latin America
Tunisia	1091	.46	.09	37.9	Muslim
Turkey	1550	.51	.03	38.4	Muslim
Ukraine	1402	.60	.07	46.9	Post-communist
United States	2133	.52	.04	49.1	New World
Uruguay	930	.53	.07	45.0	Latin America
Uzbekistan	1402	.60	.07	39.4	Muslim, Post-communist
Yemen	881	.50	.12	35.7	Muslim
Zimbabwe	1470	.54	.02	33.9	Sub-Saharan Africa
Total sample (58 countries)	76,026	.52	.14	41.7	

Appendix B. Robustness tests of the impact of share of people 65+

Table B. Robustness tests of the impact of share of people 65+ controlling for the other components of modernization index and two cultural zones

	B1	B2	B3	B4
Population aged 65 and more	-.30***	-.31***	-.26***	-.29***
	[-.37, -.22]	[-.38, -.22]	[-.36, -.13]	[-.37, -.21]
Population aged 65 and more^2	.08**	.08**	.07	.08**
	[.02, .15]	[.02, .15]	[-.001, .14]	[.02, .15]
Log GDPpc		.02		
		[-.06, .09]		
Tertiary schooling			-.05	
			[-.14, .04]	
Urbanization				-.02
				[-.09, .04]
Abs.deviance	197,531	197,531	197,530	197,531
N parameters	10	11	11	11
AIC	197,551	197,553	197,552	197,552
BIC	197,706	197,722	197,720	197,722
R^2 (country-level)	.60	.59	.60	.59

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* $p < .05$; ** $p < .01$;*** $p < .001$.
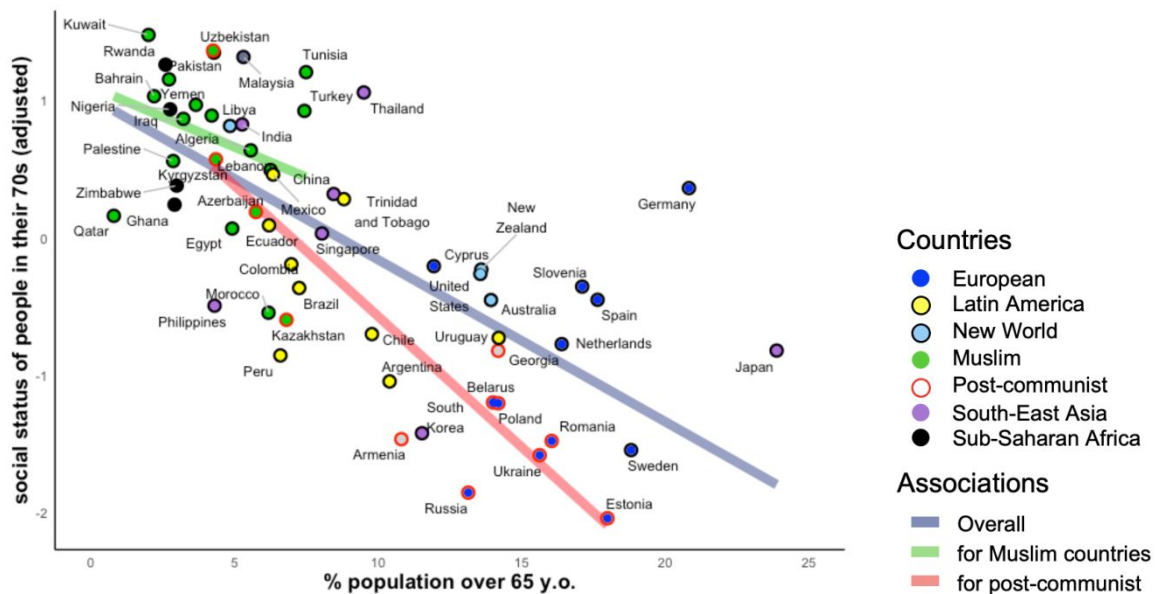
Figure B. Country means of perceived social status of people in their 70s and a share of population over 65.

Appendix C. Interactions between cultural zones and modernization pillars

Multilevel regressions accounting for Muslim and Postcommunist cultural zones and their interactions with components of the modernization index.

