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# Psychology of Trust: A Three Component Analytical Framework to Explain the Impact of Formal Institutions on Social Trust Formation

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# Psychology of Trust: A Three Component Analytical Framework to Explain the Impact of Formal Institutions on Social Trust Formation

**ABSTRACT**

Drawing on a social-cognitive theory of psychology, this study introduces a new conceptual framework to explain trust building by individuals and the role that formal rules and laws may play in this process. Trust is viewed as composed of cultural, communal, and contextual components, with the latter encompassing formal institutions. We demonstrate that the contextual component measured through three institutional indexes is the strongest predictor of social trust that may not only condition the importance of cultural and communal components for the process of trust formation, but also trigger changes in them. We also furnish evidence that this impact may vary across formal institutional types and suggest that the autonomy dimension of the institutional framework is particularly important for social trust building.

**Keywords**

interpersonal trust, trust formation, formal institutions, social-cognitive psychology

# Psychology of Trust: A Three Component Analytical Framework to Explain the Impact of Formal Institutions on Social Trust Formation

The classical approach considers trust as a cultural attribute that is influenced by an individual's internal values formed during early socialization processes (Fukuyama 2000; Putnam 1995, 2000). Recent studies dissociate trust building from an individual's personal attributes and externalize it to contexts within which trust formation processes unfold (Nooteboom 2007; Rothstein and Stolle 2001). Many refer to formal institutions as one such contextual factor (Farrell 2005; Farrell and Knight 2003).

The sociological analysis of institutional contexts' impact on trust is drawn upon a twofold definition of institutions. On the one hand, institutions are viewed as a set of public organizations that individuals interact with over the course of their lives. The process of trust formation proves affected by such organizations when citizens evaluate the quality of their performance (Edlund 2006; Mishler and Rose 2001) or that of elected officials (Thomas 1998). A positive experience with them motivates individuals to exhibit more trust towards these institutions and other people (Letki 2006; Murphy 2004; Tyler 2006). In eliciting trust, public authorities' trustworthiness does not need to be objectively valid. Rather, what matters is the perception that citizens have regarding these organizations (Levi 1998; Scholz and Lubell 1998; Steinmo 1993).

On the other hand, institutions are considered as a set of rules that define legal boundaries within which individuals are allowed – and expected – to act. Efficient

formal institutions are deemed to be conducive to establishing trust since they enforce third-party agreements (Herreros and Criado 2008). They enable individuals to pursue redress and restitution when cheated, thereby reducing the risk involved in trusting someone (Rothstein and Stolle 2001; Tillmar and Lindkvist 2007) and serving as a safety net for those who suffer because of others' dishonest behavior (Farrell 2005). If sanctions and penalties are imposed when a contract is breached, formal institutions may increase the cost of betrayal (Bohnet and Baytelman 2007) and overcome the information deficit problem by indicating what the likely actions of others will be (Farrell and Knight 2003). Formal institutions' impact is especially strong when formal rules are duly enforced (Oskarsson, Öberg, and Svensson 2009) and perceived by individuals as being fairly applied to various population groups (Oskarsson et al. 2009).

Despite the fact that both strands find empirical evidence for a positive relationship between the quality of formal institutions and trust levels, they exhibit a common deficiency: A clear formalization of the mechanisms through which formal institutional contexts impact trust is lacking. Several competing theories describe how trust emerges but none offers a clear conceptual framework that would integrate cultural and contextual determinants into a single analytical framework. Instead, most empirical studies either solely examine whether associations exist between trust levels and institutional scores while controlling for the socio-demographic characteristics of respondents (Herreros and Criado 2008). Or, they offer mathematical models, derived from the rational choice perspective (Zak and Knack 2001), which do not account for non-cognitive (cultural) forces beyond rational thinking that underlie an individual's decision-making regarding whether or not to trust. In both cases, it becomes

impossible to establish the complete set of channels through which formal institutions affect the trust formation process.

In addition, there is a problem of uni-dimensionality regarding the definition of institutions when they are limited to formal rules and laws. Institutional economics distinguishes between multiple types of institutions (Lim and Decker 2007; Persson and Tabellini 1994). By contrast, sociology's theoretical and empirical studies on trust rarely provide a precise conceptualization concerning the kinds of institutions they analyze, thereby implying that all formal rules and laws are equally important to interpersonal trust. This might not necessarily be true since particular formal rules often only regulate certain aspects of societal arrangements and each of them may affect only specific features of an individual's behavior. The institutional impact on trust is hence likely to be heterogeneous across different formal institutions. Ignoring this may lead to the false conclusion regarding which institutions actually matter in eliciting interpersonal trust and to what extent each of them does so.

This research's main objective is to introduce a new comprehensive model of trust formation by drawing on various theories of psychology. Since trust formation is governed by brain structures and represents a mental operation, we argue that psychology can offer a solid analytical framework to explain trust emergence and formal institutions' role in this process. Psychology can also allow the analysis to integrate cultural and contextual theories of trust building by addressing cognitive and non-cognitive, conscious and subconscious mechanisms of an individual's decision-making simultaneously.

## LITERATURE OVERVIEW

Psychology's point of departure is that every individual defines their own behavior based on an organized mental representation (scheme) of how an individual with certain values is likely to think, feel, and act (Shao, Aquino, and Freeman 2008), so called moral identity (Bandura 1991, 2001; Higgins 1996; Narvaez et al. 2006; Shao et al. 2008). The individual is believed to possess multiple and sometimes competing value identities that might not exist chaotically but prove organized according to one's internal understanding of the world. However, only one moral identity can be activated for processing social information at any given moment (Markus and Kunda 1986) and hence mapped on the action (Higgins 1996). Which one is eventually activated depends on many factors, including the environment within which the individual acts (Bargh et al. 1986; Shao et al. 2008).

The interaction with the environment unfolds through one's perceptual system and presupposes the collection of perceptual input. This perceptual input serves as a cue to retrieve the appropriate knowledge of action from the memory by activating the mental representation within which this knowledge is stored (Prinz 1997). The coupling between perceived input and knowledge of action becomes possible because mental representations are not stored in the individual's memory as mere facts but are augmented with (a) preconditions under which they can be carried out and (b) a representation of their expected outcomes (Taatgen et al. 2008). The perceptual input is used by the individual to align the observed conditions in the world with the preconditions and outcomes of mental representations. The mental representation whose preconditions and expected outcomes match the perceptual input is selected for mapping on action (Taatgen et al. 2008).

Psychology identifies several major problems that may arise in the interaction with the environment. First, not all the information can be available in the world. In this case, the choice of mental representation leading to the action is governed by the individual's internal understanding of the world (Taatgen 2005, 2007). Second, the mental representation containing the necessary contextual characteristics as a precondition might not be present in the declarative memory. Experiments show that in this case, participants simply discover the relevant knowledge by taking a random action and observing whether this action brings them closer to the goal. Once the correct action is picked, a new record (mental representation) will be created with the original perceptual state as precondition and the resulted perceptual state as post-condition (Taatgen et al. 2008).

Under such circumstances, a great role may be played by observing the behavioral patterns of others. If regarding others gives the perception that acting in this particular manner may bring the individual closer to their goal than the random selection of the action is limited to copying others' modes of behavior or actions. This means that the knowledge containing the desired pattern of behavior is more likely to be formed if this mode of behavior is more common among individuals and hence often observable in the given institutional contexts.

Psychology further recognizes the possibility of the feedback mechanism in relationship between the own behavior and "regarding others". It is believed that one's personal experiences may prompt an individual to expect that others may hold similar views or act in a similar way as a result of a similar experience (Lewis and Weigert 1985; Jones 1996; Nooteboom 2007). The individual affected by the context may hence make references from their own experiences to others (Nooteboom 2007) and

expect that the contextual impact on others' behavior will be similar to what they themselves experienced. This may reshape one's perception of others and result, for instance, in considering other people as more honest and law-obedient in the presence of effective formal institutions.

