Measuring Attitudes towards Immigrants: Validation of Immigration Attitude Index Across Countries

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Ave Roots, Anu Masso, Mare Ainsaar


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Contact:

Ave Roots, University of Tartu, ave.roots@ut.ee
Anu Masso, University of Tartu, anu.masso@ut.ee
Mare Ainsaar, University of Tartu, mare.ainsaar@ut.ee
Abstract:
This study aims to contribute to the methodological discussions about measurement quality of immigration attitudes. Previous studies have concentrated on various methodological aspects related to measuring attitudes towards immigration, however there are only single studies having analysed the validity of used measurement scales in this field. Based on theory (Castles, 2010) and empirical studies (Masso, 2009; Davidov & Meuleman, 2012) we use the index approach for analysing complex and multidimensional character of immigration attitudes. We offer five theoretically grounded sub-index variables using European Social Survey 2014 data: (1) support in immigration policies, (2) immigration allow, (3) immigration benefits, (4) variety of inclusion criteria, (5) and openness for contacts. Based on those sub-indexes also a composite index is calculated and evaluated. We estimate the measurement quality of these indexes across European countries. The results indicate that the all of the offered index variables have proved statistically high level of internal validity. The composite index turns out to have the highest external validity having strongest associations with other variables measuring similarly immigration attitudes. Some sub-indexes (Index 2 about immigration allow) have expressed similar external validity compared to composed index, when estimating the associations with socio-demographic background variables.

Keywords:
Attitudes toward immigration, composite index, measurement validity, cross-country studies, European Social Survey.
Introduction

The European countries have undergone several structural changes during last decades. The growth of migration is one of the crucial changes in Europe, including the recent immigration from outside of Europe, on the one hand, and the emigration from enlarged EU-countries, on the other hand. Both the international, national and local institutions are only able to formulate rather declarative policies in relation to multiculturalism. The current refugee crisis in Europe has even more intensified the public discussions regarding the immigration topic in general and explaining the immigration attitudes in particular. That in turn poses a methodological challenge to research in the field of migration.

This study aims to contribute to the methodological discussions about measurement quality of immigration attitudes. Previous studies have concentrated on various methodological aspects related to measuring attitudes towards immigration, like measurement invariance (Zercher, Schmidt, Cieciuch, & Davidov, 2015). Previous theoretical approaches (Castles, 2010) and empirical studies (Masso, 2009; Davidov & Meuleman, 2012) have indicated to the multidimensional and complex character of immigration attitudes, therefore when measuring the immigration attitudes the composite indexes are suggested as being more reliable in the quantitative analysis than single variables. Although the composite indexes of measuring immigration attitudes are widely used in previous studies (see e.g. Masso, 2009; Davidov & Meuleman, 2012), there are only single studies assessing the validity of those composite measurement scales qualitatively (Veer, Higler, Woelders, Ommundsen, & Pernice, 2013) or among relatively small number of participants (Varela, Gonzalez Jr, Clark, Cramer, & Crosby, 2013). There are only some single studies (Billiet & Meuleman, 2012) estimating the validity of composite indexes of immigration attitudes in quantitative cross-country studies. Our study aims to contribute to the discussion about measurement validity of immigration attitudes’ scales, analysing both the internal and external validity of the scales, on the one hand, and
comparing the composite and sub-indexes, on the other hand, which as far as we know, has not been done in previous studies.

In present paper we offer theoretically grounded five sub-indexes and a composite index for analysing immigration attitudes across Europe. We calculate the immigration attitudes indexes on the base of single variables measured in the European Social Survey (ESS) 2014 data, collected in 19 European countries. The analysis origins from the main criticism to migration studies as being too atheoretical\(^1\) (Castles, 2010), and the main obstacles for the theory formation being the complexity, interconnectedness, variability, contextuality and multi-level mediations of migratory processes in the context of rapid global change\(^2\). Based on the theory of Stephen Castles (ibid), we aim to test the general hypothesis if the composite index approach could offer a methodological solution for grasping the complexity, diversity and contextuality of immigration attitudes. More in particular, we test the hypothesis if a more complex composite index or one of the calculated sub-indexes may offer a better solution for analysing immigration attitudes. We also test the hypothesis raised in previous studies (Davidov et al., 2015; Billiet & Meuleman, 2012) that the validity of immigration attitude measures may vary across countries. In our analysis we estimate the construct validity of the immigration index, by analysing the internal consistency of the underlying variables in the immigration indexes, on the on one hand. We also assess the internal validity by comparing the immigration index with similar available variables measuring the immigration attitudes, and external validity by analysing the associations of immigration attitudes index with socio-demographic background variables. The index variables are validated both on the aggregate level, as well as comparing the validity of the indexes across single countries.

