

Could education promote the Israeli-Palestinian peace process?

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cemmap working paper CWP27/10

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August 2010

Abstract

The goal of this paper is to measure Palestinians' attitudes towards a peace process and their determinants. One novelty is to define these attitudes as multidimensional and to measure them carefully using a flexible item response model. Results show that education, on which previous evidence appears contradictory, has a positive effect on attitudes towards concessions but a negative effect on attitudes towards reconciliation. This could occur if more educated people, who currently have very low returns to education, have more to gain from peace but are less willing to reconcile because of resentment acquired due to their experience.

JEL classification: I20, O15, O53.

Keywords: conflict resolution, education, latent attitudes, item response models.

*I would like to thank the Palestinian Center for Policy and Survey Research, especially Khalil Shikaki and Olfat Hammad for providing the data. I would also like to thank Richard Spady, Andrew Chesher, Luigi Guiso, Lars Nesheim, Jerome Adda, Christian Dustmann, Markus Poschke, Konrad Smolinski, Rex Brynen, Sami Miaari, Carolina Villegas and seminar participants at Tel Aviv University and cemmap for helpful comments and suggestions and Aida El-Attar for her work with the maps.

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1 Introduction

The Arab-Israeli conflict is one of the most complex and emotion-laden political problems of recent times. This dispute between the State of Israel and the Palestinians living under Israeli occupation has played a critical role not only in Middle East politics, but also at the world level (see Freedman (1979)).

Repeatedly, a two state solution has been proposed, consisting in an independent Palestinian state next to the state of Israel. Several efforts at negotiating such a solution have taken place and failed. According to many polls, large majorities of Israelis and Palestinians would also favor a two state solution.¹ Despite this basic agreement, there are significant areas of disagreement about what constitutes an acceptable solution; not all Palestinians and Israelis agree on the concessions they are willing to make in order to reach a peace agreement. Moreover, several authors have emphasized that the lack of forgiveness generated by the conflict may threaten the peace processes in the long run. These factors make it important to study individuals' willingness to make enough concessions to reach a peace agreement and to reconcile and normalize the relationship between the two societies.

The goal of this paper is to measure Palestinians' attitudes towards a peace process and their determinants. One novelty is to define these attitudes as consisting of two components, willingness to make concessions and willingness to reconcile, and to measure them very carefully. Among their determinants, I focus particularly on the role played by education, a factor for which previous evidence appears contradictory.

Attitudes matter. The Israeli-Palestinian conflict has generated a considerable amount of research. Most of this research implicitly assumes that the conflict shapes individuals' attitudes and quantifies indirect consequences of that. For instance, terrorist activity affects individuals' preferences, with an effect on macroeconomic outcomes (Eckstein and Tsiddon 2004); different Israeli counterterrorism policies have different impacts on Palestinians' attitudes and on expected retaliation (Zussman and Zussman 2006); terror attacks affect Israelis' attitudes and thereby political outcomes (Berrebi and Klor 2006, 2007); and Israeli violence against Palestinians temporarily leads to more support for radical factions

¹See results from surveys conducted by the Palestinian Survey Research among Palestinians and by the Harry S. Truman Centre among Israelis.

and to more radical attitudes towards the conflict (Jaeger, Klor, Miaari and Paserman 2008). The work of Jaeger and Paserman (2006, 2007) suggests that while Israeli violent actions are systematically a response to violent actions by Palestinians, the reverse it is not necessarily true, suggesting that it is essential to understand the factors that shape Palestinians' attitudes towards peace and towards the resolution of the conflict.

However, Palestinians' attitudes have not been studied very much. Only recently have there been some attempts to study the conflict from this point of view. Jasso and Meyersson (2004) study the effects of identity and social distance on support for key provisions of the Roadmap, and Friedman (2005) studies the determinants of Palestinians' attitudes towards diplomacy and attacks. Similarly, Nachtwey and Tessler (2002) find that expected individual economic benefits from future peace exert a positive effect on attitudes towards peace but that individuals' current economic situation plays only a modest role. Since there are thus a variety of views and opinions within Palestinian society, understanding the factors that shape the attitudes of individual Palestinians is important and could help to identify some elements for a successful peace process.

One factor that constitutes something of a puzzle is education. Often, violent and extreme positions are attributed to ignorance and to low market opportunities. For instance, Berman and Laitin (2005) develop a 'club good' model where poverty breeds terrorism. This link can also be found in Bueno de Mesquita (2005) and Bueno de Mesquita and Dickson (2007). Jaeger et al. (2008) find that individuals with some college or more advanced education are less likely to support Hamas, and more likely to support Fatah or other smaller factions. International institutions have also made proposals for strengthening higher education in the West Bank and Gaza. For instance, as early as 1994 UNESCO pointed to education as one of "the first conditions to be fulfilled for success of the peace process". In contrast to this, Krueger and Maleckova (2003) and Berrebi (2007) both find that suicide attackers and participants in violent groups tend to have higher education and living standards above the poverty line. Similarly, using cross-country data, Abadie (2006) does not find a significant link between poverty and terrorism. Finally, using a unique data set detailing the biographies of Palestinian suicide bombers, Benmelech and Berrebi (2007) estimate the returns to human capital in suicide bombing and find that older and more educated suicide

bombers are assigned to more important targets and perform better (more casualties and lower probability of failure).

Because the relation between education and political violence is disputed, it is important to analyze its role for attitudes towards a peace process. In this, it is important to clearly distinguish income from education, and personal or family income from GDP per capita or the overall economic situation. While education may drive expected or potential income, this can be quite different from actual income. Indeed, given the currently very depressed returns to education in Palestine (shown in Section 2), education conditional on current income is likely to be closely related to an individual's current economic losses from the conflict. Therefore, education and income should not be expected to have similar effects.

Concretely, as argued in Section 3, if the earnings of educated individuals are particularly depressed relative to a situation of peace, they may be more willing to make concessions to reach a peace agreement. At the same time, they may be more frustrated due to past losses, and therefore less willing to reconcile. In contrast, it is not clear how current income conditional on education would evolve with a peace agreement; individuals may well all have similar expectations. Similarly, a change in the overall economic situation may affect attitudes differently from a change of an individual's situation relative to other Palestinians. One important contribution of the paper is to pay careful attention to these issues.

Measurement matters. Important advances in this literature are possible in the area of the measurement of individuals' attitudes. Concepts like attitudes towards peace, towards reconciliation or towards violence are inherently difficult to measure. Measures based on one question only, as used in previous work (e.g. 'what party do you support?' or 'Do you think that lasting peace with Israel is possible?'), are partial, restrictive and liable to contain measurement error. The approach I use overcomes these limitations by allowing for the multidimensionality of attitudes to peace (involving attitudes both towards reconciliation and towards concessions) and taking into account various facets of each of the dimensions. By using six items (questions) for each dimension, many aspects of each concept are captured, arguably allowing for a more reliable measure.

Therefore, the other main contribution of the paper lies in the measurement of the attitudes. Applying a new item response model by Spady (2007), I measure the latent attitudes

at the individual level and can infer the relation between individuals' attitudes and their personal and demographic characteristics. The data used is from surveys conducted by the Palestinian Center for Policy and Survey Research (PSR). It is particularly useful because the questions are very precise, repeated over several years, and capture many facets of each attitude.

The results of the paper indicate that a) There are theoretical reasons for considering attitudes towards peace as composed of two distinct dimensions; attitudes towards reconciliation and attitudes towards concessions. This multidimensional construct provides new meaningful insights about the role of education. b) Education is positively related to attitudes towards concessions. c) In contrast to the results on concessions, education has a negative effect on attitudes towards reconciliation. d) Attitudes towards concessions evolve inversely with GDP per capita. e) Attitudes towards reconciliation comove closely with GDP per capita; this is particularly pronounced for individuals with high education. f) What possibly drives the negative effect of education on attitudes towards reconciliation is a higher level of frustration for more educated individuals due to low labor market opportunities. g) Specific local factors such as the construction of the separation barrier and regional unemployment influence attitudes towards reconciliation, in particular for individuals with low education. Attitudes thus react to economic factors; more strongly to local ones in the case of individuals with low education and more strongly to more aggregate ones for individuals with high education. Allowing for attitudes to peace to have more than one dimension thus helps to shed light on the role of education. Its different effects in the two dimensions may elucidate previous apparently contradictory findings in the literature.

The rest of the paper is structured as follows. Section 2 briefly describes the labor market in the West Bank and Gaza and reviews previous evidence on returns to schooling. Section 3 presents a simple theoretical argument for treating attitudes towards peace as a composite of two dimensions. This argument will also guide the estimation. In Section 4 I describe the methodology used to obtain the measure of the attitudes. In Section 5 I present the data used, and I describe the questionnaire items and the personal and demographic characteristics of the respondents that play a role in the estimation of the latent attitudes. In Section 6 I obtain the measure of attitudes towards concessions and towards reconciliation

and analyze their determinants and their correlation with economic trends. I also investigate the channel through which the events of the conflict can shape attitudes. Finally, Section 7 concludes.

2 Labor market and returns to schooling

The Palestinian economy is characterized by a labor market that is completely dependent on the Israeli market, and strongly influenced by political and social events. Palestinian unemployment and domestic wage respond to job opportunities and wages in Israel. Angrist (1995) analyzes the Palestinian labor market over the period 1981-1987 and finds that over that period, the unemployment rate of college graduates increased strongly, while returns to education declined substantially. The college premium fell from was 40% at the beginning of the period to 20% between 1984 and 1987. Angrist (1995) shows that changes in labor supply explain an important part of this development. The number of Palestinian college graduates increased sharply following the opening of Palestinian institutions of higher education, which had been totally absent before 1972.

Sayre (2001*a*) studies the same period and stresses some demand factors that also explain part of the dramatic changes in returns to schooling. He argues that the reduction of demand for skilled Palestinian workers by the Arab Gulf countries, the increase in demand for unskilled Palestinian workers in Israel and changes in labor demand coming from changes in the volume of international trade can explain part of the changes observed during this period. Using a slightly different empirical approach, Sayre (2001*b*) finds that while supply changes could still account for most of the decrease in returns to schooling, demand shocks could explain as much as one-third of the change in the returns to a college. For similar reasons, the return to college remained low in the period 1995-2001 (Sayre and Miller 2004). Unemployment and wages in the Palestinian Territories continue to depend on the Israeli economy and are driven by closures, job permits, changes in the demand of low skilled workers, etc.

Angrist (1995) and Sayre (2001*a*) also link the bad labor market prospects for educated Palestinians from 1981 to 1988 to the uprising of the first Intifada. Sayre and Miller (2004) link the similar situation experienced by the Palestinian economy during 1995-2001 to the

uprising of the second Intifada.