Finally, the theories of psychology to some extent elaborate on the kind of contextual characteristics that can impact the formation of mental representations or the process of their retrieval from the declarative memory. Three features of the institutional context are usually emphasized: (1) sanctions, (2) legitimacy, and (3) autonomy. The sanction hypothesis assumes that the public perceives stronger sanctions in legal instruments as a signal that dishonest behavior deserves greater moral condemnation (Feldman and Perez 2009; White 2002). Strong sanctions will likely cause people to feel that the prohibited act is morally problematic (Bandura 1999; Paternoster and Simpson 1996), as a result of which the mental representations relating to honest behavior may be activated, and good values will be enacted in behavior. Psychology further suggests that laws are an external factor designed and implemented by the government and hence the public. However, the understanding, interpretation, and enforcement of such laws in practice are personal (White 2002). The legitimacy of formal rules or laws and the level of autonomy they promote may influence people's interpretation of these formal institutions (Kohlberg 1981; White 2002). The legitimacy hypothesis suggests that individuals tend to comply with the law and will act in a trustworthy way if they consider a particular law legitimate (Feldman and Perez 2009) achieved through enhanced citizen participation in creating formal rules (Feldman and Perez 2009) or enabling information to be available about the formation of such rules. The autonomy hypothesis presupposes that if formal rules

and laws promote autonomy and independence, then individuals are encouraged to use good values in their behavior. More autonomy is believed to strengthen the personal ego, and people with strong egos rarely develop poor values or deviate from good beliefs and morals in their behavior (White 2002). Conversely, authoritarian rules or regimes with rigidly hierarchical organizations prove to retard values enactment or development (Kohlberg 1981).

## ANALYTICAL FRAMEWORK

We use the above overview of findings from psychology to introduce a simplistic model of trust building. Since psychology suggests that the individuals behavior is determined by (1) available set of value identities, (2) others-regarding, and (3) contextual characteristics, we propose that trust as an actual behavior can be viewed as consistent of three components, with each formed through one of the above factors: (1) a crystallized component, (2) a communal component, and (3) a contextual component.

***The cultural component*** refers to an individual's set of values identities that represent one's knowledge about various levels of trust to be exhibited towards others given certain circumstances. This knowledge is expected to be formed as the brain records embedded within mental representations and shaped by both culture prevalent in one's society and one's life-long experience with trusting other people. ***The communal component*** is derived from regarding others and refers to the perception of other people whom trust is to be exhibited. We believe that on the one hand, it is formed through the direct interaction with others and may also include the evaluation of others' trustworthiness in the course of deciding which level of trust to display, if

any. On the other hand, the communal component includes the extrapolation of own experiences' effects on one's own behavior to the behavior of others, resulting in the formation of expectations about other people's actions**.** ***The contextual component*** relates to the institutional context within which the decision about trust levels is made. This context is expected to subject all the individuals to the same set of formal rules that may potentially influence trust formation. The contextual trust component is formed through the activation of rational mechanisms and conscious considerations and involves evaluating the quality of this context and estimating probable consequences from acting in a certain manner within this context.

Drawn upon this approach, trust formation process unfolds as follows. The individual that possesses a number of mental representations with each storing information about trusting others to a certain degree and augmented with (a) the precondition specifying under which contextual circumstances each particular level of trust should be displayed and (b) the expected outcome of exhibiting this certain level of trust. In choosing which mental representation to activate and hence which level of trust to exhibit, the individual evaluates the context in which he or she is placed. The perceived properties of the context are matched to the preconditions of mental representations. The one that corresponds to the match criteria will be selected and the level of trust stored in this mental representation will be displayed. If there is no match found, the individual randomly selects the level of trust to be exhibited. It will be stored as a new mental representation if the new level of trust is sufficient to bring the individual closer to their goals.

The above understanding of the trust formation process allows us to offer the following propositions. ***Proposition 1:*** We expect that the positive impact of the

cultural component on trust in improving institutional contexts is stronger for those individuals who already possess mental representations related to exhibiting sufficiently high levels of trust. This is because good institutional context may encourage trust by activating the relevant mental representation and hence in order to become active, such mental representations should be already possessed by the individual. The encoding of a new mental representation is by contrast seen as a slow process for two reasons. First, it involves a random selection of trust levels and a further analysis of this action's consequences. Since this process is likely to involve errors, it may take more time before the right level of trust is found, if any, and stored as a new record in brain. Second, the new knowledge that will be encoded is usually derived through drawing analogies with the knowledge that the individual currently possesses. Learning is viewed as a cumulative process whereas the stock of new knowledge proves a function of already existing knowledge. A sudden leap from distrust to complete trust is hence highly unlikely to occur but rather a gradual increase in trust levels by choosing more and more trust to display through the random selection process of learning.

***Proposition 2:*** Improving institutional contexts may trigger the process that at a country level looks similar to values crowding out. The improving institutional context stimulates the activation of mental representations containing high trust levels or by triggering the formation of new mental representations that embed trust levels higher than the individual is used to have. We expect that when the mental representation with the optimal level of trust is already in place and should only be activated, this trust level is embedded within a complex value identity unit and is derived from certain values internalized by the individual that underlie one's belief of

how to act under certain circumstances. This complexity manifests itself through the diversity of aspects of one's behavior that is covered by a value identity unit. For instance, the value of altruism may be embedded within a value identity that specifies one's belief regarding the extent to which the one should help others, care for others trust others, or set other people's well-being over own. When the existing values do not contain the optimal level of trust, the individual will have to learn to trust as psychology suggests. This learning process might however be relatively simple in nature sine it involves a mere choice of the level of trust to display without linking it to one' values that would internally support this level of trust. The new mental representation will highly unlikely to be a value identity but a simple record of knowledge suggesting that exhibiting this level of trust under these type of circumstances will bring these kind of outcomes. No record of how much the one should help others, are for others or the like will be created in parallel with the trust level record. The improving institutional context may hence suppress value formation (viewed as value identities) with a simple knowledge of how to act in the given situation. One should note that in the countries where initial values contain insufficient levels of trust, improvements in formal institutions will trigger a more intense process of value crowding out through the formation of simple knowledge of how to act.

***Proposition 3:*** We also expect that improving institutional contexts may change the communal component's role in defining the level of trust. This shift manifests itself through reinforcing the positive impact that regarding others as trustworthy has on trust levels or through suppressing the negative impact of viewing others as untrustworthy when choosing the level of trust to display. The rationale

behind our argument is that the individual, who himself experienced the positive change in own behavior as a result of the strong institutional context, may expect that these formal institutions will change others' behavioral pattern in the same way. This extrapolation of own experience to others' behavior may create an expectation that others to whom trust is to be displaced will act more honestly in strong institutional contexts. The individual's perception of others as untrustworthy can therefore still result in displaying trust towards them if formal institutions are well defined and enforced efficiently. Alternatively, one's perception of others as relatively trustworthy may results in higher levels of trust if a strong institutional framework exists in the country.

***Proposition 4:*** We also expect that in the long run, this extrapolation experience can lead to positive shifts in the communal component through reconsidering the level of trust that should be displayed for each level of perceived trustworthiness. If the expectation about others' behavior in the strong institutional context will be justified by a positive outcome of the interaction with other people, then the individual will gradually create a new record that would contain new match scale between the level of perceived trustworthiness and the level of trust to be displayed by leveling up trust for each degree of perceived trustworthiness.

We use the above observations to postulate our hypotheses:

***Hypothesis 1*****:** Individuals that possess larger values for any of the three components will also have higher trust scores.

***Hypothesis 2*****:** The contextual component's impact on trust will be greater for those individuals that have better cultural and communal components.

***Hypothesis 3:*** The cultural component's impact on social trust will be weaker in countries where the institutional context is stronger.

***Hypothesis 4:*** The communal component's impact on social trust will be stronger in countries where the institutional context is stronger.

***Hypothesis 5:*** An improvement in the contextual component is expected to lead to shifts in the cultural and communal components.

## DATA AND METHODS DESCRIPTION

Our empirical analysis is based on the European Social Survey (ESS) for the year 2004, with a total of 25 countries included. The variables are operationalized as follows (see Appendix 1 for descriptive statistics).

