

# Terrorism's effects on social capital in European countries

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**Abstract** Studies have shown that major terrorist events have the potential to exert significant influence on citizens' risk-perceptions, (in) security sentiments, values and behavioral attitudes towards state institutions and their fellow citizens. Within this growing strand of literature, this paper, allowing for a cohort of demographic and socioeconomic traits, examines the extent to which major terrorist events in four European countries affected two key aspects of social capital, namely institutional and social trust. The data used are drawn from European Social Surveys for the years 2004, 2012 and 2014. Results reported indicate that terrorist incidents can trigger social dynamics that affect trust attitudes; however, these effects are short-lived and dissipate rapidly.

**Keywords** Terrorism · Social capital · Institutional trust · Social trust

## 1 Introduction

Defined as “*features of social life—networks, norms, and trust—that enable participants to act together more effectively to pursue shared objectives*” (Putnam 1995, pp. 664–665), social capital constitutes an attribute of the individual as well as of the wider communities (Coleman 1990; Putnam 2000, 2002; Putnam et al. 1993; Bjornskov 2006). Trust is the core aspect of social capital. Two distinct, though interlinked, types of trust are identified in the relevant literature: institutional or political trust, which is trust in institutions and organizations, and interpersonal or social trust, which is trust in people in general (Newton

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and Zmerli 2011; Paldam 2000). Essentially, both refer to the same behavioral propensity, but are conceptually different and are influenced by different factors (Newton 2001; Rothstein 2000; Uslaner 2002; Welch et al. 2005). The former depends on the perceptions and experiences people have regarding how well state institutions and organizations perform their functions, whereas the latter refers to some kind of ‘moralistic’ faith in others on the basis of society’s underlying values (Uslaner 2002, 2008).

A strand of the steadily expanding literature on terrorism focuses its attention on the effects that terrorist events have on the wider public’s risk perceptions, (in) security sentiments, value formation, policy preferences, political self-placement, electoral choices, attitudes towards ethnic minorities and immigrants (see, *inter alia*, Berrebi and Klor 2006; Bozzoli and Muller 2011; Economou and Kollias 2015; Finseraas and Listhaug 2013; Jakobsson and Blom 2014). Trust in institutions and in people is found to be affected by terrorism (Blomberg et al. 2011; Sinclair and Antonius 2012; Sinclair and LoCicero 2010). It is shown that citizens with greater trust in public institutions tend to be more supportive of the state’s actions against terrorism; however, in societies with less social trust, individuals tend to experience an increase in feelings of fear and anxiety in the aftermaths of terrorist events (ter Huurne and Gutteling 2009). Other studies report greater trust in public institutions following a terrorist incident. A positive relationship is established mainly in the case of the United States (Chanley 2002; Sinclair and Antonius 2012; Sinclair and LoCicero 2010; Willer 2004), whereas for other countries evidence is mixed but scant. The effects on trust within society are less straightforward. On the one hand, terrorist incidents may strengthen bonds between citizens, boosting trust among people. On the other hand, terrorism may foster feelings of insecurity, raising distrust in people of different ethnicities, cultures or religions, or in people in general. Aiming to contribute to this expanding literature, this paper examines how terrorist events have affected institutional and personal trust in four European countries, namely Norway, Spain, Belgium and France, based on data from the *European Social Surveys*.

## 2 Terrorism and trust

Terrorist acts can be viewed as public demonstrations of violence, aimed to attract wide public attention, both nationally and internationally, and to become deeply imprinted on the community’s collective memory (Krieger and Meierrieks 2011; Smith 2008). As such, terrorist incidents are attention-capturing events, having instrumental as well as symbolic ends (Alexander 2004; Cowen 2006). Such incidents are conducted in order to be seen and remembered (Enders and Sandler 2012; Heath and Waymer 2014; Sandler et al. 1983), intended to instill fear and anxiety within a wider population (Konty et al. 2004) so as to provoke social insecurity and political instability (Alexander 2004; Shughart 2006).<sup>1</sup> As a result, terrorist episodes become more effective when they impinge on certain public sentiments and values related to security and trust (Konty et al. 2004).

The overall effect of terrorism on attitudes, cognition and behavior of society has been addressed from a variety of different disciplines and perspectives (e.g., Caruso and Locatelli 2014; Enders and Sandler 2012; Sandler 2014). On the psychological front, terrorist attacks or even their threat evoke feelings of fear, anxiety, powerlessness, insecurity and depression, which bias cognitive processing, increase reliance on stereotypes

<sup>1</sup> Media coverage of terrorist events will support these qualities. As such, fear is cultivated further within a society and its effects are amplified.

and lead to changes in routines and patterns of life (e.g., Bodenhausen et al. 1994; Huddy et al. 2002; Spilerman and Stecklov 2009). All of these responses may also advance a *culture of fear* in the inflicted society, whereby individuals became more self-enhancing and polarized along ideological or sociocultural lines (Greenberg and Jonas 2003; Konty et al. 2004). As such, terror-management theory (Pyszczynski et al. 2003) and group-threat theory (Legewie 2013) argue that, following a terrorist event, people tend to cling to their cultural worldviews more closely, opposing outsiders and associating more strongly with in-groups. Such reactions strengthen in-group tolerance and solidarity (Alexander 2004; Collins 2004), but may give rise to intolerance and suspicion toward outsiders (Echebarria-Echabe and Fernandez-Guede 2006).