Although recently some papers have analyzed the effects of conflict and in particular border closures with Israel on the Palestinian economy and in particular the labor market (see Bulmer (2003) or Miaari and Sauer (2006)) none of these studies report returns to schooling for the period under analysis in this paper (2001-2006). But economic conditions have worsened since 2000. Despite other factors that may affect the Palestinian economy, the World Bank (2003, 2004, 2005, 2007, 2008) repeatedly reported that the closures and restrictions on movements related to Israeli security concern have harmed the Palestinian economy and increased unemployment and poverty. The same conclusions are found in Fischer, Alonso-Gamo and Erickson von Allmen (2001). Figure 1 shows rough estimates of the college premium in the Palestinian territories for the period under analysis. This figure shows that the college premium during this period has gone from 16% to 30%. This is much lower than the college premium in the U.S., which is around 60% in this period (Goldin and Katz 2007). The difference is also important if we compare to the returns to schooling of the Palestinians or Jordanians who emigrated to the US. El-Araby and Ragan (2009) estimate the returns to education for Arab immigrants in the United States to be 8per year of schooling for Palestinians in 1990 and 6% for Jordanians in both 1990 and 2000. These returns are larger than 30/16 divided by 4 years of college.

Not surprisingly, individuals react to this lack of economic opportunities. The results of a survey performed by Birzeit University indicate that, in 2006, 44% of Palestinians aged between 18-29 years would like to migrate if that was possible. For individuals aged 30-49, this was around 30%. These numbers are higher among more educated individuals. (See Lubbad (2008) for further discussion of the results of this survey.)”

This literature suggests that the depressed opportunities faced by highly educated Palestinians could shape their attitudes towards the peace process. The next section sets out a simple model showing which relationships we could expect.

3 Education and willingness to make concessions and to reconcile

Suppose that Palestinians value consumption and derive value from their relationships with Israelis. These valuations govern their attitudes towards making concessions and towards reconciliation. The literature on conflict resolution suggests that a peace process can be divided into stages (see e.g. Gawerc 2006). The relevant stages here are the following. In a first stage, Palestinians and Israelis have to reach an official settlement or resolution and stop direct violence. Success depends on a negotiation process and on individuals' attitudes towards concessions on both sides. The second stage of the peace process consists in a normalization of the relationship between Palestinians and Israelis. This stage involves reconciliation, psychological healing and reconnecting of the societies.

Suppose that in the first stage of the conflict, Palestinians have the choice of how many concessions to make. Denote the choice of concessions by $s \in \mathbb{R}_0^+$. Making concessions may lead to a peace agreement with Israel, with the probability p of an agreement increasing in the amount of concessions made. However, the “marginal product” of concessions in increasing the probability of an agreement is decreasing and goes to zero in the limit ($p'(s) > 0$, $p''(s) < 0$, $0 \leq p(0) < 1$). Also assume that there is no finite amount of concessions that leads to an agreement with probability 1 ($\lim_{s \rightarrow \infty} p(s) < 1$).

Individual Palestinians expect income of $w(e)$ after a peace agreement. They currently earn $\bar{w}(e)$. Both w and \bar{w} increases with the individual's education e . Reflecting the evidence discussed above, current income and returns to education are both depressed ($\bar{w}(e) < w(e)$, $\bar{w}'(e) < w'(e)$ for all e). Because of depressed returns to education, more educated individuals suffer a larger loss of income due to the conflict.

Whereas making concessions could raise future incomes, it also has a psychological (and possibly also a real) cost c_i per unit of concessions. This differs across individuals. It may depend on demographics, but also vary in unobserved ways. While in principle, the cost could vary systematically with education, we abstract from this. Individuals then choose their optimal level of concessions by choosing s to maximize the objective function $p(s)w(e) + (1-p(s))\bar{w}(e) - c_i s$.² The optimal s is the theoretical counterpart to the willingness

²If this was about actions, not attitudes, this would of course be a strategic game, where Israeli actions

to concede we measure in the data. The optimal amount of concessions, if interior, then satisfies $p'(s)[w(e) - \bar{w}(e)] = c_i$. Because $p' > 0$, $p'' < 0$, $w(e) > \bar{w}(e)$ and $w' > \bar{w}'$, the optimal s increases in education and decreases in the cost of concessions. More educated individuals have more to gain from concessions, so they are willing to invest more.

Palestinians also value the quality of the relationships they have with people around them. This includes Israelis, and this allows for an analysis of the willingness to reconcile. Reconciliation requires effort, but has benefits in terms of improving the quality of relationships, and possibly also has economic benefits. Denote these benefits by $R(r; e)$, where r denotes efforts to reconcile. The benefits depend on education because economic benefits of reconciliation are likely to vary with education. Assume that the marginal product of efforts at reconciliation, R' , is positive but decreasing ($R'(\cdot, e) > 0$, $R''(\cdot, e) < 0$ for all e).

Engaging in reconciliation also has a psychological cost, as it may be hard to reconcile with people if past experience with them was bad. This cost increases in the level of frustration experienced due to the conflict. This psychological cost can be seen as hate generated because Palestinians see Israel as responsible for their miseries. (Glaeser (2005) studies the formation of hate). The experimental literature on reciprocity (see Fehr and Schmidt (2006)) confirms that subjects forgo rewards if that allows them to punish people who have behaved unfairly, particularly by rejecting unequal offers in ultimatum games. On a practical level, this hate and frustration may be linked to the poor labor market conditions and therefore may vary with individuals' level of education. To capture this, assume that the cost of reconciliation effort $c(e)$ increases in frustration due to the conflict, and that frustration is driven by the difference between potential and actual wages. Then $c(e) = f(w(e) - \bar{w}(e))$, $f' > 0$ and $c'(e) > 0$. Individuals then set their optimal amount of reconciliation to maximize its benefits net of the psychological cost. This yields the optimality condition $\partial R(r; e) / \partial r = c(e)$. Individuals engage in reconciliation up to the point where the marginal benefit equals the marginal cost. More educated individuals prefer a higher level of reconciliation if the benefits from it increase strongly enough with education. If benefits do not rise strongly with education, in contrast, more educated individuals prefer a lower level of reconciliation. This is because reconciliation is costlier for more educated people because of the wage losses due

also matter for payoffs.

to depressed returns to schooling. More generally, any factor increasing $w(e)$ or reducing $\bar{w}(e)$ increases frustration and reduces willingness to reconcile.

4 Measuring individuals' attitudes

4.1 The Item Response Model

In this section, I define a model for estimating the latent attitudes towards a peace process. The model used in this paper is a hierarchical item response model³ estimated following the approach proposed by Spady (2007). ⁴The model is represented graphically in Figure 2.

From the considerations in the previous section, every individual has attitudes towards concessions and towards reconciliation that depend on the potential payoffs and costs they face. That is, the optimal s implies an attitude towards concessions A_C and the optimal r an attitude towards reconciliation A_R . Together, these attitudes constitute the individual's predisposition towards a peace process. They also cause responses to survey questions on the issue. Finally, they also underlie agents' behavior; e.g. their political decisions or their propensity to engage in violence. This last aspect is left for future research.

From the model, education and other factors that systematically affect costs and payoffs affect the willingness to make concessions and the willingness to reconcile. Solving the optimality conditions for the optimal choices then leads to the empirical specification

$$A_C = h_C(e, X, \epsilon_C) \tag{1}$$

$$A_R = h_R(e, X, \epsilon_R) \tag{2}$$

where X is a vector of covariates that captures differences in individuals' costs or preferences. The empirical specification thus reflects the idea that individual characteristics and experiences as well as community characteristics can be related to individuals' attitudes towards reconciliation and towards concessions. It is also assumed that these characteristics do not affect the answers directly, but only through their effect on the attitudes.

³See Steele and Goldstein (2007) for an overview of this type of item response models.

⁴Item response theory (IRT) models have been widely used in psychometrics to measure latent traits like ability, trust or other attitudes using test results or survey outcomes. Confirmatory factor analysis has been used for the same purposes as IRT models (see e.g. Heckman, Stixrud and Urzua (2006) and Carneiro, Hansen and Heckman (2003)) The main advantage of IRT models compared to factor analysis is that they deal with discrete outcomes in a more straightforward way. As all the answers to the survey questions used in this paper are discrete, IRT models are particularly useful in this context.

Equations (1) and (2) constitute a structural model with the following underlying assumptions: (1) the expressions of agreement and disagreement on questions about conflict resolution (‘item responses’) reflect corresponding attitudes of the responder; (2) the ‘attitudes’ are enduring individual-specific attributes, given the individual’s characteristics and environment; and (3) each one of the series of item responses used is determined by a single attitude only (attitudes towards reconciliation and attitudes towards concessions respectively).

The variables used to estimate the individual attitudes and those included in X are discussed in Section 5. Before that, I describe how to obtain the likelihood function used to measure the attitudes towards reconciliation and to obtain the correlates with the individual personal characteristics. The likelihood function and the estimation method used for the analysis of the attitudes towards concessions only differs in the use of different questions. I denote the items used to construct the reconciliation scale as R and the items used to construct the concessions scale as C .

4.2 Structural Representation

Consider a system of M measurements R_m ($m = 1 \dots M$) for a latent factor A :

$$\begin{aligned} R_1 &= g_1(A, U_1) \\ &\vdots \\ R_M &= g_M(A, U_M) \end{aligned}$$

where A is univariate, $U_m \sim U(0, 1)$ and $g_m(\cdot)$ is weakly increasing in U and strictly increasing in A . It is also assumed that $U_i \perp U_j \forall i \neq j$ and $U_i \perp A \forall i$ which implies that conditional on A the responses are independent ($R_i \perp R_j | A$).⁵

Personal characteristics may affect the way this latent variable is distributed in the population. We assume that individual characteristics, and particularly education, may affect the latent variable A , but do not affect the measurements R_m directly. (They can of course

⁵These assumptions correspond to the standard assumption in item response theory (IRT); unidimensionality (A is unidimensional), monotonicity ($g_m(A, U_m)$ is strictly increasing in A) and local independence. See Steele and Goldstein (2007) for a review of hierarchical parametric IRT.

affect them via A .) Consider the linear case

$$A = h(X, \epsilon) = X\beta + \epsilon \quad (3)$$

where $\epsilon \sim N(0, 1)$ and $\epsilon \perp X$. Assume also that $U_m \perp \epsilon$ and $U_m \perp X$.

Denoting a realization of A by a , consider the following threshold representation for a given response variable:

$$g_m(a, u_m) = \begin{cases} 1 & \text{if } Q_0(a) < u_m \leq Q_1(a) \\ 2 & \text{if } Q_1(a) < u_m \leq Q_2(a) \\ 3 & \text{if } Q_2(a) < u_m \leq Q_3(a) \\ 4 & \text{if } Q_3(a) < u_m \leq Q_4(a) \end{cases}$$

where $Q_r(a)$, $r = \{1, 2, 3, 4\}$, are thresholds functions for item m , and $0 = Q_0(a) < Q_1(a) < Q_2(a) < Q_3(a) < Q_4(a) = 1$. Figure 3 shows the graphical representation of the functions $Q_r(a)$. This figure shows that higher item responses are associated to higher values of a , i.e. if $a_2 > a_1$ then the item responses of a_2 population stochastically dominate a_1 . Thus, higher item responses are associated to higher values of a . This assumption implies that the lines that indicate the probability of answering k or higher in item j given a have to be downward sloping. Of course, they cannot cross if probabilities are to be non-negative.

