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ACROSS-TIME CHANGE AND WITHIN-COUNTRY
VARIANCE IN CULTURAL TIGHTNESS-LOOSENESS IN
ESTONIA

Master's Thesis

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Running head: Change and Variance in Tightness-Looseness

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Abstract

An article by Gelfand and colleagues (2006) brought the construct of cultural tightness-looseness to the attention of social scientists once again. Tight cultures have strong social norms and low tolerance of deviant behaviour, whereas loose cultures have weak norms and high tolerance of different behaviour. The aim of the current study was to examine the across-time change (over ten years) as well as the within-country variance in tightness-looseness in Estonia. It was found that the tightness score increased significantly in Estonia from 2002 to 2012, but the change was rather small. A significant within country variance in 2002 (females had slightly higher tightness scores than males and people who had at the most primary or secondary education reported higher tightness than respondents who had higher education) had disappeared by 2012. An item-level analysis revealed that both in 2002 and 2012 people believed that there are many social norms in Estonia and inappropriate behaviour will be disapproved by others, but in 2012 respondents reported that the norms were clearer; there was more general agreement about appropriate vs. inappropriate behaviour and expected compliance with social norms was higher. The possible reasons for strengthened tightness in 2012 compared with 2002 include the end of the transition phase in Estonia and the adoption of new norms through integration with Europe. Such homogenisation of tightness levels across different social subgroups is in line with previous research showing identity clarification and homogenisation in post-transition countries. Further research about the temporal stability and intracultural variation of tightness-looseness in more politically stable but also more heterogeneous countries is needed in order to confirm and extend our current results.

Kokkuvõte

Kultuurilise piiravuse-lubavuse ajaline varieeruvus ja riigisisised erinevused Eestis

Gelfandi ja kolleegide artikkel (2006) tõi kultuurilise piiravuse-lubavuse taaskord sotsiaalteadlaste vaatevälja. Kultuuri piiravuse-lubavuse aste näitab, mil määral kultuuriliikmed nõustuvad selles osas, mis on õige käitumine; peavad käituma täpselt kultuuris valitsevatest normidest lähtuvalt; kritiseerivad teisi või satuvad ise kriitikatule alla neid norme rikkudes. Piiravaid kultuure iseloomustavad tugevad normid ja vähene tolerantsus normist erineva käitumise suhtes, lubavates kultuurides on olukord vastupidine. Käesoleva töö eesmärk oli uurida kultuurilise piiravuse-lubavuse riigisiseseid erinevusi ning ajalist muutust Eestis kümneaastase perioodi jooksul. Tulemused näitasid, et piiravuse skoor Eestis oli 2012. aastal 2002. aastga võrreledes küll statistiliselt oluliselt kõrgem, ent erinevus oli siiski suhteliselt väike. Kui 2002. a. pidasid Eestis elavad naised ühiskonda veidi piiravamaks kui mehed ning kõrgharidusega vastajad siinset ühiskonda lubavamaks kui põhi- või keskharidusega vastajad, siis 2012. a. olid need erinevused kadunud. Üksikküsimuste analüüs näitas, et nii 2002. kui ka 2012. aastal arvati, et Eestis on palju sotsiaalseid norme ning ebasobiv käitumine mõistetakse teiste poolt hukka. Samas leidsid vastajad 2012. aastal, et normid olid selgemad, leidsid rohkem ühist arusaamist selles osas, mis on sobiv ja mis ebasobiv käitumine, ning samuti oli tõusnud ootus, et inimesed järgivad norme. Piiravuse mõningase tõusmise võimalike põhjustena võib esile tuua siirdeperioodi lõppu Eestis ning Euroopaga integreerumise kaudu uute normide omaks võtmist. Piiravuse taseme erinevuste kadumine erinevate sotsiaalsete rühmade vahel sobib kokku varasemate uurimistulemustega, mis on näidanud siirdeperioodi läbinud maades identiteedi selginemist ja ühtlustumist erinevate rühmade vahel. Lisauuringud piiravuse-lubavuse ajalise stabiilsuse ja kultuurisisesest variatiivsuse osas nii kultuuriliselt heterogeensemates kui ka poliitiliselt stabiilsema ajalooaga maades on vajalikud, et käesolevaid tulemusi kinnitada ja laiendada.

Acknowledgment

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Introduction

What are Social Norms and Why is it Important to Study Them?

Since the emergence of cross-cultural studies, scholars from different fields (e.g., anthropology, sociology, and social psychology) have been trying to find particular dimensions or characteristics that would enable a description of cultural variability and a comparison of different societies in an optimal manner. One such important aspect is the nature of social norms of a culture. While Muzafer Sherif, one of the founders of social psychology, explored the origins and manifestations of, and appropriate research methods for, social norms already in 1936, the area is still very active in the social sciences. For example, G. Hofstede and G. J. Hofstede (2005) stated that culture consists of the unwritten rules of the social game and described norms as standards of behaviour that exist within a group or category of people. Norms refer to what is ethically right and indicate the choices made by the majority. Bicchieri (2006) likened norms to a grammar of social interaction: like a grammar, norms specify what is acceptable in a group. In the current study, social norms are defined, similarly to Gelfand and colleagues (2011), as the standards for behaviour that are generally unwritten.

Cultural tightness-looseness is one of the constructs that can be used to describe the strength of social norms and the degree of sanctioning within societies. Tight cultures have clear and pervasive social norms and severe sanctions for deviant behaviour, whereas loose cultures have weak norms and high tolerance for deviant behaviour (Gelfand et al., 2011). The concept of tightness-looseness was first introduced by Pelto in 1968, but had its renaissance at the end of 1990s and early 2000s (Carpenter, 2000; Chan, 1996; Gelfand et al., 2006), especially when an international study compared tightness-looseness in 33 countries (Gelfand et al., 2011). Recent studies have either aimed solely to clarify the theoretical framework of the construct (Gelfand et al., 2006; Gelfand, 2012) or probed cross-cultural differences in tightness-looseness, trying to explain these with various ecological and social (Carpenter, 2000; Chan, 1996; Gelfand et al., 2011) but also genetic aspects (Mrazek, Chiao, Blizinsky, Lun, & Gelfand, 2013).

The aim of the current study is to examine the across-time change as well as within-country variance in tightness-looseness scores in Estonia. As far as we know, tightness-looseness has not to date been studied in large representative samples, but mainly among

university students¹, thus leaving doubt about whether the cross-cultural variations found would be generalisable to whole populations. One-sided and relatively small samples have also prevented subgroup comparisons inside cultures. Similarly, the stability of tightness-looseness scores across time has not so far been assessed. To address these aims, the current study used data from two nationally representative samples of Estonian residents: one each from the years 2002 ($N = 1,582$) and 2012 ($N = 1,883$). The aims of the study, as well as the importance of paying attention to temporal changes and intra-cultural variations of tightness-looseness, will be discussed further below, but I first give an overview of the development of the tightness-looseness construct, as well as review various theoretical models and relevant recent studies.

Tightness-Looseness: A Measure of the Strength of Social Norms in a Society

As already mentioned, the roots of assessing tightness-looseness in cross-cultural research extend to anthropology: Pertti Pelto introduced the criteria for describing cultural tightness-looseness as a continuum already in 1968. He called some societies, like Pueblo Indians and Japanese, *tight*, because these cultures had clearly and unambiguously defined social norms, and severe sanctions followed if someone deviated from the norms. At the same time, other societies, like Skolt Lapps from North-Eastern Finland showed little formal authority, and had relatively high tolerance for deviant behaviour. Pelto called these *loose* societies. He also identified a number of factors which were related to cultural tightness: according to Pelto (1968) tight cultures tend to have a higher population density, unilateral kinship systems (descent traced by either the male or the female), corporate control of property, religious figures as leaders, and would deal with agriculture rather than hunting.

Subsequently, other researchers (e.g. Berry, 1979; Witkin & Berry, 1975) also began to use the term tightness-looseness and connected previous findings about cultural differences in social conformity and child-rearing practices (Berry, 1967) with cultural tightness, stating that agricultural societies are tighter and have stricter child rearing practices and higher conformity than societies dealing with hunting or gathering. It was also clear that these cultural differences were related to the different ecological environments in which the hunters and farmers were living (Berry, 1967, 1979). Berry later also included the aspect of cultural

¹ For instance, Chan et al. (1996) surveyed 1,200 high school male subjects aged 13–18 in each country; in Gelfand et al. (2011), 49.2% of the participants were university students, $N = 111$ – 312 in different countries).

tightness in his ecocultural framework (see e.g., Berry, 2001), a conceptual approach for explaining diversity across cultures (both at the individual and the group level) by taking into account the ecological and sociological features that humans need to adapt to in order to succeed in their environment. Boldt (1978) focused on the differences in tightness-looseness in simple vs. complex societies, proposing that although both types of societies can be relatively tighter or looser, simple societies would be expected to be tighter than complex societies. He based this assumption on the idea that, in simple societies, external role expectations are clearer and better “imposed and received” (Boldt, 1978; p. 157) than in more diverse, complex societies, the latter leaving more individual autonomy to their members.

Relationship to other cultural dimensions: Individualism-collectivism and power distance. Although the aim of the current study is not to compare tightness-looseness with other cultural value dimensions, it is still important to stress that I do not oppose tightness-looseness to any existing cultural dimension that describes attitudes towards social norms. Instead, by studying how stable and homogeneous the strength and clarity of social norms in a culture are, I aim to bring a new and complementary understanding to cultural research.

