Can Contact Cure Prejudice: A Natural Experiment in Israeli Medical Clinics *

Chagai M. Weiss *University of Wisconsin - Madison*

In many societies, even when segregation or conflict are pronounced, brief intergroup contact in busses, markets, shops and hospitals is prevalent. Such contact is often theorized as a force influencing intergroup attitudes as well as voting behavior and violence. Despite the prevalence of such intergroup contact, and despite the prominent role of contact in multiple theoretical frameworks of ethnic politics, there is little evidence regarding its causal effects. Exploiting the random assignment of patients to doctors in medical clinics in Israel, and leveraging a treatment evaluation survey, I introduce a natural experiment suited to identify the causal effects of intergroup contact between Jewish patients and Palestinian doctors. I further explore how doctor and patient characteristics moderate the effects of contact.

Keywords: contact, prejudice, intergroup relations, identity

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Introduction

Does contact affect intergroup attitudes? Since the early twentieth century scholars have studied the effects of intergroup contact occurring in residential complexes (Barnhardt, 2009; Deutsch and Collins, 1951; Irish, 1952), schools (Van Laar et al., 2005; Hughes et al., 2013), educational programs (Pagtolun-an and Clair, 1986; Scacco and Warren, 2018), and peace-building initiatives (Maoz, 2010; Yablon, 2012). In a seminal meta-analysis, Pettigrew and Tropp (2006) offer that intergroup contact reduces prejudice towards multiple social groups. Nonetheless, Paluck, Green and Green (2017) recently noted several substantive and methodological limitations of the existing literature, concluding that "*the jury is still out regarding the contact hypothesis and its efficacy as a tool.*" The natural experiment I present below is designed to identify the effects of intergroup contact, while addressing multiple limitations in the existing literature.

Identifying the causal effects of intergroup contact is of key importance, since in many societies, even when segregation or conflict are pronounced, brief intergroup contact in busses, markets, shops and hospitals is prevalent (Enos, 2017). More so, such contact is often theorized to explain patterns of violence and voting (Kopstein and Wittenberg, 2009; Bhavnani et al., 2014; Kasara, 2017). Nonetheless, despite the empirical and theoretical prevalence of such intergroup contact, it is too often overlooked by scholars, who tend to study "artificial" interactions occurring in structured environments such as mediation groups and educational programs (Forbes, 1997). Since structured settings often require some degree of self selection, and individual behavior within such contexts may be qualitatively unique, it is unclear whether the identified effects of "artificial" contact, can inform the study of contact occurring as part of everyday life.

Given the limited evidence regarding the causal effects of intergroup contact, I introduce a natural experiment which assesses how brief interactions influence attitudes. Exploiting the random assignment of patients to doctors in 25 Israeli medical clinics, I plan

to test the extent to which interactions with Palestinian doctors impact Jewish patients' intergroup attitudes. I further plan to explore how patient and doctor characteristics moderate the main effect of intergroup contact.

Studying the Effects of Intergroup Contact

Main Effect

Adapting an experimental approach to the study of intergroup contact is extremely beneficial for overcoming concerns related to selection bias, and endogeneity more broadly. That being said, since the spatial configuration of ethnic and racial groups is far from random, doing so is extremely challenging (Enos, 2017), and oftentimes impractical. I overcome this hurdle, by exploiting the random assignment of patients to doctors in emergency medical clinics in Israel.

In my study, I plan to identify how brief, professional, and generally positive interactions between Jews and Palestinians shape intergroup attitudes.[1] Though contact between doctors and patients is brief, the stakes entailed in this interaction are high. More so, contact is structured around a common goal of assistance. Thus I expect such interactions to have positive externalities on patients' attitudes.

