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The effects of political protests on youth human capital and well-being in Egypt

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ABSTRACT

Protests are one of the most common expressions of modern political conflict, and the wave of demonstrations that marked the onset of the Arab Spring contributed to a global increase in protest activity. Yet few studies have examined the effects of exposure to protests on population well-being even though such exposure may have profound and lasting effects, especially if experienced at critical stages of development over the life course. The aim of our study is to estimate the effects of exposure to political protests on the human capital accumulation and well-being of youth during the tumultuous political transition experienced in Egypt from 2011 to 2014. For a nationally representative panel of youth captured in the 2009 and 2013/2014 waves of the Survey of Young People in Egypt (SYPE), we exploit exogenous geospatial variation in the occurrence of political protests from the Armed Conflict Location & Event Data (ACLED) Project to estimate individual-level changes in social trust, uncertainty, education, and health outcomes for youth exposed to protests. In our panel, 31.1% of the sample lived in districts where riots or protests occurred. Exposure to protests increased overall perceptions of uncertainty about the future. Young men ever exposed to protests were slightly more likely to report good overall health, but experienced sizable worsening in mental health compared to young women ever exposed. Differences by own and family participation in protest events were found for perceptions of uncertainty and mental health. In the aftermath of the Arab Spring and other mass protest movements around the globe, these findings highlight the importance of examining the population-level impacts of different forms of political conflict, particularly as substantial numbers of youth in Middle East and North Africa and elsewhere progress to adulthood under conditions of political instability.

1. Introduction

While inter-state and civil wars have declined in number and fatalities in recent decades, lower-intensity political conflicts have become more common and conflict actors more diverse. These lower-intensity conflicts can still have substantial impacts on development and population well-being, both at the national level and among affected subnational populations or areas (World Bank, 2011). The changing nature of political conflict in the 21st century, coupled with the improved quality and availability of datasets that quantify the occurrence of conflict, has motivated an emerging literature that uses micro-level event data to examine the population-level impacts of conflict on non-combatants (Akresh et al., 2012; Bratti et al., 2015; Chamarbagwala and Morán, 2011; Dabalen and Paul, 2014; Minoiu and Shemyakina, 2014; Pivovarova and Swee, 2015; Shemyakina, 2015, 2011; Shemyakina and Plagnol, 2013; Williams et al., 2012).

Yet although conflict micro-data have afforded researchers greater flexibility in operationalizing the concept of conflict (Sousa, 2014; Williams et al., 2012), empirical applications on conflict impacts have focused heavily on civil war and armed conflict (e.g., in Cote d'Ivoire, Burundi, and Tajikistan), consistently finding adverse effects of these types of conflicts on population health and education outcomes (Akresh et al., 2012; Bundervoet et al., 2009; Dabalen and Paul, 2014; Diwakar, 2015; Minoiu and Shemyakina, 2014; Shemyakina, 2011). Few studies have taken advantage of conflict micro-data to examine the impacts of less violent forms of conflict even though such events can theoretically affect populations in fundamentally different ways and mechanisms than those stemming from armed conflict (Williams et al., 2012). This is

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an important gap in the study of the impacts of political conflict given the increasingly diverse nature of such conflicts across the globe.

Protests are one of the most common expressions of modern political conflict, and the wave of demonstrations that marked the onset of the Arab Spring in 2011 contributed to a global increase in protest activity in subsequent years (Leetaru, 2014). In this paper, we use a combination of event-based conflict data and a unique panel survey to analyze the impact of exposure to protest activity during Egypt's recent political transition (from 2011 to 2014) on youth outcomes related to social trust, uncertainty, education, and health. This period of profound instability in Egypt was characterized by multiple changes in national government leadership and spontaneous political activism at local levels that was often met with unpredictable responses from security forces. Following Williams et al. (2012), we argue that this sense of instability is a key mechanism by which exposure to political protest events can adversely affect population well-being. In contrast to direct threats of harm from violence or the potential for violence (which some individuals may also have perceived), political instability can induce psychosocial stress, create uncertainty over the future value of investments, and impair decision-making in the present. These behavioral responses to instability may be particularly critical during the progression to adulthood, when young people undergo changes in their social and economic roles that form the foundations of their future well-being (Elder, 1977; Hogan and Astone, 1986; Marini, 1984; Shanahan, 2000). To the best of our knowledge, this is one of the first studies to focus on the impacts of largely nonviolent political conflict on youth in a developing context, as well as one of the few studies (see also Brück et al., 2019; Diwakar, 2015) to causally examine conflict impacts in the Middle East and North Africa despite the prevalence of conflict in the region.

2. The Arab Spring in Egypt

We focus on the events of the Arab Spring in Egypt, which encompassed a period of profound political and social disruption, but did not result in war or armed conflict. Following demonstrations that culminated in the ouster of a long-sitting president in Tunisia (Kirkpatrick, 2011), nationwide protests erupted in Egypt on January 25, 2011 against the 30 year regime of President Hosni Mubarak. Mass protests, punctuated by clashes between demonstrators and security forces (Al Jazeera, 2011a), occurred throughout the country, the political and symbolic center of which was located at Tahrir Square in the capital, Cairo. Although citizens were protesting against an authoritarian regime, most analyses of the causes of the 2011 Revolution have argued that poor economic conditions, rather than political freedoms, mainly motivated protesters, many of whom came from the middle classes (Campante and Chor, 2012; Diwan, 2014; Beissinger et al., 2015). The dramatic increase in the number of political protests during this period is displayed in Fig. 1. The Supreme Council of the Armed Forces (SCAF) replaced Mubarak on February 11, 2011 (Al Jazeera, 2011b) and ruled until June 2012 when Mohamed Morsi, an Islamist candidate from the Muslim Brotherhood, was elected (Kirkpatrick, 2012). During the period of SCAF rule and the early months of the Morsi regime, political activity generally diminished to fewer than 20 protest events per month (Fig. 1), although major violent events still occurred (BBC News, 2012, 2011). Discontent with the new regime contributed to increased protest activity through early 2013; by June 2013, protests erupted calling for Morsi's resignation (Fayed and Saleh, 2013) and Morsi was deposed and replaced by the head of the Constitutional Court on July 3, 2013 (Kirkpatrick, 2013). Pro-Morsi protests continued over the following months, which were met with lethal force from security forces on several occasions (Human Rights Watch, 2014). Thus, the events of 2013 constituted the most intense period of unrest during Egypt's political transition in terms of the number of events and resulting fatalities. Protest activity began to decline in 2014 after increased state repression and the enactment of a new protest law (Amnesty International, 2013; Moody, 2014). Fig. 1 also shows that, compared to battles, which are more characteristic of armed conflict, protests and riots dominated the political events in Egypt throughout this political transition period.

A small literature has emerged on the population-level impacts of political protests during Egypt's transition period on socioeconomic and political outcomes. El Mallakh (2017), using the number of protester fatalities from 2011 to 2014, found that greater protest intensity (more fatalities) in a given district led to a greater share of votes for candidates from the former regime in the 2012 presidential election, which she argues is due to backlash against the January 2011 Revolution and dissatisfaction with government performance post-2011. Using the same exposure measure, El Mallakh et al. (2018) argued that protest activity led to a reduction in the intra-household gender gap in labor force participation (through an increase in women's economic activity among the poorest households) in areas with more fatalities due to increased income uncertainty among men. Giesing and Musić (2019) used a measure of fatalities from the same database, but aggregated at the governorate level,[1] and found evidence of increased household spending on sons' tertiary education, increased saving, and decreased spending on health in governorates with more fatalities.

The present study contributes to this literature both in its consideration of a different set of health and social outcomes, as well as in the use of a different database—the Armed Conflict Location and Event Database (ACLED)—that includes nonviolent protests, which allows us to more comprehensively capture population exposure to protests during Egypt's political transition. In the context of this transition, the use of purely fatality-based measures of political conflict involves substantial measurement error that would bias estimated effects toward the null; our data demonstrate that many individuals categorized as not having been exposed to unrest based on a fatality measure were in fact exposed to nonviolent political events. In our sample, 31.1% of youth lived in districts where riots or protests occurred, but only 12.2% lived in districts where such events resulted in fatalities (see Table 1). As uncertainty is a key mechanism by which we hypothesize that exposure to protests may have influenced other outcomes, the exclusion of nonviolent events that may induce uncertainty is a considerable limitation of previous studies.