Gelfand, Lim, and Raver (2004) have proposed a model that endorses such a complementary view and involves the constructs of *tightness-looseness*, *individualism-collectivism* (Hofstede, 1980), and *hierarchy-egalitarianism* (Schwartz, 1994), which Gelfand and colleagues (2004) combined with Hofstede’s (1980) power distance onto different axes (see Figure 1). Gelfand and colleagues (2004) claimed that each culture

could be positioned in this three-dimensional environment and described by the combination of the three aforementioned characteristics. Germany, for instance, could be described as an individualistic, tight, and hierarchical culture, because

(a) people there are generally accountable to themselves, peers, and supervisors (characteristic of an individualistic culture, and opposed to the accountability to immediate supervisor, group, and organisation of collectivistic cultures);

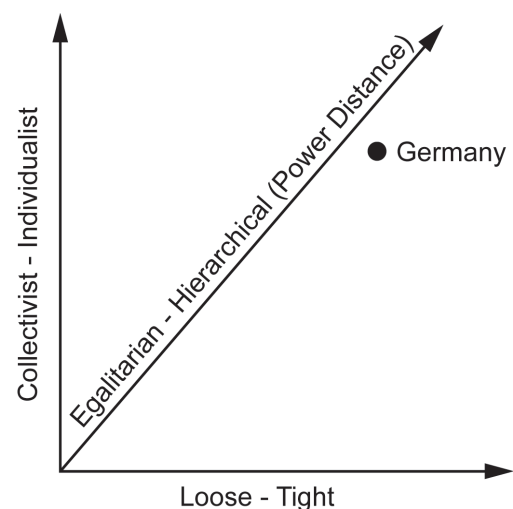


Figure 1. Three-dimensional model of cultural space. Adapted from Gelfand, Lim and Raver, 2004.

(b) there are also clear organisational rules that people should follow (characteristic to tight cultures, and opposed to the fewer and less clear standards of loose cultures); and (c) in regard to hierarchical organisation, although the needs of individuals are expected to be taken into account (e.g., through training and support), practices and rules are often explicitly communicated via the formal structure within an organisation (as opposed to more bidirectional connections and negotiations about standards in egalitarian cultures).

Such a model illustrates that tightness-looseness, individualism-collectivism, and hierarchy-egalitarianism complement rather than contradict each other. Gelfand and colleagues (2011) further demonstrated that tightness-looseness is only moderately correlated with Hofstede's (1980, 2001) value dimensions of individualism-collectivism ($r = .47-.49$) and power distance ($r = .32-.42$). Several other constructs, like conservatism (Schwartz, 1994) or uncertainty avoidance (Hofstede, 1980), were also only weakly correlated with tightness-looseness.

Multilevel theory of tightness-looseness. Michele Gelfand and colleagues (Chan, 1996; Gelfand, 2012; Gelfand et al., 2011, 2006) have studied the concept of tightness-looseness extensively, and emphasise that cultural tightness-looseness is especially useful for describing the external forces that affect an individual's behaviour in societal settings, whereas values, which are often measured in cross-cultural research, rather express the internal drives that modulate a person's behaviour.

Gelfand and colleagues (2006; 2011) further proposed a multilevel theory of cultural tightness-looseness, where "tightness-looseness is part of a complex, loosely integrated system that involves processes across multiple levels of analysis" (Gelfand et al., 2011, p. 1101). Gelfand et al. (2006; 2011) argued that, when discussing tightness-looseness, both distant ecological and historical factors and societal processes (such as ecological and historical threats and the strength of societal norms) as well proximal/ contemporaneous processes (i.e., the structure of everyday situations and degree of situational constraint, as well as psychological adaptations) should be considered (see Figure 2).

For instance, Gelfand and colleagues (2011) found that nations who have encountered historical or ecological threats (e.g., territorial conflicts, natural disasters, food deprivation, etc.) and have a higher population density (in the year 1500, and also in the year 2000 in rural areas) have higher tightness scores.

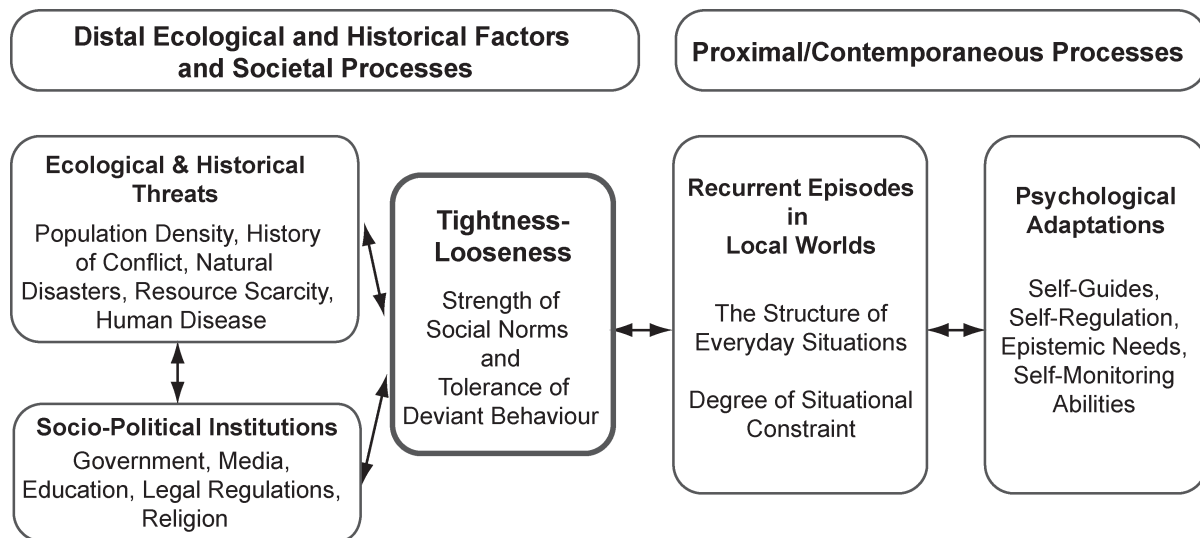


Figure 2. A systems model of tightness-looseness, proposed by Gelfand and colleagues (2011). Figure adapted from Gelfand and colleagues (2011) Figure 1.

Mrazek, Chiao, and Blizinsky (2013) later demonstrated that the link between ecological threats and cultural tightness is further modulated by a serotonin transporter gene allele: 5-HTTLPR has a higher prevalence in countries where the risk for ecological threats is higher and that are tight (e.g., Singapore or Japan) compared with countries where the risk for ecological threats is low and that are loose (e.g., Estonia).

Gelfand and colleagues (2011) also showed that tighter countries were more likely to have autocratic rules, more laws and regulations, less open media, less access to communication technology, and fewer political and civil liberties. The percentage of people participating in collective actions, like signing petitions or participating in strikes, was smaller in tighter nations. Tight nations were more religious than loose nations. A recent study (Gelfand, LaFree, Fahey, & Feinberg, 2013) related tightness to a greater number of terrorist attacks in a nation, and especially with the lethality of such events.

Finally, Gelfand, and colleagues (2011) showed that tightness also modulated behaviour at the individual level: tight nations had much higher constraints in everyday situations than loose nations, which in turn related to higher cautiousness, greater self-regulation strength, and a higher need for structuring. In a five-culture study (Ching, Church, & Katigbak, 2014), however, cultural tightness did not modulate the relationships between personality traits, reported affect, and behavioural autonomy, but the cultural differences observed in that study were rather small.

To test their multilevel theory empirically, Gelfand and colleagues (2011) developed a 6-item scale (see further description of the scale and its properties in the *Materials and*

Methods section) and measured tightness-looseness in 33 countries. They found that the perceived strength of social norms and tolerance for deviant behaviour is a shared construct within and across nations. Tightness-looseness showed high within-nation agreement and between-nation variability. Normalised average tightness scores varied from 1.6 in Ukraine to 12.3 in Pakistan, Estonia being the second loosest of the 33 countries, with an average tightness score of 2.6. Cultural tightness-looseness measured by the 6-item scale also strongly correlated with respondents' answers about appropriate behaviour and the need for self-regulation in 15 example situations.

The Aims of the Current Study

The aims of the current study are a) to examine the change in tightness-looseness scores over time and b) to study the within-country variance in tightness-looseness in Estonia, by using data from two large-scale nationally representative surveys of Estonian residents conducted in 2002 (the Estonian Survey of Culture and Personality) and 2012 (the 6th wave of the European Social Survey), respectively.

The importance of studying across-time variations in tightness-looseness. Cross-cultural psychology generally considers cultures as qualitatively homogeneous (all members within a culture are assumed to be similar—this issue will be addressed later) and also assumes that the phenomena studied remain relatively stable over time (Valsiner, 2003). The latter assumption somewhat contradicts any interest in studying the dynamics of cultures—it remains clear that cultures are not rigid structures, but are brought to life by living humans. Examples have shown that even short, but drastic, events, like 9/11 in United States (US), elicit changes in the social environment. For instance, Li and Brewer (2004) contend that the “9/11 attacks resulted in immediate, visibly evident increases in expressions of national identification and unity throughout the United States” (p. 728), and Davies, Steele, and Markus (2008) found that even priming with the 9/11 threat resulted in higher levels of nationality expressed in a questionnaire. These may be short-term or individual-level changes, but they raise the question of how much some characteristics of a culture will change over a relatively short period of time. The current study probes whether the perceived strength and amount of social norms in a country change over 10 years' time. Therefore the questions asked will be a) does the structure of the tightness-looseness construct remain stable over time and, if so, b) does the general level of tightness-looseness change?

From a cross-cultural perspective to within-country variation. As already mentioned, cross-cultural psychology generally treats countries as homogeneous units,

assuming that every member of a certain culture shares the same set of cultural characteristics with other members of that culture (Valsiner, 2003). Although in many cases, such a generalisation may be justified, there is still evidence that intracultural differences are often larger than variations between cultures (Realo & Allik, 1999, 2002).