The model is identified if the structure, together with the restrictions of the model, delivers the distribution of observables:

$$S = \{g(A, U), F_{U|A}\} \Rightarrow F_{R|A},$$

where $F_{U|A}$ denotes the cumulative distribution function of a random variable U conditional on A . From the identification result, the following equality follows:

$$F_{U|A}(Q_r(a)|A = a) = F_{R|A}(r|A = a)$$

and because of the uniformity of the error term

$$Q_r(a) = F_{R|A}(r|A = a) = Pr(R \leq r|A = a).$$

$Q_r(a)$ thus is a conditional cumulative distribution function.

The way of modeling $Pr(R \leq r|A = a)$ differs among different types of item response models. In this paper these functions are modeled as in Spady (2007), using the distribution

function corresponding to an exponential tilting of second degree of the uniform density,

$$G_r(a) = \frac{\int_0^a e^{\tau_1 \gamma_1(u) + \tau_2 \gamma_2(u)} du}{\int_0^1 e^{\tau_1 \gamma_1(u) + \tau_2 \gamma_2(u)} du} \quad (4)$$

where the functions $\gamma_1(u)$ and $\gamma_2(u)$ are 2 basis functions, chosen to be (shifted) Legendre polynomials and τ_1 and τ_2 are the parameters estimated. From $G_r(a)$ we obtain $Q_r(a)$ as $Q_r(a) = 1 - G_r(a)$.

To ensure that the lines do not cross, they are constructed as products of the estimated distribution functions. Consider an item m with 4 possible answers, so $r = \{1, 2, 3, 4\}$, $Q_4(a) = 1$ and $Q_0(a) = 0$ by definition. Assume $Q_3(a)$, $G_2(a)$ and $G_1(a)$ are distribution functions estimated as described above. Then $Q_2(a) = [1 - G_2(a)]Q_3(a)$ and $Q_1(a) = [1 - G_1(a)]Q_2(a)$.⁶

To build the likelihood function, the conditional probability of a response r , $Pr(R = r|A = a)$, is obtained as

$$\begin{aligned} Pr(R = r|A = a) &= Pr(R \leq r|A = a) - Pr(R \leq r - 1|A = a) \\ &= Q_r(a) - Q_{r-1}(a) \end{aligned}$$

To simplify notation, denote $Pr(R = r|A = a)$ as $p(r|a; \tau_r)$.

The likelihood function for N independent observations then is

$$\begin{aligned} p(r_1, r_2, \dots, r_M|X; \beta, \tau) &= \prod_{n=1}^N \int p(r_1, r_2, \dots, r_M|a, \tau_{m,r}) f(a|X; \beta) da \quad (5) \\ &= \prod_{n=1}^N \int p(r_1|a; \tau_{1,r}) p(r_2|a; \tau_{2,r}) \dots p(r_M|a; \tau_{M,r}) f(a|X; \beta) da. \quad (6) \end{aligned}$$

Because of the assumption of conditional independence of the responses, it is possible to express the likelihood function as a product of the conditional item probabilities. β is a vector of parameters that indicates the effect of X on the mean of A . τ parameterizes the distribution $Q_r(a; \tau_{m,r})$ that enters $p(\cdot)$. With two-parameter exponential tilting, it consists of elements $\tau_{m,r} = (\tau_{m,r}^1, \tau_{m,r}^2)$.

The integral in the likelihood function has no general closed form solution. The integration is thus carried out using Gauss-Hermite quadrature at 200 grid points. Quadrature

⁶This also implies that the stochastic dominance is strengthened to dominance in hazard order.

methods approximate the integral as a weighted sum of function values evaluated over a grid of points so that

$$\int f(x)dx \approx \sum_q w_q f(x_q)$$

Gaussian quadrature rules choose not only the weights, but also the evaluation points or abscissæ, and can achieve higher precision with a fixed number of points. To ensure that we can take into account even distributions with small variance, Gaussian quadrature has been applied to 5 different segments of the grid, with the segment in the middle having a higher concentration of points. A Newton-Raphson algorithm is used to maximize the log-likelihood function. Concretely, we use the BFGS method which builds an approximation to the Hessian in the course of iteration.⁷

4.3 Identification

The model is defined as the structure

$$S = \{g(A, U), F_{U|A}\}$$

with

$$F_{U|A}(Q_r(a)|A = a) = F_{R|A}(r|A = a)$$

and the restrictions described above: $U_m \sim U(0, 1)$, $g_m(\cdot)$ is weakly increasing in U and strictly increasing in A , $U_i \perp A \forall i$, $U_i \perp U_j \forall i \neq j$. The distribution of a is assumed to be known. The model identifies $g_m(\cdot)$ if $\forall (S^*, S^0)$, $S^* \neq S^0$,

$$F_{U|A}^*(Q_r^*(a)|A = a) = F_{R|A}^*(r|A = a)$$

$$F_{U|A}^0(Q_r^0(a)|A = a) = F_{R|A}^0(r|A = a)$$

and $F_{R|A}^*(r|A = a) \neq F_{R|A}^0(r|A = a)$.

Douglas (2001) shows that nonparametric item response models are only identifiable in an asymptotic sense, i.e., when the number of items tends to infinity, in which case the problem would be the one analyzed by Hu and Schennach (2006). For parametric models

⁷For a general discussion about estimation procedures for multilevel generalized linear models see Rodriguez (2008).

identification reduces to showing that the number of constraints of the form:

$$p(r_1, r_2, \dots, r_M) = \int p(r_1, r_2, \dots, r_M | a, \tau_{m,r}) f(a) da$$

generated by the different combinations of responses limits the values of the parameters to a unique set. If $Q_r(a)$ were modeled nonparametrically, the degrees of freedom would be much greater than the number of constraints, considering that the value of the function at each point may be viewed as a separate parameter and the constraints derived from the manifest distributions are not sufficient to identify $Q_r(a)$. The set up of this paper is parametric; $Q_r(a; \tau)$ is modeled as a function of some parameters.

There are $4^6 - 1 = 4095$ possible constraints in the model of attitudes towards reconciliation and $3^7 - 1 = 2186$ in the model of attitudes towards concessions. Since there are many constraints/points of support, the estimation of $Q_r(a; \tau)$, although parametric, is very flexible. The set up of this paper approximates these distributions using two parameters, therefore the degrees of freedom are larger than the number of parameters to be estimated, and the model identifies the functions $g_m(\cdot)$. Since the points of support are large enough (there is enough variation in the data), we can model the latent variables as continuous and still obtain a flexible approximation of $Q_r(a; \tau)$.⁸

5 Data

The data comes from the public opinion surveys designed and conducted by the Palestinian Center for Policy and Survey Research (PCPSR). This institution conducted public opinion polls from 2000, collecting information about attitudes and values of a representative sample

⁸Some related recent results in the literature do not exactly apply in the present case. Hu and Schennach (2006) consider a nonlinear measurement error model that is related to the model presented here. These authors relate the joint densities of the observable variables to the joint densities of the unobservable variables in the same way as equation 6 shows. This equation admits an equivalent operator representation: $L_{R|X} = L_{R|A}L_{A|X}$. The proof of identification relies on the assumption of the operator $L_{R|A} \equiv \int f_{R|A}(R|A = a)g(A)A$ being ‘injective’. Intuitively, $L_{R|A}$ will be injective if there is enough variation in the density of R for different values of A (or X). In our case this assumption is not fulfilled because of the discreteness of R combined with finite amount of data. Therefore, the proof that Hu and Schennach (2006) propose is not applicable in our case.

Also close to our model is the measurement error model analyzed in Hu (2008), where the variable with measurement error and the misclassified measurements are assumed to be discrete. In that case, the author shows that the latent model can be expressed as an explicit function of directly observed distribution functions and that therefore, under this framework $f_{R|A}$ and $f_{A|X}$ are nonparametric identified.

of Palestinians in the West Bank and the Gaza Strip, including East Jerusalem. PCPSR is an independent nonprofit institution and think tank. Its poll results have been used by numerous researchers, for instance in Krueger (2007). The survey waves used in this paper are the ones that include identical questions about attitudes towards reconciliation (December 2001 (poll #3), May 2002 (poll #4), April 2003 (poll #7), March 2005 (poll #15) and December 2006 (poll #22)) and about attitudes towards concessions (December 2003 (poll #10), December 2005 (poll #18), and December 2006 (poll #22)). These surveys also include information about personal and demographic characteristics. The only survey that contains information on both concessions and reconciliation is the one for December 2006.

This data set is particularly useful because questions are very precise and allow distinguishing between attitudes towards reconciliation and towards concessions. The items reflecting attitudes towards reconciliation emphasize that the questions refer to steps that the Palestinians could take once the state of Palestine was established. The items reflecting attitudes towards concessions refer to key issues such as final borders, the status of Jerusalem, refugees, and the security arrangements that have been recurrently brought up during peace negotiations (the Geneva Initiative, the Clinton Parameters and the Taba Negotiations). This distinction is important because the use of more general questions can lead to misleading conclusions. For instance, measuring attitudes towards peace using the support for the continuation of peace negotiations as in Abu Sada (1998) is problematic because individuals' answers are also affected by other factors like their confidence in the leaders involved in the negotiations. The use of party identification as a way to infer attitudes, as used for example in Jaeger et al. (2008), can also lead to wrong conclusions since other issues like a person's degree of religiosity or the current ruling party's level of corruption can play a role. Hence, the precise wording of the questions in the survey used here makes more precise measurement possible and makes the data set particularly useful. The full wording of the questions/items used to estimate the individuals' latent attitudes is shown in the appendix.

Summary statistics of the responses to these items are presented in Table 1. Items on reconciliation have four possible answers (scale from 1 to 4) and items on concessions have three possible answers (scale from 1 to 3). A higher score corresponds to a more positive attitude towards reconciliation or concessions. Even among the items referring

to one attitude, answering behavior varies over these items. Considering for instance the question "Would you support to adopt a school curriculum in the Palestinian state that recognizes Israel and teaches school children not to demand the return of all Palestine to the Palestinians?" and the question "In case of a two state solution, would you support to open borders to free movement of people and goods?", the mean answer differs strongly, at 1.71 for the first question and 3.04 for the second. This indicates that different items carry information on respondents' attitudes to a varying degree, or capture different aspects. Thus, by focussing on just one questions, or on a narrow subset of questions, valuable information may be lost. This is also indicated by the pairwise correlation coefficients for the items shown in Table 2; correlations are positive but far from perfect.