### *Dependent Variable*

Social trust is measured through the conventional question: "Generally speaking, would you say that most people can be trusted or that you cannot be too careful in dealing with people?", with the response scale ranging from 0 "*cannot be trusted at all*" to 10 "*can be fully trusted.*"

### *Independent Variables*

The cultural component variable is constructed based on responses to 21 questions asking one's perception of how important various values or attitudes are to the respondent. Each item is measured on a six point scale ranging from 1 "*very much like me*" to 6 "*not like me at all.*" We use a principle component factor analysis to combine

these items into three constructs by summing up their values. Table 1 provides information about the division of items among the three constructs. The first reflects one's general behavioral values regarding others, government and society. The second captures one's level of altruism and sympathy with others. The third refers to one's preference for leisure.

Table 1 near here

The communal component is measured by the question asking how worried the respondent is of being treated dishonestly. We expect that the extent to which an individual worries about dishonest treatment is a function of the individual's perception of others formed through interactions with people. The response scale varies from 1 "*very worried* " to 4 "*not at all.*"

In choosing operationalizations for the contextual component, we use the three contextual features. We associate the sanction feature with legal institutions, such as the protection of property rights and contract enforcement legislation since they achieve their main objectives of lowering transaction costs by detecting and sanctioning improper economic behavior (Troilo 2011). Political institutions are linked to the legitimacy mechanism since they reflect the quality of the political system and democratic principles and hence measure the extent to which citizens can participate in the political processes (Acemoglu and Robinson 2012). Regulatory institutions relate to the autonomy mechanism, since they set constraints on an individual's economic decision-making in the labor market, credit markets, etc.

(Jalilian, Kirkpatrick, and Parker 2007), and may therefore influence an individual's perception of how much autonomy is permitted regarding economic behavior.

We operationalized political institutions through the average of three World Bank Group institutional indexes reflecting the properties of a country's political system: voice and accountability, government effectiveness, and corruption control in government. Each item has values ranging from -2.5 "*poor political institutions*" to 2.5 "*very good political institutions*." Economic institutions are measured through a contract enforcement and property rights protection index measured on a ten-point scale with higher values corresponding to better institutions. The data are sourced from the 2007 annual report of Economic Freedom of the World (Gwartney et al. 2007). Regulatory institutions are measured by a regulation of labor, credit, and business index constructed by Economic Freedom of the World (Gwartney et al. 2007) with values varying from 1 "*entirely regulated*" to 10 "*entirely independent from regulation*". We average out all institutional indexes over three years (2003-2005) and re-scale them so that the final constructs have values between 0 "*poor formal institutions*" and 1 "*good formal institutions.*"

## *Control Variables*

The set of control variables includes the conventional determinants of trust: the frequency of meeting friends, number of years completed in full-time education, respondents' gender, actual age, and household income. In addition, we include dummies specifying whether respondents have a paid job and whether they were born in the country they reside. We also control for respondents' level of political trust calculated as the sum of responses to questions asking how much trust an individual

has in (1) country's parliament, (2) the legal system, (3) the police, (4) politicians, (5) political parties, with responses to each item ranging from 0 "*no trust at all*" to 10 "*complete trust.*"

We test our hypotheses empirically by using three strategies. ***Strategy 1:*** We seek to demonstrate that the three components relate to trust (Hypothesis 1). The main method of analysis is multilevel modeling that accounts for the hierarchical structure of our data and hence prevents the un-modeled country information from being pooled into the single individual error term (Kreft and Leeuw 1998; Luke 2004; Snijders and Bosker 1999). The base model takes the following form:

$$T_{ij} = \gamma_{00} + \gamma_{10}Cultural\_C_{ij} + \gamma_{20}Communal\_C_{ij} + \gamma_{01}Contextual\_C_{j} + \gamma_{30}X_{ij} + m_{oj} + \varepsilon_{ij} \quad (1)$$

Here, $T_{ij}$ stands for individual level of social trust. $Cultural\_C_{ij}$ and $Communal\_C_{ij}$ are measures of the cultural and communal components, respectively. $Contextual\_C_{j}$ captures the three types of formal institutions that will sequentially be included in the model, $X_{ij}$ is a set of control variables, $m_{oj}$ is the variance at the country level, and $\varepsilon_{ij}$ is the variance at the individual level. We use STATA command GLLAMM for calculating the parameters of the model.

***Strategy 2:*** We analyze the impact of formal institutions on cross-country variations in the coefficient estimates on the cultural and communal component variables of trust regressions (Hypothesis 2). In doing so, we first estimate the below trust regression individually for each country by applying the standard OLS procedure:

$$T_{ij} = \alpha_{0j} + \alpha_{1j}Cultural\_C_{ij} + \alpha_{2j}Communal\_C_{ij} + \alpha_{3j}X_{ij} + \varepsilon_{ij} \quad (2)$$

The estimated coefficients on the two components are further regressed on the institutional scores for the aggregated dataset constructed by calculating countries' averages:

$$\alpha_{1j} = \beta_0 + \beta_1 Contextual\_C_j + \beta_2 X_j + \partial_j \quad (3)$$

$$\alpha_{2j} = \zeta_0 + \zeta_1 Contextual\_C_j + \zeta_2 X_j + \partial_j \quad (4)$$

where *Cultural_C, Communal_C* and *Contextual_C* are the three components as previously mentioned. $\alpha$ is the coefficients measuring the country-specific impact of cultural and communal components on trust. The $\alpha$-regressions also contain control variables that capture countries' experience with poverty, learning, employment patterns, and religion. A country's extent of poverty is measured by the risk of poverty before social transfers sourced from EUROSTAT. Learning patterns are operationalized through a country mean to the question that takes value of one if the respondent participates in any lifelong learning activities in the last 12 months. A country's mean number of hours worked by respondents on a typical weekend sourced from the ESS relevant questions is believed to measure countries' prevalent work patterns. We further include the percentage of population adhering to Protestant and Catholic religions. In the case of the communal component, we additionally control for the quality of labor market institutions captured by a EUROSTAT gender pay gap index and the extent of the population ageing process expressed through a country's average age of respondents in the sample.

***Strategy 3:*** We check if improvements in the contextual component may lead to a positive change in the two other components (Hypothesis 3). We start the analysis by constructing a single measure for the cultural component by using STATA predict option for factor analysis. We employ a simultaneous equation model which

can run several regressions simultaneously assuming that there is a certain cross-equation correlation. The set of equations includes a cross-country trust equation and three channel equations: one for the country's cultural component, one for the communal component and one for the contextual component. We use instrumental variables estimation to ensure that our structural parameters are identified. The cultural component is instrumented through the early socialization experience at childhood which is believed to be shaped by mother and hence measured through mother's level of education. We also use the perception of wrong as an instrument for values and operationalized it through the average of two ESS questions asking whether it is alright to occasionally ignore the law and do what you want to make money. The responses vary from 1 "strongly agree " to 2 "strongly disagree". The communal component is instrumented through past experience with other people and measured through the question: "In the last five years, how often did a plumber/builder/mechanic/repairer overcharge you?" The responses vary from 1"*never*" to 5 "*more than five times.*" Regarding the contextual component, La Porta et al. (1999) argue that legal origins of a country's legislation can be used as an instrument for legal institutions. Fidrmuc (2003) suggests that one can instrument political institutions with the index of civil liberties. Mauro (1995) demonstrates that fractionalization indexes are good instruments for institutional scores. We utilize this approach for regulatory institutions.

We also include other control variables in the channel equations: percentage of female students, language fractionalization, countries' unemployment rates and education patterns measured through the aggregated ESS question about the number of years that respondents spend in full time education. In the case of institutional

indexes we control for experience with socialism (the dummy takes the value of 1 if yes), political stability sourced from Word Bank on-line database, percentage of Protestants in a country, and the extent of rent-seeking measured through a corruption perception index calculated by Transparency International Organization. The overall number of inclusions is sufficient to satisfy the order condition for identification. We estimate the full set of equations jointly by applying the STATA command reg3 to the aggregated data-set which is obtained by calculating the countries' mean values for all the variables.