For example, although the US is regarded as a prototypical individualistic culture, studies have shown that the Southern US is rather collectivistic as opposed to the more individualistic Great Plains and Mountain West areas (Vandello & Cohen, 1999). Although Estonia is a much smaller country, with only 1.3 million inhabitants (population density 29/km²), similar tendencies are still evident. For instance, Realo, Allik, and Vadi (1997) showed that different population groups (inhabitants of an isolated island, army conscripts, or housewives with many children, etc.) had remarkably different patterns of collectivism: one group was highly collectivistic in one domain of social relations and on the average level in some other domain. In addition, ethnic Estonians have been found to be less collectivistic than ethnic Russians living in Estonia (Realo & Allik, 1999). Such results clearly illustrate the importance of using samples that would be representative of the whole population and paying attention to within-country differences. Although the importance of representative samples in cross-cultural research has been clearly acknowledged for a long time (Van Raaij, 1978), research in the social sciences still largely involves university students. As already mentioned, the same applies to studies about tightness-looseness, and Gelfand and colleagues (2011) themselves also admit that the samples used in their study were not all representative across nations (on average, 49.2% of respondents were students). Indeed, in one broad analysis of various behavioural measures (Henrich, Heine, & Norenzayan, 2010), there was strong evidence that samples consisting of well-educated young western respondents are remarkably different from other populations around the world, even in simple visual perception tasks, but also in moral reasoning, self-concepts, and heritability of IQ (these being just a few examples).

In the current study, large nationally representative samples make it possible to also probe within-country variation in Estonia. The following variables, which were available in both datasets, were selected for grouping: (a) the language in which the respondent completed the questionnaire (Estonian or Russian); (b) gender; (c) age; (d) education level; and (e) place of residence (from big city to village or farm). These particular variables were chosen because previous research about social norms, values, and identities has indicated these as potential sources of intracultural diversity (see e.g., Hofstede & Hofstede, 2005 for a review).

It was particularly important to check whether there are differences in tightness ratings among respondents who filled the questionnaire in Estonian compared with those who answered in Russian, because several studies have shown differences in value patterns (for example) between the Estonian-speaking majority and the Russian-speaking minority in Estonia (T. Tulviste, Mizera, & De Geer, 2012; T. Tulviste, Konstabel, & P. Tulviste, 2013; T. Vihalemm & Kalmus, 2008). The language used to respond was chosen rather than respondent's nationality because data from the year 2012 lacked information about respondents' nationality. It was also expected that the language used to respond to the survey would better indicate whether the respondent is influenced by the Estonian- or Russian-speaking cultural environment, and that this would influence social norm perception more than ethnicity.

Measurement invariance between the two datasets and between different subgroups was assessed before any comparisons were made, because scalar measurement invariance is a requirement for valid contrasting of group means, especially when comparisons are made across time (Davidov, 2008); see more information about measurement invariance in the *Materials and Methods* section).

Country specific information: Estonia. The example of Estonia is particularly interesting, because—as already noted—it was the second loosest country (after the Ukraine) in the study by Gelfand and colleagues (2011).

Estonia is a country in the Baltic region of Northern Europe. The two main ethnic groups of the population are Estonians (69.8%) and Russians (24.8%). In early 2002, when our first set of data was collected, Estonia was still going through major developmental changes. The country had re-established independence in 1991, but was still aiming to join the European Union (EU) and the North Atlantic Treaty Organization (NATO), both of which happened in 2004. Lauristin and P. Vihalemm (2008) contend that, after going through the stages of radical reform (1992–1995) and economic stabilisation, as well as technological modernisation (1995–1999), the years 1999–2004 in Estonia were mainly characterised by integration with Europe. Joining the EU and NATO can be viewed as the end of the transition period. During the years 2005–2007, the country enjoyed around 10% growth in GDP per year (<http://www.stat.ee/29958>) and this period was defined by an increase in economic wellbeing, as well as general life satisfaction, although, at the same time, public debate about the national identity and future of Estonia was heated (Lauristin & P. Vihalemm, 2008).

In 2007, however, the economy began to cool down. While, during the transition phase, striving for personal autonomy and little concern for the “common good” were

prevalent attitudes in Estonia (T. Vihalemm & Kalmus, 2008), the economic crisis² shifted attention to social development and intensified calls for social reforms (Lauristin, 2011).

It can be hypothesised that the financial restrictions applied during the economic crisis, as well as new rules and regulations, that came into effect after joining the EU and NATO have made the general environment in which people act less flexible (those being only a few examples of the processes that took place in the relatively young democracy). The same changes can also be viewed in the opposite way: as diminishing the borders between countries and encouraging more intercultural interaction and thereby blurring existing national social norms. It has been claimed that older and more stable groups or organisations tend to be tighter (Gelfand et al., 2006), yet, at the same time, no major changes, at least in the values of Estonians, have taken place at the beginning of the 21st century (Realo, 2013).

Materials and Methods

Tightness-Looseness Scale (TLS)

In the current study the 6-item tightness-looseness scale developed by Gelfand and colleagues (Gelfand et al., 2011) was used. The scale targets the strength, clarity and number of social norms (in a country), the degree of tolerance for deviance from the norms, and overall compliance with social norms in a nation with items like “*There are many social norms that people are supposed to abide in this country*” and “*In this country, if someone acts in an inappropriate way, others will strongly disapprove*” (see the original TLS scale, as well as translations to Estonian and Russian, in Appendix).

In the 33-nation study by Gelfand and colleagues (2011), the tightness-looseness scale showed a single-factor structure, with the first factor explaining 62% of the underlying variance in an exploratory factor analysis (including data from all 33 nations, $N = 6,823$). Factor loadings were .68 or greater, with the exception of (reverse-coded) item #4, which had a loading of .26, in the expected direction. The national-level reliability of the scale was very good (Cronbach’s $\alpha = .85$) and the validity across nations was also demonstrated by showing that the factor structure obtained across nations is equivalent to the factor structures found separately in each nation.

The instructions given to respondents were that the statements refer to the country as a whole, and that the statements refer to “social norms”, which are standards for behaviour that

² The gross domestic product (GDP) in Estonia declined by 4% in 2008 and by a further 14% in 2009, and was still at the level of 2006 in 2012; source: <http://www.stat.ee/29958>.

are generally unwritten. The respondents rated the items on a 6-point Likert-type scale, ranging from “*Strongly disagree*” to “*Strongly agree*”. The scale was translated to Estonian by Anu Realo (accuracy verified by back-translation to the original language) for data collection in Gelfand et al.’s (2011) study and to Russian by a bilingual expert of both the Estonian and Russian languages.

Participants

ESCP2002. The first sample came from a study of social capital, cultural value dimensions, and identity in Estonia in 2002 (Estonian Survey of Culture and Personality, *ESCP2002*). The project’s principal investigators were Jüri Allik, Anu Realo, and Aune Valk from the University of Tartu. The questionnaire consisted of several parts, from which only the tightness-looseness measure was relevant for the present study. The sample was randomly selected from the National Census and was representative of the Estonian population in terms of age, gender, ethnicity, place of residence, and educational level. The survey was carried out by TNS Emor, a leading marketing research and consultation company in Estonia (for the sample description, see also Pullmann, Allik, & Realo, 2009)).

Altogether, 1,753 respondents aged 15–74 participated in *ESCP2002*. Complete data (with no missing values) were available for 1,582 people (889 female, 693 male; mean age 43.5, $SD = 17.4$): 1,328 (84%) of the respondents who filled in the questionnaire in Estonian and 254 (16%) in Russian. Nineteen per cent of participants had completed primary (1–9 years), 45% secondary (10–12 years), and 36% tertiary (13 years or more) education. Twenty-six per cent of respondents lived in a big city or its suburbs, 30% in a small city or town, and 44% on a farm or in a village.

ESS2012. The second sample is part of the European Social Survey round 6 (*ESS2012*), carried out in 30 European countries (<http://www.europeansocialsurvey.org>). The sample was again randomly selected from the Estonian population and was representative for all residents of private households, aged 15 and over, regardless of their citizenship, nationality, or language. The survey was organized by the University of Tartu in collaboration with fieldwork agencies Saar Poll and Norstat.

In total, 2,095 respondents aged 15–94 years participated in the ESS 6th round survey in Estonia. Data with no missing values were available for 1,883 participants aged 15–74 years (1,063 female, 820 male; mean age 44.9, $SD = 16.7$ years). Seventy per cent ($n = 1,324$) of the respondents answered in Estonian and 30 per cent ($n = 559$) in Russian. Eleven per cent of the participants had at least primary, 38% secondary, and 51% tertiary education.

Thirty-six per cent of respondents lived in a big city or its suburbs, 33% in a small city or town, and 31% on a farm or in a village.

Data Analysis

Reliability and validity of the tightness-looseness scale. Internal consistency of the scale was assessed by Cronbach's α , and a confirmatory factor analysis (CFA; Maximum likelihood method) was used to verify whether the single-factor tightness-looseness model proposed by Gelfand and colleagues (2011) fit the data well. Although the Weighted Least Squares method has previously been suggested for CFA with ordinal variables (Yang-Wallentin, Joreskog, & Luo, 2010), new studies have found that, with 5 or more categories, the Maximum Likelihood method provides comparable results with the Weighted Least Squares method (Bandalos, 2014), and is slightly more accurate when the assumption of normality is violated (Rhemtulla, Brosseau-Liard, & Savalei, 2012).

Measurement invariance. SPSS Amos (v. 22) was used to establish measurement invariance (MI) over time (i.e., between 2002 and 2012) and across different social subgroups defined by a) questionnaire language (*Estonian, Russian*); b) gender (*male, female*); c) age (*15-29, 30-44, 45-59, 60-74*; groups optimized to balance the number of respondents in each group and to roughly correspond to different life stages: studying and specializing, early and late working life, retirement); d) education level (*primary*: 1-9 years of education, *secondary*: 10-12 years of education, and *tertiary* 13 or more years of education); and e) domicile (*big city and suburbs, small city or town, country village or farm*). Descriptive statistics about the distribution of respondents among different subgroups are presented in *Results*, Table 5.