Similar effects are perceived on the political front: terrorist incidents or threats to national security in general are seen to affect confidence in ‘the system’ and its institutions (see, *inter alia*, Chanley et al. 2000; Chatagnier 2012). It is also argued that public anxiety, grief and anger following an unexpected, dramatic event, such as a transnational terrorist act, manifest themselves in approval of governmental authority and its agencies (Chanley 2002). Mueller (1973) *rally ‘round the flag’* effect is theorized to arise when citizens, triggered by appeals to patriotism, elite criticism, and media coverage, rally in support of state institutions and their actions against terrorism (Gaines 2002; Hetherington and Nelson 2003; Schubert et al. 2002). However, that effect is unlikely to be monolithic; theory suggests that groups with different political preferences and life experiences might respond differently (Collins 2004) giving rise to an *anti-rally* or *jading effect* (Tallman 2007), such that state authorities are subject to criticism (rather than support) for their failure to provide one of the most important public goods, security (Ferejohn 1986). As such, terrorist incidents, like events of political violence and conflict or natural disasters, give rise to sentiments of frustration and dismay, even anger, toward the state, and consequently to institutional distrust.<sup>2</sup>

Studies examine how the public’s concerns about threats to national security may influence institutional and/or interpersonal trust. With respect to institutional trust, scholars, drawing mainly on the US experience, find that terrorist attacks (such as 9/11) or even the fear of a terrorist incident leads to greater trust in government and other institutions (e.g., Chanley 2002; Collins 2004; Putnam 2002; Sinclair and LoCicero 2010), since the latter reflects consolidated feelings of national pride and solidarity. Others attribute this boost in political trust to the *rally effect*, though it is generally acknowledged that it is not long before this consensus starts to dissipate as people soon stake out their personal political positions and material needs (see, *inter alia*, Chatagnier 2012; Hetherington and Nelson 2003; Konty et al. 2004; Perrin and Smolek 2009; Schubert et al. 2002). Collins (2004), drawing particularly on the 9/11 experience, reports that intense solidarity builds momentum about 1–2 weeks after the event, hits its peak and stays very high for another 2–3 months, and then goes into gradual decline. This solidarity returns to normal levels in the following 6–9 months or a year. Few scholars who explore the effects of terrorism in the European political scene find terrorist attacks to have a neutral or even a negative effect (Bali 2007; Gassebner et al. 2008; Montalvo 2011) on the electoral support of the incumbent government, which is attributed to the policies undertaken to prevent, confront, counter, or overcome the impact of such attacks. As such, the anti-rally or jading effect hypotheses seem to be valid.

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<sup>2</sup> This is because perceptions of state performance and responsiveness are most often identified as key determinants of political trust (e.g., Keele 2007).

The influence of terrorism on interpersonal trust is ambiguous, too. Some scholars assert that the tragedy caused by terrorist attacks bonds citizens and heightens social trust (Gross et al. 2004; Paxton 2005; Putnam 2002). Putnam (2002), in particular, discussing the immediate effects of 9/11, argues that it pushed Americans to put aside differences and divisions and bond across ethnic, racial, class and partisan lines. That unprecedented attack opened an opportunity for civic renewal, including augmented interpersonal trust. This enhanced solidarity, however, seemed to be clustered in specific groups (Paxton 2005), which generated its own process of conflict that gradually led to decline towards normality after 6–9 months (Collins 2004; Sander and Putnam 2010).

In contrast, others point out that feelings of personal threat and insecurity, following a terrorist attack, may erode social trust and solidarity (Blomberg et al. 2011; Brehm and Rahn 1997; Huddy et al. 2002; Uslaner et al. 2004). For instance, Huddy and Feldman (2006) show that fears of terrorist attacks in the aftermath of 9/11 made people less likely to trust others. In turn, Blomberg et al. (2011) report a negative influence of terrorism on trust, but acknowledge that the effects could, in principle, go in any direction, depending on the composition and characteristics of the affected population. Thus, a racially and culturally homogenous society could see its trust levels rising after a terrorist incident, as people unite in order to face a common external threat.

This reasoning sheds some light on the outcomes of a recent study by Clark and Eisenstein (2013), who find no evidence of change in generalized trust following 9/11. They propose two possible explanations. First, single acts of terrorism may be insufficient to permeate trust attitudes in the long-term if they don't shape collective memories. Second, interpersonal trust is domain specific, rendering some groups and, in particular, those with profiles similar to the terrorist perpetrators and those with different ethnic, linguistic, religious, cultural and ethical backgrounds as more suspicious and less trustworthy (Paxton 2005; Traugott et al. 2002).

### 3 Data and methodology

Given that social capital is a multidimensional concept, we follow established practice (e.g., Delhey and Newton 2003; Freitag and Buhmann 2009; Knack and Keefer 1997) and focus on trust, as this constitutes the pivotal element of social capital and is associated with more policy-relevant outcomes than alternative measures based on civic participation and association membership (Halpern 1999). Moreover, scholars argue that trust and group membership are contradictory variables that should not be mixed together in constructing composite indicators of social capital (van Staveren and Knorringa 2007). As discussed above, trust is conventionally assessed along two dimensions: trust towards political institutions—institutional trust—and trust towards other people—interpersonal trust.

Four major terrorist events are used as case studies in the empirical examination that follows:

- (i) *The 2004 Madrid train bombings in Spain* Almost simultaneous, coordinated bombings against the Cercanías commuter train system of Madrid, on the morning of 11 March 2004 (between 07:37 and 07:41 local time), which occurred 3 days before Spain's general elections.
- (ii) *The 2011 Oslo and Utøya attacks in Norway* Two sequential lone-wolf terrorist attacks on 22 July 2011. The first was a car bomb explosion in Oslo within the executive government quarter. The second attack occurred less than 2 h later at a

**Table 1** The incidents

	Date	Attack type and target	Venue	Perpetrator	Victims		Nationalities of victims
					Fatalities	Injuries	Fatalities
1	11 Mar 2004	Bombs on commuter trains	Madrid, Spain	Abu Hafs al-Masri Brigades (suspected, presumed cell of Al-Qaeda)	191	≈ 1800	Bulgarian, Colombian, Dominican, Ecuadorian, French, Peruvian, Polish, Romanians, Spanish, Ukrainian, etc.
2	22 Jul 2011	Car bomb and mass shooting	Oslo and Utoya, Norway	Individual (Far-right extremist)	77	≈ 319	Norwegian
3	24 May 2014	Attack in Jewish museum	Brussels, Belgium	Individual, Islamic extremist	4	0	Belgian, French, Israelis
4	07 Jan 2015	Charlie Hebdo newspaper shootings	Paris, France	Al-Qaeda in the Arabian Peninsula	12	11	French

*Source* Enders and Sandler (2012) and Global Terrorism Database. Data on the number and the Nationalities of the victims are drawn from the Global Terrorism Database and various internet sources, whereas all information was cross-checked for its validity (international press, victims' memorial, etc.)