## ANALYSIS AND RESULTS

The empirical analysis supports our 3-C component model of trust formation. Table 1 suggests that the cultural and communal components are strong predictors of social trust. The contextual component proves particularly important for explaining the cross-country variations in trust scores, with coefficient estimates on the institutional variables varying, however, across types of institutions. Regulatory institutions that capture the extent of overall economic freedom in a country have been found to have the strongest impact on trust levels. The logic of our findings does not change after including the standard set of controls for social trust or instrumenting the institutional variables to eliminate the endogeneity problem in the trust regressions (see Tables 3).

Table 2 and Table 3 near here

We also detect cross-level interactions between the contextual component and the two other components of trust when running the individual-level analysis. Political

and economic institutions are found to primarily condition the communal component's impact on trust, by reinforcing the positive impact that the perception of others as trustworthy has on trust scores. By contrast, regulatory institutions prove important for enhancing the positive impact of altruism or sympathy with others on trust levels and to a lesser extent interact with the communal component. We also find that the three institutional measures enhance the effect of high preference for leisure on trusting others.

Table 4 near here

The country specific analysis reveals that the impact of cultures and others-regarding on trust scores is not universal across countries but considerably varies (see Appendix 2), further confirming that the context might also matter for their overall importance in trust building processes. Regressing the two coefficient estimates on the contextual component provides results that are in line with our expectation: The cultural component's impact on social trust is weaker in countries where the institutional context is stronger. Similar to growth research (Ahlerup, Olsson, and Yanagizawa 2009), culture proves particularly important for social trust formation in the countries with poorly defined or enforced formal institutions, with its role declining as the legal framework improves.

A strong institutional contexts however reinforces the communal component's role in trust formation and hence the same perception of others will produce greater trust in countries where the institutional context is better. The analysis also confirms the previous findings that the effect of the communal component on social trust is

shaped mainly by political and economic institutions and to a less extent by regulatory institutions. These results also prove robust to instrumenting formal institutions or controlling for the maturity level of cultural scores and the communal measure in the countries of our sample.

Tables 5, 6, 7, 8 near here

In the long run, one can also expect that formal institutions may suppress the development of cultural values traditionally relevant to social trust but prompt individuals to perceive others as more trustworthy in their behavior. Interestingly, the simultaneous equation model does not reveal a direct effect of institutions on social trust (with the exception of regulatory institutions) but rather suggests that trust is shaped by formal institutions through values and the perception of others. Again, we detect certain heterogeneity in this respect: Political and legislative institutions are found to be a strong determinant of perception of others, but still lead to a value revision process. Regulatory institutions, by contrast, have a weaker effect on the communal component in terms of statistical significance but a strongly statistically significant effect on values. This type of formal institutions is also the only one that conducts a direct effect on trust levels. The autonomy dimension of formal institutional frameworks seems to be particularly important for trust formation. Trust is more likely to emerge where more autonomy in the economic decision-making is permitted by the government.

Table 9 near here

## CONCLUSION AND DISCUSSION

Overall, our study supports the new conceptual framework of trust formation derived from social-cognitive theories of behavior. Trust should be viewed as composed of people's values, their perception of others, and the properties of the context in which they act. Formal institutions prove an important element of this context and may influence trust in a threefold manner: by (1) imposing sanctions on those who deviate from rules, (2) ensuring legitimacy of rules introduced, and (3) allowing citizens some degree of autonomy in their economic decision-making.

We also detects two peculiarities in the impact of contexts on social trust. First, the institutional context's impact on trust proves heterogeneous across types of formal institutions. Regulatory institutions are found to be the strongest predictor of trusting others. Second, the institutional context may correlate with the extent to which the cultural and communal components shape individual trust. In the long-run, a strong institutional framework may positively affect the regarding of others as trustworthy, but retard the formation of values that traditionally relate to high trust.

Further research is needed to eliminate two major drawbacks of our study. On the one hand, an alternative set of operationalizations should be found for each of the three components to further validate the complex structure of trust proposed by our model. Second, it is necessary to check the dynamic nature of the relationship between the three components and social trust by testing the proposed analytical framework with longitudinal data.

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**REFERENCES**

Acemoglu, Daron and James A. Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity and Poverty.* New York: Crown Publishers.

Ahlerup, Pelle, Ola Olsson, and David Yanagizawa. 2009. "Social Capital vs Institutions in the Growth Process." *European Journal of Political Economy* 25:1-14.

Bandura, Albert. 1991. "Social Cognitive Theory of Moral Thought and Action." Pp. 45-103 in *Handbook of Moral Behavior and Development*, edited by W.M. Kurtines and J.L. Gewirtz. Hillsdale, NJ: Erlbaum.

Bandura, Albert. 1999. "Moral Disengagement in the Perpetration of Inhumanities." *Personality and Social Psychology Review* 3(3):193-209.

Bandura, Albert. 2001. "Social Cognitive Theory: An Agentic Perspective." *Annual Review of Psychology* 52:1-26.

Bargh, John A., Ronald N. Bond, Wendy J. Lombardi, and Mary E. Tota. 1986. "The Additive Nature of Chronic and Temporary Sources of Construct Accessibility." *Journal of Personality and Social Psychology* 50(5):869-878.

Bohnet, Iris and Yael Baytelman. 2007. "Institutions and Trust: Implications for Preferences, Beliefs and Behavior." *Rationality and Society* 19(1): 99-135.

Edlund, Jonas. 2006. "Trust in the Capability of the Welfare State and General Welfare State Support: Sweden 1997-2002." *Acta Sociologica* 49(4):395-417.

Farrell, Henry. 2005. "Trust and Political Economy: Institutions and the Sources of Interfirm Cooperation." *Comparative Political Studies* 38(5):459-483.

Farrell, Henry and Jack Knight. 2003. "Trust, Institutions and Institutional Evolution: Industrial Districts and the Social Capital Hypothesis." *Politics and Society* 31(4):537-556.

Feldman, Yuval and Oren Perez. 2009. "How Law Changes the Environmental Mind: An Experimental Study of the Effect of Legal Norms on Moral Perceptions and Civic Enforcement." *Journal of Law and Society* 36(4):501-535.

Fidrmuc, Jan. 2003. "Economic Reform, Democracy and Growth during Post-Communist Transition." *European Journal of Political Economy* 19(3):583-604.

Fukuyama, Francis. 2000. "Social Capital and Civil Society." IMF Working Paper No. 00/74, Washington.

Gwartney, James, Robert Lawson, Russel S. Sobel, and Peter T. Leeson. 2007. *Economic Freedom of the World: 2007 Annual Report*. The Fraser Institute: Economic Freedom Network.

Herreros, Francisco and Henar Criado. 2008. "The State and the Development of Social Trust." *International Political Science Review* 29(1):53-71.

Higgins, Tory E. 1996. "The "Self-Digest": Self-Knowledge Serving Self-Regulatory Functions." *Journal of Personality and Social Psychology* 71(6):1062-1083.

Jalilian, Hossein, Colin Kirkpatrick, and David Parker. 2007. "The Impact of Regulation on Economic Growth in Developing Countries: A Cross-Country Analysis." *World Development* 35(1): 87-103.

Jones, Karen. 1996. "Trust as an Affective Attitude." *Ethics* 107(1):4-25.

Kohlberg, Lawrence. 1981. *The Philosophy of Moral Development*: *Moral Stages and the Idea of Justice*. Cambridge, MA: Harper & Row.

Kreft, Ita and Jan de Leeuw. 1998. *Introducing Multilevel Modelling*. Thousand Oaks, CA: Sage Publications.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny. 1999. "The Quality of Government." *Journal of Law, Economics and Organization* 15(1): 222–279.

Letki, Natalia. 2006. "Investigating the Roots of Civic Morality: Trust, Social Capital, and Institutional Performance." *Political Behavior* 28(4):305-325.