\(^1\) The idea behind this criticism is that although there is variety of migration theories, due to the specific characteristic of local contexts, those theories are not always applicable to the local contexts. In the context of resulting dominating empirism and atheoretical studies in the field of migration the social theory in general or social transformation perspective in particular is offered as a solution (see Castles, 2010).

\(^2\) Although this criticism mostly focuses in migration practices rather than attitudes, we believe based on theory (Lefebvre, 1992) the tight interrelatedness of spatial practices and representations.
**Measuring immigration attitudes**

Previous studies have analysed the attitudes toward immigration from the various perspectives, like studying immigration attitudes in general (Masso 2009) or focusing on ethnic prejudice (Onraet & Van Hiel, 2013), expected benefits related to immigration (Esses, Brochu, & Dickson, 2012), diversity of exclusion criteria (Alexseev, 2015), readiness for contacts, or social distance in particular (Hipp & Boessen, 2012), etc.

Studies in the field of immigration and immigration attitudes have often been criticized (see e.g. Iosifides 2012), since the research practice failing to effectively account for the complexity of interactions between social structure, social system and agency. Also the methodologies in social science in general (Taagepera 2008) or in the field of migration in particular (Castles, 2010) have been sight of those criticism since being not efficient for analysing and the methods used not conducing to detect and explain the social laws. The availability of large sized databases has also lead to several criticism in the field of quantitative analysis methods, like domination of narrow empiricism, arbitrary data manipulation (Diekmann 2012), or incomparability of cross-national research (due to diverse cultural and linguistic background, incomparability of national statistics, see e.g. Vargas-Silva 2012). Such tendencies have turned the attention to the issues related to measuring the social phenomena like immigration attitudes and validating the used measurement methods.

One of the solutions to those criticisms would be using the methodologically justified and tested composite indexes instead of single variables, when analysing immigration attitudes. The advantages include mostly the better opportunities for analysis and generalising the results, in the situations where the single directly measured variables do not enable to grasp the complexity of the phenomena under consideration (Vihalem, Masso 2016). However, the
index approach may include also some disadvantages like poor discrimination of used sub-indexes, loss of precision (see e.g. Beierlein, Davidov, Schmidt, Schwartz, & Rammstedt, 2012), or problems of measurement error since measuring abstract variables only indirectly (Sullivan & Feldman, 1979). One of the reasons for criticism could be also due to the relatively shorter traditions using index approach in the field of sociology and in cultural studies (see e.g. Watson, Clarke, Swallow, & Forster, 2005; Bauer, 2009), whereas being more widely used in the field of economy (Vogt, Barta, & Fisher, 1997).

There are several previous studies about immigration attitudes that have empirically analysed the complex phenomena of immigration attitudes by constructing the composite index of immigration attitudes (see e.g. Masso, 2008; Davidov & Meuleman, 2012). Although there is a vast amount of studies in the field of immigration attitudes in general (Veer et al., 2013; Varela, Gonzalez Jr, Clark, Cramer, & Crosby, 2013) there are only some single studies focusing on methodological issues related to composition of immigration attitude index and validating the immigration attitudes index used. Some studies have focused on validating the index composition of migration related phenomena, like attitude index to Christianity (Dorman, 2001), perceived Islamophobia index (Kunst, Sam, & Ulleberg, 2012), or foreign language attitude scale (Raymond & Roberts, 1983). However, there are only some single studies evaluating methodologically the immigration attitudes composite indexes (Varela, Gonzalez Jr, Clark, Cramer, & Crosby, 2013; Veer, Higler, Woelders, Ommundsen, & Pernice, 2013, Billiet & Meuleman, 2012). Those previous studies about evaluation of immigration attitudes indexes have focused on several issues like measurement equivalence in cross-country studies (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014; Billiet & Meuleman, 2012) scale evaluation depending on the way immigrants are framed by the subjects (Veer et al., 2013), or internal consistency of the immigration index (Varela et al., 2013). Several issues in the design of scales like length of the scale (Saris & Gallhofer, 2014), lack of empirical significance (see
e.g. Boumans, 2007) are some of the examples about the issues in the previous studies about measurement scales.

**Instrument development**

**Theoretical considerations**

European Social Survey round 7 data offer theoretically and empirically grounded composite indexes as one of the solutions for analysing immigration attitudes, and the validation of those calculated indexes. The European Social Survey (ESS) is used as an empirical basis for calculating and analysing the immigration indexes. The European Social Survey is an essential data source enabling cross-country comparisons in the academic research and the questions about the immigration attitudes are some of the most often used in the academic research, compared to other modules in the survey. Five thematic sub-indexes and a composite index are offered in this article and calculated on the base of single variables included in the survey questionnaire.