Furthermore, while youth have featured prominently in hypotheses and analyses of the causes of the Arab Spring and the Egyptian Revolution specifically (Cammett and Salti, 2016; Campante and Chor, 2012; Hoffman and Jamal, 2012; Pellicer et al., 2017), little research has examined the effects of these political events on youth outcomes. One non-representative study of children aged 10 to 15 attending primary school near Tahrir Square in 2012 found high rates of depressive symptoms, anxiety, and post-traumatic stress disorder; the authors therefore argued for the need for population-based estimates of the impact of exposure to violence on young Egyptians' mental health (Moussa et al., 2015). To the best of our knowledge, no previous study has examined the effects of Egypt's political unrest on youth well-being within a causal framework.

3. Theoretical framework

After 30 years of continuous rule under Mubarak, the events of Egypt's multiple transitions from 2011 to 2014 constituted a period of profound instability for the country. Following Williams et al. (2012), we argue that the reduced ability to predict the future resulting from this instability—rather than direct threat of harm—is a key mechanism by which exposure to political protest events can adversely affect population well-being. Behavioral responses to instability may be particularly critical during the transition to adulthood, when young people

[1] In Egypt, there are 27 governorates, the highest sub-national administrative unit.

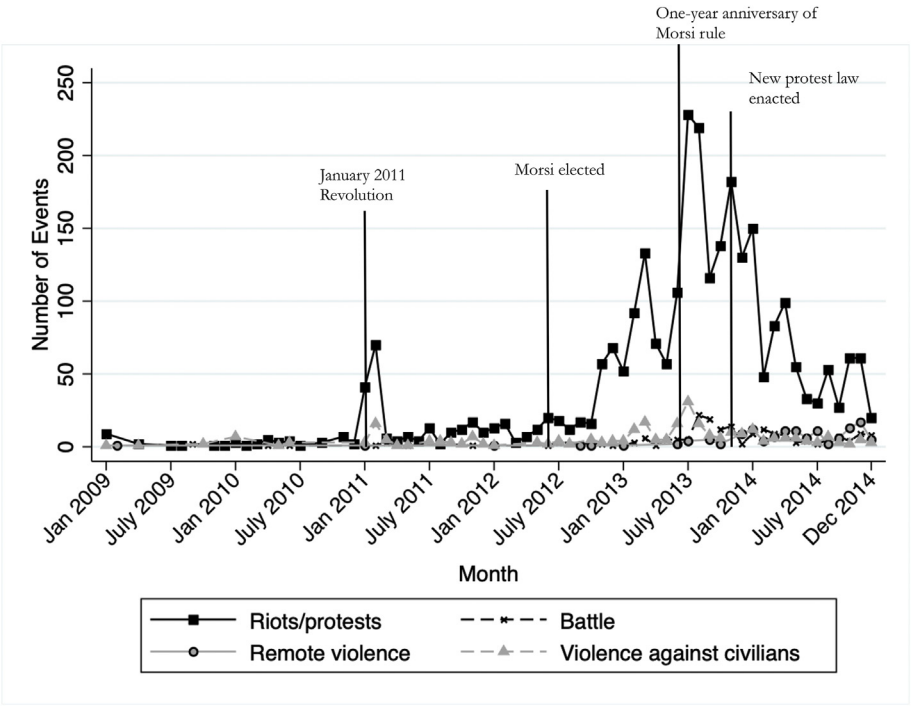

Fig. 1. Number of events per month, by event type, ACLED Egypt 2009–2014. Compared to battles, which are more characteristic of armed conflict, protests and riots dominated the political events in Egypt throughout the recent political transition period. Nationwide protests erupted on January 25, 2011 against the regime of President Hosni Mubarak. Political activity generally diminished after Mubarak was ousted until discontent with the new regime led to increased protest that peaked in July when Morsi was deposed and replaced on July 3, 2013. Pro-Morsi protests continued and only declined in 2014 after increased state repression and the enactment of a new protest law.

Table 1
Mean number of protest events.

	Districts	Individuals[a]
Number of events (SD)	9.2 (21.0)	3.37 (11.39)
0	41.8%	69.0%
1	14.3%	7.6%
2-4	15.7%	10.5%
5-19	14.3%	8.0%
20+	13.8%	5.0%
Any event	58.1%	31.1%
Without a fatality	31.4%	18.8%
With a fatality	26.7%	12.2%
N	210	10,255

[a] Adjusted for panel weights.

undergo changes in their social and economic roles that form the foundations of their future well-being. Negative stressors and poor coping strategies adopted during these critical years can have long-term impacts. According to life course theory, age-based institutions and social norms shape the progression to adult roles, such as those from school to the labor market and marriage. The failure to make expected transitions successfully, including delayed or accelerated transitions (e.g. early school drop-out, unemployment and stalled transitions to the labor market), can contribute to long-term negative outcomes (Hogan and Astone, 1986; Shanahan, 2000; Strauss and Thomas, 2007). We therefore focus our analysis on youth outcomes that are likely to have been affected by behavioral responses to uncertainty induced by the occurrence of local protests during Egypt's political transition, and which may have implications for youth investments and human capital accumulation. While human capital can refer to a wide variety of outcomes that vary across disciplines, we refer to the neoclassical economics concept of human capital in terms of the assets that generate returns over a person's lifetime (Becker, 1975). Within this conceptualization, investments related to education and health are often viewed as the most important, as they contribute to economic earnings vis-à-vis productivity in the labor market (Becker, 1975; Grossman, 1972). Use of panel data further allows us to examine changes in these outcomes for the same individuals before and towards the end of the political transition period, rather than changes across different individuals, which might vary substantially for reasons unrelated to protests. Negative effects on human capital accumulation in response to protest events, even if only manifest in the short-term, may ultimately reduce productivity and well-being over the long-term.

3.1. Social trust

At a conceptual level, the effects of political protests on perceptions of social trust remain ambiguous, although empirical studies suggest that conflict may contribute to strengthening social capital. On the one hand, the erosion of civil society due to political differences, failure of political institutions to effectively govern, and mounting insecurity can weaken general faith in the integrity of the existing social contract (Murshed, 2002). On the other hand, individuals suffering from traumatic events may find that increased group solidarity and collective action in response to the event may instead strengthen their perceptions of social trust, at least at local levels (Powell et al., 2003; Tedeschi and Calhoun, 1996). Among the few studies that have examined social capital-related outcomes, including generalized trust, in relation to exposure to civil war, positive effects have been found (Bellows and Miguel, 2009; Gilligan et al., 2011; Voors et al., 2012). To the best of our knowledge, no previous study has examined the impact of exposure to political protests on social capital outcomes.

In the Egyptian context, during and immediately following the 2011 Revolution, there was an outpouring of public optimism and volunteering (Huffington Post, 2011; Mekhennet and Kulish, 2011; Shadid, 2011), which could have contributed to increased social capital, and generalized trust in particular, through increased political engagement and activism. However, our outcome data were collected in 2013–2014 when the national economic and political situation had substantially deteriorated, and political expression was suppressed (Amnesty International, 2013); opinion polls showed declining satisfaction with and trust in public institutions (El-Mallakh, 2017). Thus the potential impact of exposure to protests on generalized social trust in the context of Egypt is unclear and may be dependent on contextual factors.

3.2. Uncertainty

Young people's expectations for their future play an important role in their decision-making about investments in human capital today. Even largely nonviolent, local expressions of political conflict can disrupt one's sense of control and ability to navigate through daily activities. This may have been exacerbated during the political transition in Egypt, which was characterized by widespread spontaneous collective action, fueled by social media and met with unpredictable reactions from local security forces. Inability to judge the threat of harm under such conditions may impair effective planning for the future (Williams et al., 2012), and thus contribute to a sense of increasing uncertainty about one's future prospects. In addition, the multiple transitions of power that Egypt experienced in a short period of time may have exacerbated the impact of local political conflict on uncertainty. Thus, we hypothesize that youth's perceptions of uncertainty over the future will be negatively affected by exposure to political protests. To the best of our knowledge, no previous study of conflict impacts has measured the effect of conflict on a direct measure of uncertainty about life in the future, although qualitative evidence suggests such effects may exist (Williams et al., 2012).