Levi, Margaret. 1998. "A state of Trust." Pp. 77-101 in *Trust and Governance,* edited by V. Braithwaite and M. Levi. New York: Russell Sage Foundation.

Lewis, David J. and Andrew Weigert. 1985. "Trust as a Social Reality." *Social Forces* 63(4):967-985.

Lim, Jamus J. and Jessica H. Decker. 2007. "Do Democracies Grow Faster? Revisiting the Institutions and Economic Performance Debate." MPRA Paper No. 6076. Munich Personal RePEc Archive.

Luke, Douglas A. 2004. *Multilevel Modeling*. Thousand Oaks, CA: Sage Publications.

Markus, Hazel and Ziva Kunda. 1986. "Stability and Malleability of the Self-Concept." *Journal of Personality and Social Psychology* 51(4):858-66.

Mauro, Paolo. 1995. "Corruption and Growth." *Quarterly Journal of Economics* 110(3): 681-712.

Mishler, William and Richard Rose. 2001. "What are the Origins of Political Trust? Testing Institutional and Cultural Theories in Post-Communist Societies." *Comparative Political Studies* 34(1):30-62.

Murphy, Kristina. 2004. "The Role of Trust in Nurturing Compliance: A Study of Accused Tax Avoiders." *Law and Human Behavior* 28:187-209.

Narvaez, Darcia, Daniel K. Lapsley, Scott Hagele, and Benjamin Lasky. 2006. "Moral Chronicity and Social Information Processing: Tests of a Social-Cognitive Approach to the Moral Personality." *Journal of Research in Personality* 40(6):966-985.

Nooteboom, Bart. 2007. "Social Capital, Institutions and Trust." *Review of Social Economy* LXV(1):29-53.

Oskarsson, Sven, Perola Öberg, and Torsten Svensson. 2009. "Making Capitalism Work: Fair Institutions and Trust." *Economic and Industrial Democracy* 30(2):294-320.

Paternoster, Raymond and Sally S. Simpson. 1996. "Sanction Threats and Appeals to Morality: Testing a Rational Choice Model of Corporate Crime." *Law and Society Review* 30(3):549-583.

Persson, Torsten and Guido Tabellini. 1994. "Is Inequality Harmful for Growth? Theory and Evidence." *American Economic Review* 84(3):600-621.

Prinz, Wolfgang. 1997. "Perception and Action Planning." *European Journal of Cognitive Psychology* 9(2):129-154.

Putnam, Robert. 1995. "Bowling Alone: America's Declining Social Capital." *Journal of Democracy* 6(1):65-78.

Putnam, Robert. 2000. *Bowling Alone*. New York: Simon & Schuster.

Rothstein, Bo and Dietlind Stolle. 2001. "Social Capital and Street-Level Bureaucracy: An Institutional Theory of Generalized Trust." Paper prepared for "Trust in Government Conference" at the Centre for the Study of Democratic Politics, November 30, Princeton University.

Scholz, John T. and Mark Lubell. 1998. "Trust and Taxpaying: Testing the Heuristic Approach to Collective Action." *American Journal of Political Science* 42:398-417.

Shao, Ruodan, Karl Aquino, and Dan Freeman. 2008. "Beyond Moral Reasoning: A Review of Moral Identity Research and its Implications for Business Ethics." *Business Ethics Quarterly* 18(4):513-540.

Steinmo, Sven. 1993. *Taxation and Democracy*. New Haven, CT: Yale University Press.

Taatgen, Niels A. 2005. "Modeling Parallelization and Flexibility Improvements in Skill Acquisition: From Dual Tasks to Complex Dynamic Skills." *Cognitive Science* 29(3):421-455.

Taatgen, Niels A. 2007. "The Minimal Control Principle ." Pp. 368-379 in *Integrated Models of Cognitive Systems,* edited by W. Gray. Oxford: Oxford University Press.

Taatgen, Niels A., David Huss, Daniel Dickison, and John R. Anderson. 2008. "The Acquisition of Robust and Flexible Cognitive Skills." *Journal of Experimental Psychology: General* 137(3):548-565.

Thomas, Craig W. 1998. "Maintaining and Restoring Public Trust in Government Agencies and their Employees." *Administration and Society* 30(2):166-93.

Tillmar, Malin and Lars Lindkvist. 2007. "Cooperation Against all Odds: Finding Reasons for Trust where Formal Institutions Fail." *International Sociology* 22(3):343-366.

Troilo, Michael. 2011. "Legal Institutions and High-Growth Aspiration Entrepreneurship". *Economic Systems* 35: 158-175.

Tyler, Tom R. 2006. “Psychological Perspectives on Legitimacy and Legitimation.” *Annual Review of Psychology* 57:375-400.

White, Richard D. 2002. “Do Employees Act Like they Think? Exploring the Dichotomy between Moral Judgment and Ethical Behavior.” *Public Administration Quarterly* 25(4):391-412.

Zak, Paul T. and Stephen Knack. 2001. "Trust and Growth." *The Economic Journal* 111(470):295-321.

Table 1. Factor loadings for values component

| Item name | The cultural component | | |
|---|---|---|---|
| | General behavioral values | Altruism and sympathy with others | Preference for leisure |
| Important to seek fun and things that give pleasure | | | 0.593 |
| Important to follow traditions and customs | 0.604 | | |
| Important to care for nature and environment | | 0.579 | |
| Important to be loyal to friends and devoted to people close | | 0.608 | |
| Important to get respect from others | 0.478 | | |
| Important to behave properly | 0.691 | | |
| Important to seek adventures and have an exiting life | | | 0.656 |
| Important that government provides security | 0.603 | | |
| Important to be successful and that people recognize achievements | | | 0.744 |
| Important to help others and care for others' well-being | | 0.618 | |
| Important to make own decisions and be free | | 0.426 | |
| Important to have a good time | | | 0.567 |
| Important to be humble and modest, not draw attention | 0.441 | | |
| Important to understand different people | | 0.669 | |
| Important to do what is told and follow rules | 0.632 | | |
| Important to try new and different things in life | | | 0.525 |
| Important to live in secure and safe surroundings | 0.629 | | |
| Important to show abilities and be admired | | | 0.696 |
| Important that people are treated equally and have equal opportunities | | 0.597 | |
| Important to be rich, have money and expensive things | | | 0.689 |
| Important to think new ideas and being creative | | 0.423 | |

Notes: Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. Rotation converged in 20 iterations.

Table 2. Decomposition of trust structure: A three component approach

| VARIABLES | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| The cultural component | | | | | |
| General behavioral values | 0.045*** | 0.045*** | 0.045*** | 0.044*** | 0.044*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Altruism and sympathy with others | -0.047*** | -0.048*** | -0.0462*** | -0.047*** | -0.047*** |
| | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Preference for leisure | 0.002 | -0.001 | -0.001 | -0.001 | -0.001 |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| The communal component | | | | | |
| Others-regarding | | 0.411*** | 0.400*** | 0.402*** | 0.416*** |
| | | (0.014) | (0.014) | (0.014) | (0.014) |
| The contextual component | | | | | |
| Political institutions | | | 5.230*** | | |
| | | | (0.101) | | |
| Economic institutions | | | | 4.365*** | |
| | | | | (0.092) | |
| Regulatory institutions | | | | | 7.264*** |
| | | | | | (0.153) |
| *Variance at level 1* | 5.133 | 5.011 | 5.013 | 5.008 | 5.013 |
| | (0.036) | (0.035) | (0.035) | (0.035) | (0.035) |
| *Variance at level 2* | 0.273 | 0.248 | 0.211 | 0.158 | 0.217 |
| | (0.008) | (0.007) | (0.009) | (0.007) | (0.009) |
| *Number of countries* | 25 | 25 | 25 | 25 | 25 |
| *Number of observations* | 40,935 | 40,015 | 40,015 | 40,015 | 40,015 |

Notes: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 3. A three-component approach to trust: A robustness check