	C1	C2	C3	C4
Log GDPpc	-.04			
	[-.14, .06]			
× Muslim	.03			
	[-.10, .16]			
× Post-communist	-.17			
	[-.37, .03]			
Population 65+	-.12*	-.14***	-.07	-.08*
	[-.22, -.02]	[-.21, -.06]	[-.16, .02]	[-.16, -.01]
× Muslim		-.03		
		[-.34, .29]		
× Post-communist		-.17*		
		[-.35, -.01]		
Tertiary schooling			-.11**	
			[-.19, -.03]	
× Muslim			.13	
			[.002, .28]	
× Post-communist			-.14	
			[-.29, -.001]	
Urbanization				-.12**
				[-.20, -.04]
× Muslim				.11
				[-.01, .23]
× Post-communist				-.24
				[-.50, -.01]
Muslim	.24**	.16	.26***	.26***
	[.08, .40]	[-.11, .44]	[.12, .41]	[.12, .40]
Postcommunist	-.33***	-.20*	-.25***	-.41***
	[-.48, -.17]	[-.37, -.04]	[-.40, -.12]	[-.58, -.25]
Abs.deviance	197,515	197,516	197,506	197,507
N parameters	14	13	14	14
AIC	197,543	197,542	197,534	197,535
BIC	197,749	197,732	197,741	197,741
R2 (country-level)	.67	.67	.72	.71

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* p < .05; ** p < .01;*** p < .001.

6

Appendix D. Robustness of the squared terms

Standardized fixed effects of the multilevel regressions that simultaneously included modernization indicators and the two cultural zones.

	D1	D3	D2	D4	D5
Modernization index	-.15***				
	[-.21, -.08]				
Modernization index^2	.01				
	[-.05, .06]				
Log GDPpc		-.09**			
		[-.15, -.03]			
Log GDPpc^2		.04			
		[-.01, .08]			
Population aged 65 and more			-.20***		
			[-.28, -.10]		
Population aged 65 and more^2			.05		
			[-.02, .10]		
Tertiary schooling				-.14***	
				[-.20, -.09]	
Tertiary schooling^2				.01	
				[-.03, .07]	
Urbanization					-.11***
					[-.18, -.05]
Urbanization^2					.04
					[-.02, .09]
Muslim	.31***	.38***	.19*	.30***	.39***
	[.17, .43]	[.26, .49]	[.05, .34]	[.18, .43]	[.28, .50]
Postcommunist	-.35***	-.36***	-.24**	-.32***	-.39***
	[-.49, -.22]	[-.51, -.21]	[-.40, -.10]	[-.46, -.19]	[-.53, -.23]
Abs.deviance	197,514	197,524	197,518	197,516	197,518
N parameters	12	12	12	12	12
AIC	197,538	197,548	197,542	197,540	197,542
BIC	197,719	197,729	197,723	197,722	197,724
R^2 (country-level)	.69	.63	.67	.68	.66

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* p < .05; ** p < .01;*** p < .001.

Appendix E. Alternative indicators and outliers

Table E1. Alternative indicator of economic development

	E1	E2	E3	E4
Population aged 65 and more		-.26***		-.25***
		[-.34, -.17]		[-.32, -.17]
GNI per capita, Atlas method (log)	-.12**	.02		
	[-.21, -.02]	[-.06, .10]		
GNI per capita, purchasing power parity (log)			-.10*	.02
			[-.18, -.01]	[-.06, .09]
Abs.deviance	197,569	197,538	197,572	197,538
N parameters	9	10	9	10
AIC	197,587	197,558	197,590	197,558
BIC	197,727	197,712	197,729	197,712
R^2 (country-level)	.23	.55	.20	.55

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table E2. Alternative indicators of country education