3.3. Education

Empirically, the impact of conflict on education among children and youth depends on the context and nature of the conflict, the gender of the child, and the educational outcome examined (see Buvinić et al., 2013 for a review). Whereas the literature on armed conflict has generally found negative effects on educational attainment for exposed cohorts (Chamarbagwala and Morán, 2011; Diwakar, 2015; Shemyakina, 2011; Verwimp and Van Bavel, 2014), lower-intensity conflicts that do not cause long-term disruptions in schooling supply or children's household situations may not have an effect on educational attainment (Buvinić et al., 2013). Nevertheless, lower-intensity conflicts and the resulting instability may still impact shorter-term educational outcomes (Buvinić et al., 2013), even when school provision is not disrupted, potentially due to deteriorating safety and security or psychosocial stress that hinders achievement. In the West Bank, for instance, Brück et al. (2019) found negative effects of exposure to conflict during the Second Intifada on secondary students' exam performance. However, previous studies that have examined insurgencies or other forms of political conflict that may be of lower intensity than civil wars have also used conflict exposure measures based on fatalities or other violent events (Brück et al., 2019; Kibris, 2015; León, 2012) rather than protests per se. Because academic calendars were at times delayed, but schools were never closed for long periods of time during Egypt's transition period, we expect some short-term negative effects on educational outcomes, such as attendance.

3.4. Health

In the context of largely nonviolent, repeated political events, population health among nonparticipants is most likely to be affected through perceptions of uncertainty, which induces stress, or indirectly through witnessing events or family members' exposure to such events and related stressors; effects on health through the destruction of health infrastructure or resulting income constraints are more likely to manifest in violent conflict settings. As such, we anticipate that the effects of protest events will manifest in mental health and more subjective measures of health, which have been shown to impact lifelong well-being and productivity (Bohman et al., 2010; Fergusson et al., 2007; Naicker et al., 2013), rather than objective physical health measures (e.g., manifestations of chronic conditions). Among the few studies that have examined subjective or mental health impacts of violent conflict in Bosnia and Herzegovina (Bratti et al., 2015) and Northern Uganda (Rockmore et al., 2016), negative effects have consistently been found. Observational studies of youth exposed to different forms of conflict in the Middle East and North Africa, including political protests, have also consistently shown negative associations between exposure to conflict and mental health (Dimitry, 2012; Giacaman et al., 2007; Moussa et al., 2015). Thus, we expect that exposure to political unrest will negatively impact youth subjective and mental health.

3.5. Heterogeneity of effects

The impacts of exposure to political conflict are likely to vary for different subgroups of the population. First, because the institutions and social norms that shape the transition to adulthood are often gendered, especially in the Middle East, the impacts of conflict are likely to vary for young men versus young women. Direct participation or pressure to participate in conflict events may be higher for men than for women in general (Buvinić et al., 2013; Williams et al., 2012). In Egypt, young men were more likely to participate in protests than young women, for whom gender norms around mobility constrained participation (Roushdy and Sieverding, 2017). Increasing insecurity and gender-based violence (Langhor, 2013; Sieverding and Hassan, 2016; Singerman, 2013; Tadros, 2016) may also have led parents to fear for girls' safety and prevent them from participating in other activities, such as school (Buvinić et al., 2013; Shemyakina, 2011). Young men, expected to be financially established in order to marry and provide for a family, may also be indirectly affected through local economic impacts of protests (e.g. closure of workplaces) more so than young women, for whom completed education and marriage are key milestones in the progression to adulthood rather than labor force participation (Sieverding and Hassan, 2016).

Second, one critically important implication of life course theory relates to the age of exposure. Past research on the effect of conflict on health and education outcomes for young children (Akresh et al., 2012; Chamarbagwala and Morán, 2011; Shemyakina, 2015, 2011) has found differential age effects. Among youth transitioning to adulthood, impacts are likely to differ depending on the stage of progression through age-differentiated roles, and hence the delay of or failure to successfully complete certain socially or institutionally conditioned events (e.g. marriage, school-to-work transition). Indeed, poorer mental health status among youth in Egypt has been shown to be associated with the failure to become employed among older youth cohorts and not completing school among school-aged women (Liu et al., 2017).

Lastly, our data allow us to explore potential differential impacts of exposure to protests by young people's level of involvement in protest activity: youth who were involved in protests themselves, youth for whom family members engaged in protests, and youth who neither participated themselves nor had participating family members. Based on the few previous studies that have examined direct involvement in or victimization during conflict as a mechanism for impacts on outcomes (Bellows and Miguel, 2009; Shemyakina and Plagnol, 2013), we expect greater magnitude of effects on social trust, uncertainty, and health outcomes in particular for those who were closer to direct participation in protest events. Consistent with previous studies (Bundervoet et al., 2009; Chamarbagwala and Morán, 2011; Shemyakina, 2015), we also investigate differences in effects across urban and rural areas, as protest activity was generally more frequent in urban than rural districts (see Appendix Table A1), thus resulting in higher average levels of exposure to protest activity overall among urban youth.

4. Data sources and measures

To estimate the impact of exposure to protest activity on youth, we use two data sources linked at the district level. The Armed Conflict Location & Event Dataset (ACLED) is a publicly available database that collates and codes conflict events based on newspaper reports (Raleigh et al., 2010) from which we characterize district-level occurrence of

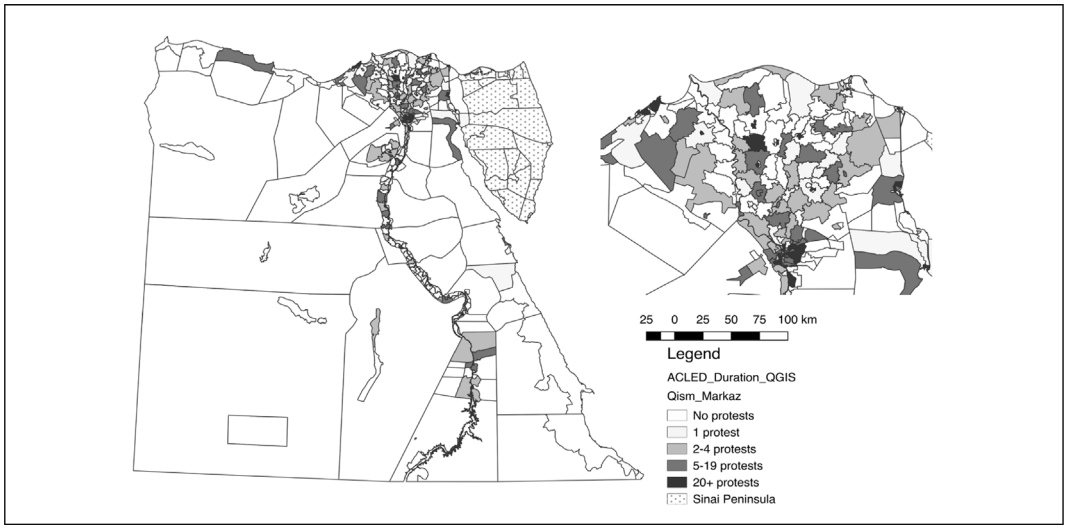

Fig. 2. Cumulative number of riots and protests (2009–2014) in districts of residence for SYPE respondents
SYPE panel respondents were exposed to varying numbers of protests events between 2009 and 2014. The greatest number of events occurred in major urban centers (e.g., Cairo, Alexandria), while relatively fewer events occurred in rural areas.

political protests. The Survey of Young People in Egypt (SYPE) is a nationally representative survey of young people aged 10–29 in 2009 who were followed-up in 2013/4, providing individual measures for well-being outcomes of interest.