The single-factor MI model was constructed according to the guidelines described by van de Schoot, Lugtig, and Hox (2012) where *response to a questionnaire item (X)* would be defined as

$$X = b_0 + b_1 \times ksi + b_2 \times \text{error} \text{ (Equation 1)}.$$

In Equation 1 (Eq. 1) b_0 indicates the item intercept, b_1 the regression coefficient (factor loading in the standard solution), ksi the latent variable (tightness-looseness), and b_2 the regression coefficient of the residual variance (*error*).

To compare the factor loadings across groups, the latent factor (ksi) mean was constrained to 0 and its variance was equal to 1. Also, the regression coefficients of the residual variance were fixed to 1 (b_2 in Eq. 1), and the means of the residual variances were fixed to 0.

MI was measured at four different levels: 1) *configural MI*, which confirms that the proposed single-factor model is valid in each of the subgroups studied in both of the datasets; 2) *metric MI*, which adds the assumption that factor loadings of the items are equal across groups (b_1 in Eq. 1, 3); and *scalar MI*, which adds the assumption that item intercepts (b_0 in Eq. 1) are also equal across groups. Scalar MI allows the conducting of comparisons of means between the datasets and across different subgroups (Davidov, 2008; Meredith, 1993). In addition, *strict MI* (sometimes called *full uniqueness MI*) means that residual (error in Eq. 1) variances are also equal across groups.

Across-time and within-country differences in tightness-looseness scores were tracked with a univariate analysis of variance (ANOVA) and Student's *t*-test using SPSS v. 22.0.

Results

Reliability and Validity of the Tightness-Looseness Scale

Table 1 shows the correlations between the six TLS items, separately for the *ESCP2002* and *ESS2012* data. Although item #4 was designed to be a reverse-coded item, it shows positive correlations with the other five items in the scale. Item #4 also had, on average, the lowest correlations with the other items in the scale.

Table 1

Inter-item correlations between tightness-looseness scale items

ESCP2002	Item 2	Item 3	Item 4	Item 5	Item 6
Item 1	.38 **	.19 **	.12 **	.12 **	.09 **
Item 2		.41 **	.07 *	.19 **	.26 **
Item 3			.13 **	.22 **	.32 **
Item 4				.00 ns	.16 **
Item 5					.26 **
ESS2012					
Item 1	.58 **	.33 **	.24 **	.26 **	.18 **
Item 2		.45 **	.22 **	.29 **	.28 **
Item 3			.24 **	.28 **	.35 **
Item 4				.22 **	.18 **
Item 5					.34 **

Note. * $p = .003$; ** $p < .0001$

Internal consistency. Cronbach's α for the 6-item scale (item #4 reversed according to the expected model) was .47 in the *ESCP2002* data and .51 in the *ESS2012* data. When item #4 was left out, Cronbach's α increased to .61 for the *ESCP2002* data and to .71 for the *ESS2012* data. Therefore, item #4 was left out of all further analysis. Excluding any other single item did not improve internal consistency of the scale³.

Model fit. CFA was used to test whether the single-factor tightness-looseness model proposed by Gelfand et al (2011) fits the current data. In the *ESCP2002* data, factor loadings of the items varied between .33 (item 5) and .69 (item 2) in the initial 5-item model, and the model did not reach an acceptable fit in an adjusted goodness of fit index (AGFI) = .92, CFI = .89, and RMSEA = .11⁴. Modification indices showed strong covariances between the residuals of items #1 and #2 (modification index (mod. ind.) = 44.8 and parameter change (par. ch.) = 0.2), and between the residuals of items #5 and #6 (mod. ind. = 30.6 and par. ch. = 0.2).

After adding the covariance between items #1 and #2, the model fit was very good (AGFI = .98, CFI = .98, RMSEA = .06) and the factor loadings of the items varied between .26 (item #1) and .68 (item #3). The covariance value between items #1 and #2 was .29. When covariances between items #1 and #2 and items #5 and #6 were included, the modified model showed a nearly perfect fit to the data (AGFI = .997, CFI = 1.00, RMSEA < .00); the factor loadings in the modified model varied between .26 (item #1) and .72 (item #3), with the residual covariance values being .29 between items #1 and #2 and .13 between items #5 and #6.

In the *ESS2012* data, the factor loadings of the 5 items varied between .40 (item #6) and .80 (item #2) in the initial model, but as in the *ESCP2002* data, the model failed to reach an acceptable level of fit (AGFI = .87, CFI = .89, RMSEA = .14). Modification indices again highlighted error covariances between several items, the strongest covariance being between items #5 and #6 (mod. ind = 89.4, par. ch. = 0.23). Allowing residual covariance between items #5 and #6 did not lead to a clearly acceptable model fit (AGFI = .92, CFI = .94, but RMSEA = .12). Using the same modification that was used for the *ESCP2002* data, and

³ To test whether the problems with item #4 might reflect difficulties in sentence comprehension, we checked whether item #4 would fit the expected model, among highly educated respondents. Among people who had higher education, the average correlation between reversed item #4 and the other TLS items was -.04 in the *ESCP2002* and -.22 in the *ESS2012* data. Average correlations between other TLS items varied between .19 and .34 among higher educated respondents in the *ESCP2002* sample and between .29 and .40 in the *ESS2012* sample, showing that the item did not work as expected, even among highly educated respondents.

⁴ We followed the advice of van de Schoot and colleagues (2012) for evaluating the model fit—comparative fit index (CFI) > .9 and root means square error of approximation (RMSEA) < .08).

adding covariances between items #1 and #2, and items #5 and #6 to the model, improved the fit considerably (AGFI = .97, CFI = .99 and RMSEA = .06). The item factor loadings in the modified model varied between .43 (item 5) and .71 (item 3). The residual covariance value between items 1 and 2 was .40 and between items 5 and 6 .18.

Testing across-time and within-country measurement invariance (MI). First, in order to find out if it is possible to compare the mean tightness-looseness scores in the *ESCP2002* and *ESS2012* surveys, MI of the tightness-looseness scale was tested to establish to what extent the scale produces comparable results over time (see Davidov, 2008). Based on the above-described CFA models, I used the single-factor model (with 5 items) for tightness-looseness and allowed the residuals of items #1 and #2, and items #5 and #6 to covary.

First, the MI results between the two datasets (*ESCP2002* and *ESS2012*) are presented as a whole and, thereafter, in the different subgroups of the *ESCP2002* vs. *ESS2012* data (see *Materials and Methods* for detailed subgroup descriptions).

The comparison between *ESCP2002* and *ESS2012* datasets indicated an acceptable fit at the scalar MI level (CFI = .93, RMSEA = .06), which, as already mentioned, is a necessary precondition for comparing mean scores. In the *ESCP2002* vs. *ESS2012* subgroup-comparisons (e.g., males in *ESCP2002* vs. *ESS2012*), scalar MI criteria (CFI > .9, RMSEA < .08) were met for all subgroups, except the oldest age group (65–74 years). Table 2 gives an overview of the detailed results.

Table 2

Measurement invariance between ESCP2002 and ESS2012 data: Single-factor model with 5 items (item #4 excluded; items #1 and #2, and items #5 and #6 covarying)

<i>ESCP2002</i> vs. <i>ESS2012</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	26.97	6	.000	.99	.03	94.97
Metric	58.15	11	.000	.98	.04	116.15
Scalar	207.25	16	.000	.93	.06	255.25
Strict	370.33	21	.000	.87	.07	408.34

Comparisons between <i>ESCP2002</i> vs. <i>ESS2012</i> samples by different subgroups						
Questionnaire language						
<i>Estonian</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	32.93	6	.000	.99	.04	100.93
Metric	76.12	11	.000	.97	.05	134.12
Scalar	227.94	16	.000	.91	.07	275.94
Strict	336.16	21	.000	.86	.08	374.16

(Table 2 continued)

<i>Russian</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	8.84	6	.183	1.00	.02	76.84
Metric	22.81	11	.019	.98	.04	80.81
Scalar	64.12	16	.000	.92	.06	112.13
Strict	129.69	21	.000	.81	.08	167.69
Gender						
<i>Male</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	19.52	6	.003	.99	.04	87.52
Metric	22.88	11	.018	.99	.03	8.88
Scalar	105.23	16	.000	.93	.06	153.23
Strict	195.62	21	.000	.85	.07	233.62
<i>Female</i>						
Configural	16.85	6	.010	.99	.03	84.85
Metric	59.18	11	.000	.97	.05	117.18
Scalar	130.19	16	.000	.93	.06	178.19
Strict	213.65	21	.000	.88	.07	251.65
Age						
<i>15-29</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	13.16	6	.041	.99	.04	81.16
Metric	32.34	11	.001	.97	.05	90.34
Scalar	68.12	16	.000	.92	.06	116.12
Strict	103.66	21	.000	.88	.07	141.66
<i>30-44</i>						
Configural	6.56	6	.364	1.00	.01	74.56
Metric	20.13	11	.044	.99	.03	78.13
Scalar	78.78	16	.000	.90	.07	126.78
Strict	111.17	21	.000	.86	.07	149.17
<i>45-59</i>						
Configural	9.59	6	.143	1.00	.03	77.59
Metric	20.59	11	.038	.99	.03	78.59
Scalar	49.80	16	.000	.95	.05	97.81
Strict	106.20	21	.000	.88	.07	144.21
<i>60-74</i>						
Configural	19.94	6	.003	.98	.05	87.94
Metric	57.18	11	.000	.94	.07	115.17
Scalar	112.37	16	.000	.87	.09	160.37
Strict	157.38	21	.000	.82	.09	195.38
Level of Education						
<i>Primary</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	18.93	6	.004	.96	.07	86.93
Metric	24.53	11	.011	.96	.05	82.53
Scalar	33.24	16	.007	.95	.05	81.25
Strict	73.63	21	.000	.84	.07	111.63