The data show some important changes in the composition of the sample regarding the level of education. One could think that the possibility of an important flow of migration from the Palestinian territories to other countries could affect the composition of the sample and therefore could explain the evolution of the attitudes. Some authors who have tried to gather information on the evolution of emigration flows from Palestine (see Lubbad (2008) and references therein) have faced the problem that it is difficult to obtain this information since the Palestinians do not have an effective system of registering departures and arrivals at their borders as Israel controls these registrations. It also is difficult to obtain this information from the host countries, since the definition of what constitutes a Palestinian is not always clear. Lubbad (2007) reports different estimates of the number of Palestinians living abroad, from 1970 to 2006. The magnitude of the estimates differs a lot depending on the source, but using the results from the PCBS (the only ones that use the same method for 2000 and 2006) emigration does not appear to be very important during the period analyzed here.

To evaluate whether the assumptions of unidimensionality, local independence and monotonicity that are required for identification are fulfilled in the data, I use Mokken scale analysis. A more detailed explanation of the Mokken scale analysis is given in the Appendix of this paper (section A.3). The results of this analysis show that the scales constructed in this paper fulfill the assumptions required by the model.

The theoretical model suggests that some demographic variables are informative about the individual attitudes. Therefore, they are also used in the estimation. A descriptive anal-

ysis of these variables is shown in Table 3. This table shows an increase in the percentage of individuals with high levels of education and with a high degree of religiosity. The theoretical justification for the inclusion of personal and demographics characteristics in the estimation is the following:

Education. As seen above, the role of education in shaping attitudes towards a peace process is not well understood in the existing literature. The goal of this paper is to shed some light on the connection of education with Palestinians' attitudes. To measure education I use three dummy variables: Low education (elementary education or less), medium education (preparatory or secondary education) and high education (college or more).

Religion: personal piety. Tessler and Nachtway (1998) state that "the theoretical linkage between religion and international politics is based on the assumption that religion plays a crucial role in shaping both the normative orientation of individuals and their understanding of the surrounding world." They find that different dimensions of religiosity have different effects on individuals' attitudes towards politics or towards international conflicts. They find that support for political Islam and religious activism have a strong effect on an individual's political views, while personal piety is unrelated to those views. Unfortunately, the surveys used in this paper only contain information on the degree of personal piety. The measure of personal piety used are three dummy variables based on the answer to the following question: "How often do you pray? 1) every day, 2) only on Friday or occasionally, 3) rarely or never."

Economic determinants: household income/family size. The relation between individuals' current economic situation and their attitudes is a priori ambiguous. It could be that individuals who are currently doing well believe that this will allow them to benefit more from economic opportunities arising with peace. It may, however, also motivate them to avoid change, and pit them against an agreement, whereas the poor might support it in the hope of an improvement in their situation, and because they have little to lose. On the other hand, they may be frustrated due to their economic situation, and not believe in the benefits of an agreement.

Controlling for income is also important in order to correctly interpret the effect of education. Education drives potential or expected income. Actual income may well deviate from that, in particular in the Palestinian context with recently very low returns to education. In this sense, the effect of education conditional on income can be interpreted as a measure of an individual's current economic loss due to the conflict.

Finally, it is important to distinguish the effects of individual and aggregate income, respectively. The effect of individual (relative) income as captured by its coefficient may well be different from that of aggregate income, about which results for different years contain information.

In the survey, household income is reported as a categorical variable. We measure income using three dummies: Low Income (monthly income per person in the household ≤ 125 \$), medium income (income per person between 125 and 450\$) and high income (income per person > 450 \$).

Age. Since attitudes might change over the life cycle due to personal experience but also due to national and global developments, the age of respondents can be informative.⁹

Working for the Public Sector. The public sector is an important source of employment in Palestine. In 2003, public sector employment (by the Palestinian Authority and by municipalities) accounted for about 26 percent of total employment in the West Bank and Gaza. For many young men coming from poor families this is the only route of social mobility. Therefore, working for the public sector is also an indication of how well the individual is doing. In addition, working in the public sector may of course by itself influence attitudes.

Being unmarried. Being unmarried in Palestine can be a source of frustration. Marriage is important because in Palestine, it represents the key to adulthood. It also is a religious obligation. Marriage is expensive; some families have to save all their lives to afford the wedding of their children.¹⁰ Since the economic situation has been deteriorating in the

⁹Note that the variable used is age standardized by its mean, and standardized age squared over 100.

¹⁰For an illustration, see 'The wedding shortage', Navtej Dhillon, Newsweek.com, March 2007. This article explore why the Middle East has the lowest rates of marriage in the developing world.

last years, it is possible that individuals who cannot afford marriage seek outlets for their frustration, translating into more negative attitudes towards reconciliation.

We also control for gender and region of residence as they can influence the experiences faced during life.

6 Results

In this section I use the methodology explained above to infer the relationship between demographics and attitudes towards concessions and towards reconciliation with a particular focus on education. I then use regional heterogeneity, in particular the construction of the separation barrier, to explore how local factors affect different educational groups.

6.1 Attitudes towards concessions

Table 4 shows the effect of the personal characteristics on the mean of the probability distribution of attitudes towards concessions for a given person. They correspond to the coefficient vector β in equation (3). The effects are additive, which means that statements such as ‘more educated people have more positive attitudes towards concessions’ must be understood in a ‘*ceteris paribus*’ sense (Spady 2006). Coefficients describe deviations from a ‘standardized’ person. This is a male who lives in Hebron, has the mean age of the sample, is married, has a medium level of income per family member, is not a refugee, has low education and prays very often.

Results show that education is positively related to attitudes towards concessions. This finding is in line with the argument advanced above that more educated people could have more to gain from an agreement that eases the constraints on the Palestinian economy and therefore have more to gain from concessions. Figure 4 shows the evolution of the effect of education over time. To facilitate a visual interpretation, the middle panel of Figure 4 plots the difference between the coefficients associated with high education and the coefficients associated with low education (from column II in Table 4). The effect of high education evolves inversely with GDP per capita, indicating that in periods in which market opportunities are lower, more educated individuals are more willing to make concessions. In

such periods, the payoff from peace may be larger.

Family income also matters; families with lower income tend to support the concessions discussed in the peace talks. Again, controlling for education, these might be the ones who have most to gain or least to lose from an agreement. The degree of religiosity reduces the willingness to make concessions.

Other authors have found that education has a negative impact on attitudes towards continuing with the peace negotiations after the Oslo agreements (Abu Sada 1998) or towards the Road Map (Jasso and Meyersson 2004). These authors explain this result by the fact that better educated respondents have more access to information and are therefore more aware of the problems of the possible agreements. Because of the different questions used to measure the attitudes, it is difficult to compare their results with the ones in this paper. The questions used in those papers are related to a particular moment in time and to a particular negotiation process. It seems likely that the individuals' answers take into account other factors like the strength of the Palestinian leaders or the international and Israeli political situation. The questions used in this paper to measure attitudes towards concessions are more atemporal in the sense that they are related to the key elements that have recurrently been subject of negotiation in peace talks. Therefore they provide more reliable information on individuals' general attitudes towards concessions.

6.2 Attitudes towards reconciliation

The previous section described results about willingness to make concessions obtained using a collection of items C_m . In this section I measure 'attitudes towards reconciliation' using a different collection of items R_m .

6.2.1 Education and attitudes towards reconciliation

Results are presented in Table 5. It is clear that they differ substantially from those for concessions. In particular, results in the first column show that education is negatively correlated with attitudes towards reconciliation. The interactions of education with year dummies shown in the second column show the evolution of the effect of education over time. They are also plotted in Figure 4. The coefficient on high education is negative and

statistically significantly smaller than that on low education in all years. The coefficient on the medium education dummy is less negative, parallels the evolution of the high education coefficient, and is significantly smaller than the low education one in all years except for 2005.

It is instructive to consider the evolution of attitudes over time in more detail. Figure 4 plots the coefficients associated to the interactions of education with the year dummies together with the evolution of GDP per capita. It is clear that attitudes comove with GDP per capita for all education groups, and more so for the highly educated individuals. (The correlation between the coefficients and GDP per capita is greater than 70% for low and medium education and over 90% for high education.) In particular, the fall in GDP per capita from the beginning of the second Intifada in 2000 until 2002 is accompanied by a steep drop in the attitudes towards reconciliation of the highly educated. Afterwards, as GDP per capita recovers following the Road Map conference, attitudes also improve again briefly, only to deteriorate again from 2003 onwards. They reach a low point in 2006, the year Hamas wins the Parliamentary elections. The international response to that victory again caused an important drop in GDP per capita. Overall, since the start of the Second Intifada in 2000, per capita GDP in Palestine has fallen by about a third, from \$1621 in 1999 to \$1129 by the end of 2006. Attitudes have evolved in a similar way.

This is an indication that the economic environment affects attitudes. These results also lend support to the idea that the depressed market opportunities of highly educated workers and the frustration generated by the difference between expected and actual wages matter for attitudes towards reconciliation (assuming that Palestinians attribute this lack of opportunities to the conflict and the interdependence with Israel).

Despite the importance of economic factors at the aggregate level, we find that family income does not have a significant effect on attitudes towards reconciliation. So relative income (conditional on education) is not significantly related to these attitudes. This suggests that it is overall and not individual economic deprivation that is closely related to attitudes.

These results are similar to those obtained in the literature on education and violence. For instance, Krueger and Maleckova (2003) find that “having a living standard above the poverty line or a secondary school or higher education is positively associated with participation in

violent groups.” Berrebi (2007) arrive at a similar conclusion. Although our explanation relates low willingness to reconcile to the lack of opportunities in the labor market, the results are also consistent with the hypothesis stated by these authors that more highly educated individuals have a more acute awareness of the political situation, resulting in deeper moral concerns and a more negative attitude towards reconciliation.

Finally, both Krueger and Maleckova (2003) and Berrebi (2007) point out the possibility that the positive relationship between education and violence could be related to the content of education. For instance, Stern (2000) explains how religious schools in Pakistan can induce students to get involved in violence and terrorism. In the case of Palestine it is unlikely that the education system itself negatively affects attitudes to reconciliation. In 2006 around 67 percent of students were enrolled in Palestinian Authority public schools, 27.2 percent in schools run by the United Nations (UNRWA), and 6.2 percent in private or NGO-run schools, including those linked to Hamas and other groups.¹¹ Figure 5 shows the evolution of the distribution of schools of each type during 2001 to 2007. The share of private schools is small and stable over the period. So even if religious schools gained importance among private schools, this can only be a minor phenomenon. Although it is true that the curriculum of Palestinian public schools has been criticized for containing anti-Semitic stereotypes, this refers to primary and secondary schools only.¹² Therefore, if the content of education was radicalizing students, it should have an effect on the whole sample. It is implausible that it mainly affects the most highly educated individuals.