Building on previous advances, I expect intergroup contact in medical clinics to alleviate prejudice and social distance, and foster trust and peaceful attitudes. In line with Pettigrew and Tropp (2006), I hypothesize that:

H1: *Intergroup contact will reduce prejudice amongst patients*

H2: *Intergroup contact will reduce social distance amongst patients*

H3: *Intergroup contact will foster peaceful attitudes amongst patients*

H4: *Intergroup contact will increase trust amongst patients*

I extend the existing literature and leverage my unique experimental context to further

[1] For qualitative evidence regarding positive interactions within Israeli medical facilities, see Rosner (2016).

examine how contact affects general service satisfaction. I do not have a strong theoretical prior regarding the direction of effects, and I hypothesize that:

H5: *Intergroup contact will affect service satisfaction*

Heterogeneous Treatment Effects

Providing causally identified evidence for the effects of intergroup contact in a natural setting which requires no experimental intervention is a substantial contribution in and of itself. Nonetheless, one may wonder what explains observed effects? I expect contact to improve intergroup relations, since it enables Jews to share a positive experience with Palestinians.

If prejudice reduction is driven by a positive experience mechanism, one would expect effects to be conditional upon the capability of doctors to provide patients with a positive experience. Thus assignment to higher quality doctors, which on average display higher levels of professionalism and bed side manners is likely to enhance the effects of contact. More broadly, I offer that prejudice reduction depends not only on the mere experience of (positive) contact, but also upon exposure to *specific* individuals who are more likely to enhance the positivity of an interaction.

To test this proposition, I utilize aggregate doctor rankings,[2] and I hypothesize that:

H6: *The effects of contact are moderated by doctor quality*

Additionally, building on recent advances linking contact theory with the motivated reasoning literature, I expect ideology to moderate the effects of contact (Homola and Tavits, 2017). More specifically, the effect of contact will be stronger amongst left-leaning patients. It follows that:

H7: *The effects of contact are moderated by ideology*

Exposure to out-groups varies amongst individuals, and one may expect that brief contact with a Palestinian may leave a stronger impression on patients who are not ac-

[2]Doctor rankings are generated from responses to a generic satisfaction survey, filled out by both Jewish and Palestinian patients before the time of my current study.

customed to intergroup contact in their daily lives. It follows that:

H8: *The effects of contact are moderated by previous exposure to the out-group*

The above hypotheses consider the heterogeneous treatment effects of doctor and patient personal attributes. Moving beyond individual attributes, I test whether prejudice reduction is conditional on the political atmosphere in which contact occurs. I leverage the outburst of confrontations between Hamas and the Israeli military between November 11-13 (2018) to test whether contact during intense violence is still effective in reducing prejudice. I expect contact to be effective to lesser degrees during, and in the week following a cycle of violence. It follows that:

H9a: *The effects of contact are smaller during a cycle of violence* **H9b:** *The effects of contact are smaller during, and in the week following, a cycle of violence*

Lastly, given the brevity of contact between patients and doctors, I test the persistence of effects over time. In doing so, I will test the hypotheses above in the day following treatment, as well as 10 days following treatment. I expect effects to be smaller 10 days following treatment.

Identification Strategy

A key feature of the medical clinics in my study (Hereinafter: clinic X),[3] is that services within them are provided in many locations, around the clock, with minimal waiting time, on a first come first serve basis.[4] Patients do not select their doctors or nurses, and requests for specific doctors are not met. Thus assignment of patients to doctors depends on multiple factors, including: The exact time in which a patient arrives in a clinic, the length of the line in the clinic, the number of doctors in the clinic and their daily work load.[5]

[3]The medical clinics which I am collaborating with, requested to keep their identity anonymous at this stage of implementation.

[4]An elaborate description of my experimental context is provided in the supplementary materials.

[5]It should be noted that apart from emergency medical services, clinic X also provides routine check-ups and medical tests such as MRIs, in which individuals select doctors. In order to avoid selection bias,

Given the multiple determinants of assignment to doctors within clinics, I assume that it is impossible to select a Jewish or Palestinian doctor. Therefore, the matching of doctors and patients, and in our case the assignment of patients to intergroup contact, or lack thereof, is administered randomly, or at least in a manner which is orthogonal to an individual's political and social attitudes. Additionally, the clinics firm policy to decline patients' requests for specific doctors, limits concerns regarding treatment compliers and non-compliers. Thus, the assignment process described above serves as the base of my empirical inquiry.