(Table 2 continued)

<i>Secondary</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	12.15	6	.059	.99	.03	80.15
Metric	35.87	11	.000	.98	.04	93.87
Scalar	100.86	16	.000	.92	.06	148.86
Strict	137.90	21	.000	.89	.06	175.90
<i>Tertiary</i>						
Configural	10.34	6	.111	1.00	.02	78.34
Metric	27.87	11	.003	.99	.03	85.87
Scalar	143.23	16	.000	.91	.07	191.23
Strict	199.56	21	.000	.87	.08	237.56
Place of residence						
<i>Big city & suburbs</i>	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	13.83	6	.032	.99	.04	81.83
Metric	21.73	11	.027	.99	.03	79.73
Scalar	56.28	16	.000	.95	.05	104.28
Strict	127.84	21	.000	.87	.07	165.84
<i>Small city or town</i>						
Configural	12.61	6	.050	.99	.03	8.62
Metric	25.48	11	.008	.99	.04	83.49
Scalar	80.12	16	.000	.94	.06	128.12
Strict	117.54	21	.000	.90	.07	155.54
<i>Village or farm</i>						
Configural	12.58	6	.050	.99	.03	80.58
Metric	3.82	11	.001	.98	.04	88.82
Scalar	90.70	16	.000	.92	.06	138.70
Strict	159.76	21	.000	.85	.07	197.76

One of the aims of the current study was to probe the within-country variance in tightness-looseness scores. Therefore, MI tests within surveys are necessary to find out whether comparisons of the mean tightness-scores of different subgroups are feasible. The subgroups used for categorisation, as indicated above, were *Questionnaire language*, *Gender*, *Age*, *Education level*, and *Place of Residence*. In the *ESCP2002* sample, all subgroups met strict MI criteria (all CFI-s > .90, all RMSEA-s < .06; see Table 3 for detailed results), except for the oldest subgroup (65–74 years) of the *Age* variable, which had to be left out to achieve acceptable criteria (both at the scalar and strict MI levels). In the *ESS2012* data, all subgroups met the strict MI criteria (all CFI-s > .97, all RMSEA-s ≤ .05; see Table 4 for detailed results).

Table 3

Measurement invariance between different subgroups in the ESCP2002 data: Single-factor model with 5 items (item #4 excluded; items #1 and #2, and items #5 and #6 covarying)

Questionnaire language	χ^2	df	p	CFI	RMSEA	AIC
Configural	7.71	6	.260	1.00	.01	75.71
Metric	21.34	11	.030	.99	.02	79.34
Scalar	91.89	16	.000	.92	.06	139.89
Strict	108.96	21	.000	.91	.05	146.96
Gender						
Configural	6.09	6	.413	1.00	.00	74.09
Metric	11.62	11	.393	1.00	.01	69.62
Scalar	19.78	16	.230	1.00	.01	67.78
Strict	30.10	21	.090	.99	.02	68.10
Age						
<i>Age group 65–74 included</i>						
Configural	19.31	12	.081	.99	.02	155.31
Metric	78.20	27	.000	.94	.04	184.20
Scalar	149.83	42	.000	.88	.04	225.83
Strict	203.57	63	.000	.85	.04	237.57
<i>Age group 65–74 excluded</i>						
Configural	9.08	9	.430	1.00	.00	111.08
Metric	35.91	19	.011	.97	.03	117.91
Scalar	55.29	29	.002	.96	.03	117.29
Strict	101.76	43	.000	.91	.03	135.76
Level of Education						
Configural	9.57	9	.386	1.00	.01	111.57
Metric	18.92	19	.462	1.00	.00	100.92
Scalar	70.94	29	.000	.95	.03	132.94
Strict	119.98	39	.000	.91	.04	161.98
Place of Residence						
Configural	7.46	9	.589	1.00	.00	109.46
Metric	13.92	19	.789	1.00	.00	95.92
Scalar	29.31	29	.449	1.00	.00	91.31
Strict	34.09	39	.693	1.00	.00	76.09

Table 4

Measurement invariance between different subgroups in the ESS2012 data: Single-factor model with 5 items (item #4 excluded; items #1 and #2, and items #5 and #6 covarying)

Questionnaire language	χ^2	<i>df</i>	<i>p</i>	CFI	RMSEA	AIC
Configural	34.05	6	.000	.99	.05	102.05
Metric	55.02	11	.000	.98	.05	113.02
Scalar	60.47	16	.000	.98	.04	108.85
Strict	63.56	21	.000	.98	.03	101.56
Gender						
Configural	30.29	6	.000	.99	.05	98.29
Metric	41.69	11	.000	.98	.04	99.69
Scalar	45.17	16	.000	.98	.03	93.17
Strict	55.26	21	.000	.98	.03	93.26
Age						
Configural	29.94	12	.003	.99	.03	165.94
Metric	50.92	27	.004	.99	.02	156.92
Scalar	73.37	42	.002	.98	.02	149.37
Strict	112.03	63	.000	.97	.16	146.03
Level of Education						
Configural	31.88	9	.000	.99	.04	133.84
Metric	44.37	19	.001	.99	.03	126.37
Scalar	52.51	29	.005	.99	.02	114.51
Strict	85.32	39	.000	.98	.03	127.32
Place of Residence						
Configural	31.57	9	.000	.99	.04	133.57
Metric	47.15	19	.000	.99	.03	129.15
Scalar	53.26	29	.004	.99	.02	115.26
Strict	71.91	39	.001	.98	.02	113.91

To sum up, the MI analysis showed that it is feasible to compare mean tightness-looseness scores between the *ESCP2002* and *ESS2012* samples, and also between different subgroups within both samples, because the scalar MI criteria were met. The only exception was the oldest age group (65–74 years) in the *ESCP2002* data and, therefore, this age group is not included in the following across-time and within-country (*ESCP2002*) comparisons.

Across-Time Change and Within-Country Variance in Tightness-Looseness Scores

Figure 3A shows that the mean tightness-looseness score is higher in the *ESS2012* than in the *ESCP2002* data (\pm 95% confidence intervals indicated by error bars; see Table 5 for descriptive statistics), and the effect is statistically significant, although the effect size is

small ($F(1, 3463) = 35.49, p < .001, \eta_p^2 = .010$; all reported p -values are Bonferroni-corrected for multiple comparisons). The same tendency is evident across all social subgroups studied.

To check whether questionnaire language, respondent gender, age, education level, or place of residence would, in addition to data source (*ESCP2002* vs. *ESS2012*), contribute to the differences in the average tightness scores, the aforementioned variables were added one-by-one into a two-way factorial ANOVA model (together with the *data source*-factor).

As there were no significant differences in the average tightness scores between people who had filled in the questionnaire in Estonian and those who had filled it in in Russian (Fig 3B, see Table 5 *Language* for descriptive statistics), those respondents are not separated in further analysis.

Table 5

Average tightness scores in Estonia in the 2002 (ESCP2002) vs. 2012 (ESS2012) overall above, and broken down in different social subgroups below

	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	η_p^2
ESCP2002	1582	3.86	0.77	35.49	< .001	.010
ESS2012	1883	4.02	0.74			

Subgroups	ESCP2002			ESS2012			ESCP2002 vs. ESS2012		
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	η_p^2
Questionnaire Language									
<i>Estonian</i>	1328	3.86	0.76	1324	4.02	0.76	28.78	< .001	.008
<i>Russian</i>	254	3.87	0.80	559	4.01	0.70	6.14	.013	.002
Gender									
<i>Male</i>	693	3.80	0.79	820	4.02	0.74	31.47	< .001	.009
<i>Female</i>	889	3.91	0.75	1063	4.01	0.75	8.99	.003	.003
Age									
<i>15-29</i>	410	3.77	0.65	443	4.00	0.77	20.11	< .001	.008
<i>30-44</i>	430	3.83	0.74	464	4.06	0.68	22.12	< .001	.008
<i>45-59</i>	359	3.89	0.85	526	3.95	0.74	1.48	n.s.	.001
<i>60-74</i>	383	3.98	0.82	450	4.06	0.77		MI not achieved	
Education Level									
<i>Primary</i>	301	3.95	0.82	215	4.05	0.71	2.39	n.s.	.001
<i>Secondary</i>	713	3.90	0.75	713	4.00	0.78	5.74	.017	.002
<i>Tertiary</i>	568	3.77	0.76	955	4.02	0.72	40.27	< .001	.012
Place of residence									
<i>Big city</i>	403	3.83	0.78	670	4.00	0.70	13.18	< .001	.004
<i>Town</i>	480	3.85	0.77	623	4.01	0.79	12.71	< .001	.004
<i>Village or farm</i>	690	3.90	0.76	590	4.05	0.74	12.4	< .001	.004

As expected, the main effect of *data source* (*ESCP2002* vs. *ESS2012*) was significant in all comparisons ($F(1, 2626-3461) = 21.65-38.34, p < .001, \eta_p^2 = .006-.011$). In addition to *data source*, only *education level* (see Figure 3E) showed a significant main effect ($F(2, 3459) = 4.08, p = .017, \eta_p^2 = .002$), with the average tightness score being higher for people who have a lower education level, but the difference was significant only between primary and tertiary education (for all mean values, see Table 5).