4.1. Armed Conflict Location & Event Dataset (ACLED)

The ACLED is a database of political conflict events, compiled from international, national, and local media sources, and government and NGO reports. ACLED defines an event as a conflict-related action by or between specified actors on a given day for a specific location. Multi-day events in the same location, such as the protests in Tahrir Square that helped topple Mubarak, are thus captured as a separate observation for each day. Other attributes of each event, such as event type, actors involved, number of resulting fatalities, news source, and a brief description are also recorded (Raleigh et al., 2010). Unlike other geo-located conflict datasets, ACLED does not restrict event inclusion based on fatalities and is thus the most comprehensive dataset available for conflicts characterized by nonviolent and non-fatal political events (Raleigh et al., 2010; Eck, 2012; Sousa, 2014), such as the Arab Spring in Egypt.

We used ACLED Version 5, containing events through December 31, 2014, which encompasses the latest SYPE interview dates. The geo-coding precision in ACLED necessitated some recoding. Events with GPS coordinates corresponding to the nearest large city or a generic center point of a governorate, or that were inaccurate, were recoded (using Google Maps) for the specific location based on the event description to the extent possible. Because our identification strategy utilized variation at the district level, only events with precision at the center point of a medium sized city or more specific were included in our analyses; 633 events were thus excluded. We also excluded events in the two Sinai governorates (901 events) due to the different context of conflict there.

ACLED codes nine distinct types of events, broadly classified into violent events (battles, violence against civilians, and remote violence (e.g. bombings)), demonstrations (riots and protests), and non-violent actions by political actors (consisting primarily of arrests of and statements by political actors in the Egyptian context) (ACLED, 2017a, 2017b). Per our theoretical framework focusing on political conflict, we restricted the ACLED data to riots and protests. ACLED defines a protest as a "non-violent, group public demonstration" and rioting as a violent protest. Empirically, this category best captured the nature of the Arab Spring in Egypt, constituting 83 percent of the 2941 ACLED events occurring during our study period (see Fig. 1). However, it is important to note that the category riots and protests includes a wide array of events of varying levels of violence, some of which only involved one group of actors (e.g. a peaceful protest) while others involved multiple groups of actors (e.g. a protest that is broken up by security forces).

Within the category of riots and protests, 60% of events were protests led by civilians and 38% were riots led by civilians. In the remaining 2% of events, the primary actor included police, military, and militias. Corresponding to ACLED's distinction between riots and protests based on the violence of the events, in the vast majority (82%) of protests, the event involved only protesters. Another 15% of protests involved military action against protestors, which ACLED coded as not resulting in violence. In contrast, in events where the main actor was rioters, 55% of events involved military action against the rioters, another 12% involved rioters alone, and 29% involved clashes between two different groups of rioters. Whereas less than 1% of protests resulted in a fatality, 20% of riots did (8% of events in the aggregated protest/riot category). ACLED does not capture data on injuries. Additional details about the ACLED data and examples of the scope of events captured in our analytic sample of events are given in the Appendix. For brevity, we henceforth refer to our sample of events as "protests."

From the cleaned and restricted set of events, we aggregated events at the district level. Many districts did not have any events, resulting a large percentage of SYPE individuals not experiencing any protests in their district of residence, and some districts experiencing more than 20 events. We constructed three measures of protest exposure for each district:

1 Any event is an indicator variable for the occurrence of any protest versus no such event, and reflects our basic measure for *exposure* to protests.
2 Number of events is an ordinal variable for the occurrence of 0, 1, 2–4, 5–19, or 20 or more events, and reflects the *intensity* of political protests. These categories were chosen *a priori* based on the evenness of event occurrences across districts (see Table 1; further details available in the Appendix).
3 Occurrence of fatalities is a categorical variable distinguishing districts with (a) no protest events, (b) events in which none resulted in a fatality, and (c) events in which at least one resulted in a fatality; this is a proxy for the *severity* of protests.

Table 2
Sample characteristics for SYPE Panel, 2009.

	All	Men	Women
	N = 10,255	N = 4774	N = 5481
Age group			
8–12[a]	20.2%	19.5%	20.9%
13-19	39.5%	41.5%	37.5%
20-24	23.4%	23.4%	23.3%
25-29	16.9%	15.6%	18.3%
Education (highest completed)			
Never attended	21.7%	17.9%	25.7%
Primary	23.5%	23.8%	23.2%
Preparatory	17.4%	18.2%	16.6%
Secondary	7.3%	8.0%	6.6%
Vocational secondary	21.8%	23.4%	20.1%
Beyond secondary	8.2%	8.7%	7.8%
School enrollment			
Out of school	51.4%	50.0%	52.9%
Currently in school	48.6%	50.0%	47.1%
Marital status			
Not married	64.7%	75.6%	53.2%
Married	35.3%	24.4%	46.8%
Employment status			
Employed	23.1%	39.1%	6.2%
Unemployed	4.5%	6.0%	3.0%
Out of the labor force	72.4%	54.9%	90.9%
Religion			
Muslim	96.5%	96.5%	96.4%
Christian	3.5%	3.5%	3.6%
Participation in protests			
Personally participated	2.7%	4.1%	1.4%
Family member participated	14.3%	17.1%	11.9%
Wealth			
Poorest	21.6%	20.9%	22.4%
Second	20.7%	20.9%	20.5%
Middle	22.1%	23.0%	21.3%
Fourth	19.3%	19.3%	19.3%
Richest	16.3%	15.9%	16.6%
Region			
Urban Governorates	18.9%	19.4%	18.4%
Urban Lower Egypt	11.3%	11.1%	11.4%
Rural Lower Egypt	32.0%	32.6%	31.3%
Urban Upper Egypt	8.1%	8.2%	7.9%
Rural Upper Egypt	28.9%	27.8%	30.0%
Frontier Governorates	0.9%	1.0%	0.9%

All summary statistics are adjusted for panel weights.

[a] A small number of age misreporting across SYPE waves led to inconsistencies. As we cannot determine in which wave is correct, we categorize individuals based on their age reported in the 2013/14 wave, and calculate their commensurate age for 2009. This resulted in 274 individuals that were ages below the age of 10 in 2009, which was the SYPE age inclusion threshold.

4.2. Survey of young people in Egypt (SYPE)

All outcome data were derived from the SYPE, a nationally representative survey of young people aged 10–29 in 2009 and followed up between November 2013 and July 2014, constituting a panel of 10,916 young people surveyed before and towards the end of Egypt's transition period (additional details about the SYPE are given in the Appendix). The SYPE data include a range of measures related to the transition to adulthood, covering education, employment, health, family formation, and civic participation. From the SYPE, our outcomes of interest were: (1) perceptions of social trust; (2) uncertainty about the future; (3) investments in education, measured through on-time completion and school absenteeism; and (4) health, measured by self-reported (perceived) overall health status and the validated Self-Reporting Questionnaire-20 for mental health status.

4.2.1. Social trust

Among those aged 15 or over in 2009, respondents were asked, "Generally speaking, would you say that most people can be trusted, or that you need to be very careful in dealing with people?" We created an indicator variable for responses that "most people can be trusted" versus responses of "need to be careful with people."

4.2.2. Uncertainty about the future

SYPE respondents aged 15 or over in 2009 were also asked to rate their feelings of uncertainty about their own future on a 10-point scale in response to the question, "In your opinion, on a scale from 1 (very certain) to 10 (very uncertain), what is the degree that reflects your feeling of uncertainty about your future?" We retained the continuous scale as given.

4.2.3. Education

For individuals enrolled in school during both survey waves, we constructed three measures:

- Absence from school is a binary indicator for missing school for at least one day during the school year.
- Days absent is a continuous variable of the number of school days missed if the respondent was ever absent.
- Delayed school completion identified respondents currently in the level and grade expected for their age if they were enrolled. The variable is coded based on changes in on-time progression between the survey waves; students were identified as either catching up from being behind, remaining unchanged, or becoming delayed relative to their expected grade-for-age.