Another factor that is strongly related to attitudes towards reconciliation is the degree of religiosity (measured as the frequency with which the individual prays). More religious people tend to be less favorable to reconciliation. Causality is not clear, since we do not know if people with more negative attitudes towards reconciliation become more religious or if more religious individuals changed their attitudes toward reconciliation.

To summarize, educated or religious individuals are less in favor of reconciliation with Israel. The effect of education follows the evolution of economic conditions, particularly so for the highly educated.

¹¹Source: ‘Factbox – Facts about Palestinian schools,’ Reuters Foundation, September 2006.

¹²This has led to the introduction of new textbooks in 2000, but the sample of individuals under analysis has not been affected by this. For more information on the old and new textbooks see Brown (2001).

6.2.2 Heterogeneity in current economic conditions

Whereas education influences frustration due to differences in potential economic conditions, other factors affect frustration through their effect on current conditions. Regional differences constitute such heterogeneity. The model suggests that individuals in a worse current economic situation will be more frustrated and thus less willing to reconcile.

Column II of Table 6 shows that this is indeed the case for Gaza. The economy of Gaza has been more depressed than the economy of the West Bank during the period analyzed in this paper. The Gaza strip has high population density, is disconnected from the West Bank, and residents face strict internal and external security controls. Since the start of the second Intifada, closures of the border with Israel have been very prevalent, making trade and labor movements very difficult. There has also been substantial destruction of capital (e.g. the airport) during this period. The economic situation has been continuously worse than in the West Bank both in terms of GDP per capita and in terms of unemployment. All of these factors could induce more frustration and more negative attitudes towards reconciliation.

Results show that indeed, attitudes towards reconciliation are more negative among residents of Gaza. This effect is less pronounced for individuals with intermediate levels of education.

Regional economic conditions, measured by the regional unemployment rate, may also affect attitudes. Variations in regional unemployment are at least in part due to the conflict because of border closures, preventing locals from working in Israel as in the past, and may therefore affect attitudes. The second column shows that attitudes towards reconciliation are indeed more negative in regions with higher unemployment. This effect is particularly strong for individuals with low education who usually are less mobile and therefore more strongly affected by local conditions. They also suffer disproportionately high unemployment and wage cuts when there are local labor supply shocks affecting the local unemployment rate, as shown by Mansour (forthcoming).

Of course, the location of border closures and thus variation in regional unemployment may be motivated by local attitudes and therefore might not be exogenous. More exogenous variation in economic condition is provided by the construction of the separation barrier by Israel.

The effect of the separation barrier. In June 2002 the Israeli authorities began building a barrier (wall) along the border of the West Bank with Israel. The Israeli government has declared that the objective of the wall is to protect Israeli citizens from the attacks of suicide bombers. The trajectory of the wall is depicted in Figure 6. The first parts were built in the northern West Bank districts of Jenin, Tulkarem and Qalqilia. At the end of July 2003 Israel also started building a wall in the northern and eastern parts of Jerusalem and Bethlehem. After that, the wall continued south to Hebron. To build the wall, Palestinian land has been expropriated. In addition, the wall at times extends far into the West Bank, leaving parts of it inaccessible or disrupting circulation between villages.

The wall affects certain occupations more than others. Low educated individuals are more likely to be farmers, a group particularly strongly affected by the wall, both because of the loss of arable land and because of the disruption of transport routes.¹³ The prospects of highly educated individuals are more likely to be affected by economic conditions at a more aggregate scale. The model would thus suggest that the wall would more strongly affect attitudes of individuals with low education.

This can be tested because the data indicate in which region individuals live. In addition, I use measures of the evolution of the length of the wall, the areas of land left on the Israeli side of the wall (in most of the cases, this land has been confiscated) and the areas that have become enclaves.¹⁴

I have this information for July 2003, February 2005, and July 2006. The first two dates correspond quite closely to the moments in time when the surveys have been conducted (maximum difference of three months). For 2006, the difference is larger. To deal with this, I assume that the parts of the wall that were under construction in July 2006 were completed by the time of the survey, in December 2006. To construct the measures of the effect of the wall, I use the following index:

$$WE_R = \frac{Wall_R}{Border_R} + \frac{OutsideLand_R + Enclaves_R}{TotalArea_R} \quad (7)$$

¹³See B'Tselem report on the effects of the wall. B'Tselem is the information center for human rights in the occupied territories.

¹⁴Sources: These measures have been computed with information from the U.N. Office for the Coordination of Humanitarian Affairs in the Occupied Palestinian Territory and the Palestinian Environmental NGO's network.

where WE_R refers to the effect of the wall in region R , $Wall_R$ is the length of the wall expressed in km , and $Border_R$ refers to the length of the Green Line border for region R expressed in km . The $OutsideLand_R$ is the area of the region that remains between the Green Line and the wall and the $Enclaves_R$ are the areas that have become enclaves due to the route of the wall. These areas are divided by the total area of the region and they are all expressed in km^2 . Figure 6 and tables 8, 9 and 10 show the evolution of the construction of the wall and the measures used to construct the index. While it is not obvious if the functional form chosen is optimal for fitting disruptions suffered by individuals living in adjacent regions, it receives some support from evidence suggesting that other possible measures of the effect of the wall are correlated with the index constructed here. Using data for 2005, figure 7 shows the relation of WE_R for 2005 with the number of buildings destroyed and with the amount of land that has been expropriated. The correlation between WE_R and the two alternative measures is 0.61 and 0.57 respectively.¹⁵

Because the effect of the wall differs across regions and over time, it can be distinguished from just a year effect and from regional effects. In addition, because deviations of the wall from the Green Line are mainly guided by the placement of Israeli settlements and by the location of natural resources, the index is exogenous.¹⁶

Results are reported in columns IV and V in Table 6. It confirms the effects found above; more educated or more religious people are less in favor of reconciliation. In addition, we find that individuals with low education living in areas strongly affected by the wall are less favorable to reconciliation. The effect on individuals with medium or high education is slightly negative but not significant. This results are in line with what the model suggests.

To summarize, results show that economic conditions matter for attitudes. Current bad conditions imply worse attitudes, as indicated by the effect of regional unemployment rates

¹⁵Note that it was not possible to directly use these alternative measure in our analysis since they are available only for 2005.

¹⁶The Government of Israel maintains that the following considerations are taken into account when determining the route of the wall: continuity in order to be operational, creation of controlled areas, minimum damage to the landscape, avoidance of the inclusion of Palestinian villages in the areas of the security fence, and minimal disruption in the daily life of the population residing near the wall. See the Israeli Ministry of Defense's website: www.seamzone.mod.gov.il. Concerning the settlements, Ariel Sharon's cabinet agreed to extend the wall to encircle Jewish settlements deep in the West Bank (see 'Israeli cabinet extends 'security fence'', The Guardian, October 2 2003). The International Court of Justice Report of 8 September 2003 (E/CN.4/2004/6) also points out that the Wall incorporates illegal Israeli settlements that form the subject of negotiations between Israel and Palestine.

and the separation barrier on attitudes of people with low education. In addition, attitudes vary closely with current economic conditions. Losses suffered due to the conflict may also induce resentment and thereby affect attitudes, as highly educated people, whose returns to education are depressed relative to other countries or a situation of peace, have particularly negative attitudes towards reconciliation.

Measuring attitudes towards the peace process in two dimensions thus resolves the contradictions encountered in the earlier literature on education and attitudes towards peace. It also allows for a richer interpretation of the relationships between demographics, economic conditions and attitudes.

7 Conclusion

Given the importance of the Israeli-Palestinian conflict, hints about why it is so hard to resolve are very valuable. In this paper, I have used Palestinian survey data to explore the determinants of Palestinians' attitudes towards the peace process, understood as attitudes towards possible concessions they might be willing to make to achieve a settlement, and attitudes towards reconciliation in case of such a settlement. Because of the breadth of the object to be measured, the use of more than one dimension is natural. This is confirmed by the empirical analysis, which shows that the effect of education is not the same in the two dimensions.

On economic grounds, more educated people could be expected to have more to gain from a peace process, in particular in the context of the repressed Palestinian economy. The empirical analysis indeed confirms that controlling for current family income more educated people are more willing to make concessions. This could be understood as an investment in peace, allowing the dividends of peace to be reaped later on. The effect of education on attitudes towards reconciliation is negative. A possible explanation is that the cost of reconciliation may be linked to the frustration endured due to the depressed labor market conditions, and therefore may be larger for highly educated individuals, explaining why highly educated individuals prefer lower levels of reconciliation. These detailed findings shed some light on why results on education appeared contradictory in previous work.

At the macro level, it is clear that there is a strong interdependence between politics and

economics, and between the socio-economic situation and attitudes towards reconciliation. While relative economic deprivation may not be associated with worse attitudes towards reconciliation at the individual level, periods of economic stagnation or contraction coincide with a strengthening of the negative effect of education on individuals' attitudes. I can identify that this is not only due to direct, local effects of the separation barrier. It hence seems plausible that conditions and events at the national level drive attitudes of people with high education. Education and economic aid may not be sufficient remedies.

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A Figures

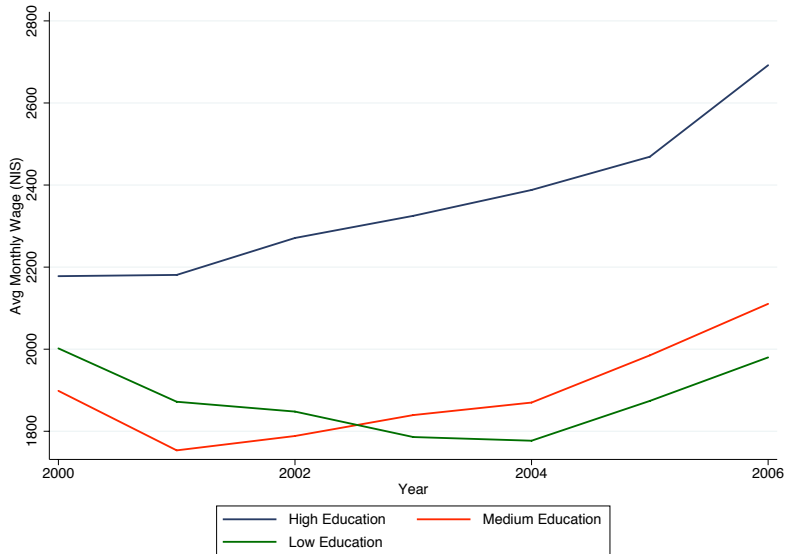


Figure 1: Average Monthly Wage in NIS for wage employees in the Palestinian Territory. High education is bachelor and above, medium education is associate diploma and secondary certificate and low Education is preparatory or less. Period: 2000-2006. Source: Palestinian Central Bureau of Statistics.