Workers' Youth League (AUF)-run summer camp on the island of Utoya, where the perpetrator opened fire at the participants.

- (iii) *The 2014 Jewish Museum shooting in Belgium* On 24 May 2014, a gunman opened fire at the Jewish Museum of Belgium in Brussels.
- (iv) *The 2015 Charlie Hebdo shooting in France* On 7 January 2015 at around 11:30 local time, two gunmen forced their way into the offices of the French satirical weekly newspaper *Charlie Hebdo* in Paris. Several related attacks followed in the Île-de-France region.

All were major, headline-capturing terrorist incidents (Table 1). The data used to examine their effects on institutional and interpersonal trust are drawn from three waves of the European Social Survey (ESS),<sup>3</sup> namely for the years 2004, 2012 and 2014. The surveys measure attitudes, beliefs, values, behavior patterns, and so on, of sampled individuals in the countries surveyed (i.e., Belgium, France, Norway and Spain). The choice of the events was very much dictated by the availability of a survey near the times of the incidents. In particular, the number of days between each terrorist attack and the individual interview dates ranged from 23 to 327 days for Spain, from 395 to 563 days for Norway, from 115 to 253 days for Belgium and from 0 to 47 days for France. The zero number of days in the latter case indicates that interviews started taking place 3 H following the terrorist incident. The time window between each event and the survey is of course a factor that could influence the findings. Indeed, as other studies show, the memory of a terrorist attack tends to fade away as time elapses (e.g., Chen and Siems 2004; Enders et al. 1992;

<sup>3</sup> The ESS are regarded as the most reliable cross-national surveys of this kind owing to their rigor in sampling methods, questionnaire design, translation, fieldwork, face-to-face interviewing and pilot testing (Kohler 2007).

Enders and Sandler 1991; Kollias et al. 2013). Similarly, the attributes of each of the four incidents could be another factor that can affect the findings. As can be seen in Table 1, three of the four events are associated with extremist Islamist terrorism, whereas in the case of the 2011 attacks in Norway the perpetrator was a Norwegian far-right extremist.

Following similar studies, such as that of Zmerli and Newton (2008), rather than pooling together all of the data, we opt to start the analysis on a country level basis in order to look for common cross-national patterns. The first concept to be examined is institutional trust. In the footsteps of similar papers (e.g., Newton and Zmerli 2011; Rothstein and Stolle 2008; Zmerli and Newton 2008), it is measured by a composite index that adds together assessments of confidence in a number of institutions. These assessments are drawn from the ESS on the basis of a question asking:<sup>4</sup> *how much you personally trust each of the following institutions:*

- The country's parliament
- The legal system
- The police
- Politicians
- The European Parliament
- The United Nations

Respondents place themselves on an eleven-point rating scale, ranging from 0 (no trust at all) to 10 (complete trust).

The second concept of interest is interpersonal trust. Following similar studies (e.g., Clark and Eisenstein 2013; Zmerli and Newton 2008), it is measured combining three ESS questions:

- Generally speaking, would you say that most people can be trusted, or that you cannot be too careful in dealing with people?
- Do you think that most people would try to take advantage of you if they got the chance, or would they try to be fair?
- Would you say that most of the time people try to be helpful or that they are mostly looking out for themselves?

These questions constitute the well-known Rosenberg Trust Scale,<sup>5</sup> which is shown to be reliable and valid for the ESS countries (Reeskens and Hooghe 2008; Zmerli and Newton 2008).<sup>6</sup> The responses again are classified in an eleven-point scale with 0 indicating the lowest and 10 the highest level of trust.

For the purposes of the investigation conducted here, we incorporate various (closely related, though slightly different) aspects of attitudes and beliefs on the issues examined in terms of one multidimensional index that captures each of the two above-mentioned indicators. Thus, the common variation of the available facets is expected to reflect in a more objective and coherent manner the true state of the individual stance on trust towards institutions and people in general, respectively. To this end, it seems most appropriate to develop a continuous composite index for each of the examined concepts

<sup>4</sup> Other researchers (such as Zmerli and Newton 2008) examine exactly the same institutions in their composite measure of political trust.

<sup>5</sup> Rosenberg (1956) first uses them to form a reliable and valid trust scale.

<sup>6</sup> Earlier studies (such as Paxton 1999) conclude that combining these items is an acceptable means of assessing interpersonal trust.

that approximate the individual's subjective overall position based on the available information provided by the survey data (Economou and Kollias 2015).

To do so, we use Polychoric Principal Component Analysis (P-PCA), as suggested by Kolenikov and Angeles (2009). Typically, Principal Component Analysis (PCA) is applied in constructing composite indices similar to ours (see, e.g., Freitag and Buhlmann 2009; Newton and Zmerli 2011). Capturing the common variance of available variables, PCA enables dimensionality reduction and is considered to be an adequate method for modeling an underlying continuous multifaceted variable, such as a social-value indicator (Filmer and Pritchett 2001). However, Moser and Felton (2007) argue that P-PCA is a much more appropriate tool for developing a composite index like ours, because it relies on polychoric and polyserial correlations to provide more accurate weights; it also enables incorporation of categorical and discrete data (Kolenikov and Angeles 2009). Overall, the main advantages of P-PCA over standard PCA analysis is that it can accommodate both discrete and continuous observations and its coefficients are more accurate (Moser and Felton 2007). From P-PCA, we extract the First Principal Component, which reflects the common information shared by the observed indicators for each of the two composite indicators utilized (Branisa et al. 2014). Following Dustmann and Okatenko (2014) and Branisa et al. (2014), we rescale the first components to range between 0 and 1, where larger values indicate greater individual trust. When no other eigenvectors exceed unity, this does not pose a problem, since scholars agree that only the first component can be used in the construction of the composite index, given that the new composite index is less complicated and easy to interpret (Jolliffe 2002; Moser and Felton 2007). The eigenvalue of the first eigenvector is the only one exceeding unity for each one of the two indices and it explains around 53 to 65 % of the total variance for each of the two trust indices.<sup>7</sup>