4.2.4. Health

We used two measures of health:

- Good health status is a binary indicator for responses of "excellent," "very good," or "good" health status compared to "fair" or "poor" to the question, "In general, how would you describe your own health?" This question, known as self-reported health (SRH), has been used widely as a single measure to capture a variety of domains related to health, including physical health, functional limitations, mental health, and sociodemographic characteristic. SRH has been shown to vary systematically by context, age and gender (Bates et al., 2017; Idler and Cartwright, 2018).
- Mental health SRQ-20 score sums all positive responses (indicating the presence of a condition or symptom) to items in the Self-Reporting Questionnaire-20 (SRQ-20) validated to screen for psychiatric disturbance in primary health care settings; higher scores represent worse mental health status (Beusenberg and Orley, 1994). This measure has previously been used in studies of mental health in Egypt (Liu et al., 2017; Vizcarra et al., 2004).[2] See Appendix Table A2 for component items.

We also used the SYPE data to construct a variety of sociodemographic variables: age[3] (in 2009: 8–12; 13–19, 20–24, and 25–29), marital status, religion, highest level of schooling completed, school enrollment status, employment status, wealth, and region of residence.[4]

[2] All individuals included in our analysis of the mental health SRQ-20 score reported a valid response in both survey waves. Our empirical strategy employs individual-level fixed effects to examine only the within-individual *change* in this score between survey waves, which has also been used in a separate analysis of mental health correlates; the distribution of this change resembles a normal curve for both men and women (see Liu et al., 2017, Fig. 2).

[3] A small amount of age misreporting across SYPE waves led to inconsistencies. As we cannot determine in which wave age was correctly reported, we categorize individuals based on their age reported in the 2013/14 wave, and calculate their commensurate age for 2009. This resulted in 274 individuals being below the age of 10 in 2009, which was the SYPE age inclusion threshold.

[4] Urban Governorates (Cairo, Alexandria, Suez, and Port Said), urban Lower Egypt, rural Lower Egypt, urban Upper Egypt, rural Upper Egypt, and Frontier

Table 3
Changes in outcomes across survey waves.

Outcome	All			Male			Female		
	2009	2014	Change	2009	2014	Change	2009	2014	Change
Social trust[a]	9.5%	20.8%		10.7%	21.0%		8.2%	20.5%	
Decreased			7.2%			7.8%			6.5%
No change			74.4%			74.1%			74.7%
Increased			18.4%			18.1%			18.8%
Uncertainty about the future (10-point scale)[a]	6.66	7.03	0.36	6.73	7.163	0.40	6.591	6.914	0.32
School level on-time completion[b]	83.7%	61.6%		85.3%	62.9%		81.8%	60.2%	
Caught up			2.9%			2.9%			2.9%
On-time/no change			72.1%			71.8%			72.5%
Became delayed			25.0%			25.3%			24.6%
Ever absent during school year[c]	73.3%	61.3%	−12.0%	74.3%	60.2%	−14.1%	72.1%	62.4%	−9.7%
Days absent during school year (if ever absent)[c]	5.97	9.30	3.33	6.34	10.24	3.91	5.54	8.22	2.67
Good health (vs. fair or poor)	87.2%	92.9%		85.4%	93.5%		89.1%	92.3%	
Worsened			5.8%			5.1%			6.6%
No change			82.7%			81.8%			83.6%
Improved			11.5%			13.1%			9.8%
Mental health SRQ-20 score[a]	3.54	2.18	−1.36	2.28	1.67	−0.61	4.89	2.72	−2.17

All statistics are adjusted for panel weights.
[a] Restricted to youth aged 15 + in 2009 to whom the question was asked.
[b] Restricted to school-aged youth ages 8–19 in 2009.
[c] Restricted to youth in school at time of survey.

Although many of these variables were not used in our main regression analyses, they were used to describe our sample and for sensitivity analyses. Finally, we derive from SYPE our measure of youths' own participation or that of a household member in protest activity. The SYPE questionnaire in 2013/2014 asked respondents to indicate their own participation in different political activities (e.g., attending meetings, making donations, petitioning, supporting protesters, protesting, engaging in violence) from January 2011 until the time of the survey as well as the participation of family members. We created indicator variables for a positive response to participating in any related political activity for the respondent, and a separate indicator for the participation by any household member (i.e., parent or siblings). We include the latter measure in part because we suspect that young people's own participation in protests is underreported (Sieverding and Ramadan, 2015).

4.3. Dataset linkage

We link the two datasets by district, the smallest geographic unit for which we have data for SYPE respondents. Only events that occurred between the dates that each SYPE respondent was interviewed were included in each individual's protest exposure measures. Notably, all individuals who moved into a new household between waves remained in their original district, necessitating no additional adjustment to their event exposure measures.

5. Empirical strategy

Our analytical strategy exploits exogenous variation in the occurrence of protests in an individual's district of residence to examine their reduced form effect on changes in individual human capital and well-being outcomes. Descriptive analyses of protest events show substantial variation in exposure across individuals (see Fig. 2). The greatest number of events occurred in major urban centers (e.g., Cairo, Alexandria), while relatively fewer events occurred in rural areas. Table 1 summarizes the mean number of protest events for the full sample and the percentage of districts and SYPE respondents affected.

We estimated the effects of exposure to protests in an individual's district of residence by leveraging the panel feature of the SYPE data to include individual-level fixed effects. Exposure to protest events may be correlated with both observable (e.g., better educated youth live closer to universities where some protests have occurred) and less unobservable or quantifiable characteristics (e.g., strong political convictions), potentially biasing estimates of the effect of event occurrence. The fixed effects model controls for all time-invariant differences in individual characteristics including time-invariant differences in the individual's district of residence. This strategy is analogous to a difference-in-difference estimation method (Wooldridge, 2013). Importantly the fixed effects models use only within-individual variation to compare changes in outcomes over time (rather than levels) in protest-affected districts.

Thus, for each individual i in district d at time t, we estimated the following equation:

$$Z_{itd} = \beta_0 + \beta_1 P_{dt} + \beta_2 D_{dt}{}^{*}\mu_t + \theta_i + \mu_t + \varepsilon_{itd}, \quad (1)$$

where Z_{itd} is the outcome of interest, P_{dt} is the measure of protests in an individual's district at each survey wave, θ_i is a vector of individual fixed effects, and μ_t controls for survey wave. To additionally control for potential confounding due to district-level characteristics, we include a number of district-level characteristics, represented by D_{dt}, calculated from the 2006 Egypt Census (i.e., population size, and the percentages of the population in different wealth quintiles, with a literate household head, who are Muslim, who are employed, unemployed or not in the labor force, who own a cell phone, and that reside in urban areas), and interacted these with survey wave ($D_{dt}{}^{*}\mu_t$); this essentially controls for secular trends in our outcome variables dating from prior to our period of observation that may also fuel the incidence of protests across districts. The estimate for β_1 thus reflects the reduced form main effect of exposure to protests. Time-varying observable individual-level characteristics (i.e., household size, education, marital, and employment statuses) were omitted due to potential endogeneity, but are further examined in sensitivity analyses. To test differences in effects along gender, age groups, and protest participation status, we estimate Equation (1) with an interaction between the characteristic of interest and the measure of protest events.

In sensitivity analyses, we examined the robustness of our estimates to a number of potential threats to validity by: (i) excluding events prior to 2011 (the start of the Revolution) that may reflect a substantively different type of political expression unrelated to the sentiments of the

(*footnote continued*)
Governorates.

Table 4
Estimated effects of protest event occurrences on social trust and perceived uncertainty.