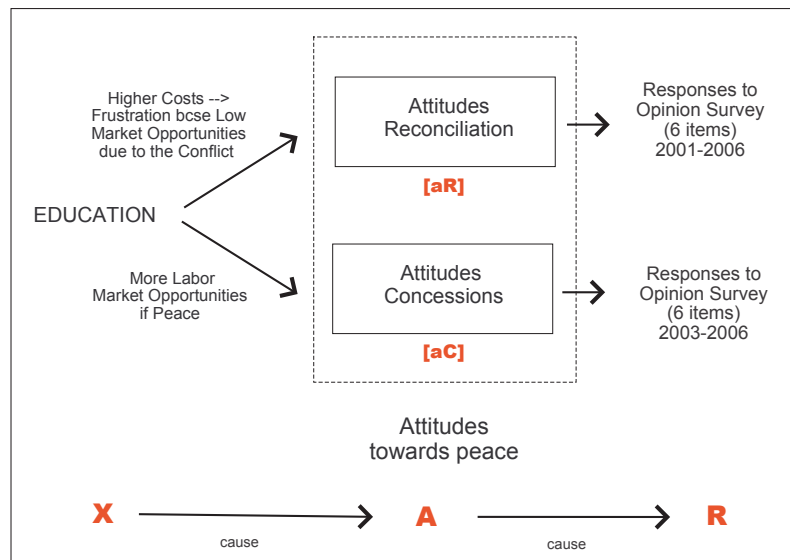


Figure 2: Diagram of the underlying process.

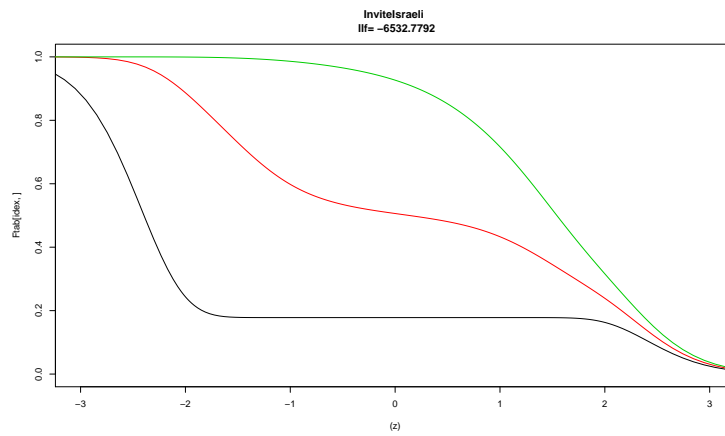


Figure 3: Probability Distributions of answering 1, 2, 3 or 4 in the item 'Invite an Israeli

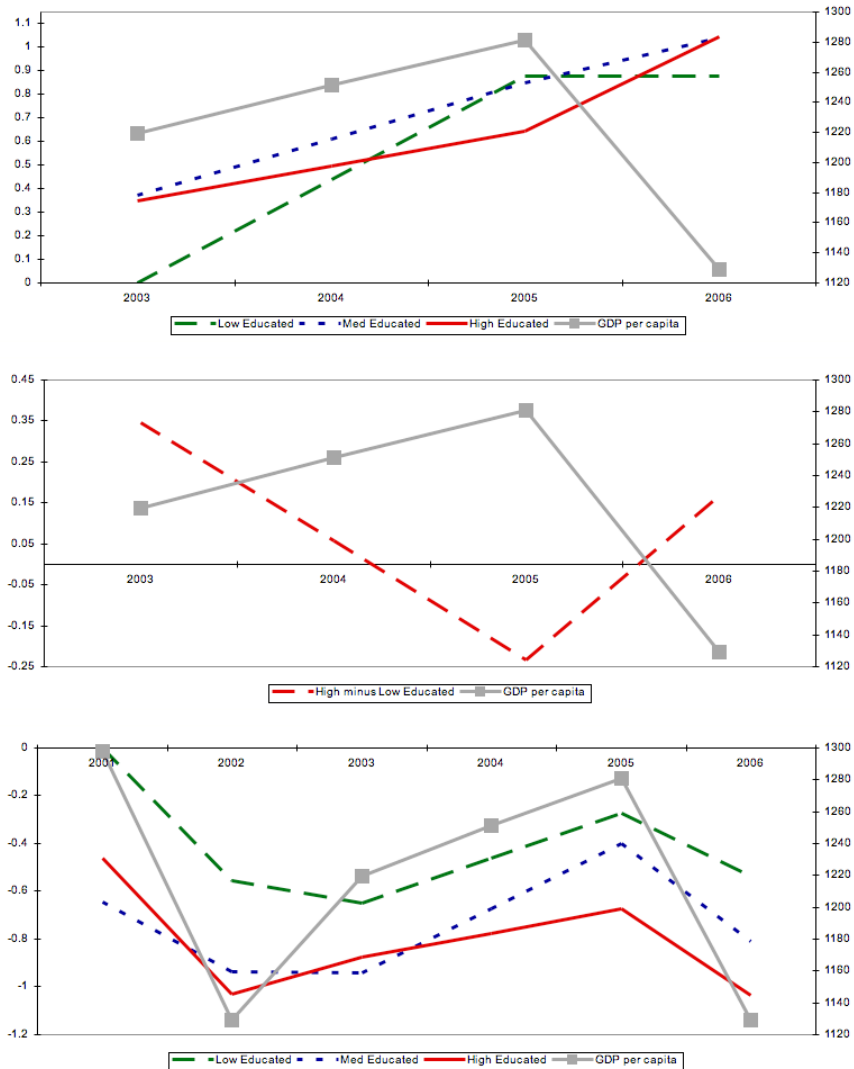


Figure 4: Coefficients associated to the education variables in the regression on attitudes towards concessions (top figure), difference between the coefficients associated to high education and low education in the regression on attitudes towards concessions (middle figure) and coefficients associated to the education variables in the regression on attitudes towards reconciliation (bottom figure). All the graphs include the evolution of GDP per capita.

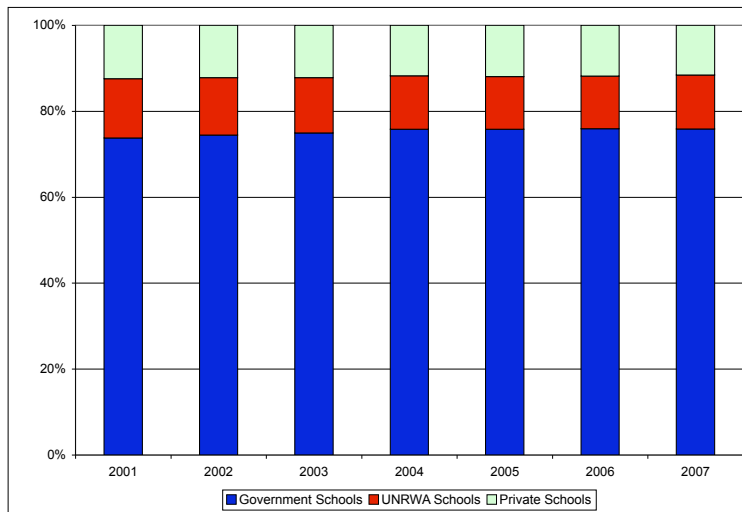


Figure 5: Distribution of the schools by supervising authority. Source: Palestinian Education Ministry.

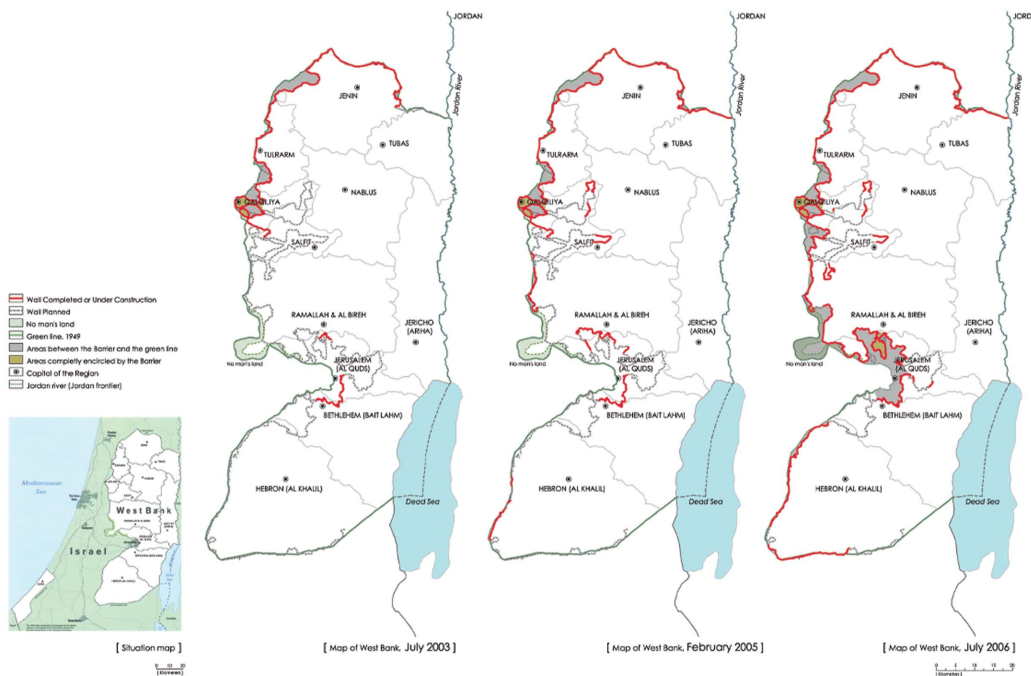


Figure 6: Evolution of the Separation Barrier.

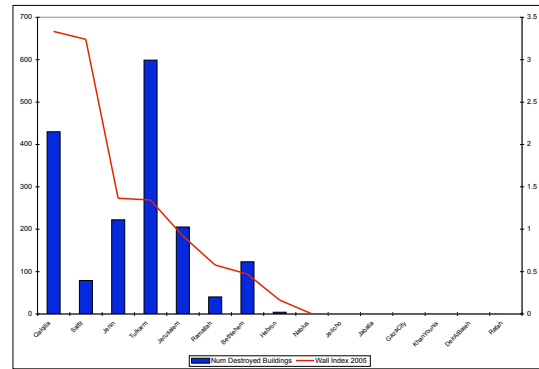
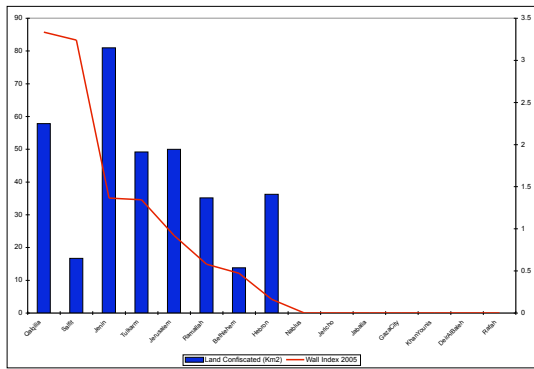


Figure 7: Correlation between the index used and other possible measures of the effect of the wall. The number of buildings destroyed refer to the number of establishments in different sectors which were totally closed as a result of the wall, the confiscated land is the total area confiscated by Israeli forces to construct the wall (usually taken by military order). Source: PCBS – Survey on the Impact of the Expansion and Annexation Wall on the Socio-Economic Conditions of Palestinian Localities which the Wall Passes Through, June 2005.