The development of the continuous composite indices for institutional and interpersonal trust enables us to use traditional OLS regressions in order to assess their determinants. It is worth mentioning that if the variables were ordinal, we should have employed ordered logit or probit models to conduct the empirical analysis (e.g., Blomberg et al. 2011). This is not the case here. The transformation employed allows the use of less computationally demanding and more straightforward OLS regression (Origo and Pagani 2009; Van Praag and Ferrer-i-Carbonell 2008). Our models, therefore, take the form:

$$Y_i = \alpha + \beta_1 \text{Terorism}_i + \beta_2 X_i + u_i, \quad (1)$$

where  $Y$  are the continuous composite indices of institutional trust and interpersonal trust,  $X$  is a vector of demographic and socioeconomic indicators and  $i$  indexes survey respondents. As stated, the analysis is repeated separately for each one of the four countries and terrorist events in order to detect cross-country variations. Robust heteroscedasticity standard errors also are reported for all regression models.

The basic independent variable of interest involves the effect of *Terrorism* ("Terrorism elapsed days"). It counts the number of days elapsed between the time of the terrorist event and the interview date for each ESS participant in the corresponding country. Intuitively, we expect the terrorist incidents to lodge in the society's collective

<sup>7</sup> Details of the P-PCA results and the associated eigenvalues are to be found in Table A1 in the Online Appendix; the Scree plots for each of the two composite indicators are shown in Figures A1–A8.

memory, as a result of the fatalities and injuries caused as well as the general insecurity they generate.

As a robustness check, we also estimate a pooled data model for the four countries included in the analysis. In this case, the “Terrorism elapsed days” indicator is constructed for each one of the four incidents as an interaction variable that weights the time elapsed between the attack and the interview day with the number of victims involved in the attack. The number of *Victims* is calculated as the number of fatalities plus the weighted number of injured people (where each injury corresponds to 0.57 deaths), using the methodology proposed by Sandler et al. (2011).

A number of indicators are used as independent variables on the basis of data availability. These correspond to the determinants of trust as identified by the relevant literature. In addition, they serve to limit the unobserved heterogeneity in the formation of individuals’ values. To this end, we entered demographic information (gender, age) and socio-economic indicators (education level, employment status, income satisfaction and religiosity) at the individual level. Additional information on individual survey respondents are included in the models, since they might be correlated with the terrorism-trust relationship. Hours of television watched per day are controlled for, since they might reflect individual engagement with each specific attack. A second variable accounts for individual attitudes regarding immigrants. Respondents are asked whether they think immigrants make the country a worse or a better place. This indicator might also explain individual responses following a terrorist incident. In detail, three out of the four attacks were instigated by Muslim extremists and the fourth attack’s motive was the intense anti-Islamic stance of the perpetrator. A third variable—*Safe environment*—captures individual preferences toward living in a secure, safe environment and hence could affect responses following a terrorist attack. Additionally, in the pooled regressions, dummy variables<sup>8</sup> are entered to examine whether the ethnic origin of the perpetrators (Arabic or not) and the occurrence of national elections during the period of interviews<sup>9</sup> affect the institutional and interpersonal trust of respondents.

Among the samples considered herein, Norwegian citizens report greater levels of both institutional and interpersonal trust than respondents in the three other countries. More than 50 % of the sample seems to be quite religious in all countries. Similarly, a large percentage of the sample, ranging from 77 % for Belgium up to 93 % for Norway, is living comfortably on its household income. Respondents seem to be, in their majority, either of higher or middle educational status and employed in all country samples. The average age of the respondents is between 44 years (for Spain) and 48 years (for Belgium) and approximately half of them are males. More than half of the sample spends more than 2 h daily watching television. About 70 % of the respondents in France scores above-average on the immigrants-related attitudes questions, indicating more egalitarian opinions about immigrants. The lowest percentage of respondents expressing tolerant attitudes toward immigrants is observed for Norway, where about 50 % of the respondents expressed similar opinions. In all countries, living in a safe environment is important for the majority of the sample, with the highest mean value observed for Belgium and the lowest for France.<sup>10</sup>

<sup>8</sup> Detailed descriptions of the variables in are available in Table A2 of the Online Appendix.

<sup>9</sup> This was the case for Spain, where elections were held three days after the Madrid terrorist attack.

<sup>10</sup> The variables’ means per country and incident can be found in Online Table A3.

**Table 2** Institutional trust determinants, OLS regression models

Variables	2004 Madrid train bombings, Spain	2011 Oslo and Otoyra attacks, Norway	2014 Jewish museum shooting, Belgium	2015 Charlie Hebdo shooting, France	Pooled sample
Terrorism elapsed days	0.002***	0.001	0.001	−0.001*	
Terrorism elapsed days squared	−0.000004***	−0.000001	−0.000004		
Victims					0.008
Terrorism elapsed days × victims (Spain attack)					0.000001***
Terrorism elapsed days × victims squared (Spain attack)					−0.000***
Terrorism elapsed days × victims (Norway attack)					−0.000
Terrorism elapsed days × victims (Belgium attack)					0.0004
Terrorism elapsed days × victims squared (Belgium attack)					−0.000
Terrorism elapsed days × victims (France attack)					−0.0001
Age	0.0003	−0.001***	−0.001***	−0.001	−0.001***
Gender	−0.007	0.001	0.012	0.008	0.004
Middle level education	0.008	0.063	0.021	−0.016	−0.002
High level education	0.015	0.099**	0.079***	0.032	0.035***
Employed	0.013	−0.006	−0.023***	−0.007	−0.006
Feeling aboutheousehold's income	0.067***	0.062***	0.073***	0.074**	0.060***
Religiosity	0.057***	0.026***	0.0351***	−0.011	0.0323***
Hours spent watching TV	0.020*	−0.012	−0.012	−0.001	−0.002
Immigrant-related stance	0.054***	0.082***	0.101***	0.093***	0.078***
Safe environment	0.004	0.002	0.003061	0.027	0.002
Perpetrators origin					2.046
Elections					−10.407
Constant	0.092	0.255	0.277***	0.412***	−1.728
R <sup>2</sup>	0.07	0.12	0.18	0.14	0.11
F test	7.04***	14.77***	31.26***	4.18***	29.32***