	(1)	(2)	(3)	(4)
	Trust	Trust	Uncertainty about the future	Uncertainty about the future
Panel A: Any event				
Any event	0.0430	0.0310	0.566**	0.484*
	[0.0306]	[0.0335]	[0.212]	[0.215]
Any event*male		0.0232		0.160
		[0.0213]		[0.131]
Panel B: Number of events				
1	0.0578	0.0485	0.598*	0.417
	[0.0454]	[0.0470]	[0.283]	[0.295]
2–4	0.0751	0.0702	0.945**	0.799*
	[0.0438]	[0.0508]	[0.262]	[0.308]
5–19	−0.0203	−0.0409	−0.00181	0.0286
	[0.0308]	[0.0371]	[0.264]	[0.269]
20+	−0.0127	−0.0290	0.0165	0.0519
	[0.0480]	[0.0557]	[0.348]	[0.369]
1*male		0.0186		0.360
		[0.0408]		[0.251]
2-4*male		0.00921		0.279
		[0.0368]		[0.268]
5-19*male		0.0395		−0.0559
		[0.0471]		[0.231]
20+*male		0.0319		−0.0663
		[0.0498]		[0.240]
Panel C: Occurrence of fatalities				
No fatalities in all events	0.0423	0.0382	0.711**	0.648**
	[0.0322]	[0.0351]	[0.233]	[0.241]
Fatality in any event	0.0447	0.0205	0.236	0.126
	[0.0446]	[0.0522]	[0.214]	[0.221]
No fatalities in all events*male		0.00794		0.120
		[0.0278]		[0.182]
Fatality in any event*male		0.0469		0.214
		[0.0339]		[0.179]
Observations	14,464	14,464	14,468	14,468
R-squared	0.066	0.070	0.043	0.047
Rho	0.409	0.409	0.338	0.333
Number of individuals	7232	7232	7234	7234
Sample	Age 15 + in 2009	Age 15 + in 2009	Age 15 + in 2009	Age 15 + in 2009

Robust standard errors in brackets.
**p < 0.01, *p < 0.05.
Each panel is estimated with a separate regression model.

Arab Spring period; (ii) excluding potential outliers that may unduly influence population-level effects, in particular (a) urban centers where the largest and most visible protests events occurred (i.e. Cairo, Alexandria, Port Said, and Suez), and (b) individuals who directly participated in protests; and (iii) controlling for additional sources of confounding from (a) time-varying observable characteristics (i.e., household size, education, marital, and employment statuses), and (b) differences in static baseline individual and household characteristics, area-level characteristics, and unobservable time-invariant differences across governorates.

Although some outcomes are binary, we used linear probability models (LPMs) to estimate Equation (1) for all outcomes to facilitate comparison of estimates. In addition, nonlinear models with small time dimensions (i.e., two in this case) and large numbers of fixed effects can produce biased estimators (Greene et al., 2002). Even though predictions from LPMs may exceed the range of 0–1, we focus on marginal effects interpreted relative to sample means. Standard errors were clustered at the district level.

6. Results

Table 2 displays the sample characteristics of SYPE panel respondents as reported in 2009 for the analytic panel subset. At that time, even though 20.2% and 39.5% of respondents were aged 8–12 and 13–19, respectively, only 48.6% of all respondents were currently enrolled in school. About 35% of respondents were married—46.8% among young women but only 24.4% among young men. While the large majority of respondents were not in the labor force, employment (overall 23.1%) was much higher among young men (39.1%) than young women (6.2%). Only 2.7% of respondents reported that they had participated in protests, with a higher percentage among young men (4.1%) than women (1.4%), whereas 14.3% reported that a family member had participated in protests.

For all outcomes, changes in observed levels between SYPE waves are described in Table 3. Trends in outcomes were similar for young men and women. On average, perceptions of social trust increased over time with more individuals reporting increases in trust (18.4%) than decreases (7.2%). Average levels of uncertainty increased by 0.36 points from a baseline of 6.66 (a 5.4% increase). For education, on-time completion substantially declined: 25.0% of youth experienced a delay in schooling progression while only 2.9% caught up to their expected grade-for-age. While the percentage of youth experiencing an absence declined among those who remained in school, the average number of days absent increased by 3.33 days for those with an absence. Overall SRH improved, with 11.5% reporting better health while 5.8% reported worsening health. Similarly, SRQ-20 scores decreased over time, signifying improved mental health status on average, though levels of improvement varied by gender.

Regression estimates of the overall and gender-specific effects of exposure to protests on perceptions of social trust and uncertainty are displayed in Table 4. There were no changes in sentiments of generalized trust in areas with protest activity either overall or by gender; while significant effects were found in urban areas compared to rural areas (Appendix Table A5), this result was sensitive to model choice (results not shown). In contrast, perceptions of uncertainty increased for all young people in areas that experienced protest activity; uncertainty increased by 0.566 in relation to having any occurrence of a protest event, which is an increase of 8.27% over the mean (6.85) for all respondents. No differences were estimated by gender, across age groups, or between urban and rural areas. Effects were significant in areas experiencing 2–4 events and among those without fatalities.

For education outcomes, effects of protests were not found overall or by gender (Table 5) or between urban/rural areas.

Estimates for health outcomes show that the lack of overall population effects masks opposing effects among young men and women (Table 6). Compared to young women, young men were more likely to report improved SRH, but experienced worse mental health, in areas with protests. For exposure to any protest event, there was a 3.05 percentage point increase in SRH for young men, which translates into a 3.4% improvement relative to the mean across survey waves (89.5%), compared to a 5.01 percentage point decline in SRH for young women or a 5.5% decrease over the mean among women (90.7%). This can be contrasted with a 0.797 increase in SRQ-20 score among young men, representing a 21% worsening relative to the mean SRQ-20 score for men (1.98), and a 0.732 decrease in the SRQ-20 score for young women, which represents a 37% improvement over their mean SRQ-20 score (3.81). Estimates by the number of protest events and the occurrence of fatalities corroborate the summary estimates of exposure to any protest event. No differences were found across age groups or urban/rural areas.

Table 7 displays results of analyses of differential effects of exposure to any protest event by participation status (see Appendix Tables A7 and A8 for estimates by the number of events and occurrence of fatalities). For individuals who personally participated in protests, mental health scores significantly increased, signifying a worsening of

Table 5
Estimated effects of protest event occurrences on education.

	(1)	(2)	(3)	(4)	(5)	(5)
	Ever absent from school	Ever absent from school	Days absent from school	Days absent from school	Delayed schooling	Delayed schooling
Panel A: Any event						
Any event	0.0467	0.0903	0.398	−0.317	−0.0140	−0.0138
	[0.0392]	[0.0470]	[1.039]	[1.229]	[0.0219]	[0.0229]
Any event*male		−0.0834		1.398		−0.000424
		[0.0424]		[1.293]		[0.0154]
Panel B: Number of events						
1	0.0215	0.0707	1.595	0.805	−0.00551	−0.00906
	[0.0610]	[0.0722]	[1.102]	[1.684]	[0.0322]	[0.0326]
2–4	0.0661	0.139*	−0.198	−1.738	−0.0363	−0.0364
	[0.0480]	[0.0626]	[1.319]	[1.779]	[0.0253]	[0.0279]
5–19	0.0636	0.0777	0.119	0.0382	0.0125	0.0125
	[0.0567]	[0.0741]	[1.415]	[1.877]	[0.0340]	[0.0395]
20+	−0.0257	−0.00528	−3.349	−3.182	−0.0184	−0.0107
	[0.0946]	[0.103]	[1.859]	[2.317]	[0.0468]	[0.0467]
1*male		−0.0947		1.441		0.00706
		[0.0604]		[3.079]		[0.0276]
2-4*male		−0.143		3.183		0.000213
		[0.0754]		[2.402]		[0.0272]
5-19*male		−0.0247		0.138		−0.00004
		[0.0932]		[2.076]		[0.0338]
20+*male		−0.0326		−0.177		−0.0152
		[0.103]		[2.476]		[0.0354]
Panel C: Occurrence of fatalities						
No fatalities in all events	0.0347	0.103	0.661	−0.463	−0.0238	−0.0199
	[0.0413]	[0.0533]	[1.089]	[1.348]	[0.0227]	[0.0242]
Fatality in any event	0.0745	0.0808	−0.256	−0.493	0.00981	0.00467
	[0.0559]	[0.0646]	[1.255]	[1.720]	[0.0306]	[0.0328]
No fatalities in all events*male		−0.137*		2.220		−0.00792
		[0.0529]		[1.572]		[0.0195]
Fatality in any event*male		−0.00907		0.346		0.00958
		[0.0659]		[2.101]		[0.0246]
Observations	5103	5103	1566	1566	11,836	11,836
R-squared	0.069	0.073	0.094	0.097	0.179	0.180
Rho	0.356	0.357	0.365	0.366	0.532	0.532
Number of individuals	2552	2552	783	783	5918	5918
Sample	In school	In school	In school and had absence	In school and had absence	Age 8–19 in 2009	Age 8–19 in 2009

Regressions additionally control for self-reported health status.
Robust standard errors in brackets.
**p < 0.01, *p < 0.05.
Each panel is estimated with a separate regression model.

mental health compared to individuals not actively protesting. For individuals in areas where protests occurred, those whose family members participated in protests had increased perceptions of uncertainty relative to those who did not have any family members who participated in protests; the magnitude of effect is similar to the overall main effect of any event occurring.