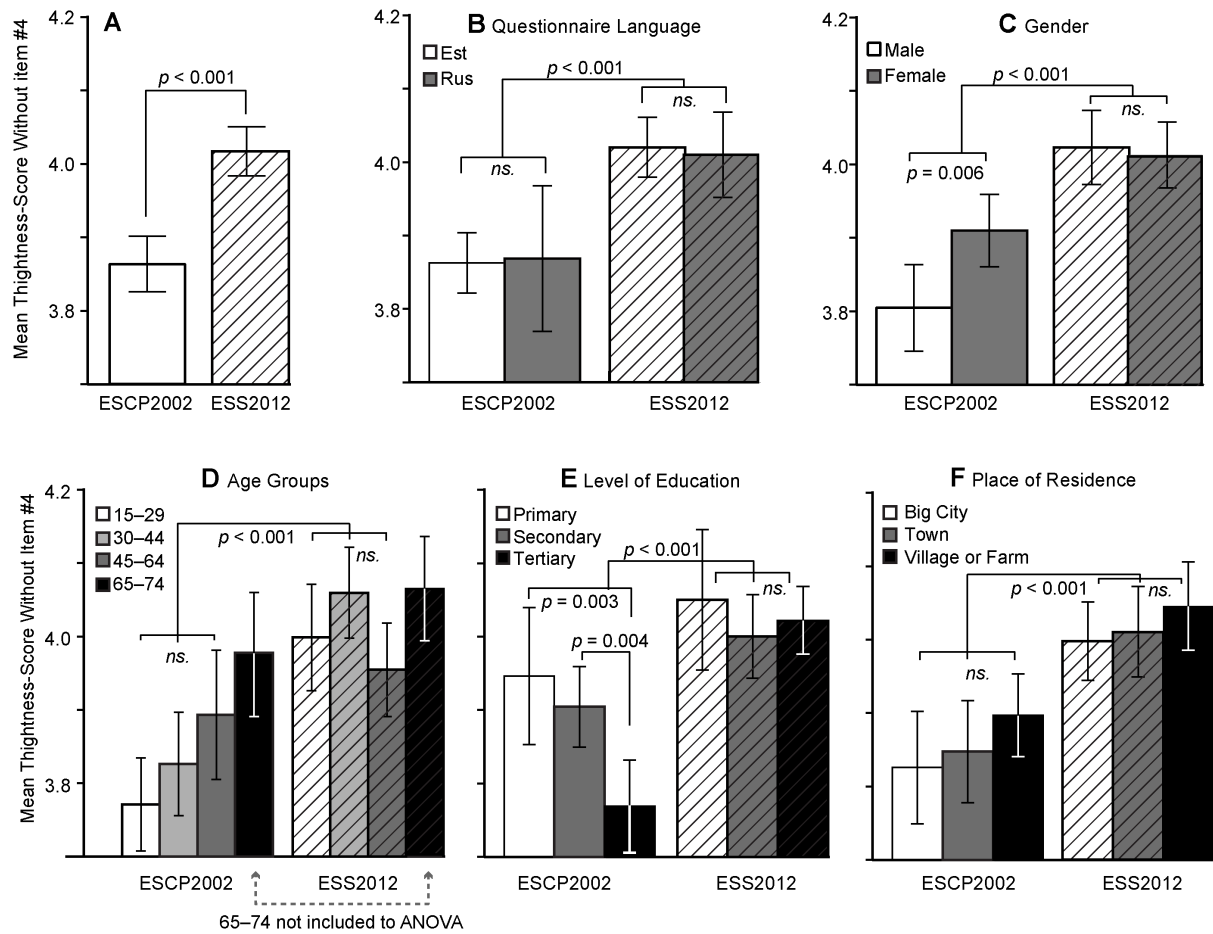


Figure 3. Differences in average tightness-looseness scores in 2002 (*ESCP2002*) vs. 2012 (*ESS2012*) as a whole (A), and subsequently in different social subgroups, divided by questionnaire language (B), gender (C), age (D), education level (E), and place of residence (F). All p -values are Bonferroni-corrected.

Several factors showed statistically significant interactions with *data source*. The interaction between *data source* and *gender* ($F(1, 3461) = 4.96, p = .026, \eta_p^2 = .001$) indicated that the tightness of men had risen more than that of female respondents (all mean values are presented in Table 5), and the difference between men and women was significant only in the *ESCP2002* data ($F(1, 1580) = 7.60, p = .006, \eta_p^2 = .002$).

The interaction between *data source* and *respondent age* ($F(2, 2626) = 3.72, p = .024, \eta_p^2 = .003$) revealed that tightness scores have risen the most among 15–29 ($F(1, 2626) = 20.1, p < .001, \eta_p^2 = .008$) and 30–44 years old respondents ($F(1, 2626) = 22.1, p < .001, \eta_p^2 = .008$). While in the *ESCP2002*, sample tightness scores increased with age (although the effect was statistically non-significant), in the *ESS2012* sample there was no significant difference in tightness scores between the age groups. As already mentioned, the group of 60–74-years-olds was not included to the ANOVA analysis, because the scalar MI assumption was not fulfilled for this group.

Data source and *level of education* also revealed a significant interaction in average tightness scores ($F(2, 3459) = 4.37, p = .013, \eta_p^2 = .003$), meaning that, in 2002, tightness scores decreased with higher education level, but, in the *ESS2012* sample, there was no significant difference in tightness between the three education levels. Tightness rose significantly among people with secondary ($F(1, 3459) = 5.74, p = .017, \eta_p^2 = .002$) and tertiary education ($F(1, 3459) = 40.27, p < .001, \eta_p^2 = .012$).

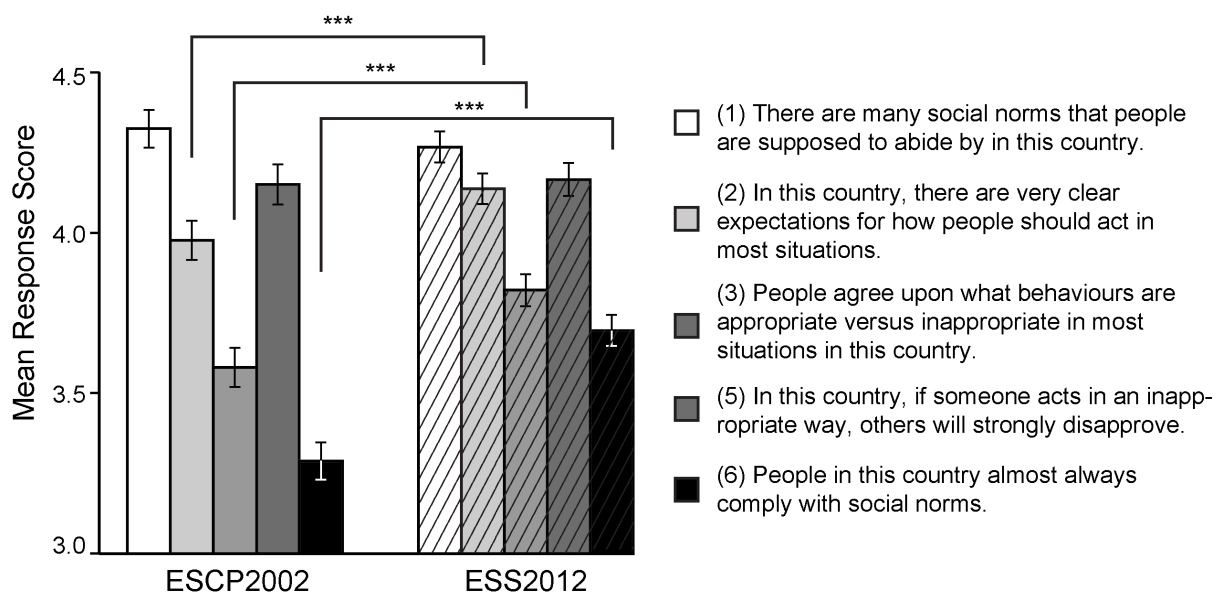


Figure 4. Average response scores to five TLS items (item #4 omitted) in 2002 (ESCP2002) vs. 2012 (ESS2012). *** $p < .001$

Across-time change in single-item responses. Finally, in order to better understand the factors behind the rise in average tightness scores from 2002 to 2012, the changes in response to single TLS items were tracked. A similar single-item analysis has previously been used by Pullmann, Allik, and Realo (2009), for instance. Figure 4 shows the mean (\pm 95% confidence intervals indicated by error bars) responses to single TLS items, separately

for the *ESCP2002* (left) and *ESS2012* (right) samples. It is evident that people still agree that there are rather many social norms in Estonia (item #1), and people will disapprove of inappropriate behaviour (item #5)—these perceptions have not changed in ten years.

At the same time, in the year 2012, people report having clearer expectations for how they should act in certain situations (item #2; *ESCP2002* $M = 3.98$, $SD = 1.25$, *ESS2012* $M = 4.14$, $SD = 1.06$; $t(3115) = -4.06$, $p < .001$, $d = -0.14$) and stronger general agreement upon appropriate and inappropriate behaviours (item #3; *ESCP2002* $M = 3.58$, $SD = 1.24$, *ESS2012* $M = 3.82$, $SD = 1.11$; $t(3202) = -6.01$, $p < .001$, $d = -0.20$). Also, compliance with social norms has significantly risen (item #6; *ESCP2002* $M = 3.29$, $SD = 1.18$, *ESS2012* $M = 3.70$, $SD = 1.07$; $t(3219) = -10.64$, $p < .001$, $d = -0.34$).

Discussion

Tightness-looseness indicates how strong and clear the social norms in a culture are, as well as how many norms there are: tight cultures have strong norms, with general agreement about acceptable behaviour and it is usually the case that others will generally disapprove of deviant actions. Loose cultures, on the contrary, have fewer or more heterogeneous social norms and higher tolerance for behaviour that differs from the norm. The aims of the current study were to examine the across-time change (over 10 years) and within-country variance of tightness-looseness in Estonia.

Measurement invariance (i.e., structural equivalence of the measured construct) across time and across different subgroups was a prerequisite for any comparisons of the mean tightness scores. Indeed, analyses showed that cultural tightness-looseness is a valid and reliable cultural construct with a similar, stable structure over a ten-year period within different social subgroups.