**Table 2** continued

Variables	2004 Madrid train bombings, Spain	2011 Oslo and Otoyra attacks, Norway	2014 Jewish museum shooting, Belgium	2015 Charlie Hebdo shooting, France	Pooled sample
Observations	1148	1303	1593	250	4342

All regressions are estimated with heteroskedasticity-robust standard errors

\* Significance at 10 %

\*\* Significance at 5 %

\*\*\* Significance at 1 %

## 4 The findings

The results from estimating Eq. (1) for each one of the four countries and terrorist incidents are shown in Tables 2 and 3. Overall, the results are not identical and do not allow for robust universal inferences to be drawn. Nevertheless, they do seem to uncover an interesting feature of the effect of terrorism on the two social capital variables. Starting with *institutional trust* (Table 2), it can be seen that the terrorist events exert significant effects in France and Spain, but not so in the cases of Norway and Belgium.

With respect to the 2004 Madrid train bombings, the terrorist attack appears to have a non-linear effect on institutional trust (the joint significance test for the two terrorist attack variables report  $F(2, 1135) = 3.69$ ,  $\text{Prob} > F = 0.025$ ). Probing deeper, we see that the graphical representation of this effect unearths an inverted U-shaped relationship between the terrorist incident and public trust in government and institutions (Fig. 1). As can be observed, institutional trust increases in the days following the attack, possibly reflecting a *rally* effect (Chatagnier 2012). However, as time elapses, this strengthening of institutional trust levels off and exhibits signs of reversing possibly back to its pre-terrorist attack levels. The turning point is at 250 days, roughly 8 months after the event. A tentative conclusion that can be drawn on the basis of the results for Spain is that the impact of terrorism is largely temporary and gradually withers away as time passes. In fact, this finding is in line with those of other studies showing that the effects of terrorism on political trust (e.g., Collins 2004; Perrin and Smolek 2009) as well as in market institutions (e.g., Chen and Siems 2004; Enders et al. 1992; Kollias et al. 2013) generally are short-lived. On a broader level, the result for Spain suggests that the levels of institutional trust are affected by time-invariant factors and are shaken only temporarily by one-off violent and publicity capturing events, just as in the case of financial market turmoil.

In contrast to the results for the Madrid bombings, a monotonic negative relationship is found to be the case in the Charlie Hebdo shootings in France (Fig. 2). That incident brought about a reduction in institutional trust, quite the opposite of the Spanish case. Specifically, an increase in the number of days following the attack by one is associated with a 0.008 standard-deviation decline in institutional trust.<sup>11</sup> This finding again is in line with the literature providing evidence in support of the jading effect hypothesis (Bali 2007; Gassebner et al. 2008). However, we must point out an important qualitative difference that possibly sheds light on the contradictory findings. The ESS interviews in France were

<sup>11</sup> This is based on the estimated effect on the standardized institutional trust variable.

**Table 3** Interpersonal trust determinants, OLS regression models

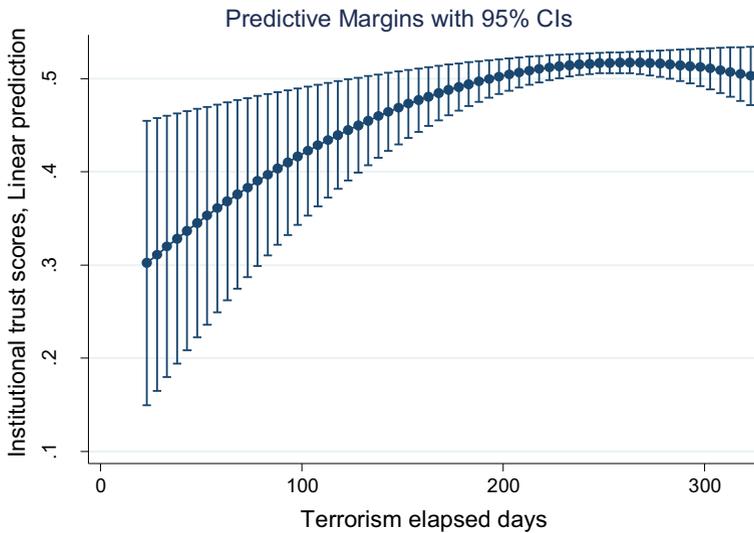
Variables	2004 Madrid train bombings, Spain	2011 Oslo and Otoyra attacks, Norway	2014 Jewish museum shooting, Belgium	2015 Charlie Hebdo shooting, France	Pooled sample
Terrorism elapsed days	0.001*	0.001	0.002**	−0.002**	
Terrorism elapsed days squared	−0.000001*	−0.000001	−0.00001***		
Victims					0.011**
Terrorism elapsed days × victims (Spain attack)					0.000
Terrorism elapsed days × victims Squared (Spain attack)					−0.000
Terrorism elapsed days × Victims (Norway attack)					0.000
Terrorism elapsed days × victims (Belgium attack)					0.001**
Terrorism elapsed days × victims squared (Belgium attack)					−0.0000001***
Terrorism elapsed days × victims (France attack)					−0.0001***
Age	0.0004*	0.001***	0.0002	0.001	0.001***
Gender	0.006	−0.016**	0.004	−0.042**	−0.004
Middle level education	−0.0001	0.033	0.013	0.087**	0.008
High level education	0.028**	0.047	0.085***	0.118***	0.042***
Employed	0.004	0.001	−0.008	0.001	0.001
Feeling about household's income	0.036***	0.081***	0.077***	0.087***	0.058***
Religiosity	0.021***	0.011	0.020***	−0.004	0.016***
Hours spent watching TV	0.0001	−0.027***	0.002	−0.038**	−0.008**
Immigrant-related stance	0.049***	0.054***	0.072***	0.062***	0.055***
Safe environment	−0.008	0.001	−0.015	0.037*	−0.005
Perpetrators origin Elections					2.624**
Constant	0.321***	0.153	0.218**	0.382***	−2.315**
R <sup>2</sup>	0.07	0.10	0.19	0.19	0.11
F test	7.02***	11.19***	35.15***	5.97***	29.86***
Observations	1148	1303	1593	250	4342