To relax any concerns regarding my assignment mechanism, I will empirically test the assumptions detailed above, ensuring that patients' religiosity, education, gender, and age do not predict assignment to specific doctors. The code to test such assumptions is presented bellow.[6]

```
survey_data <- "mock_data.csv"


# Regress doctor assignment variable over patients' religiosity,
# education, age, and gender.
# Models includes clinic, and day fixed effects.
# Errors are clustered by clinic.


lm_robust(arab_doctor ~ religiosity +
                        edu + age + gender,
          data = survey_data,
          fixed_effects = clinic + date,
          clusters = clinic,
```

I emphasize on patients receiving emergency medical care. Emergency medical care in the clinic X is any condition which does not require hospitalization.

[6]The code in this pre-analysis plan was used to analyze covariate and outcome variables from a pilot study. Variables related to doctor assignment were fabricated.

```
          se_type = "CR0")
```

Survey Instrument

As a private enterprise clinic X collects demographic and service related information from patients, as well as satisfaction survey data following treatment.[7] In order to study the effects of contact on intergroup attitudes, clinic X's evaluation team will embed within their routine surveys several questions relating to intergroup attitudes. To study the short and longer term effects of contact, surveys are distributed randomly either 1 or 10 days after treatment.[8]

By embedding additional questions within clinic X's routine survey, I am able to test whether Jewish patients experiencing contact with Palestinian doctors differ in their intergroup attitudes from counterparts who do not experience intergroup contact during their medical treatment. A major benefit of this research design, is that when experiencing contact, subjects are unaware of my study. This reduces concerns related to demand or experimental effects at the time of treatment.

Estimation Strategy

Main Analysis

My estimation strategy considers the random assignment of treatment within 25 clinics for an extended period of time,[9] by incorporating clinic, doctor, and day fixed effects. Standard errors will be clustered by doctor. Equation 1 depicts my main model, a linear

[7] Originally, clinic X surveyed patients via phone-calls. In light of our cooperation, clinic X has moved to SMS based survey distribution. This prcatice is more efficient, as it enables the clinic to approach the population of patients, rather than a random sample of patients.

[8] Randomization is administered according to odd and even visit ids. The survey instrument embedded within clinic X's ongoing routine evaluation program is available through the following link: https://www.dropbox.com/sh/og38jul80az4ox5/AABUaaCzfMvvBCsqL2YRMfbVa?dl=0. All survey items are detailed in the supplementary materials bellow.

[9] Over 3 months, depending on Clinic X's final decision. The decision to terminate the study will be made by clinic X's CEO, who is not taking part in the data analysis.

regression, where Y_{icdt} is a survey response of patient i, in clinic c, treated by doctor d at time t. β is the coefficient of my main treatment, η_c, Ψ_d, and γ_t represent clinic, doctor, and day fixed effects successively, and ϵ_{ict} is my models error term.

$$Y_{icdt} = \beta X_{treatment} + \eta_c + \Psi_d + \gamma_t + \epsilon_{ict} \tag{1}$$

In the main analysis, I will study the effects of my treatment on five main survey measures, for which I expect to find that $\beta \neq 0$. These measures are:

1. Intergroup feeling thermometers
2. Intergroup trust measures
3. Intergroup social distance measures
4. Intergroup peace questions
5. Satisfaction from service in the clinic

I expect my treatment to affect these outcomes in a similar fashion enhancing (reducing) positive (negative) intergroup attitudes. My survey also includes additional questions regarding intra-group attitudes, and attitudes towards tourists and foreign workers, which should not be affected by my treatment ($\beta = 0$). The code for my main analyses is detailed bellow:[10]

```
# H1 Thermometer
lm_robust(gen_therm ~ trtmnt, data = survey_data,
          fixed_effects = clinic + date + doctor_id,
          clusters = doctor_id, se_type = "CR0")
```