	E6	E6a	E7	E7a	E8	E8a	E9	E9a
Population aged 65 and more		-.25*** [-.33, -.15]		-.24*** [-.30, -.17]		-.28*** [-.37, -.19]		-.21*** [-.31, -.11]
Government expenditure per student, secondary (% of GDP per capita)	-.002 [-.09, .09]	.03 [-.04, .10]						
Government expenditure on education, total (% of GDP)			.01 [-.08, .09]	.03 [-.04, .09]				
School enrollment, secondary (% net)					-.16*** [-.26, -.08]	-.02 [-.10, .05]		
School enrollment, tertiary (% gross)							-.21*** [-.28, -.14]	-.08 [-.17, .02]
Abs.deviance	143,697	143,670	178,328	178,295	163,950	163,920	186,504	186,489
N parameters	9	10	9	10	9	10	9	10
AIC	143,715	143,689	178,346	178,315	163,968	163,940	186,522	186,509
BIC	143,850	143,839	178,484	178,468	164,105	164,091	186,661	186,662
R^2 (country-level)	.13	.52	.14	.54	.29	.61	.44	.57
N countries	44	44	53	53	49	49	55	55

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* $p < .05$; ** $p < .01$;*** $p < .001$.

Table E3. Share of employed among older adults

	E10	E11	E12	E13	E14	E15
Percent of employed adults aged 65+ in all the employed in working age (%)	.05 [-.05, .16]	-.02 [-.11, .09]	.04 [-.06, .16]	-.07 [-.16, .02]	-.03 [-.12, .07]	.03 [-.05, .10]
Modernization index		-.18*** [-.28, -.08]				
Log GDPpc			-.04 [-.15, .07]			
Population aged 65 and more				-.25*** [-.33, -.17]		
Tertiary schooling					-.19*** [-.29, -.10]	
Muslim						.42*** [.27, .58]
Postcommunist						-.39*** [-.60, -.20]
Abs.deviance	151,734	151,724	151,734	151,710	151,720	151,699
N parameters	9	10	10	10	10	11
AIC	151,752	151,744	151,754	151,730	151,740	151,721
BIC	151,887	151,892	151,902	151,880	151,889	151,881
R^2 (country-level)	.17	.33	.16	.51	.39	.61

Note. N countries = 44. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* $p < .05$; ** $p < .01$; *** $p < .001$.

Table E4. Government spending on pensions

	E16	E17	E18	E19	E20	E21
Public social protection expenditure on benefits as a percent of GDP by age (%)	-.16*** [-.25, -.07]	-.02 [-.12, .08]	-.12* [-.22, -.01]	.06 [-.07, .18]	-.05 [-.14, .04]	-.10** [-.17, -.02]
Modernization index		-.20*** [-.29, -.10]				
Log GDPpc			-.09 [-.20, .02]			
Population aged 65 and more				-.28*** [-.40, -.16]		
Tertiary schooling					-.19*** [-.26, -.11]	
Muslim						.40*** [.26, .56]
Postcommunist						-.33*** [-.50, -.16]
Abs.deviance	161,648	161,634	161,646	161,631	161,630	161,618
N parameters	9	10	10	10	10	11
AIC	161,666	161,654	161,666	161,650	161,649	161,640
BIC	161,803	161,805	161,816	161,801	161,801	161,803
R^2 (country-level)	.33	.49	.36	.53	.54	.63

Note. N of countries = 48. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* $p < .05$; ** $p < .01$; *** $p < .001$.

1

Table E5. Controlling for life expectancy

	E22	E23	E24	E25	E26	E27
Life expectancy at birth, both sexes	-.13** [-.23, -.05]	.10 [-.04, .22]	-.13 [-.25, -.01]	.02 [-.07, .10]	.02 [-.08, .12]	-.13*** [-.20, -.08]
Modernization index		-.28*** [-.41, -.15]				
Log GDPpc			-.01 [-.13, .11]			
Population aged 65 and more				-.26*** [-.34, -.17]		
Tertiary schooling					-.22*** [-.31, -.12]	
Muslim						.38*** [.26, .49]
Postcommunist						-.40*** [-.53, -.25]
Abs.deviance	197,568	197,552	197,568	197,538	197,550	197,519
N parameters	9	10	10	10	10	11
AIC	197,586	197,572	197,588	197,558	197,570	197,541
BIC	197,726	197,725	197,740	197,712	197,723	197,708
R^2 (country-level)	.24	.42	.23	.54	.44	.67

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.
* $p < .05$; ** $p < .01$;*** $p < .001$.