All regressions are estimated with heteroskedasticity-robust standard errors

\* Significance at 10 %

\*\* Significance at 5 %

\*\*\* Significance at 1 %



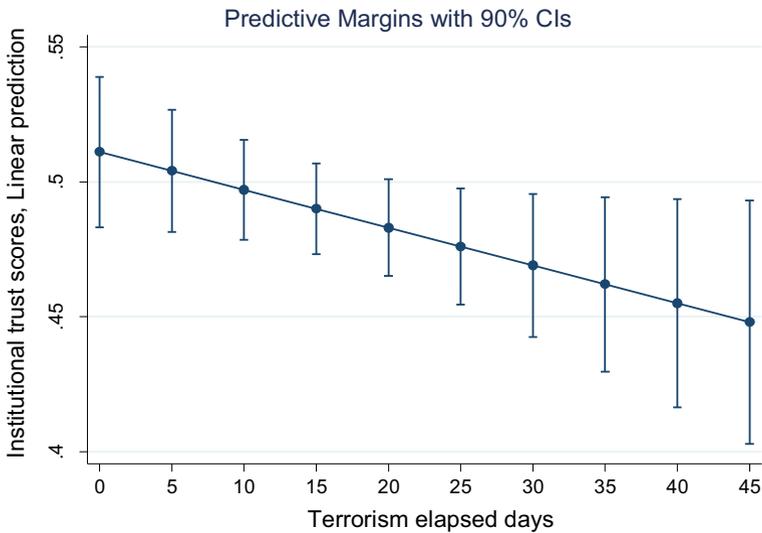
**Fig. 1** Terrorism and institutional trust in Spain

conducted very near the time of the events. Indeed, in some cases, the respondents were interviewed only a few hours after the Charlie Hebdo attacks. We tentatively argue that in this very short time-window between the terrorist attacks and the ESS survey, the initial, first-reaction sentiments that prevailed were those of insecurity, dismay and dissatisfaction with the ability of the state apparatus and the security forces to prevent and thwart the terrorist threat. Hence, the reduction in institutional trust observed in Fig. 2. Still, the findings on the French terrorist attack should be viewed with caution owing to the small sample size.

On balance, the results for both the 2004 Madrid bombings and the 2015 Charlie Hebdo shootings seem to suggest that the effects of single acts of terrorism on institutional trust are time-dependent. The levels of institutional trust are determined by broader and more deeply embedded factors and are ruffled only temporarily by one-off terrorist incidents.

The last column of Table 2 presents the empirical estimates from the pooled model. In broad terms, the picture is consistent with the ones observed in the cross-country models. As mentioned already, the “*Terrorism elapsed days*” indicator (introduced separately for each attack in the pooled model) is weighted by the number of victims involved in each attack. Once again, a strong inverse U-shaped relationship is observed for Spain, but the monotonic negative relationship for the Charlie Hebdo attack is no longer statistically significant. The three other independent variables introduced into the models—the number of victims, the Arabic origins of perpetrators and the holding of national elections—do not seem to exert any significant effect on institutional trust.

Finally, the rest of the statistically significant indicators, controlled for in the estimations (Table 2), show the expected effects on institutional trust. A strong and consistent effect, which is in agreement with the literature (see Back and Kestila 2009; Brehm and Rahn 1997), is observed for the index of subjective feelings about one’s own income situation. This finding suggests that individuals who feel happy with their household incomes report more trust in institutions stronger than other, less satisfied respondents. Religiosity also seems to be significant, with more religious respondents exhibiting more

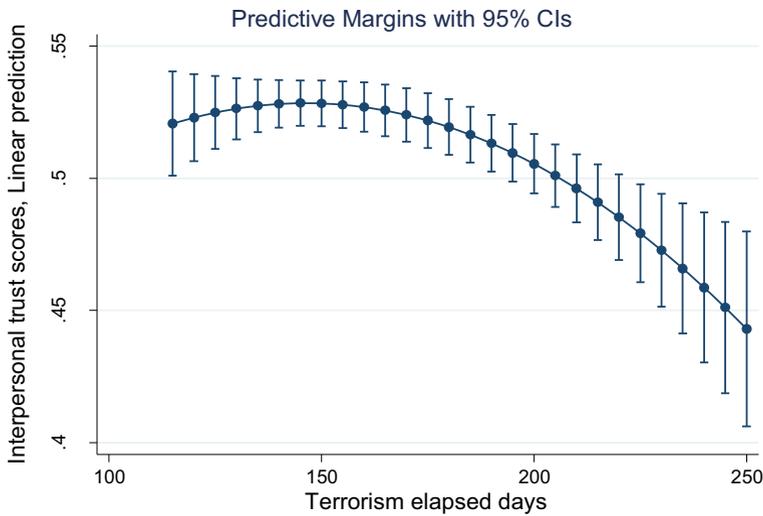


**Fig. 2** Terrorism and institutional trust in France

institutional trust (similar findings are reported by Newton and Zmerli 2011). Strong effects also are observed for the indicator of immigrant-related opinions. Respondents with more egalitarian views towards immigrants tend to report greater institutional trust in all four countries.