[10]Note that I will run these analyses on the full sample which includes respondents receiving surveys 1 and 10 days following treatment. I will also run these analyses on subsamples, according to the timing in which respondents receive the survey (i.e. 1 or 10 days post-treatment). Doing so, I will gain insight on the short and long-term effect of contact.

```
# H2 Social Distance
lm_robust(gen_soc_dis ~ trtmnt, data = survey_data,
          fixed_effects = clinic + date + doctor_id,
          clusters = doctor_id,se_type = "CR0")



# H3 Peace Attitudes
lm_robust(gen_peace ~ trtmnt, data = survey_data,
          fixed_effects = clinic + date + doctor_id,
          clusters = doctor_id, se_type = "CR0")

# H4 Trust
lm_robust(gen_trust ~ trtmnt, data = survey_data,
          fixed_effects = clinic + date + doctor_id,
          clusters = doctor_id, se_type = "CR0")

# H5 Satisfaction from clinic
lm_robust(clinic_satis ~ trtmnt, data = survey_data,
          fixed_effects = clinic + date + doctor_id,
          clusters = doctor_id, se_type = "CR0")
```

Heterogenous Treatment Effects

To test hypotheses 6-9, I plan to measure the heterogenous effect of my treatment, conditional on doctors' quality ratings, patients' ideology and self-reported previous intergroup contact, or time of treatment (i.e. during the November 11-13 cycle of violence). Each doctor will have a quality rating measure, based on aggregate rankings provided by

all patients attending clinics prior to the period of study. Using this aggregate variable, I seek to achieve a general measure of doctor quality. Each patient will have a self-reported ideology and previous contact score. I plan to use these scores in order to determine whether individuals from different political backgrounds are affected by contact in diverse ways. Lastly, each patient will be assigned a binary variable, denoting whether she received treatment during (or during and in the week following) the November 11-13 cycle of violence. Using this indicator I will test the efficacy of contact during cycles of violence. Equation 2, denotes the model which I plan to use when testing hypothesis 6-9.

$$Y_{icdt} = \beta X_{treatment} + \delta F_{covariate} + \theta(X_{treatment} * F_{covariate}) + \eta_c + \Psi_d + \gamma_t + \epsilon_{icdt} \quad (2)$$

In this model, Y_{icdt} represents a survey response of patient i from clinic c, treated by doctor d, at time t. β is the coefficient of my treatment, and δ is the coefficient of my additional covariate. θ is the heterogenous treatment effect coefficient, denoting the moderating effect of doctor quality, patient ideology, previous contact, or cycle of violence indicators. In a similar manner to equation 1, η_c, Ψ_d, and γ_t represent clinic, doctor and day fixed effects successively, and ϵ_{icdt} represents the models error term. Standard errors will be clustered by doctor. The general code for testing hypothesis 6-9, is provided bellow:

```
# H6-8
lm_robust(outcome ~ trtmnt*covariate, data = survey_data,
          fixed_effects = clinic + date + doctor_id,
          clusters = doctor_id, se_type = "CR0")
```

After testing hypotheses 6-9, I will proceed to an exploratory analysis regarding the effects of contact, conditional on pre-treatment demographics and covariates. I will consider the covariates listed bellow:

1. Gender
2. Age
3. Religiosity
4. Education
5. Time spent in clinic
6. Mixed city (Is clinic situated in a mixed city)

I consider this analysis as exploratory for two reasons: First, I do not have clear theoretical priors regarding the moderating effect of the above covariates. Second, non of these covariates are assigned randomly to respondents, and some of them are not manipulable. Thus a heterogenous treatment effect of education would offer that educated respondents react differently to my treatment, and not that education causes diverse effects of my treatment.

Emphasis on Jewish Patients

Throughout my main analysis I will focus on prejudice reduction among Jewish patients which represent an overwhelming majority of patients in the studied medical clinics. The inability to distribute surveys in Arabic at this stage (due to technical clinic constraints), dovetailed with the expected limited participation of Palestinians in the survey,[11] make it reasonable to focus on prejudice reduction among Jews. However, conditional on the number of Palestinian survey respondents, I may implement additional analyses to get at the effects of contact on Palestinian patients' intergroup prejudice.[12]

[11] Based on experiences in pilot studies.