When composing the indexes of immigration attitudes both the theoretical premises, previous empirical studies, as well as the single available underlying variables in the database were combined as basis. The main theoretical premise for calculating multiple immigration attitude indexes was that there may be several underlying dimensions rather than one way for measuring immigration attitudes. Previous studies have focused on somewhat different dimensions of immigration attitudes, labelling the used scales as general attitudes to immigration (Karreth, Singh, & Stojek, 2015), attitudes towards the immigration policies (Berg, 2009), readiness for the immigration (Masso, 2009), perceived social distance with various ethnic groups (Hipp & Boessen, 2012), construction of symbolic borders (Bail, 2008), inclusion- and exclusion criteria (Alexseev, 2015), hostility (Dewaard, 2015), prejudice
(Houvouras, 2001), racism and xenophobia (Leong & Ward, 2006) etc. In our study we rely on those previous studies when composing and labelling the index variables. Besides, various empirical criteria are used as basis, when composing index variables, like the similar content of the underlying variables, similar constructional logic (e.g. variables locating in the questionnaire in the same module or matrix table). Besides those general theoretical and empirical assumptions, several statistical criteria were used as basis, more in detailed explanations are in the results section of present article.

The questions about immigration attitudes have been collected in ESS since 2002 in all rounds (the impact of immigrants on the economy, culture of the country and country as a place to live, and how many immigrants with the same and different race or ethnicity and poorer countries outside Europe to allow to come to live in the country). In 2014 round 7 the survey focused more precisely on measuring the immigration attitudes. The immigration module in ESS survey in 2014 aimed to measure various dimensions of immigration attitudes and focus on theory-driven concepts, like threat perceptions and intergroup contact, and adaptation with changes in immigration context, policy agendas and attitudinal climate (for initial proposal see Smith et al 2012). Therefore besides the questions about the attitudes and perceptions of current policies related to immigration, being already included in the previous ESS survey rounds, additional topics and theory-driven concepts about immigration attitudes, as well as changes in policy agenda and context of immigration were added.

*Index composition*
Using the available variables in the ESS survey round 7 we calculated five sub-indexes and one composite index of immigration attitudes. Table 1 gives an overview of the calculated indexes, underlying initial variables as well as on measurement scales.

First, the initial variables were recoded for calculations of the indexes. In the cases of variables on the ordinal scales (indexes 1-2) only the positive values of the initial variables were used for constructing the indexes. In the case of numeric ordinal scales where the verbal equivalents to the scales were not presented in the questionnaires, and therefore the middle point of the scale being subjective rather than being fixed, the scales were summed up when composing the indexes. Third, the indexes are calculated as the aggregated indexes by summing up all responses to all items in the index. Besides those quantitative scales, the categorical scales were also created based on all of the numeric indexes to distinguish different levels of immigration attitudes (varying from 1- negative to 5-positive). Based on the positive values of categorical sub-indexes, the composite index of immigration attitudes was calculated in summing up the positive values of categorical sub-indexes,

As a result five sub-indexes measuring different aspects of the immigration attitudes were composed. We have named the first index as *Support to immigration policy* (Policy), measuring the general acceptance of immigration of different groups (same and different rice or ethnicity, from poorer countries inside and outside Europe) to the country , . The second index is labelled as ”allow”, and it is focussing more in detail on the readiness to allow some particular ethnic groups, like Jews, Muslims and Gypsies, to the country. Third index was labelled as *Immigration benefits* (Benefits), and measures the perception of immigration as benefit for the country’s economy, cultural life or for country in general. Fourth index is entitled as *Variety of inclusion criteria* (Selectivity), and it measures the readiness for the accepting immigrants regarding various characteristics,, like educational qualifications, knowledge of language, religious background, race, work skills and the commitment to the country. The last,
fifth index is labelled as *Openness for contacts (Contact)*, focusing on the readiness for accepting immigrants in different race or ethnic group as majority being appointed as respondent’s boss or as married to close relative. Besides those five sub-indexes, a composite immigration attitude index was calculated, adding up all previously accounted indexes into one variable.

Due to the missing values in the initial variables imputation procedure was used for handling the missing data problem. As the first five indexes consist of the items measured on the same scale and their internal validity (measured by Cronbach’s alpha) was high (i.e. >.6), average values of non-missing items in the same index were used for imputation. All together 10% of cases needed imputation treatment for calculating index 1, 6% for index 2, 7% for index 3, 4% for index 4, and 5% for index 5. The summary index had initially 21% of missing cases. The average values of five sub-indexes were used for imputation, if the value was missing in the case of summary index. After imputation procedures share of missing values declined notably, but did not disappear. The final share of missing cases was as follows: index 1 2%, index 2 2%, index 3 1%, index 4 0%, index 5 2% and summary index 0%.