Consistent with the literature, education too seems to matter (see, *inter alia*, Brehm and Rahn 1997; Delhey and Newton 2003; Freitag and Buhlmann 2009; Glaeser et al. 2000; Newton and Zmerli 2011) since, for Norway and Belgium, individuals with more education report higher levels of institutional trust than less well educated respondents. Respondents' age is significant in two out of the four cases (Norway and Belgium), with the effect indicating that older individuals exhibit less institutional trust (e.g., Back and Kestila 2009; Gronlund and Setala 2012). Gender differences do not explain variations in institutional trust in any of the four countries. It should be noted that similar studies report mixed findings: in some cases, males are found to be more trusting (Back and Kestila 2009; Newton and Zmerli 2011) and in other cases males are less trusting than females (Gronlund and Setala 2012); the pattern varies over time and from one country to another. Employed individuals are characterized by lower levels of institutional trust than those not in the labor force or unemployed, but only in Belgium. Finally, in Spain, individuals watching television more than 2 h on a daily basis, trust institutions more than the remaining respondents.

In the case of Spanish respondents who live comfortably on their current incomes and have positive attitudes towards immigrants the results show a 0.65 standard deviation increase in institutional trust relative to respondents who experience economic difficulties and are less tolerant toward immigrants. Similarly, the results indicate a 1.23 standard deviation increase in institutional trust for Belgian respondents of higher educational status, employed, possessing a comfortable income and having a favorable attitude towards immigrants. The findings also show a 1.54 standard deviation increase in institutional trust in the case of Norwegian respondents of higher educational status, who live comfortably on their incomes and have positive attitudes toward immigrants. Finally, the results show a



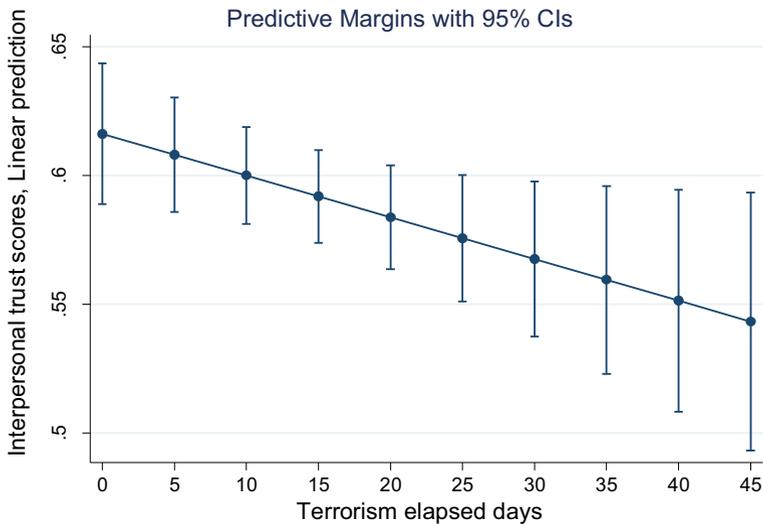
**Fig. 3** Terrorism and interpersonal trust in Belgium

0.98 standard deviation increase in institutional trust in the case of French respondents with better income positions and positive attitudes toward immigrants.

We now discuss the findings for *interpersonal trust* (Table 3). Just as before, the results vary across countries. A statistically significant effect of terrorism is established in two of the four. The “*Terrorism elapsed days*” index, i.e., the number of days between the event and the interview for each respondent, seems to be significant in the case of the 2004 Madrid bombings, the Belgium Jewish museum attack and the French Charlie Hebdo incident. However, the joint test for Spain reveals that we cannot reject the hypothesis that the two terrorism coefficients are not jointly zero; hence, we treat the estimated effects as insignificant. The respective test for the joint significance of the second degree polynomial function of “*Terrorism elapsed days*” in the case of Belgium is  $F(2, 1580) = 9.87$ ,  $\text{Prob} > F = 0.000$ . The findings are markedly similar to those reported above for institutional trust. France is the only country for which terrorist attacks exert a statistically significant effect on both social trust indices.

An inverted U-shaped effect is established in the case of Belgium (Fig. 3), suggesting that, while interpersonal trust was strengthened initially after the terrorist attack, the effect is again transitory and time-dependent. As time elapses, the early positive impact levels off and starts to diminish. The turning point seems to be at 126 days, roughly 4 months following the terrorist shooting at the Brussels Jewish Museum. It appears that following the initial effect, interpersonal trust gradually returned to its pre-attack level. The findings are in line with the literature (see, *inter alia*, Collins 2004; Paxton 2005; Sander and Putnam 2010) and offer further support for the argument that social trust is influenced by more enduring factors and is affected only temporarily by one-off events. Just as before, a monotonic negative relationship is established between the terrorist event and interpersonal trust in France (Fig. 4). Every day that passes following the incident is associated with a 0.01 standard deviation reduction in interpersonal trust.<sup>12</sup>

<sup>12</sup> This is based on the estimated effect on the standardized institutional trust variable.



**Fig. 4** Terrorism and interpersonal trust in France

The pooled model results are shown in the last column of Table 3 and present a broadly similar picture. As can be seen from the victim-weighted indicator of “*Terrorism elapsed days*”, an inverse U-shaped relationship is again observed for Belgium and a monotonic negative relationship is seen for France. Blomberg et al. (2011) come to similar conclusions, though they use different data<sup>13</sup> and methodology.<sup>14</sup> Additionally, other factors related to the attacks seem to affect interpersonal trust levels. More specifically, the number of victims and the ethnic origins of the perpetrators are positive and significant, suggesting that interpersonal trust rises with the number of fatalities, or when terrorists are of Arabic descent. The holding of national elections immediately following the attack, as in the case of Spain, seems to erode people’s solidarity and social trust.