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| The cultural component | | | | | | |
| General behavioral | 0.038*** | 0.040*** | 0.038*** | 0.044*** | 0.042*** | 0.040*** |
| values | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Altruism and sympathy | -0.036*** | -0.036*** | -0.037*** | -0.022*** | -0.023*** | -0.021*** |
| with others | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) | (0.003) |
| Preference for leisure | 0.009*** | 0.010*** | 0.008*** | 0.016*** | 0.017*** | 0.014*** |
| | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| The communal component | | | | | | |
| Others-regarding | 0.295*** | 0.299*** | 0.299*** | 0.286*** | 0.288*** | 0.290*** |
| | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) | (0.016) |
| The contextual component | | | | | | |
| Political institutions | 2.488*** | | | 2.584*** | | |
| | (0.132) | | | (0.145) | | |
| Economic institutions | | 2.564*** | | | 2.413*** | |
| | | (0.116) | | | (0.126) | |
| Regulatory institutions | | | 4.021*** | | | 5.443*** |
| | | | (0.181) | | | (0.271) |
| Individual-level control variables | | | | | | |
| Meeting friends | 0.097*** | 0.104*** | 0.097*** | 0.119*** | 0.123*** | 0.122*** |
| | (0.008) | (0.008) | (0.008) | (0.009) | (0.008) | (0.008) |
| Born in the country | 0.079* | 0.089* | 0.099** | 0.096** | 0.099** | 0.145*** |
| | (0.046) | (0.046) | (0.047) | (0.047) | (0.047) | (0.047) |
| Paid job | 0.104*** | 0.112*** | 0.098*** | 0.193*** | 0.191*** | 0.162*** |
| | (0.028) | (0.028) | (0.028) | (0.029) | (0.029) | (0.029) |
| Gender (Male =1) | -0.039 | -0.042* | -0.033 | -0.007 | -0.014 | -0.018 |
| | (0.025) | (0.025) | (0.025) | (0.026) | (0.026) | (0.026) |
| Age | 0.006*** | 0.006*** | 0.006*** | 0.009*** | 0.008*** | 0.008*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Years of education | 0.053*** | 0.054*** | 0.051*** | 0.081*** | 0.078*** | 0.073*** |
| | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) | (0.004) |
| Household income | 0.051*** | 0.052*** | 0.062*** | 0.009 | 0.019*** | 0.026*** |
| | (0.006) | (0.006) | (0.006) | (0.007) | (0.006) | (0.006) |
| Political trust | 0.071*** | 0.071*** | 0.072*** | 0.072*** | 0.072*** | 0.072*** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| *Variance at level 1* | 4.387 | 4.393 | 4.393 | | | |
| | (0.036) | (0.036) | (0.036) | | | |
| *Variance at level 2* | 0.170 | 0.349 | 0.345 | | | |
| | (0.009) | (0.022) | (0.022) | | | |
| *Number of countries* | 25 | 25 | 25 | 25 | 25 | 25 |
| *Number of observations* | 29,294 | 29,294 | 29,294 | 29,294 | 29,294 | 29,294 |
| *R-squared* | | | | 0.253 | 0.255 | 0.256 |

Notes: Standard errors in parentheses. The estimation of models 4, 5 and 6 is conducted by applying STATA command ivreg. Formal institutions are instrumented as described in the methodological part of the manuscript.

*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 4. Cross-level interactions between trust components, multi-level model

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| The cultural component | | | | | | |
| General behavioral values | 0.048 | 0.043*** | 0.059 | 0.042*** | 0.115** | 0.044*** |
| | (0.034) | (0.006) | (0.035) | (0.006) | (0.055) | (0.005) |
| Altruism and sympathy with others | 0.005 | -0.023*** | -0.018 | -0.023*** | 0.008 | -0.023*** |
| | (0.024) | (0.006) | (0.025) | (0.006) | (0.008) | (0.006) |
| Preference for leisure | 0.096*** | 0.015** | 0.082*** | 0.016*** | 0.081* | 0.015** |
| | (0.026) | (0.005) | (0.028) | (0.005) | (0.044) | (0.005) |
| The communal component | | | | | | |
| Others-regarding | 0.295*** | -0.627*** | 0.294*** | -0.480*** | 0.303*** | -0.234 |
| | (0.036) | (0.162) | (0.039) | (0.161) | (0.037) | (0.311) |
| The intrapersonal component | | | | | | |
| Political institutions | 5.546*** | -1.209 | | | | |
| | (1.865) | (1.189) | | | | |
| Economic institutions | | | 4.881*** | -0.796 | | |
| | | | (1.627) | (1.274) | | |
| Regulatory institutions | | | | | 8.833*** | 1.596 |
| | | | | | (2.504) | (1.800) |
| Interactions | | | | | | |
| Political X General behavioral values | -0.006 | | | | | |
| | (0.044) | | | | | |
| Political X Altruism and sympathy with others | -0.038 | | | | | |
| | (0.032) | | | | | |
| Political X Preference for leisure | -0.106*** | | | | | |
| | (0.033) | | | | | |
| Political X Others-regarding | | 1.237*** | | | | |
| | | (0.210) | | | | |
| Economic X General behavioral values | | | -0.022 | | | |
| | | | (0.046) | | | |
| Economic X Altruism and sympathy with others | | | -0.009 | | | |
| | | | (0.034) | | | |
| Economic X Preference for leisure | | | -0.088** | | | |
| | | | (0.036) | | | |
| Economic X Others-regarding | | | | 1.054*** | | |
| | | | | (0.225) | | |
| Regulatory X General behavioral values | | | | | -0.098 | |
| | | | | | (0.079) | |
| Regulatory X Altruism and sympathy with others | | | | | -0.086*** | |
| | | | | | (0.015) | |
| Regulatory X Preference for leisure | | | | | -0.102* | |
| | | | | | (0.059) | |
| Regulatory X Others-regarding | | | | | | 0.781* |
| | | | | | | (0.440) |
| Observations | 29,294 | 29,294 | 29,294 | 29,294 | 29,294 | 29,294 |
| Number of countries | 25 | 25 | 25 | 25 | 25 | 25 |
| R-squared | 0.255 | 0.257 | 0.257 | 0.258 | 0.260 | 0.258 |

Notes: Standard errors in parentheses. All regressions contain a standard set of control variables, including meeting friends, born in the country dummy, paid job dummy, gender dummy, age, years of education, household income and political trust.
*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 5. Formal institutions and the impact of general behavioral values on trust

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Extent of poverty | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Learning patterns | 0.003*** | 0.003*** | 0.003** | 0.003*** | 0.003** | 0.003** | 0.002* | 0.002 | 0.002* |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Work patterns | -0.054** | -0.067** | -0.032 | -0.0516** | -0.063* | -0.034 | -0.029 | -0.042 | -0.003 |
| | (0.022) | (0.028) | (0.021) | (0.023) | (0.032) | (0.024) | (0.029) | (0.037) | (0.026) |
| % of Catholics | 0.001** | 0.001 | 0.001* | 0.001** | 0.001 | 0.001* | 0.001** | 0.001* | 0.001** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Political institutions | -0.179*** | | | -0.167*** | | | -0.163*** | | |
| | (0.055) | | | (0.064) | | | (0.062) | | |
| Economic institutions | | -0.172*** | | | -0.159* | | | -0.162** | |
| | | (0.065) | | | (0.082) | | | (0.079) | |
| Regulatory institutions | | | -0.216** | | | -0.242 | | | -0.337** |
| | | | (0.092) | | | (0.168) | | | (0.164) |
| Mean for general behavioral values | | | | | | | 0.005 | 0.005 | 0.009** |
| | | | | | | | (0.004) | (0.004) | (0.004) |
| Observations | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| R-squared | 0.518 | 0.449 | 0.416 | 0.517 | 0.448 | 0.413 | 0.562 | 0.497 | 0.516 |

Notes: Standard errors in parentheses. Models 1 to 3 include the institutional scores and the list of controls; Models 4 to 5 additionally instrument institutional measures as described in the methodological part of the manuscript. The STATA *ivreg* command is used for calculating model parameters; Models 6 to 9 augment the previous models by controlling for the maturation level of the cultural subcomponents calculated as countries' mean values.