*Data and method*

To test validity of six indexes we employ data from the seventh round (2014) of the European Social Survey. For each of the European countries, respondents were selected by means of strict probability samples of the resident populations aged 15 years and older. Participants were interviewed using face-to-face mode regarding different social issues including their attitudes towards immigration and value priorities. In this paper we use data from 19 countries in ESS round 7: Belgium (N=1,769), Switzerland (N=1,532), Czech Republic (N=2,148), Germany (N=3,045), Denmark (N=1,502), Estonia (2,051), Spain (1,925), Finland (2,087), France
(1,917), United Kingdom (2,264), Hungary (1,698), Ireland (2,390), Lithuania (2,250), Netherlands (1,919), Norway (1,436), Poland (1,615), Portugal (1,265), Sweden (1,791), Slovenia (1,224). There are all together 35828 individuals in the database of 19 countries.

In the next analysis internal and external validity is under focus when assessing the calculated composite indexes. Based on the suggestions of previous studies, we test the internal validity of the immigration indexes using Cronbach’s Alpha (Datler, Jagodzinski, & Schmidt, 2013; Dorman, 2001; Inglehart & Baker, 2000; Kunst, Sam, & Ulleberg, 2013; Kwan & Sodowsky, 1997; Varela et al., 2013) and factor analysis (Datler et al., 2013; Dorman, 2001; Inglehart & Baker, 2000; Kunst et al., 2013; Zumbo, 2006).

For testing the external validity multiple regression analysis (Datler et al., 2013; Kunst et al., 2013; Varela et al., 2013), will be used. For external validity estimation we tested associations between indexes and variables that proved to have consistent results in previous studies. Selection of test variables is based on theory, or they have been suggested for validation in previous studies (Datler et al., 2013; Kunst et al., 2013; Varela et al., 2013). Based on the earlier research we use background variables like gender (1- male, 2-female), age (numeric variable), years of education (numeric variable), contact with immigrants (7 point scale from never to every day), assessment of household income (the initial scale was reversed so that 1-living comfortably with present income, 4-very difficult on present income) are used for estimating the external validity of the immigration indexes. Also two human values variables (Davidov & Meuleman, 2012; Davidov et al. 2014) and everyday contacts with immigrants are used here for assessing the external validity of immigration attitude indexes. The two indices of value orientations calculated and included in the analysis are: self-transcendence (including variables about importance, that (1) people are treated equally and have equal opportunities, (2) to understand different people, (3) help people and care for others well-being, (4) be loyal to friends and devote to people close) and conservation (including variables about importance (1)
to live in secure and safe surroundings, (2) that government is strong and ensures safety (3) to be humble and modest, not draw attention, (4) to follow traditions and customs, (5) to follow rules, and (6) behave properly). The variables were measured on 6-point scale (the initial scale was reversed so that 1 = not like me at all to 6 = very much like me, thus higher scores implying a higher similarity). Everyday contacts with people who are of different race or ethnic group was measured on 7-point scale (1 = never to 7 = every day). The external validity is also measured by analysing the associations between indexes and questions measuring immigration related attitudes, not included in the indexes. Two variables were here used in the analysis, first focusing on the agreement with the statement ‘It is better for a country if almost everyone shares the same customs and traditions’ second measuring the agreement if ‘the government should be generous in judging people's applications for refugee status’ (in both cases the initial 5-point scale was reversed so that 5- agree strongly to 1-disagree strongly).

Results of validation

Descriptive of immigration attitudes indexes

First, the explanation of the index variables across countries will be explained for giving a general overview about the indexes and for evaluating the indicators across countries.

The results on figure 1 indicate that Sweden has the highest means in all indexes, the Bonferroni pairwise post-hoc tests shows that the mean values of the indexes of Sweden are different of all other country means and these differences are statistically significant (see figure 1). Although respondents of Norway, Germany, Switzerland, and Denmark have expressed higher level of openness towards immigration on the base of calculated summary index, in the case of single sub-indexes the position of these countries varied in some degree. Czech Republic and Hungary are consistently in the lower end in terms of all of the index means; these countries
also differ from all other countries statistically significantly in case of index 1 focusing on the immigration policy openness and summary index. In case of index 2, focusing on allowing various ethnic groups as immigrants, Hungary has lower values than other countries and this difference also being statistically significant. In terms of the means of index 3, measuring benefits of immigration, Czech Republic differs from other countries, having statistically significantly lower mean compared to other countries. In the case of index 5, focusing on the frequency of contacts with various ethnic groups, respondents of Hungary, Czech Republic and Lithuania have significantly lower means than other countries. In case of index 4, no single country stands out clearly differing from other countries.

In sum, analysis indicates that the average of summary index compared to other sub-indexes has varied mostly across countries, indicating that the index best enables to analyse the general differences in the immigration attitudes across countries. The analysis of order of countries based on the calculated indexes (see table next to the figure 1) indicates that numerous countries, like Sweden, Hungary, Czech Republic, Belgium, and Norway have had quite stable results regarding all of the analysed indexes. However, in the case of several countries, like United Kingdom, Slovenia, France, and Poland the results differ significantly across analysed indexes. Therefore for the cross-country comparative purposes the summary index would provide more stable results, whereas in the single country-studies one of the sub-indexes could be preferred or simultaneously compared.