It became evident that respondents' perception of tightness in Estonia rose from the year 2002 to the year 2012, and had done so in all social subgroups studied, but the effect size was subtle. At the same time all the within-country differences that were present in 2002, had disappeared by the year 2012. In addition, responses to single tightness-looseness scale items revealed in both surveys that people believe that there are many social norms in Estonia, but, in 2012, respondents felt there was more general agreement on appropriate vs. inappropriate behaviour.

In the following, I discuss the reasons for why such changes in society have occurred, as well as how the concept of tightness-looseness complements current cultural research. I

also consider the properties and usability of the tightness-looseness scale developed by Gelfand and colleagues (2011), and bring out some interesting paths for future research.

The Strengthening of Social Norms in Estonia from 2002 to 2012

The current study revealed that cultural tightness in Estonia had risen from 2002 to 2012. The effect, although statistically significant, was small, with only 1% of the total variance in tightness scores accounted for. Compared with the results from Gelfand et al. (2011; data gathered 2000–2003), the average tightness score was the same in the present data for 2002 ($M = 3.86$; non-standardised tightness scores, courtesy by Michele Gelfand, June 10, 2011). In the 2012 sample, average tightness scores had risen to 4.02—this would shift Estonia from being one of the loosest countries (along with the Ukraine, Hungary, and the Netherlands) to somewhere in the middle of the 33-country tightness-ranking (close to Iceland and Poland) in Gelfand et al.'s (2011) data. Of course, we do not know how much tightness in the other countries has changed during the ten years since the data were collected for Gelfand et al.'s (2011) study.

In 2002, Estonia, although it had been independent again since 1991, was still a transitional country on a path of re-integration with Europe. As already mentioned in the introduction, joining the EU and NATO in 2004 can be viewed as the end of the transition period in Estonia (Lauristin & P. Vihalemm, 2008). Moving to a more stable state and adapting new norms through integration with Europe could, at least partially, contribute to the minor rise in tightness observed in the current study.

An item-level analysis revealed that, whereas the perceived amount of social norms had not changed from 2002 to 2012, people felt that the norms were clearer and there was more general agreement about appropriate vs. inappropriate behaviour in 2012 than in 2002. The expected compliance with social norms had also risen significantly.

The above-described rather subtle changes in perceived tightness-looseness follow a somewhat similar path with the dynamics of values in Estonia. On one hand, Realo (2013) contends that no major changes in values occurred from 1990 to 2011. In 2011, Estonia was still a highly secular country, where survival values outweighed self-expressive ones⁵. Still, a slight rise in self-expressive values was evident: for example, Estonians' trust in other people and tolerance towards minorities have steadily increased over time. Although, on the World Value Map, Estonia still remained in the same cluster with other Former Soviet Republics

⁵ According to Inglehart and Welzel (2010), *survival values* refer to economic and physical security and *self-expressive values* to subjective-wellbeing and self-expressive freedom.

and African countries in 2011, such a rise in self-expressive values indicates a shift towards Western and Northern European countries (Realo, 2013).

The fact that social norms were perceived more clearly and there was more agreement about appropriate vs. inappropriate behaviour in 2012 than 2002, might also explain why the within-country differences that were present in 2002 (tightness scores were slightly higher for females than males, and lower for people who had higher education compared with those who had primary or secondary education) had disappeared in 2012.

Tightness-looseness scores did not differ between the Estonian-speaking majority and the Russian-speaking minority, either in 2002 or in 2012. The dynamics of internal (personal) views of these two groups have been compared frequently over the transition period in Estonia (Magun & Rudnev, 2010; Sömer, 2011; T. Tulviste et al., 2013; T. Vihalemm & Kalmus, 2008). Realo (2013) concludes that the values of ethnic Estonians and Russians in Estonia have generally become more similar over time. Similarly, the identities (based on rankings of aspects that people consider important in life) of Estonians and Estonian Russians have homogenised from 2002 to 2005 (T. Vihalemm & Kalmus, 2008; T. Vihalemm, 2007). Triin Vihalemm (2007) also argues that the structure of identities was more clearly clustered in separate value-categories (like *sub-cultural identity*, involving similar tastes and values with other people or *network identity* involving family and friends) in 2005 than in 2002. These results support the idea that, following the end of the transition period, the views of people living in Estonia have become more similar.

Still, one might ask, why did the tightness-scores of Estonians and Estonian Russians not differ in 2002, when differences in values and identities were still larger (Realo, 2013; T. Vihalemm, 2007)? One suggestion would be that, if questions about values address a respondent's personal beliefs, then questions about social norms (tightness-looseness) refer to the country as a whole (e.g., "There are many social norms that people are supposed to abide by in this country"), therefore shifting the attention of the respondent to more external (and more general) than internal (and personal) issues.

How Does the Concept of Tightness-Looseness Complement Current Cultural Research?

The concept of tightness-looseness has received criticism from some researchers (Minkov, Blagoev, & Hofstede, 2012) mainly for two reasons: one question is whether tightness-looseness is an independent construct when it correlates moderately with other cultural constructs, e.g., individualism-collectivism and power distance. The second concerns

the fact that asking people about “social norms” may be too general—in other words we do not know what people mean exactly when they answer about *social norms* or whether respondents are really able to make a unified judgement about social norms at such a general level. In addition, Kates (2011) questions the correlative nature of connections between tightness-looseness and other constructs in the systems model proposed by Gelfand and colleagues (2011), as this does not allow the drawing of any real causal inferences (I address all of these issues in the following paragraphs).

At the same time Kates (2011) acknowledges “the effort, difficulty and utility” (p. 3) of the 33-nation study by Gelfand et al. (2011). Norenzayan (2011) also underlines the importance of understanding behavioural differences (and the grounds for these) across nations—he finds the broad study of tightness-looseness by Gelfand and colleagues (2011) especially useful, because it targeted a wide array of nations and bound together ecological, social, and individual variables that modulate cultural variability in the strength of social norms.

The position of tightness-looseness among other cultural constructs. This issue was already considered in the introduction, with the conclusion that, although tightness-looseness is moderately correlated with e.g., individualism collectivism (Carpenter, 2000; Gelfand et al., 2011), power distance, and conservatism (Gelfand et al., 2011), this does not mean that the strength and clarity of social norms are explained by those other constructs or that tightness-looseness could replace any of them. Instead, Gelfand and colleagues (2004) offered a binding model which connected tightness-looseness, individualism-collectivism, and hierarchy-egalitarianism into a three-dimensional structure and enabled a description of cultures within that space. Furthermore, empirical findings have shown that societal tightness-looseness actually modulates the predictive power of various cultural constructs (among others, individualism-collectivism and power distance), because those have significantly stronger predictive effects in tighter countries (Taras, Kirkman, & Steel, 2010).

What do we refer with “social norms”? In the current study, social norms were defined for respondents as standards of behaviour that are generally unwritten. Is this explanation enough for respondents to know what they should assess?

Minkov, Blagoev, and Hofstede (2012) studied attitudes towards ten morally debatable behaviours and found (similarly to Vauclair and Fisher, 2011) that the responses clustered into two factors, one of which (*personal-sexual*, including items about homosexuality, abortion, euthanasia, etc.) was more stable across cultures and had stronger correlations with cultural constructs like collectivism, conservatism, and power distance (and

with the autonomy-embeddedness value dimension in Vauclair and Fisher, 2011). The other factor (*illegal-dishonest*, probing the acceptability of breaking laws and rules) was less stable and correlated less with other constructs (Minkov et al., 2012; Vauclair & Fischer, 2011). Minkov and colleagues (2012) therefore claimed that measuring cultural tightness-looseness without indicating which specific social norms or situations are targeted, may result in inaccurate or mixed responses. On the other hand, Minkov and colleagues (2012) themselves acknowledged that it is possible that a particular tight society may approve certain behaviours while strongly discouraging others, and, in another tight society, the particular behaviours to which strict rules are targeted may be different, but it would not change the fact that the societies are tight.

While this last argument is valid, the broadness of the term “social norms” can be seen rather as a strength, because the focus of regulations may fall into different areas in different cultures or social groups: whilst in some countries personal life (e.g., decisions about divorce, abortion, etc.) is strongly regulated by e.g., norms derived from religion, in other countries the freedom to make personal choices is a value in itself, but clear rules still apply about how one should behave in society (e.g., respecting laws or taking into account common goals). It would be very challenging to ensure that all possible aspects that might define the strength of social norms in a culture are targeted by specific examples when conducting research. Still, assuming we could have such a conclusive list of situations, and could ask people how much those aspects are regulated in their culture, would we be able to draw feasible conclusions about the general strength and clarity of social norms in a particular culture when we already know that leaving a particular area of life unregulated may not be a sign of cultural looseness, but just a reflection of the fact that this domain is not central in that culture?

An illustration about clear differences in appropriate vs. inappropriate behaviours in certain situations comes from a recent study (Realo, Linnamägi, & Gelfand, 2014) that compared tightness scores with actual behaviour in Estonia and Greece. Although Estonia and Greece have relatively similar average tightness levels (Estonia ranked 32nd and Greece 25th among the 33 countries in Gelfand et al.’s (2011) study), some remarkable differences in situational behaviour were evident: for example, whereas singing and talking were considered highly appropriate behaviours at an Estonian funeral ceremony, in Greece they were strongly inappropriate—still, in both countries, a funeral ceremony was among the most constrained situations. Therefore, asking people only about the appropriateness of certain

behaviours in a limited number of situations may lead to inaccurate estimations about the strength of social norms in those societies.

That said, it is indisputably important to find real-life correlates for cultural tightness-looseness, and Gelfand and colleagues (2011) already demonstrated that tightness-looseness is related to everyday situational constraints: behaviour in everyday situations is more regulated in tight than in loose countries, and the general tightness level also correlates well with the ratings given about the appropriateness of certain behaviours in particular situations (e.g., argue in a job interview or kiss in a restaurant). Realo and colleagues (2014) directly showed that, although the strength of certain situations varies substantially within and across cultures, the reported situational constraint ratings of the members of a respective culture are reliable and in accordance with the actual general behaviour of that culture.