*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 6. Formal institutions and the impact of altruism and sympathy with others on trust

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| Extent of poverty | 0.002 | 0.001 | 0.002 | 0.002 | 0.002 | 0.001 | 0.002 | 0.001 | 0.002 |
| | (0.001) | (0.001) | (0.002) | (0.001) | (0.001) | (0.002) | (0.001) | (0.002) | (0.002) |
| Learning patterns | -0.002* | -0.001 | 0.001 | -0.003** | -0.002 | -0.001 | -0.003** | -0.003 | 0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.002) | (0.001) | (0.002) | (0.002) |
| Work patterns | 0.057* | 0.063 | 0.007 | 0.069** | 0.091* | 0.024 | 0.083** | 0.107* | 0.008 |
| | (0.028) | (0.037) | (0.030) | (0.030) | (0.044) | (0.037) | (0.035) | (0.058) | (0.035) |
| % of Catholics | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Political institutions | 0.209*** | | | 0.261*** | | | 0.300*** | | |
| | (0.071) | | | (0.083) | | | (0.106) | | |
| Economic institutions | | 0.170* | | | 0.261** | | | 0.303* | |
| | | (0.087) | | | (0.112) | | | (0.156) | |
| Regulatory institutions | | | -0.046 | | | 0.158 | | | -0.001 |
| | | | (0.130) | | | (0.252) | | | (0.221) |
| Mean for altruism and sympathy with others | | | | | | | 0.007 | 0.005 | -0.005 |
| | | | | | | | (0.006) | (0.007) | (0.006) |
| Observations | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| R-squared | 0.377 | 0.237 | 0.080 | 0.358 | 0.190 | 0.100 | 0.415 | 0.182 | 0.110 |

Notes: Standard errors in parentheses. Models 1 to 3 include the institutional scores and the list of controls; Models 4 to 5 additionally instrument institutional measures as described in the methodological part of the manuscript. The STATA *ivreg* command is used for calculating model parameters; Models 6 to 9 augment the previous models by controlling for the maturation level of the cultural subcomponents calculated as countries' mean values.

*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 7. Formal institutions and the impact of preference for leisure on trust

| VARIABLES | (1) leisure | (2) leisure | (3) leisure | (4) leisure | (5) leisure | (6) leisure | (7) leisure | (8) leisure | (9) leisure |
|---|---|---|---|---|---|---|---|---|---|
| Extent of poverty | -0.001 | -0.001 | -0.001 | -0.002 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Learning patterns | -0.001 | -0.001 | -0.001 | 0.001 | -0.001 | -0.001 | 0.001 | 0.001 | -0.001 |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Work patterns | -0.005 | -0.003 | 0.011 | -0.020 | -0.013 | 0.004 | -0.037 | -0.031 | 0.003 |
| | (0.020) | (0.024) | (0.018) | (0.022) | (0.028) | (0.021) | (0.022) | (0.028) | (0.019) |
| % of Catholics | -0.001** | -0.001*** | -0.001*** | -0.001** | -0.001*** | -0.001** | -0.001** | -0.001*** | -0.001*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Political institutions | -0.059 | | | -0.125** | | | -0.153** | | |
| | (0.050) | | | (0.061) | | | (0.057) | | |
| Economic institutions | | -0.036 | | | -0.068 | | | -0.094 | |
| | | (0.057) | | | (0.073) | | | (0.070) | |
| Regulatory institutions | | | 0.040 | | | -0.046 | | | 0.027 |
| | | | (0.078) | | | (0.147) | | | (0.132) |
| Mean for preference for leisure | | | | | | | -0.007** | -0.006** | -0.005* |
| | | | | | | | (0.003) | (0.003) | (0.003) |
| Observations | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| R-squared | 0.507 | 0.481 | 0.477 | 0.459 | 0.471 | 0.442 | 0.580 | 0.598 | 0.556 |

Notes: Standard errors in parentheses. Models 1 to 3 include the institutional scores and the list of controls; Models 4 to 5 additionally instrument institutional measures as described in the methodological part of the manuscript. The STATA *ivreg* command is used for calculating model parameters; Models 6 to 9 augment the previous models by controlling for the maturation level of the cultural subcomponents calculated as countries' mean values.
*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 8. Formal institutions and the impact of communal component on trust

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| % of Catholics | -0.003*** | -0.003*** | -0.003*** | -0.003*** | -0.003*** | -0.003** | -0.003*** | -0.003*** | -0.003** |
| | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) | (0.001) |
| Equality in labor markets | -0.013*** | -0.015*** | -0.016*** | -0.014*** | -0.015*** | -0.017*** | -0.014*** | -0.015*** | -0.018** |
| | (0.001) | (0.004) | (0.005) | (0.004) | (0.004) | (0.005) | (0.004) | (0.004) | (0.006) |
| Extent of population ageing | -0.016 | -0.018 | -0.012 | -0.016 | -0.018 | -0.002 | -0.016 | -0.019 | 0.003 |
| | (0.014) | (0.014) | (0.017) | (0.014) | (0.014) | (0.019) | (0.014) | (0.014) | (0.022) |
| Political institutions | 0.584** | | | 0.570** | | | 0.779* | | |
| | (0.248) | | | (0.267) | | | (0.375) | | |
| Economic institutions | | 0.512** | | | 0.504** | | | 0.673** | |
| | | (0.213) | | | (0.231) | | | (0.305) | |
| Regulatory institutions | | | 0.354 | | | 0.970 | | | 1.358 |
| | | | (0.404) | | | (0.562) | | | (0.865) |
| Mean for communal component | | | | | | | -0.113 | -0.093 | -0.107 |
| | | | | | | | (0.130) | (0.121) | (0.168) |
| Observations | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| R-squared | 0.583 | 0.587 | 0.477 | 0.583 | 0.587 | 0.410 | 0.604 | 0.598 | 0.329 |

Notes: Standard errors in parentheses. Models 1 to 3 include the institutional scores and the list of controls; Models 4 to 5 additionally instrument institutional measures as described in the methodological part of the manuscript. The STATA *ivreg* command is used for calculating model parameters; Models 6 to 9 augment the previous models by controlling for the maturation level of the communal component calculated as countries' mean values.

*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Table 9. Decomposition of contextual effects on trust, simultaneous equation model

| Variables | The contextual component | | |
|---|---|---|---|
| | Political institutions | Economic institutions | Regulatory institutions |
| The trust equation | | | |
| The cultural component | 0.505*** | 0.517*** | 0.327*** |
| | (0.108) | (0.113) | (0.124) |
| The communal component | 2.533*** | 2.499*** | 1.890*** |
| | (0.565) | (0.605) | (0.528) |
| The contextual component | 1.478 | 1.233 | 5.965** |
| | (1.131) | (1.235) | (2.332) |
| R-squared | 0.751 | 0.759 | 0.813 |
| The cultural component equation | | | |
| Percentage of female students | 0.064*** | 0.069*** | 0.076*** |
| | (0.019) | (0.021) | (0.021) |
| Early socialization | 0.761*** | 0.687*** | 0.755*** |
| | (0.153) | (0.165) | (0.185) |
| Perception of the wrong | 2.613*** | 2.695*** | 2.673*** |
| | (0.625) | (0.646) | (0.639) |
| Language fractionalization | 1.849*** | 1.862*** | 1.964*** |
| | (0.471) | (0.489) | (0.592) |
| The external component | -1.585** | -2.098** | -4.455** |
| | (0.784) | (0.843) | (2.046) |
| R-squared | 0.700 | 0.679 | 0.712 |
| The communal component equation | | | |
| Unemployment patterns | -0.021*** | -0.016*** | -0.017*** |
| | (0.005) | (0.005) | (0.006) |
| Education patters | 0.061*** | 0.064** | 0.076** |
| | (0.023) | (0.026) | (0.033) |
| Negative experience with others | -0.783*** | -0.796*** | -1.050*** |
| | (0.249) | (0.269) | (0.276) |
| The external component | 0.935*** | 1.076*** | 1.789** |
| | (0.285) | (0.316) | (0.842) |
| R-squared | 0.771 | 0.705 | 0.632 |
| The contextual component equation | | | |
| Civil liberties | -0.099*** | | |
| | (0.011) | | |
| Percentage of Protestant | 0.001* | | |
| | (0.000) | | |
| Soviet dummy | -0.125*** | | |
| | (0.020) | | |
| Extent of rent-seeking | | 0.055*** | 0.025*** |
| | | (0.009) | (0.006) |
| Legal origins dummy: Socialist | | 0.016 | |
| | | (0.039) | |
| Legal origins dummy: French | | 0.017 | |
| | | (0.028) | |
| Legal origins dummy: English | | 0.055* | |
| | | (0.033) | |
| Legal origins dummy: German | | 0.052* | |
| | | (0.029) | |
| Political stability | | 0.038 | 0.023 |
| | | (0.026) | (0.023) |
| Extent of fractionalization | | | 0.071* |

| | | | |
|---|---|---|---|
| | | | (0.041) |
| R-squared | 0.891 | 0.910 | 0.615 |
| *Number of observations* | 25 | 25 | 25 |