Internal validation of immigration attitude indexes
When constructing the indexes, the unidimensionality was used as a aimed standard as formulated in previous studies (Kim & Rabjohn, 1980) and inherent to Guttman scaling summation method used here for index composition. Therefore the unidimensionality is also used here as one of the main criteria for estimating internal validity of the calculated immigration indexes. Two main methods are used here for estimating the unidimensionality: for estimating the internal consistency of the index variables the measure of Cronbach alpha is used, on the one hand, and for estimating the dimensionality of the underlying variables constituting the indexes the factor analysis method is applied, on the other hand.

Table 2 shows presents the values of Cronbach’s alpha compared to sub-indexes and composite index. The table indicates that value of Cronbach’s alpha exceeds in case of all indexes the level of 0.6, which is often considered the acceptable level to decide that the index is still consistent and valid. The first index (Support in immigration policies) seems to be the internally most consistent construct, whereas fourth index of selectivity (Variation of inclusion criteria) having lowest value of internal consistency (however, the result might be also influenced by the higher number of underlying variables in this index).

Cross-country comparisons in the table 3 indicate some variation across the countries regarding the internal consistency of the indexes, average values varying from .78 Switzerland to .85 in Sweden. However, also the lowest values of Cronbach’s alpha, i.e. summary index in the case of Poland, Lithuania, and Czech Republic, is above of the .6 criteria and therefore may be concluded that all of the index scales being valid. The first or Policy index has the strongest internal consistency also in cross national comparison, and Summary and Selectivity index have somewhat lower values here. Although in the case of the summation index the measure of internal consistency is somewhat lower, the differences within countries are relatively small. Or in other words, in the case of summation index there are no countries with very high level
of validity, but the index validity is stable in different countries where the survey was conducted.

Also conducted factor analysis confirms mostly the unidimensionality assumption of the index construction (see table 2). Used statistical Kaiser criteria suggesting to drop all components with eigenvalues under one suggests that in most of the cases the one-factor solution turns out to be best (although the explained variance being the lowest in the case of summary index, and highest in the case of first two indexes). The only exception is index four, where two-factor solution is offered; here the higher number of initial variables could explain the multidimensionality, however, the underlying variables being logically related and the internal consistency being still high.

Average correlation coefficient between the sub-indexes as presented in table 4 is .473 indicating that about 22 per cent of the total variance in one index may be explained by another index. Therefore we could conclude that the sub-indexes measure similar phenomena and could be summed up into one single composite index for explaining the general attitudes toward immigration. The calculated summary index has the strongest relationship with sub-indexes 1 (Policy) and 2 (Allow), whereas having lowest correlation in the case of sub-index 4 measuring the selectivity or exclusion criteria related to openness to immigration.

*External validation of immigration attitude indexes*

To test external validly of indexes we use regression analysis with nine variables, which had demonstrated in the previous studies strong associations with immigration attitudes. All variables had statistically significant regression coefficients in models with all indexes (Figure 4). Also the signs and general strength of the coefficients are logical and in accordance with previous studies. The comparison of six indexes (Figure 4) demonstrates, that the Summary
index is the most successful in capturing variability of attitudes in this nine variables model with data of all 19 countries, since having the strongest associations with background variables. Index 2 and 3 demonstrate here the next best results, having here second largest average associations with background variables.

Table 4 shows that in the case of summary index and sub-indexes 1 (Support in immigration policies) and 2 (Allow immigration) the association with gender is statistically weak, but being non-significant in the case of all other sub-indexes. Such results are in the accordance with previous empirical studies (Davidov & Meuleman, 2012), showing the relatively weak relationship between immigration attitudes and gender. Also other socio-demographic background variables analysed here, follow the general lines found in these previous studies. Younger people have expressed more positive attitudes to immigrants, however the relationship being statistically significant in the case of summary index and two sub-indexes (index 1 policy and index 2 allow).

Income and education are statistically significantly related to all index variables, so that people who are doing better on current income and having higher education have expressed more positive attitudes towards immigration. However, also here are some differences when comparing the indexes so that the index 3 (Immigration benefits) being mostly distinguished by the individuals’ education and index 2 (Allow immigrants with various ethnic background) having strongest association with income. Similarly some variation in coefficients could be seen in the case of frequency of contacts with various ethnic groups, that has logically strongest relationship with sub-index 5 (Openness for contacts). Similarly to previous studies (Davidov & Meuleman, 2012), values are statistically significantly related to all of the index values so that the higher estimation of conservation values being related to more negative attitudes, and the higher evaluation of transcendence being related to higher immigration support.
Other variables in the model help to estimate the external validity of the indexes so that focusing on the similar content as the index variables. The results indicate that the more generous the attitudes regarding the refugee applications are, the more open are also the attitudes towards immigrants in general. Or, the more one evaluates that it is better for the country when everyone shares similar customs and traditions, the more negative attitudes towards immigration is expressed. The relatively strong associations here with all index variables indicate high level of validity, however being highest in the case of summary index.