Table E6. Re-analysis with Slovenia categorized as Postcommunist country

	E28	E29	E30	E31	E32	E33
Non-Postcommunist Europe - reference group						
LatinAmerica	.02					
	[-.18, .23]					
NewWorld	.24					
	[-.03, .49]					
South-East Asia	.13					
	[-.07, .33]					
Sub-Saharan Africa	.14					
	[-.20, .47]					
Muslim	.37***	.30***	.37***	.18	.33***	.34***
	[.19, .56]	[.18, .42]	[.24, .48]	[-.11, .47]	[.20, .46]	[.22, .45]
Postcommunist	-.26**	-.29***	-.35***	-.19*	-.26***	-.47***
	[-.43, -.10]	[-.42, -.16]	[-.50, -.22]	[-.37, -.02]	[-.40, -.12]	[-.61, -.32]
Modernization index	-.14**	-.16***				
	[-.22, -.06]	[-.22, -.09]				
× Muslim		.14				
		[-.01, .32]				
× Postcommunist		-.18*				
		[-.37, -.005]				
Log GDPpc			-.12**			
			[-.20, -.04]			
× Muslim			.11			
			[-.02, .23]			
× Post-communist			-.12			
			[-.32, .07]			
Population 65+				-.14***		
				[-.21, -.05]		
× Muslim				-.03		
				[-.35, .31]		
× Post-communist				-.11		
				[-.30, .06]		
Tertiary schooling					-.15***	
					[-.23, -.08]	
× Muslim					.14	
					[.01, .31]	
× Post-communist					-.08	
					[-.23, .07]	
Urbanization						-.17***
						[-.24, -.10]
× Muslim						.16**

1.

						[.05, .28]
× Post-communist						-.28*
						[-.52, -.04]
Abs.deviance	197,512	197,511	197,526	197,521	197,515	197,511
N parameters	15	13	13	13	13	13
AIC	197,541	197,537	197,551	197,547	197,541	197,536
BIC	197,756	197,729	197,743	197,737	197,734	197,729
R^2 (country-level)	.68	.70	.61	.64	.68	.70

Note. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.

* $p < .05$; ** $p < .01$; *** $p < .001$.

1·

Table E7. Dropping outliers Germany and Japan

	E34	E35	E36	E37	E38	E39	E40	E41
Modernization index	-.21***						-.16***	
	[-.29, -.13]						[-.22, -.09]	
Modernization index^2	-.02							
	[-.09, .05]							
Log GDPpc		-.09*						
		[-.18, -.01]						
Log GDPpc^2		.07*						
		[.004, .14]						
Population aged 65 and more			-.27***					-.18***
			[-.34, -.19]					[-.27, -.09]
Population aged 65 and more^2			.02					.003
			[-.05, .07]					[-.06, .06]
Tertiary schooling				-.21***				
				[-.29, -.13]				
Tertiary schooling^2				.02				
				[-.05, .08]				
Urbanization					-.08			
					[-.17, .01]			
Urbanization^2					.10*			
					[.03, .18]			
Muslim						.40***	.30***	.18*
						[.27, .54]	[.19, .41]	[.03, .35]
Postcommunist						-.36***	-.29***	-.22**
						[-.51, -.18]	[-.41, -.15]	[-.36, -.06]
Modernization index							.16*	

× Muslim							[.02, .29]	
× Postcommunist							-.22**	
							[-.38, -.06]	
Abs.deviance	187,532	187,547	187,506	187,530	187,546	187,516	187,483	187,494
N parameters	10	10	10	10	10	10	13	12
AIC	187,552	187,567	187,526	187,550	187,566	187,536	187,509	187,518
BIC	187,706	187,720	187,681	187,703	187,719	187,687	187,701	187,699
R^2 (country-level)	.42	.24	.64	.45	.25	.57	.75	.70

Note. Excludes Germany and Japan. The model includes individual-level controls: perceived social status of people in their 40s, age, gender, education level, and income. AIC is Akaike information criterion, and BIC is Bayesian information criterion. B stands for Bayesian model.

* $p < .05$; ** $p < .01$; *** $p < .001$.

1