B Tables

Table 1: Descriptive statistics for survey questions on reconciliation and concessions

Reconciliation			Concessions		
Items	Mean	Std.Dev	Items	Mean	Std.Dev
Borders	3.038	0.718	Borders 67	2.458	0.729
Eco Inst.	2.781	0.760	No Army	2.110	0.769
Pol Inst.	2.220	0.785	Jerusalem	2.241	0.790
No Incitement	2.282	0.776	Refugees	2.233	0.781
Curriculum	1.714	0.665	End Conflict	2.337	0.670
Invite Israeli	2.155	0.867	Security	2.072	0.867
Obs	6121		Obs	3509	
Scale	1-4		Scale	1-3	

Note: The 2003 survey does not contain the item ‘Invite an Israeli’.

Table 2: Pairwise correlation coefficients for the items used to build the reconciliation and concessions scale

Reconciliation Items (2001-2006)	Borders	Economic Institutions	Political Institutions	No Incitement	Curriculum	Invite Israeli
Borders	1					
Eco Inst	0.556	1				
Pol Inst	0.284	0.425	1			
Non Incitement	0.278	0.362	0.462	1		
Curriculum	0.114	0.205	0.367	0.395	1	
Invite Israeli	0.217	0.288	0.242	0.255	0.239	1

Concessions Items (2003-2006)	Borders 1967	No Army	Jerusalem	Refugees	End Conflict	Security
Borders 1967	1					
No Army	0.363	1				
Jerusalem	0.385	0.449	1			
Refugees	0.350	0.386	0.471	1		
End Conflict	0.453	0.344	0.447	0.478	1	
Security	0.442	0.418	0.416	0.435	0.508	1

Note: The 2003 survey does not contain the item ‘Invite an Israeli’.

Table 3: Descriptive Statistics of the Personal and Demographic Characteristics

Variable	2001	2002	2003	2005	2006
	Mean	Mean	Mean	Mean	Mean
Female	0.499	0.495	0.497	0.480	0.504
Age	35.576	35.894	36.626	35.682	35.786
std. dev	(13.229)	(13.523)	(13.952)	(12.621)	(13.164)
Refugee	0.440	0.445	0.436	0.476	0.454
Low Education	0.310	0.242	0.282	0.187	0.178
Med Education	0.530	0.565	0.554	0.572	0.599
High Education	0.160	0.193	0.164	0.240	0.223
Unmarried	0.210	0.213	0.205	0.227	0.228
High Praying	0.382	0.371	0.399	0.836	0.832
Med Praying	0.379	0.370	0.382	0.072	0.079
Low Praying	0.239	0.259	0.219	0.093	0.089
Public Sector	0.090	0.117	0.111	0.121	0.142
Low Income	0.311	0.311	0.333	0.309	0.298
Med Income	0.596	0.479	0.526	0.518	0.528
High Income	0.094	0.135	0.073	0.151	0.174
Jenin	0.078	0.067	0.076	0.068	0.061
Toubas	0.010	0.007	0.009	0.008	0.022
Tulkarm	0.052	0.042	0.049	0.050	0.048
Qalqilia	0.026	0.024	0.025	0.025	0.031
Salfit	0.017	0.017	0.017	0.016	0.032
Nablus	0.093	0.090	0.088	0.091	0.086
Ramallah	0.076	0.086	0.083	0.073	0.070
Jerusalem	0.074	0.081	0.076	0.098	0.094
Jericho	0.007	0.008	0.008	0.008	0.022
Bethlehem	0.050	0.051	0.051	0.050	0.047
Hebron	0.145	0.141	0.141	0.143	0.136
Jabalia	0.064	0.068	0.066	0.068	0.064
GazaCity	0.129	0.134	0.135	0.134	0.126
KhanYounis	0.075	0.076	0.074	0.075	0.072
DeirAlBaleh	0.056	0.057	0.050	0.050	0.047
Rafah	0.048	0.051	0.051	0.042	0.041
Observations	1262	1227	1224	1228	1180

Table 4: The relationship between personal and demographic characteristics and attitudes towards concessions.

	(I)		(II)	
Med Education	0.203	(0.052)***		
High Education	0.128	(0.070)*		
EducationL*y02				
EducationL*y03				
EducationL*y05			0.878	(0.099)***
EducationL*y06			0.878	(0.108)***
EducationM*y01				
EducationM*y02				
EducationM*y03			0.370	(0.071)***
EducationM*y05			0.850	(0.071)***
EducationH*y06			1.042	(0.072)***
EducationH*y01				
EducationH*y02				
EducationH*y03			0.347	(0.101)***
EducationH*y05			0.644	(0.089)***
EducationH*y06			1.044	(0.106)***
Year 2002				
Year 2003				
Year 2005	0.547	(0.051)***		
Year 2006	0.742	(0.055)***		
Female	0.150	(0.042)***	0.141	(0.043)***
Age	0.004	(0.002)**	0.004	(0.002)**
Age ²	0.005	(0.010)	0.004	(0.010)
Refugee	-0.125	(0.047)***	-0.125	(0.047)***
Unmarried	0.011	(0.063)	0.016	(0.063)
Low Income	0.078	(0.047)*	0.074	(0.047)
High Income	0.017	(0.067)	0.021	(0.066)
High Praying	-0.287	(0.087)***	-0.281	(0.087)***
Medium Praying	-0.257	(0.090)***	-0.249	(0.089)***
Public	0.073	(0.070)	0.069	(0.069)
Regional Dummies	yes		yes	
Observations	3500		3500	

Note: White robust standard errors in parentheses; stars indicate significance at 10 (*), 5 (**), and 1 (***) percent levels, respectively.

Table 5: The relationship between personal and demographic characteristics and attitudes towards reconciliation

	(I)		(II)	
Med Education	-0.315	(0.037)***		
High Education	-0.458	(0.052)***		
EducationL*y02			-0.555	(0.104)***
EducationL*y03			-0.648	(0.101)***
EducationL*y05			-0.272	(0.107)**
EducationL*y06			-0.535	(0.116)***
EducationM*y01			-0.645	(0.089)***
EducationM*y02			-0.936	(0.087)***
EducationM*y03			-0.941	(0.088)***
EducationM*y05			-0.401	(0.087)***
EducationH*y06			-0.808	(0.087)***
EducationH*y01			-0.461	(0.099)***
EducationH*y02			-1.031	(0.113)***
EducationH*y03			-0.876	(0.124)***
EducationH*y05			-0.673	(0.114)***
EducationH*y06			-1.034	(0.114)***
Year 2002	-0.352	(0.046)***		
Year 2003	-0.368	(0.046)***		
Year 2005	0.128	(0.051)**		
Year 2006	-0.250	(0.051)***		
Female	-0.052	(0.032)	-0.070	(0.032)**
Age	0.005	(0.002)**	-0.007	(0.002)***
Age ²	-0.032	(0.007)***	0.007	(0.007)
Refugee	0.020	(0.034)	0.026	(0.034)
Unmarried	0.009	(0.047)	-0.188	(0.046)***
Low Income	-0.020	(0.035)	0.021	(0.035)
High Income	0.051	(0.051)	-0.013	(0.051)
High Praying	-0.463	(0.044)***	-0.450	(0.045)***
Medium Praying	-0.403	(0.045)***	-0.387	(0.040)***
Public	-0.081	(0.058)	-0.114	(0.058)**
Regional Dummies	yes		yes	
Observations	6121		6121	

Note: White robust standard errors in parentheses; stars indicate significance at 10 (*), 5 (**), and 1 (***) percent levels, respectively.

Table 6: The effect of different economic changes on the attitudes towards reconciliation

	(I) All	(II) Gaza	(III) Reg U	(IV) Wall	(V) Wall WB
Med Educ	-0.315 *** (0.037)	-0.508 *** (0.044)	-0.526 *** (0.056)	-0.338 *** (0.044)	-0.466 *** (0.054)
High Educ	-0.458 *** (0.052)	-0.652 *** (0.062)	-0.681 *** (0.082)	-0.489 *** (0.060)	-0.547 *** (0.078)
Year 2002	-0.352 *** (0.046)	-0.409 *** (0.047)	-0.39 *** (0.047)	-0.348 *** (0.048)	-0.515 *** (0.058)
Year 2003	-0.368 *** (0.046)	-0.411 *** (0.047)	-0.368 *** (0.051)	-0.350 *** (0.050)	-0.404 *** (0.063)
Year 2005	0.128 ** (0.051)	0.033 (0.050)	0.064 (0.054)	0.150 *** (0.055)	-0.006 (0.067)
Year 2006	-0.250 *** (0.051)	-0.332 *** (0.051)	-0.285 *** (0.058)	-0.207 *** (0.062)	-0.348 *** (0.084)
Med Educ*Gaza		0.136 * (0.077)			
High Educ*Gaza		0.051 (0.106)			
Gaza		-0.302 *** (0.074)			
Med Educ*Reg.U			0.028 *** (0.007)		
High Educ*Reg.U			0.019 * (0.011)		
Reg.U			-0.031 *** (0.008)		
Med Educ*Wall				0.084 ** (0.049)	0.067 (0.051)
High Educ*Wall				0.104 ** (0.063)	-0.107 (0.073)
Wall				-0.112 *** (0.050)	-0.113 ** (0.053)
Observations	6121	6121	6121	6121	3851

Note: The different regressions include different variables: (1) uses all the sample and is the same regression as shown in Table 5, (2) includes the variable *Gaza* (a dummy variable that takes the value 1 if the individual lives in Gaza) and its interaction with education, (3) includes the variable *Reg.U*, which is a measure of regional unemployment obtained from the *Palestinian Central Bureau of Statistics*, (4) includes the variable *Wall*, which is the measure of the effect of the wall discussed in Section 6.2.2 and (5) includes the variable *Wall* and only uses the sample of individuals living in the West Bank. All the regression include regional dummies and the controls shown in tables 4 and 5. White robust standard errors in parentheses; stars indicate significance at 10 (*), 5 (**), and 1 (***) percent levels, respectively.

A Appendix (not for publication)

A.1 Original wording of the questions/items we use to estimate the individual's attitudes towards reconciliation.

- After reaching a peace agreement between the Palestinian side and Israel and the establishment of a Palestinian state that is recognized by Israel, the following are steps may be taken in order to enhance relations between the State of Israel and a Palestinian State. For each of the suggested steps please tell me whether you support or oppose it:
 - Open borders to free movement of people and goods.
 - Create joint economic institutions and ventures.
 - Create joint political institutions (such as a parliament. designed eventually to lead to a confederate system)
 - Take legal measures against incitement against Israel.
 - Adopt school curriculum in the Palestinian state that recognizes Israel and teaches school children not to demand return of all Palestine to the Palestinians.
- After reaching a peace agreement between the Palestinian side and Israel and the establishment of a Palestinian state that is recognized by Israel, would you, under these conditions of peace, invite an Israeli colleague to visit you in your home?