The picture becomes somehow more diverse after running the same analyses by all countries separately. When calculating similar regression coefficients for all indexes by variables and for each country separately. Result shows that on average 17 countries out of 19 got expected statistically significant results from regression analyses with these indexes. For indexes 1 (Policy) and 3 (Benefits) 14 countries on average got expected results and for index 4 (Selectivity) 13 countries respectively.

Conclusions

Growing immigration flows has been one of the biggest structural changes European countries have undergone during last decades. Therefore the individual readiness for accepting the immigration is a key factor for the development of social cohesion in the context of those structural changes. Therefore it is essential to analyse the methodological issues related to measuring and studying immigration attitudes. There have been previously only some single studies estimating the quality of the measurement methods for analysing immigration attitudes and none of them have focused on the comparative estimation of composite indexes, as one of the methodological opportunities for embracing the complexities and various dimensions of
attitudes related to immigration. This study aims to fill this methodological cap in analysis of immigration attitudes.

The aim of this study was to measure the external and internal validity of six immigration attitude indexes across countries formed in combination of questions in ESS round 7 2014 survey. Based on theoretical knowledge and previous empirical studies (see e.g. Davidov et al., 2015; Billiet & Meuleman, 2012; Masso, 2009) we calculated five sub-indexes and one composite index of immigration attitudes. The sub-indexes covered areas as follows: immigration policy, allow immigration of different ethnic groups, estimated benefits of immigration, selectivity of immigration by skills and background, openness for close contact with immigrants. Besides those sub-indexes, each characterising somehow various dimensions of immigration attitudes, the composite index was aggregated based on values of all those sub-indexes.

Two main techniques were used for estimating the indexes of immigration attitudes: first, the internal consistency of the underlying variables in the immigration indexes were estimated; second, the external validity by analysing the associations of immigration attitudes indexes with background variables was tested. These methods for estimating internal and external validity were implemented both in the whole database, including all countries, as well as separately across single countries. Analyses showed that although the sub-index 1, measuring the support in immigration policies had internally the most consistent construction, all indexes have shown very high level of internal consistency, both considering the whole sample in general and comparing the results across the countries. Therefore we could conclude based on this analysis that all of the suggested indexes can be used for measuring immigration attitudes in cross-country studies.

The high level of external validity is indicated by the associations with variables that also capture attitudes towards immigration, like attitudes about government’s generosity
judging refugee application and attitude whether it is better for the country if everybody share the same culture. These variables are consistently associated with all indexes as well as across all countries. Therefore we conclude that all these indexes are also externally valid and usable in different country contexts. However, we would suggest the use of the aggregated summary index over other indexes, because it captures the multidimensional nature of the attitudes towards immigrants the best.

External validy was also tested by analysing the associations between immigration index variables and related background variables, that have turned out to be significant in previous studies. The analysis demonstrated that although all proposed indexes could be used and offer a valid result when analysing the aggregated data on European level, the summary index has the best external validity here, since having strongest and most stable relationships across countries. The analysis of external validity across countries that we estimated on the base of associations between indexes and nine immigration attitudes related variables, demonstrated that Summary index and sub-index Allow (measuring the readiness to allow to the country various immigrant groups like Gypsies, Jews and Moslems) might be the most useful for academic analyses.

Based on theory (Castles, 2010), our methodological assumption prior the analysis was that the composite index, including several dimensions of immigration attitudes, may help to grasp the complexity, diversity and contextuality of immigration attitudes. On the other hand, one of the practical assumption before this analysis was, if one of the sub-indexes would work as well as the aggregated composite index, considering the relatively high costs of data collection within survey method (especially in the case of cross-country studies), the future studies could save the costs for data collection restricting the number of variables of immigration attitudes. The results of our analysis indicate that more complex index, based on higher number of initial variables, or based on sub-indexes in our case, may capture different
aspects of attitudes better, however one should also take into consideration that since it needs more information for calculations, the more complex indexes are more sensitive regarding missing values. The indexes with more simple structure are easier to collect and measure, but they might suffer from lower validity.