6.1. Sensitivity analyses

We further examined the sensitivity of our main results; regression outputs are given in the Appendices. First, we found that our results were robust to the exclusion of events that occurred in the years prior to the 2011 Egyptian Revolution. We dropped 70 events occurring before 2011 from our cumulative exposure measures and reran our main specification for Equation (1); all resulting estimates were nearly identical (Appendix Table A9).

Second, we find that our results are robust to the inclusion of potential outliers in events and individuals. In analyses that exclude the large urban areas (Cairo, Alexandria, Port Said, and Suez) where the greatest number of protests occurred, and potentially with the most media coverage that could lead to improved completeness of the ACLED data, the magnitude of point estimates generally reduce toward zero, but results remain substantively similar (Appendix Table A10). The exclusion of individuals who directly participated in protests (N = 506) also results in estimates nearly identical to that of our main specification (Appendix Table A11).

Third, changes in important life events—marriage, school enrollment, and employment—may be correlated with both the likelihood of protests occurring in the local area (e.g., through frustrations in the labor market) and resulting well-being outcomes, although these transitional states may themselves be endogenous with our outcomes of interest. We included these time-varying variables for marital status, employment status, schooling enrollment, and household size as additional controls in our regression and but find similar point estimates. These results suggest little confounding due to these factors (Appendix Table A12).

Lastly, because all time-invariant variables dropped from the equation when individual fixed effects were included, we further examined the robustness of our findings to differences in baseline individual and household characteristics, area-level characteristics, and unobservable time-invariant differences across governorates. We transformed the panel data to first-differences (i.e., expressing all independent and dependent variables as changes in levels between 2009 and 2014) and reran our main specification including the following sets of controls: (1) observable individual sociodemographic characteristics measured in 2009 (i.e., age, highest education level attended, school

Table 6
Estimated effects of protest event occurrences on health.

	(1)	(2)	(3)	(4)
	Good self-reported health	Good self-reported health	Mental health SRQ20 score	Mental health SRQ20 score
Panel A: Any event				
Any event	−0.00911	−0.0501*	0.0566	−0.732*
	[0.0201]	[0.0204]	[0.304]	[0.323]
Any event*male		0.0806**		1.529**
		[0.0227]		[0.246]
Panel B: Number of events				
1	−0.0283	−0.0418	0.135	−0.737
	[0.0243]	[0.0286]	[0.407]	[0.427]
2–4	−0.0186	−0.0758**	0.137	−0.521
	[0.0273]	[0.0242]	[0.369]	[0.382]
5–19	0.0225	−0.0256	−0.0886	−0.647
	[0.0316]	[0.0361]	[0.412]	[0.470]
20+	0.0493	0.00880	−0.415	−1.690*
	[0.0390]	[0.0472]	[0.539]	[0.659]
1*male		0.0280		1.743**
		[0.0377]		[0.319]
2-4*male		0.109**		1.240*
		[0.0327]		[0.507]
5-19*male		0.0926		1.078*
		[0.0536]		[0.471]
20+*male		0.0791		2.506**
		[0.0570]		[0.576]
Panel C: Occurrence of fatalities				
No fatalities in all events	−0.0245	−0.0605**	−0.0903	−0.819*
	[0.0218]	[0.0212]	[0.315]	[0.333]
Fatality in any event	0.0263	−0.0226	0.392	−0.490
	[0.0266]	[0.0321]	[0.400]	[0.449]
No fatalities in all events*male		0.0707*		1.407**
		[0.0275]		[0.331]
Fatality in any event*male		0.0956*		1.727**
		[0.0390]		[0.341]
Observations	20,510	20,510	14,486	14,486
R-squared	0.026	0.034	0.078	0.094
Rho	0.346	0.350	0.404	0.425
Number of individuals	10,255	10,255	7243	7243
Sample	All	All	Age 15 + in 2009	Age 15 + in 2009

Robust standard errors in brackets.
**p < 0.01, *p < 0.05.
Each panel is estimated with a separate regression model.

enrollment status, marital status, and employment status, religion, household wealth); (2) measures of district characteristics constructed from the Egypt 2006 census; and (3) governorate-level fixed effects. Results remain substantively similar (Appendix Tables A13-A15).

7. Discussion

Although political unrest characterized by repeated, largely non-violent events may not be as destructive as armed conflict, our analyses show that such occurrences nonetheless negatively affect overall life certainty and health among exposed youth, at least in the short-term. Notably, many effects were gender-specific, representing the added complexity of analyzing the impacts of politically-charged localized activities within a sociocultural context characterized by strong gender norms and roles. In the aftermath of the Arab Spring and other mass protest movements around the globe, these findings highlight the importance of examining the population-level impacts of different forms of political conflict, particularly as substantial numbers of youth in the Middle East and North Africa and elsewhere progress to adulthood under conditions of political instability.

Among both young men and women, occurrences of protests in the district of residence resulted in increased uncertainty over the future.

Table 7
Estimated interaction effects of protest participation by oneself or a family member.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Trust	Trust	Uncertainty about the future	Uncertainty about the future	Ever absent from school	Ever absent from school	Days absent from school	Days absent from school	Delayed schooling	Delayed schooling	Good self-reported health	Good self-reported health	Mental health SRQ20 score	Mental health SRQ20 score
Any event*participated in protest	0.0157		−0.0634		0.0200		1.035		−0.0892		0.0350		1.195**	
	[0.047]		[0.277]		[0.083]		[3.004]		[0.065]		[0.033]		[0.414]	
Any event*family member participated in protest		0.0653		0.478*		0.0611		1.464		0.0098		−0.018		0.362
		[0.039]		[0.191]		[0.049]		[1.416]		[0.022]		[0.024]		[0.356]
Observations	14,464	14,424	14,468	14,428	5103	5083	1566	1558	11,836	11,798	20,510	20,412	14,486	14,426
R-squared	0.066	0.068	0.043	0.044	0.069	0.069	0.094	0.095	0.180	0.179	0.026	0.026	0.079	0.079
Rho	0.409	0.392	0.333	0.320	0.355	0.357	0.365	0.371	0.540	0.533	0.346	0.348	0.405	0.401
Number of individuals	7232	7212	7234	7214	2552	2542	783	779	5918	5899	10,255	10,206	7243	7213
Sample	Age 15 + in 2009	Age 15 + in 2009	Age 15 + in 2009	Age 15 + in 2009	In school	In school	In school, had absence	In school, had absence	Age 8–19 in 2009	Age 8–19 in 2009	All	All	Age 15 + in 2009	Age 15 + in 2009

Regressions for schooling outcomes additionally control for self-reported health status.
Robust standard errors in brackets.
**p < 0.01, *p < 0.05.
Each panel is estimated with a separate regression model.

While studies from post-civil war contexts (Bellows and Miguel, 2009; Gilligan et al., 2011) have found positive effects on generalized trust, we find this only in urban areas where more protests occurred. This suggests that the impact of conflict on generalized trust, as an indicator of social capital, may be sensitive to the type of conflict, the context, and when trust is measured relative to conflict events. As such, this result was less consistent across model specifications compared to other outcomes. In addition, the SYPE 2013/14 was fielded during a period of increased political repression and low levels of public satisfaction with national institutions (Amnesty International, 2013; El-Mallakh, 2017). The combination of repression and continued tensions and uncertainty over the country's political future in 2013/14 may have negatively affected social capital as measured concurrently, in contrast to other studies that measured social capital effects several years after civil wars ended (Bellows and Miguel, 2009; Gilligan et al., 2011).