A.2 Original wording of the questions/items we use to estimate the individual's attitudes towards concessions.

The individuals are informed of the permanent compromise settlement, then they are ask what do they think of each of the following items (Do they agree or disagree with them):

- Withdrawal to 1967 borders with territorial swap. (An Israeli withdrawal from all of the Gaza Strip and the evacuation of its settlements. But in the West Bank, Israel withdraws and evacuates settlements from most of it, with the exception of few settlement areas in less than 3% of the West Bank that would be exchanged with an equal amount of territory from Israel in accordance with the attached map show map.)
- A state without an army but with international forces. (An independent Palestinian state would be established in the areas from which Israel withdraws in the West Bank and the Gaza Strip; the Palestinian state will have no army, but it will have a strong security force but an international multinational force would be deployed to insure the safety and security of the state. Both sides will be committed to end all forms of violence directed against each other.)
- East Jerusalem as capital of the state of Palestine after it is divided. (East Jerusalem would become the capital of the Palestinian state with Arab neighborhoods coming under Palestinian sovereignty and Jewish neighborhoods coming under Israel sovereignty. The Old City (including al Haram al Sharif) would come under Palestinian sovereignty with the exception of the Jewish Quarter and the Wailing Wall that will come under Israeli sovereignty.)

- Refugees with five options for permanent residence. (With regard to the refugee question, both sides agree that the solution will be based on UN resolutions 194 and 242 and on the Arab peace initiative. The refugees will be given five choices for permanent residency. These are: the Palestinian state and the Israeli areas transferred to the Palestinian state in the territorial exchange mentioned above; no restrictions would be imposed on refugee return to these two areas. Residency in the other three areas (in host countries, third countries, and Israel) would be subject to the decision of the states in those areas. The number of refugees returning to Israel will be based on the average number of refugees admitted to third countries like Australia, Canada, Europe, and others. All refugees will be entitled to compensation for their "refugeehood" and loss of properties.)
- End the conflict. (When the permanent status agreement is fully implemented, it will mean the end of the conflict and no further claims will be made by either side. The parties will recognize Palestine and Israel as the homelands of their respective peoples.)
- A sovereign state with security arrangements. (The Palestinian state will have sovereignty over its land, water, and airspace. But Israeli will be allowed to use the Palestinian airspace for training purposes, and will maintain two early warning stations in the West Bank for 15 years. The multinational force will remain in the Palestinian state for an indefinite period of time and its responsibility will be to insure the implementation of the agreement, and to monitor territorial borders and coast of the Palestinian state including its international border crossings.)

A.3 Testing the assumptions required for identification in the item response model

To evaluate whether the assumptions of unidimensionality, local independence and monotonicity that are required for identification are fulfilled in the data, I use Mokken scale analysis.¹⁷ This method is based on the fact that item response models imply that for dichotomous items there is stochastic ordering of the latent variable by the sum of the scores ($X_+ = \sum_j X_j$). van der Ark (2005) shows that generally, the stochastic ordering also holds for polytomous items if the number of items is larger than five. Therefore, Mokken scale analysis can be used to investigate the assumptions of our model. Sijtsma and Molenaar (2002) show that the assumptions of unidimensionality, local independence, and latent monotonicity imply the following testable restrictions: a) $0 \leq H_{ij} \leq 1$, for all $i \neq j$, where H_{ij} is the item-pair scalability coefficient, defined as $H_{ij} = cov(X_i, X_j) / cov(X_i, X_j)^{max}$; b) $0 \leq H_j \leq 1$ for all j , where H_j is the item scalability coefficient defined as $H_j = cov(X_j, R_{-j}) / cov(X_j, R_{-j})^{max}$ and R_{-j} is the total score minus the score of the item of which the response probabilities are investigated; c) $0 \leq H \leq 1$, where H is the scalability coefficient for the entire set of items, defined as $H = \sum_{j=1}^J cov(X_j, R_{-j}) / \sum_{j=1}^J cov(X_j, R_{-j})^{max}$. The scalability coefficient H for the scale on concessions is 0.503 and for the scale on reconciliation is 0.432. Table 7 shows the other scalability coefficients for both scales; concessions and reconciliation. The values of these coefficients are in almost all the cases greater than 0.3, the rule of thumb threshold indicating that the scale constructed with this data fulfills the assumptions required by the model.

¹⁷For a more detailed explanation of the Mokken scale see Mokken (1971) and Mokken (1982). For an extension to polytomous items see Molenaar (1997). The implementations of the Mokken scale has been done using the 'mokken' package in R, van der Ark (2007).

Table 7: Item-pair scalability coefficients (H_{ij}) and item scalability coefficients (H_j) for the items used to build the reconciliation and concessions scale^b

Items	Item-pair scalability coefficients (H_{ij}) for the concessions scale						
	Borders 1967	No Army	Jerusalem	Refugees	End Conflict	Security	Security
Borders 67	1	0.499	0.486	0.427	0.473	0.549	0.549
No Army	0.499	1	0.516	0.467	0.484	0.491	0.491
Jerusalem	0.486	0.516	1	0.500	0.582	0.428	0.428
Refugees	0.427	0.467	0.500	1	0.605	0.448	0.448
End Conflict	0.473	0.484	0.582	0.605	1	0.652	0.652
Security	0.549	0.491	0.428	0.448	0.652	1	1
H_j	Scalability coefficients H_j for each item						
	0.486	0.492	0.497	0.486	0.558	0.504	0.504

Items	Item-pair scalability coefficients (H_{ij}) for the reconciliation scale						
	Borders	Economic Institutions	Political Institutions	No Incitement	Curriculum	Curriculum	Curriculum
Borders	1	0.668	0.335	0.331	0.172	0.172	0.172
Eco Inst	0.668	1	0.533	0.457	0.254	0.254	0.254
Pol Inst	0.335	0.533	1	0.490	0.472	0.472	0.472
Non Incitement	0.331	0.457	0.490	1	0.508	0.508	0.508
Curriculum	0.172	0.254	0.472	0.508	1	1	1
H_j	Scalability coefficients H_j for each item						
	0.393	0.485	0.459	0.447	0.361	0.361	0.361

^aThe survey realized in 2003 does not contain the item 'Invite an Israeli', this results include all the surveys but do not include this item.

^bThe survey realized in 2003 does not contain the item 'Invite an Israeli', this results include all the surveys but do not include this item.

A.4 Information used to construct the Wall-Index

Table 8: Summary of the wall and its effects in 2003, by region

	Total Area <i>km</i> ²	Area Outside <i>km</i> ²	Area Enclaves <i>km</i> ²	Green Line Border <i>km</i>	Wall <i>km</i>	WE Index
Jenin	587.838	33.891	0.000	50.02	61.421	1.286
Toubas	352.811	0.000	0.000	13.092	0.000	0.000
Tulkarm	243.586	23.135	0.000	29.867	37.321	1.345
Nablus	615.314	0.000	0.000	0.000	0.000	0.000
Qalqilia	155.235	24.423	15.662	18.458	46.16	2.759
Salfit	211.175	0.000	0.000	5.598	4.003	0.715
Ramallah	849.188	0.000	0.000	46.283	0.000	0.000
Jericho	651.958	0.000	0.000	0.000	0.000	0.000
Jerusalem	345.277	0.000	0.000	27.375	15.856	0.579
Bethlehem	637.548	0.000	0.000	22.245	10.475	0.471
Hebron	1007.135	0.000	0.000	91.817	0.000	0.000
Jabalia	0.000	0.000	0.000	0.000	0.000	0.000
Gaza City	0.000	0.000	0.000	0.000	0.000	0.000
Khan Younis	0.000	0.000	0.000	0.000	0.000	0.000
Deir Baleh	0.000	0.000	0.000	0.000	0.000	0.000
Rafah	0.000	0.000	0.000	0.000	0.000	0.000

Table 9: Summary of the wall and its effects in 2005, by region

	Total Area <i>km²</i>	Area Outside <i>km²</i>	Area Enclaves <i>km²</i>	Green Line Border <i>km</i>	Wall <i>km</i>	WE Index
Jenin	587.838	36.104	0.000	50.02	65.19	1.365
Toubas	352.811	2.68	0.000	13.092	12.608	0.971
Tulkarm	243.586	23.135	0.000	29.867	37.321	1.345
Nablus	615.314	0.000	0.000	0.000	0.000	0.000
Qalqilia	155.235	24.423	15.662	18.458	56.75	3.333
Salfit	211.175	0.000	0.000	5.598	18.134	3.239
Ramallah	849.188	7.761	0.000	46.283	26.31	0.578
Jericho	651.958	0.000	0.000	0.000	0.000	0.000
Jerusalem	345.277	0.000	0.000	27.375	25.176	0.920
Bethlehem	637.548	0.000	0.000	22.245	10.475	0.471
Hebron	1007.135	2.325	0.000	91.817	14.658	0.162
Jabalia	0.000	0.000	0.000	0.000	0.000	0.000
Gaza City	0.000	0.000	0.000	0.000	0.000	0.000
Khan Younis	0.000	0.000	0.000	0.000	0.000	0.000
Deir Baleh	0.000	0.000	0.000	0.000	0.000	0.000
Rafah	0.000	0.000	0.000	0.000	0.000	0.000

Table 10: Summary of the wall and its effects in 2006, by region

	Total Area <i>km²</i>	Area Outside <i>km²</i>	Area Enclaves <i>km²</i>	Green Line Border <i>km</i>	Wall <i>km</i>	WE Index
Jenin	587.838	36.104	0.000	50.02	65.19	1.365
Toubas	352.811	2.68	0.000	13.092	12.608	0.971
Tulkarm	243.586	23.135	0.000	29.867	37.321	1.345
Nablus	615.314	0.000	0.000	0.000	0.000	0.000
Qalqilia	155.235	37.318	15.662	18.458	56.75	3.416
Salfit	211.175	13.567	0.000	5.598	25.86	4.684
Ramallah	849.188	84.521	1.512	46.283	59.158	1.379
Jericho	651.958	0.000	0.000	0.000	0.000	0.000
Jerusalem	345.277	93.466	13.883	27.375	80.724	3.260
Bethlehem	637.548	8.815	0.000	22.245	10.475	0.485
Hebron	1007.135	12.71	0.000	91.817	64.757	0.718
Jabalia	0.000	0.000	0.000	0.000	0.000	0.000
Gaza City	0.000	0.000	0.000	0.000	0.000	0.000
Khan Younis	0.000	0.000	0.000	0.000	0.000	0.000
Deir Baleh	0.000	0.000	0.000	0.000	0.000	0.000
Rafah	0.000	0.000	0.000	0.000	0.000	0.000