As a final conclusion we can suggest using Summary index or Index 2 Allow (measuring the readiness to allow to the country immigrants with various ethnic backgrounds) for analysing immigration attitudes. These both indexes have a good internal validity and turned out to have the best fit with theory based external variables. Although Summary index had the highest scores of capturing variability in external validity analyses it might suffer from missing data problem in large international analyses. Due to strongest correlation between Summary index and sub-index 2 (Allow), and their equally good validity results, much more simple index The sub-index of Allow (to the country immigrants with various ethnic backgrounds) can be a good alternative instead of more complex index.
References


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<th>1. Names of indices (short names)</th>
<th>2. Underlying variables (ESS codes)</th>
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<th>5. Recoding of index scales</th>
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<tr>
<td><strong>Index 1. Support in immigration policies (POLICY)</strong></td>
<td>1. Allow many/few immigrants of same race/ethnic group as majority (B29), 2. Allow many/few immigrants of different race/ethnic group from majority (B30), 3. Allow many/few immigrants from poorer countries in Europe (B30a), 4. Allow many/few immigrants from poorer countries outside Europe (B31).</td>
<td>1- allow many, 4-allow some</td>
<td>1=2, 2 and 3=1, 4, 7, 8, and 9=0</td>
<td>1-low (1+2, 3.5%), 2-below average (=3, 13.4%), 3-average (=4, 60.6%), 4-above average (5+6, 15.1%), 5-high (7+8, 7.4%).</td>
</tr>
<tr>
<td><strong>Index 2. Allow immigration (ALLOW)</strong></td>
<td>1. Allow many or few Jewish people to come and live in country (D26), 2. Allow many or few Muslims to come and live in country (D27), 3. Allow many or few Gypsies to come and live in country (D28).</td>
<td>1- allow many, 4-allow some</td>
<td>1=2, 2 and 3=1, 4, 7, 8, and 9=0</td>
<td>1-low (=0, 10.1%), 2-below average (=1, 26%), 3-average (2+3, 52.7%), 4-above average (=4, 7.2%), 5-high (5+6, 4%).</td>
</tr>
<tr>
<td><strong>Index 3. Immigration benefits (BENEFITS)</strong></td>
<td>1. Immigration bad or good for country's economy (B32), 2. Country's cultural life undermined or enriched by immigrants (B 33), 3. Immigrants make country worse or better place to live (B 34).</td>
<td>0-bad (undermined; worse), 10- good (enriched; better place)</td>
<td>Sum of 0-10, 77, 88, 99=0</td>
<td>1-low (0-7, 10,4%), 2-below average (8-12, 17,3%), 3-average (13-17, 38,7%), 4-above average (18+21, 21,6%), 5-high (22-30, 12,2%).</td>
</tr>
<tr>
<td><strong>Index 4. Variety of inclusion criteria (SELECTIVITY)</strong></td>
<td>1. Good educational qualifications (D1), 2. Speak country's official language (D2), 3. Christian background (D3), 4. Be white (D4), 5. Work skills needed in country (D5), 6. Committed to way of life in country (D6).</td>
<td>0- extremely unimportant, 10- extremely important.</td>
<td>Sum of reversed scale 0-10, 77, 88, 99=0.</td>
<td>1-low (51-60, 9,5%), 2-below average (43-50, 20,5%), 3-average (32-42, 38,8%), 4-above average (23-31, 21,4%), 5-high (0-22, 9,8%).</td>
</tr>
<tr>
<td><strong>Index 5. Openness for contacts (CONTACT)</strong></td>
<td>1. Immigrant different race/ethnic group majority appointed as your boss (D10), 2. Immigrant different race/ethnic group majority married close relative (D11).</td>
<td>0- not mind at all, 10 mind a lot.</td>
<td>Sum of reversed scale 0-10, 77, 88, 99=0.</td>
<td>1-low (16-20, 12,5%), 2-below average (11-15, 17,8%), 3-average (6-10, 33,9%), 4-above average (summa 1-5, 19,8%), 5-high (=0, 16%).</td>
</tr>
</tbody>
</table>
| **Immigration support summary index (SUMMARY)** | Index 1  
Index 2  
Index 3  
Index 4  
Index 5 | 1- low, 5- high. | 5=2, 4=1, 1-3=0. | 1-low (5-11, 10,2%), 2-below average (2-13, 14,9%), 3-average (14-17, 49,2%), 4-above average (18-19, 15,4%), 5-high (20-25, 10,3%). |
Figure 1. Indexes of immigration attitudes by countries (left: mean, on the 5-point scale, where 5-high, 1-low; right order of countries)
Table 2. Internal consistency of indexes of immigration attitudes (Cronbach’s alpha, eigenvalues, explained variance)

<table>
<thead>
<tr>
<th>Indexes</th>
<th>Cronbach’s Alpha</th>
<th>Eigenvalues of one factor (number of factors)*</th>
<th>Total variance explained**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index 1 POLICY. Support in immigration policies</td>
<td>0.89</td>
<td>3.22 (1)</td>
<td>80%</td>
</tr>
<tr>
<td>Index 2 ALLOW. Allow immigration</td>
<td>0.85</td>
<td>2.40 (1)</td>
<td>80%</td>
</tr>
<tr>
<td>Index 3 BENEFITS. Immigration benefits</td>
<td>0.85</td>
<td>2.31 (1)</td>
<td>77%</td>
</tr>
<tr>
<td>Index 4 SELECTIVITY. Variety of inclusion criteria</td>
<td>0.78</td>
<td>2.95 (2)</td>
<td>49%</td>
</tr>
<tr>
<td>Index 5 CONTACT. Openness for contacts</td>
<td>0.83</td>
<td>1.70 (1)</td>
<td>85%</td>
</tr>
<tr>
<td>Index SUMMARY. Immigration support summary index</td>
<td>0.79</td>
<td>2.46 (1)</td>
<td>49%</td>
</tr>
</tbody>
</table>

* Initial eigenvalues of first factor and (number of factors with eigenvalues >1 in parentheses)
** Cumulative per cent of total variance explained by one factor.