Notes: Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1 (two-tailed tests)

Appendix A. Descriptive statistics for variables used in the analysis

| Variable | Obs | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Individual sample | | | | | |
| Social trust | 47328 | 4.917 | 2.489 | 0.000 | 10.000 |
| Preference for leisure | 43068 | 23.608 | 6.451 | 7.000 | 42.000 |
| General behavioral values | 42520 | 19.085 | 5.654 | 7.000 | 42.000 |
| Altruism and sympathy with others | 43057 | 15.833 | 4.628 | 7.000 | 42.000 |
| Others-regarding | 46013 | 3.035 | 0.843 | 1.000 | 4.000 |
| Political institutions | 47537 | 0.754 | 0.138 | 0.351 | 0.903 |
| Legal institutions | 47537 | 0.746 | 0.142 | 0.440 | 0.930 |
| Regulatory institutions | 47537 | 0.692 | 0.080 | 0.520 | 0.800 |
| Meeting friends | 47345 | 4.883 | 1.607 | 1.000 | 7.000 |
| Born in the country | 47442 | 0.917 | 0.276 | 0.000 | 1.000 |
| Paid job | 47537 | 0.497 | 0.500 | 0.000 | 1.000 |
| Gender (Male =1) | 47456 | 1.540 | 0.498 | 0.000 | 1.000 |
| Age | 47264 | 44.165 | 18.456 | 10.000 | 100.000 |
| Years of education | 46953 | 11.515 | 4.029 | 0.000 | 44.000 |
| Household income | 36430 | 5.731 | 2.777 | 1.000 | 12.000 |
| Political trust | 44056 | 22.861 | 10.280 | 0.000 | 50.000 |
| Aggregated sample | | | | | |
| Social trust | 25 | 4.982 | 1.028 | 2.945 | 6.755 |
| Values combined | 25 | 0.004 | 0.882 | -1.853 | 1.651 |
| Countries' average for | | | | | |
| General behavioural values | 25 | 19.265 | 2.068 | 14.004 | 22.707 |
| Altruism and sympathy with others | 25 | 15.865 | 1.269 | 13.740 | 18.893 |
| Preference for leisure | 25 | 23.512 | 1.489 | 20.840 | 26.199 |
| The interpersonal component | 25 | 3.051 | 0.312 | 2.417 | 3.539 |
| Impact on social trust | | | | | |
| of general values | 25 | 0.032 | 0.027 | -0.048 | 0.082 |
| of altruism and sympathy with others | 25 | -0.035 | 0.030 | -0.009 | 0.033 |
| of preference for leisure | 25 | 0.008 | 0.022 | -0.059 | 0.043 |
| of interpersonal component | 25 | 0.291 | 0.149 | 0.006 | 0.640 |
| Share of female students | 25 | 53.888 | 4.803 | 40.800 | 62.800 |
| Mother's level of education | 25 | 1.877 | 0.626 | 0.457 | 2.759 |
| Perception of right and wrong | 25 | 3.330 | 0.178 | 3.038 | 3.698 |
| Language fractionalization | 25 | 0.256 | 0.207 | 0.010 | 0.640 |
| Unemployment rate | 25 | 6.320 | 5.323 | 3.580 | 18.300 |
| Years of education | 25 | 11.575 | 1.605 | 6.533 | 13.268 |
| Past experience with others | 25 | 1.597 | 0.132 | 1.317 | 1.848 |
| Civil liberties | 25 | 1.774 | 0.945 | 1.000 | 4.630 |
| Percentage of protestants | 25 | 28.512 | 36.528 | 0.000 | 97.800 |
| Socialist dummy (Former socialist=1) | 25 | 0.280 | 0.458 | 0.000 | 1.000 |
| Legal origins dummy: English | 25 | 0.080 | 0.277 | 0.000 | 1.000 |
| Legal origins dummy: French | 25 | 0.320 | 0.476 | 0.000 | 1.000 |
| Legal origins dummy: German | 25 | 0.120 | 0.332 | 0.000 | 1.000 |
| Legal origins dummy: Socialist | 25 | 0.280 | 0.458 | 0.000 | 1.000 |
| Political stability | 25 | 0.874 | 0.537 | -0.750 | 1.620 |
| Extent of rent-seeking | 25 | 6.912 | 2.162 | 2.440 | 9.660 |
| Risk before social transfers | 24 | 24.641 | 4.448 | 17.000 | 31.200 |
| Extent of lifelong learning | 25 | 11.480 | 9.295 | 1.470 | 29.100 |
| Weekend job | 25 | 2.602 | 0.269 | 2.258 | 3.356 |
| Percentage of Catholics | 25 | 44.124 | 39.108 | 0.010 | 96.900 |
| Pay gap | 23 | 18.026 | 5.988 | 7.700 | 30.300 |
| Extent of population ageing process | 25 | 42.818 | 2.725 | 33.697 | 45.266 |

Appendix B. Coefficient estimates for the key variables of the trust regression

| Countries | The cultural variables | | | |
|---|---|---|---|---|
| | The general behavioral variable | The altruism and sympathy with others variable | The preference for leisure variable | The interpersonal component variable |
| AT | 0.059 | -0.081 | -0.001 | 0.259 |
| BE | 0.040 | -0.035 | 0.004 | 0.295 |
| CH | 0.076 | -0.088 | 0.015 | 0.418 |
| CZ | 0.029 | -0.060 | 0.023 | 0.128 |
| DE | 0.046 | -0.028 | 0.007 | 0.470 |
| DK | 0.028 | -0.045 | 0.018 | 0.640 |
| EE | 0.005 | -0.028 | 0.007 | 0.133 |
| ES | 0.047 | -0.025 | -0.017 | 0.183 |
| FI | 0.006 | -0.028 | 0.007 | 0.226 |
| FR | 0.038 | -0.045 | 0.010 | 0.283 |
| GB | 0.032 | -0.024 | 0.017 | 0.311 |
| GR | -0.048 | -0.013 | 0.043 | 0.262 |
| HU | 0.044 | -0.065 | 0.043 | 0.253 |
| IE | 0.018 | -0.028 | -0.008 | 0.036 |
| IS | 0.034 | -0.019 | 0.004 | 0.380 |
| LU | -0.002 | 0.033 | -0.020 | 0.375 |
| NL | 0.042 | -0.036 | 0.024 | 0.264 |
| NO | 0.038 | -0.035 | 0.007 | 0.518 |
| PL | 0.011 | -0.034 | -0.016 | 0.388 |
| PT | 0.031 | 0.011 | -0.059 | 0.125 |
| SE | 0.059 | -0.004 | -0.006 | 0.467 |
| SI | 0.082 | -0.064 | 0.025 | 0.365 |
| SK | 0.027 | -0.054 | 0.001 | 0.006 |
| TR | 0.018 | 0.014 | 0.034 | 0.268 |
| UA | 0.055 | -0.090 | 0.041 | 0.245 |

Note: The coefficient estimates are calculated by applying the model from Table 2 (Column 2).