Turning to the various control variables, we see, once again, that their effects on interpersonal trust generally correspond to those in the literature. Thus, individuals living comfortably with their household incomes exhibit more interpersonal trust, an effect that is strong, uniform across all cases examined and in agreement with other studies (e.g., Alesina and Ferrara 2002; Delhey and Newton 2003; Knack and Keefer 1997). Religiosity again returns a positive sign in Spain and Belgium, indicating that more religious individuals display more trust in other people (Delhey and Newton 2005; Rothstein and Stolle 2008). More tolerant attitudes toward immigrants are associated with greater interpersonal trust in all countries examined. Respondents of middle and higher educational levels report more interpersonal trust than those with less education (with the exception of Norwegians), a pattern that is reported consistently in the literature (e.g., Alesina and Ferrara 2002;

<sup>13</sup> One trust question is drawn from the World Values Survey and a dummy variable for terrorist attacks is drawn from the ITERATE dataset.

<sup>14</sup> A probit/logit pooled model is estimated for all countries. Tables A4 to A7 in the Online Appendix present the ordered logit model estimates separately for each sub-index of social trust applied in this study. Stronger effects of the terrorist events on social trust are observed, as expected, for Spain and for Belgium (for interpersonal trust).

Bjornskov 2006; Delhey and Newton 2003, 2005; Freitag and Buhlmann 2009; Glaeser et al. 2000; Newton and Zmerli 2011; Rothstein and Stolle 2008).

Contrary to the finding for institutional trust, interpersonal trust seems to increase with age in two out of four cases, i.e., in Spain and Norway (similar to the results reported by Freitag and Buhlmann 2009; Newton and Zmerli 2011; Rothstein and Stolle 2008), while males report lower levels of interpersonal trust than females in Norway and France (similar evidence is reported by Delhey and Newton 2003; Newton and Zmerli 2011).<sup>15</sup> A different effect also is found for respondents watching many hours of television daily. More time spent watching television is associated with less interpersonal trust in Norway and France. Finally, in contrast to other studies, we find that interpersonal trust in all of our countries is not affected by the employment status of the respondent (as found by Blomberg et al. 2011; Brehm and Rahn 1997; Rothstein and Stolle 2008).

Once again, for Spain, higher socioeconomic status (measured by higher educational attainment and larger incomes) and more positive views of immigrants are associated with a 0.86 standard deviation increase in interpersonal trust in comparison to the rest of the respondents. For Norwegians, a comfortable income and positive opinions about immigrants lead to a 0.95 standard deviation increase in interpersonal trust. For Belgians, higher socioeconomic status and positive views regarding immigrants are associated with a 1.44 standard deviation increase in interpersonal trust. Finally, for France, respondents of higher socioeconomic status (i.e., middle or higher educational status and a satisfactory income) and with more positive attitudes toward immigrants display a 2.26 standard deviation increase in interpersonal trust relative to others.

## 5 Concluding remarks

As shown by a number of studies, terrorist activity can have profound effects on the general public's risk perceptions and attitudes. This paper examines how terrorist events impact core aspects of social capital, namely trust in institutions and trust in other people in general. Four cases are examined using data from European Social Survey waves. Albeit not fully consistent across four European countries, the findings here allow for some inferences to be drawn. Overall, the findings indicate that the effects of specific terrorist incidents are very much time-dependent and wither away the further from the date of the attack. This finding is in keeping with those reported by studies examining the impact of terrorism on both political trust and interpersonal trust as well as on market institutions. Terrorist events seem only to disrupt temporarily the social fabric, and their impact declines as time passes. This time dependency of effects might explain why no statistically traceable impact was found in the case of Norway. The number days elapsed between the incident and the ESS interviews was the largest of the four incidents examined. Furthermore, the Oslo attack was the only one in which the perpetrator was not associated with extremist Islamic terrorism. This difference could be a further factor explaining the absence of any statistically traceable effect on the levels of trust. Another factor, adding to the unobserved heterogeneity unaccounted for by the models and probably affecting the

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<sup>15</sup> Again the literature provides mixed evidence on this point. Some studies find females to be less trusting than males (Alesina and Ferrara 2002; Blomberg et al. 2011; Freitag and Buhlmann 2009) and others find females to be more trusting than males (Delhey and Newton 2003; Newton and Zmerli 2011), depending on the time frame and the countries examined.

insignificant findings for Norway, could be the cumulative effect of terrorism and the way it “adds” to the individual sentiments of social trust when a specific terrorist attack occurs.

The time-dependency factor seems to offer a plausible explanation for the findings in the cases of France, Spain and Belgium. In the first, the effect on the two trust indices was negative, providing evidence in support of the jading effect (Tallman 2007). However, it should be acknowledged that the time window between the interviews and the Charlie Hebdo shootings was very short and the sample size was too small to reveal any possible non-linearities in the relationship of interest. Some of the ESS French interviews coincided with the event, which probably explains the predominance of the attack’s negative effect on institutional and interpersonal trust. In other words, it is possible that what the estimations captured is the initial first reaction and shock caused by the shootings. For Spain, the *rally* effect probably explains the positive effect on institutional trust that gradually diminishes as the time between the interviews and the bombings in Madrid grows. A similar inverted U-shape finding is seen in the case for interpersonal trust in Belgium. Again, the effect withered away as time passed.

Overall, it appears that terrorist attacks do not seem to exert any long-term effect on social trust. This may tentatively be interpreted as indicating that the factors influencing the levels of trust in a society are embedded in more durable individual and/or societal factors. Finally, it seems that the impact of the terrorist attacks on different aspects of social capital can vary greatly from one society (or country) to another, or from one incident to another. The massive terrorist blow in Spain (in terms of victims) seems to have affected citizens’ trust towards state institutions, but it did not change the trust level within the society. In turn, the more focused, small-scale attack on the Brussels Jewish Museum shook social trust, but it did not have an effect on trust towards public authorities in Belgium. The ‘White’ (non-Arabic) Norwegian attacks in Oslo had no significant impact on institutional and interpersonal trust. Thus, specific traits of both the terrorist act and the targeted society play key roles in whether and how terrorism affects a community’s social capital.

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