Table 3. Internal consistency of immigration attitude sub-indexes and summary index by countries (Cronbach’s alpha)*

<table>
<thead>
<tr>
<th>Index 1: Policy</th>
<th>Index 2: Allow</th>
<th>Index 3: Benefits</th>
<th>Index 4: Selectivity</th>
<th>Index 5: Contact</th>
<th>Index Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>.88</td>
<td>.82</td>
<td>.84</td>
<td>.81</td>
<td>.82</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>.93</td>
<td>.83</td>
<td>.89</td>
<td>.78</td>
<td>.83</td>
</tr>
<tr>
<td>Sweden</td>
<td>.96</td>
<td>.92</td>
<td>.85</td>
<td>.83</td>
<td>.76</td>
</tr>
<tr>
<td>France</td>
<td>.9</td>
<td>.85</td>
<td>.88</td>
<td>.76</td>
<td>.81</td>
</tr>
<tr>
<td>Germany</td>
<td>.87</td>
<td>.83</td>
<td>.83</td>
<td>.75</td>
<td>.78</td>
</tr>
<tr>
<td>Slovenia</td>
<td>.9</td>
<td>.87</td>
<td>.83</td>
<td>.71</td>
<td>.74</td>
</tr>
<tr>
<td>Belgium</td>
<td>.88</td>
<td>.83</td>
<td>.8</td>
<td>.72</td>
<td>.77</td>
</tr>
<tr>
<td>Denmark</td>
<td>.87</td>
<td>.81</td>
<td>.87</td>
<td>.8</td>
<td>.79</td>
</tr>
<tr>
<td>Ireland</td>
<td>.9</td>
<td>.82</td>
<td>.88</td>
<td>.73</td>
<td>.83</td>
</tr>
<tr>
<td>Spain</td>
<td>.95</td>
<td>.89</td>
<td>.84</td>
<td>.81</td>
<td>.82</td>
</tr>
<tr>
<td>Norway</td>
<td>.9</td>
<td>.79</td>
<td>.79</td>
<td>.83</td>
<td>.81</td>
</tr>
<tr>
<td>Hungary</td>
<td>.82</td>
<td>.81</td>
<td>.86</td>
<td>.76</td>
<td>.83</td>
</tr>
<tr>
<td>The Nether</td>
<td>.91</td>
<td>.86</td>
<td>.76</td>
<td>.72</td>
<td>.77</td>
</tr>
<tr>
<td>Poland</td>
<td>.92</td>
<td>.85</td>
<td>.81</td>
<td>.81</td>
<td>.83</td>
</tr>
<tr>
<td>Portugal</td>
<td>.89</td>
<td>.87</td>
<td>.77</td>
<td>.73</td>
<td>.85</td>
</tr>
<tr>
<td>Estonia</td>
<td>.83</td>
<td>.77</td>
<td>.84</td>
<td>.74</td>
<td>.8</td>
</tr>
<tr>
<td>Switzerland</td>
<td>.88</td>
<td>.82</td>
<td>.78</td>
<td>.74</td>
<td>.75</td>
</tr>
<tr>
<td>Lithuania</td>
<td>.88</td>
<td>.82</td>
<td>.86</td>
<td>.83</td>
<td>.83</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>.9</td>
<td>.73</td>
<td>.85</td>
<td>.8</td>
<td>.84</td>
</tr>
<tr>
<td>All</td>
<td>.89</td>
<td>.85</td>
<td>.85</td>
<td>.78</td>
<td>.83</td>
</tr>
</tbody>
</table>

* Ordered descending by summary index.

Table 4. Immigration attitude summary index by sub-indexes (Pearson correlation)

<table>
<thead>
<tr>
<th>Index 1: Policy</th>
<th>Index 2: Allow</th>
<th>Index 3: Benefits</th>
<th>Index 4: Selectivity</th>
<th>Index 5: Contact</th>
<th>Summary index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index 1: Policy</td>
<td>.789</td>
<td>.820</td>
<td>.775</td>
<td>.687</td>
<td>.698</td>
</tr>
</tbody>
</table>

All correlations are significant on the level p<.001.
Continues indexes are used as indepent variables in the analysis.

**Figure 4. Immigration attitude indexes by background variables** (standardised regression coefficients)