The Properties and Usability of the Tightness-Looseness Scale (TLS)

Gelfand and colleagues (2011) developed a 6-item TLS, which probes the strength and clarity of social norms in a culture. The current study found that the single factor structure remained stable over ten years and among different social subgroups. However, we had to exclude item #4 (“People in this country have a great deal of freedom in deciding how they want to behave in most situations”) from the analysis, as, although it was intended to be reverse-coded, it still correlated positively with the other items on the scale, which were all referring to strong social norms (although that item had the weakest inter-item correlations with the other TLS items). Similarly, Gelfand and colleagues (2011) point out that in their study the same item also had a considerably weaker factor loading (although in the theorised direction) than the other scale items. In the current case, the correlation between item #4 and the other TLS items did not improve even when only the highly educated respondents were included in the analysis. These results show that the problems in responding to item #4 do not merely reflect comprehension difficulties. One plausible explanation for why the item did not work as expected is the fact that the item did not include direct reference to social norms, or to the possible disapproval of other people. Therefore, respondents may have understood it as referring to democratic rights in general—people in this country have a great deal of freedom in choosing how they want to behave (as long as they do not care about the reactions of other people). The context of long social surveys, which the TLS was part of and where our data were gathered, might have reinforced the confusion.

Nevertheless, the current study proved, similarly to Gelfand and colleagues (2011), that the TLS is a useful tool for studying the strength and clarity of social norms. Although,

as discussed above, the broadness of the term “social norms” does not allow controlling for which particular norms or situations people have in mind when they answer the questions, it has already been shown that tightness-looseness measured by the TLS shows strong correlations with situational behaviour measures (Gelfand et al., 2011; Realo et al., 2014). If needed, adding questions about appropriate behaviours in certain situations is always possible in research, but, by using the general reference to social norms as “standards for behaviour that are generally unwritten” (Gelfand et al., 2011), we avoid the risk of missing some example situations which are particularly important in expressing social norms in a certain culture, or sampling situations which do not represent key socially regulated events in that culture. The fact that no specific situations are bound to TLS items also gives the possibility to use the same scale for measuring tightness at very different levels of culture, ranging from whole countries (as in the current case) to larger social subgroups, organisations, or even families and groups of friends—it is possible that different social subgroups in the same culture express different levels of tightness, and the TLS gives excellent possibilities for such comparisons.

Another advantage of the TLS is that, although compact, it differentiates between the perceived abundance of social norms (e.g., item #1 “There are many social norms that people are supposed to abide by in this country”) and the clarity of those norms (e.g., item #2 “In this country there are very clear expectations for how people should act in most situations”). This separation already proved useful in the current study, where people felt both in 2002 and in 2012 that there are many social norms in Estonia, but in 2012 the norms were clearer and there was more general agreement about how one should behave.

How Does Studying Tightness-Looseness Improve Our Understanding of Culture and its Relationship with Other Aspects of Life?

Gelfand and colleagues (2011) developed a systems model of tightness-looseness: it sees tightness-looseness as a hub, which binds together distal processes like ecological threats and the historical background of cultures on the one hand (cultures with higher threats require stronger norms), and contemporary processes like the degree of constraint in everyday situations and psychological adaptations (need for self-regulation is higher in tighter cultures) on the other. The connections between tightness and the aforementioned processes are bidirectional, because, e.g., autocratic regimes can enforce tighter social norms, but tighter cultures can also prefer strict leaders. The same is true for contemporary social adaptations: everyday situations are more structured in tighter cultures and therefore demand more self-

regulation at the individual level, but, at the same time, people living in these cultures are the ones who create and maintain tight norms.

Gelfand and colleagues (2011) found significant positive correlations between the strength of social norms and high population density, resource scarcity, history of territorial conflict and environmental threats, as well as the strength of structure and need for self-regulation in everyday situations. Tight cultures also tended to be more religious (measured as the percentage of people attending religious services) than loose ones. Kates (2011), on the other hand, criticises the fact that Gelfand et al. (2011) do not present many other findings to back up their theory about the connections between tightness-looseness and ecological or historical factors than the mostly moderate correlations found in their own study. Research in genetics (e.g., Mrazek et al., 2013) has now also specified the connections between tightness-looseness and ecological threats, showing that the relationship can be mediated by a specific allele in the serotonin transporter gene 5-HTTLPR—and hopefully future collaboration between social and biological researchers will further clarify the links between tightness-looseness and background ecological factors. Still, Norenzayan (2011) offers three distinct possibilities for the origins of population-level variations in behaviour (such as different strengths of social norms), namely (a) in addition to genetic transmission, there could be a cultural inheritance system which triggers intergroup variability, even when the living environment is similar; or on the contrary, (b) population differences could be the result of phenotypic plasticity triggered by environmental differences; or—combining the two first possibilities—(c) gene-culture coevolution takes place (see more in Laland, Odling-Smee, & Myles, 2010), meaning that certain cultural practices (like domestication of milk-producing mammals) affect certain gene frequencies (e.g., genes affecting adults' lactose absorption).

Although, taken together, the current knowledge allows us to claim that tightness-looseness could be considered an important aspect of an interrelated system that binds together ecological and historical factors, our genetic background, current societal processes, and individual behaviour, much work about understanding how these processes affect each other is still needed.

Future Directions

The current study showed that the level of tightness in a culture can change over a period of ten years. Estonia, however, is an example of a country that has gone through major transitional changes during the time period studied. It would also be crucial to study the temporal stability of tightness-looseness in other countries which have a more stable

historical background to find out whether and how much contemporary changes (like economic crisis, political tensions) affect the strength of social norms in a culture. Estonia is also a very small and, accordingly, a rather homogeneous country, therefore further research about the intracultural variations in tightness-looseness should target more heterogeneous societies.

As already mentioned, studying the differences in tightness-looseness with reference to smaller, intra-cultural groups like social minorities, organisations, or even families, would give important information about how much the strength and clarity of social norms varies inside a culture when the same individuals take part in different group activities. And turning the same question around—asking different individuals about the same group where they voluntarily (or by default) belong to, would enable finding out whether people (a) see the tightness of the same group similarly, (b) choose groups with a certain level of tightness if they have the possibility to do so, or even (c) whether some individual characteristics (e.g., personality, gene variations) correlate with the level of tightness that people prefer in their life.

Studying the factors that affect tightness (or that cultural tightness affects) has already given fruitful results, showing that historical and ecological threats as well as current psychosocial adaptations are related to cultural tightness (Gelfand et al., 2011). In addition, we now know that certain gene variations can modulate the relationships between moral judgements and cultural tightness (Mrazek et al., 2013). Probing the factors that mediate the strength of social norms should certainly continue to shed more light on exactly how the factors bound to the systems model of tightness-looseness by Gelfand and colleagues (2011), are interrelated.

Conclusions

This thesis targeted the across-time change and within-country variance of cultural tightness-looseness in Estonia over ten years, from 2002 to 2012. To our knowledge, the current study is the first that uses a large culturally representative sample to target these issues. The results showed that the average tightness score increased slightly, but significantly, during the ten-year period, whereas minor within-country variance was evident only in 2002, but not in 2012. Further research on tightness-looseness is needed to study the temporal changes in tightness-looseness both in more heterogeneous countries as well as in countries with a more stable political history. Probing the connections between tightness-looseness and other sociological and psychological, as well as biological variables, has

already started and will no doubt continue. In addition, tightness-looseness in smaller social subgroups should be targeted to see how much the strength of social norms varies in different groups inside a culture.

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Appendix

Original tightness-looseness scale developed by Gelfand and colleagues (2011): Response options (1–6) and items (top) and the Estonian (middle) and Russian version of the same scale (bottom)

1	2	3	4	5	6
Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. There are many social norms that people are supposed to abide by in this country.					
2. In this country, there are very clear expectations for how people should act in most situations.					
3. People agree upon what behaviors are appropriate versus inappropriate in most situations this country.					
4. People in this country have a great deal of freedom in deciding how they want to behave in most situations.					
5. In this country, if someone acts in an inappropriate way, others will strongly disapprove.					
6. People in this country almost always comply with social norms.					
1	2	3	4	5	6
ei ole üldse nõus	enamjaolt ei ole nõus	pigem ei ole nõus	pigem nõus	enamjaolt nõus	täiesti nõus
1. Eestis on palju sotsiaalseid norme, millest inimesed peaksid kinni pidama.					
2. Eestis on enamikes situatsioonides käitumise kohta selged reeglid.					
3. Eestis elavad inimesed on ühel nõul selles suhtes, millised on enamikes situatsioonides sobivad käitumisviisid ja millised mitte.					
4. Eestis elavatel inimestel on suur vabadus otsustada, kuidas nad enamikes situatsioonides käituda tahavad.					
5. Kui keegi käitub ebasobivalt, mõistavad teised selle kindlasti hukka.					
6. Eestis elavad inimesed käituvad peaaegu alati vastavalt sotsiaalsetele normidele.					
1	2	3	4	5	6
совершенно не согласен	в основном не согласен	скорее не согласен	скорее согласен	в основном согласен	абсолютно согласен
1. В Эстонии много социальных норм, которых люди должны бы придерживаться.					
2. В Эстонии в большинстве случаев есть конкретные правила поведения.					
3. Люди, живущие в Эстонии единогласны в мнении о том, какое поведение подходит и какое не подходит для большинства случаев.					
4. У людей, живущих в Эстонии, есть большая свобода решать, как они желают вести себя в большинстве ситуаций.					
5. Если кто-либо ведет себя неподобающим образом, другие обязательно отнесутся к этому с осуждением.					
6. Люди, живущие в Эстонии ведут себя почти всегда соответственно социальным нормам.					

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