The increase in uncertainty about one's own future aligned with our theoretical expectations given the instability represented by the variation in political protests during the study period. This is an important finding given that previous studies in Egypt (El-Mallakh et al., 2018) and elsewhere (Williams et al., 2012) have argued that uncertainty is a key mechanism by which protest or other largely nonviolent forms of political conflict may affect population outcomes, but have not directly measured this construct. Increased uncertainty in the future was largest in areas with moderate protest activity (i.e., up to four events), which may suggest that the occurrence of relatively fewer events may be a more salient stressor vis-a-vis a deviation from the norm compared to areas where protests became more prevalent, frequent, and perhaps more expected as a norm. More research is needed to further understand how uncertainty is internalized as political conflicts become protracted. There were also no systematic differences in areas with fatalities, emphasizing the importance of our more comprehensive event measure over fatality-based measures. Uncertainty was also higher among youth who reported participation of family members in protest activity, which may reflect added stress on young people with closer ties to political activism.

We find no effects on education overall or by gender. These results are consistent with the literature showing considerable variation in conflict impacts on education, including limited impacts of lower-intensity conflicts on educational attainment (Buvinić et al., 2013). In Egypt, the lack of impact on attendance and progression outcomes is likely due to the fact that there was no damage to infrastructure (schools) due to the conflict, and school closures were short-lived and would have similarly affected all students in the same area. Other studies have also found a positive impact of greater protest intensity on educational expenditures among Egyptian households; although the effect was greatest for tertiary education among men (Giesing and Musić, 2019) it is possible that increased expenditures offset effects on other potential negative impacts on schooling. Particularly notable is the lack of impact on young women's attendance compared to higher-intensity conflicts occurring in settings with conservative gender norms where girls' educational outcomes have been found to disproportionately suffer, likely due to threats of gender-based violence (Shemyakina, 2011). One important outcome that we are unable to study with the SYPE data is achievement vis-à-vis test scores, for which negative effects have been found in studies of insurgencies (Brück et al., 2019; Kibris, 2015).

We find intriguing effects of protest exposure at the district level on SRH and mental health. For individuals participating in protests, mental health worsened compared to non-participants, which may partially reflect differential estimates by gender. Young men were more likely to report a small improvement in perceived overall health, but experienced a sizable worsening of mental health in areas with protests compared to young women who were more likely to report a substantial improvement in mental health and only a small worsening in perceived overall SRH. These divergent patterns for SRH and mental health by gender already existed at baseline (i.e., young women reported worse mental health and slightly better SRH than young men in 2009), suggesting that these health measures may be capturing different sub-domains along gender lines. Compared to baseline levels, there was greater room for improvement for young women'smental health. Furthermore, men were much more likely to participate in protests (Beissinger et al., 2015; Roushdy and Sieverding, 2017) and to face pressure from different groups to be active in the events, including non-political events, such as neighborhood watches, that were formed in areas that experienced unrest (Sieverding and Ramadan, 2015). Men may thus have experienced acute stressors related to the occurrence of protest activity that affected mental health, especially in areas with fatalities. Lastly, SRH may be measuring a relative generalized malaise, while the SRQ-20 is more directly and precisely assessing mental health, such as depression and anxiety symptoms. Since women were less likely to personally participate in protest events and more indirectly involved in political activities compared to men, manifestations of protest-related stressors may be more generalized, linked to latent correlates of health vis-à-vis SRH rather than mental health specifically.

Overall, our estimates may be an underestimate of the impact of protests on long-term well-being because we only use within individual variation. Our estimates do not take into account systematic cohort effects affecting all youth, even those not living in protest areas. Interestingly, for men, the increase in uncertainty among SYPE respondents for those exposed to protest events was about the same for those exposed to any protests and those exposed to protests involving fatalities. This suggests a ubiquitous and general anxiety from protest activity that was not necessarily linked to severity. Furthermore, nearly all of the effects we observe were in relation to the occurrence of any event; few unique patterns were observed according to the intensity (i.e., number) or severity (occurrence of fatalities) of events. Our findings thus show the importance of considering conflict exposure measures beyond counting fatalities, which misses exposure among much of the population. The magnitude of our estimated coefficients are moderate for the affected outcomes among both young men and women, suggesting that exposure to protests may continue to affect well-being into the future, and particularly through instability (Williams et al., 2012) and internalized stress (Jylhä, 2009). Returning to the life course theory framework that guided our approach, these findings have important implications for the generation of young people growing up in situations of political instability in MENA and elsewhere; longitudinal research, which is greatly lacking in the region, is critical to further understanding the impacts of these different political context and transitions on young people's later life outcomes.

Our results should be interpreted in light of several important caveats. Although many biases and inaccuracies of media-based event databases are well-established, these biases are reduced for events with higher levels of media coverage and by multiple outlets (Weidmann, 2015; Wigmore-Shepherd, 2015), which was the case for the Arab Spring in Egypt. While we cannot rule out potential biases toward greater coverage of urban events or lack of geographic precision for events with less media coverage, our separate analyses for urban and rural areas attempts to limit these sources of systematic measurement error (Table A5). Our ability to measure the severity and intensity of protest events, such as violence beyond fatalities, is also limited by the measures available in ACLED. Furthermore, our findings are only applicable to youth who were successfully followed-up in the SYPE survey; no studies are available to determine patterns of migration in Egypt, which may have itself been an important outcome in response to political conflict.

Our identification strategy also leveraged variation in exposure at a local level, but those who do not live in protest areas could also have been exposed to protest activity in different ways (e.g., indirectly through media). Thus, individuals in areas where protests did not directly occur may have been indirectly affected, which would lead to attenuation bias. If there were protest participants living in unexposed areas who traveled to protest districts, this exposure among some in our

'control' group could also lead to attenuation bias. Lastly, there may have been important effects of political conflict on labor or marriage markets that have yet to be well-quantified. Our analysis in Table A12 did not find evidence for systematic differences in other local characteristics that may have been correlated with protest activity. Although, El Mallakh and coauthors (2017; 2018) have found some systematic changes in voting practices and labor force participation in areas with fatalities, we do not find such differences with our more comprehensive protest event measure using the same data source for area-level characteristics (i.e., from the 2006 census). Similarly, important effects of pre-existing cultural constructs or political persuasions (e.g., sense of collectivism, preferences for democracy or authoritarianism) may moderate the effects of political conflicts on young people's outcomes, particularly as related to trust and uncertainty, but these data were not available for our sample of youth. To the extent that such factors did not change over time, the inclusion of individual fixed effects would have controlled for these differences.

These limitations notwithstanding, we believe that our study contributes to the emerging event-based literature on political conflict, which has thus far focused primarily on civil war and other forms of armed conflict. Our study demonstrates the importance of examining the impacts of exposure to both violent and nonviolent political conflict. In particular, the Middle East and North Africa region has and is currently experiencing complex situations of political conflict that take a variety of forms, including but not limited to the Egyptian experience. Our results add population-level evidence to the growing literature that demonstrates the negative impact that diverse forms of political conflict in the region have on the mental health of young people (Dimitry, 2012; Giacaman et al., 2007; Moussa et al., 2015), and adds a new dimension by showing negative effects on uncertainty. These findings have important implications for the health needs of a young generation in a region where mental health is stigmatized and services are underdeveloped. The negative impacts of political instability on individual life uncertainty may also have longer-term implications for a wide range of outcomes affected by investments during the transition to adulthood. In order to fully understand these implications, there is a need for both cross-national and longitudinal studies of conflict impacts, both of which are lacking in the MENA region. Through comparative research, over time and across populations exposed to different conflicts, we can more fully understand the pathways between subjective measures of short-run conflict impacts and longer-term outcomes and investments among youth in the region.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2019.112602.

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