[12] As these analyses are likely to be conducted on a very small sample clustered in specific clinics, I will not include clinic and doctor fixed effects.

Supplementary Information

Emergency Medical Clinics in Israel

In the early 1990's, in light of extreme patient overload in public hospitals, a group of doctors established clinic X – an emergency care center aimed to provide treatment for patients who do not need hospitalization. Since then, clinic X has grown to be a major healthcare provider in Israel, operating in 25 centers across the country, and providing services to over 800,000 patients a year. Services include emergency treatment as well as other routine checkups.[13]

Dispersed across Israel, clinic X provides services to a diverse crowd of patients ranging from Bedouins in Rahat, through ultra-orthodox Jews in Bnei-Brak, African asylum seekers in south Tel-Aviv and secular Jews in Modi'n. As indicated in the clinic's webpage, and further corroborated in qualitative interviews, "The [clinics] staff itself is made up of a varied mix of cultural, ethnic and religious backgrounds, whose exceptional teamwork serves as a shining example of devotion to the principles of mutual respect and consideration." [14]

More specifically, approximately 70% of clinic X's doctors are Palestinians, and intergroup contact and cooperation amongst co-workers and between patients is a common and undisputed norm. Given the prominence of clinic X, and given the intense intergroup animosity between Jews and Palestinians in Israel, this site serves as a crucial case for the study of intergroup contact and its causal effects.

[13] Emergency medical services are subsidizes by all Israeli health maintenance organizations (HMO), and the price of a visit may range from 69-480 NIS depending on HMO affiliation and time of visit.

[14] For more information see: *link omitted at this stage due to clinic X's request*.

Survey Questions

Routine Questions

- Satisfaction from service in clinic x
- Satisfaction from doctor
- Satisfaction from nurse
- Satisfaction from clinic clerk
- Satisfaction from rentgan technician
- Satisfaction from clinic cleanliness
- Additional comments (text)

Demographics

1. Sex
2. Age
3. Religion
4. Religiosity
5. Education
6. Left-Right scale

Embedded Intergroup Items

7. **Feeling thermometer**: (Jews, Arabs, Foreign workers, Tourists)
8. **One can trust most Arabs in Israel** (Agree, tend to agree, tend to disagree, do not agree)
9. **One can trust most Jews in Israel** (Agree, tend to agree, tend to disagree, do not agree)
10. **Most Arabs want to live in peace with Israel** (Agree, tend to agree, tend to disagree, do not agree)

11. **Most Jews want to live in peace with Israel** (Agree, tend to agree, tend to disagree, do not agree)
12. **Social Distance**: (Jews, Arabs, Foreign workers, Tourists)
13. **In your life, how often do you interact with Arabs** (Every day, often, rarely, never)
14. **In your life, how often do you interact with Arabs** (Every day, often, rarely, never)

Additional Information from Medical Records

- Date
- Clinic name
- Doctor name
- Nurse name
- The general quality ranking of the treating doctor[15]
- Patients overall time in clinic

Matching Hypotheses and Survey Questions

The following table indicates the correspondence between my hypotheses and survey items:

Hypothesis	DV: Survey Item
H1	Q7
H2	Q12
H3	Q10
H4	Q8
H5	Satisfaction from service in clinic x
H6	Main outcomes (Inependent Variable: Treatment *x* doctor quality measure)

[15]This is a cumulative ranking score which doctors receive over time.

Hypothesis	DV: Survey Item
H7	Main outcomes (Inependent Variable: Treatment *x* ideology)
H8	Main outcomes (Inependent Variable: Treatment *x* previous contact)
H9a	Main outcomes (Inependent Variable: Treatment *x* indicator: Nov. 11-13)
H9b	Main outcomes (Inependent Variable: Treatment *x* indicator: Nov. 11-20)

Power Analysis

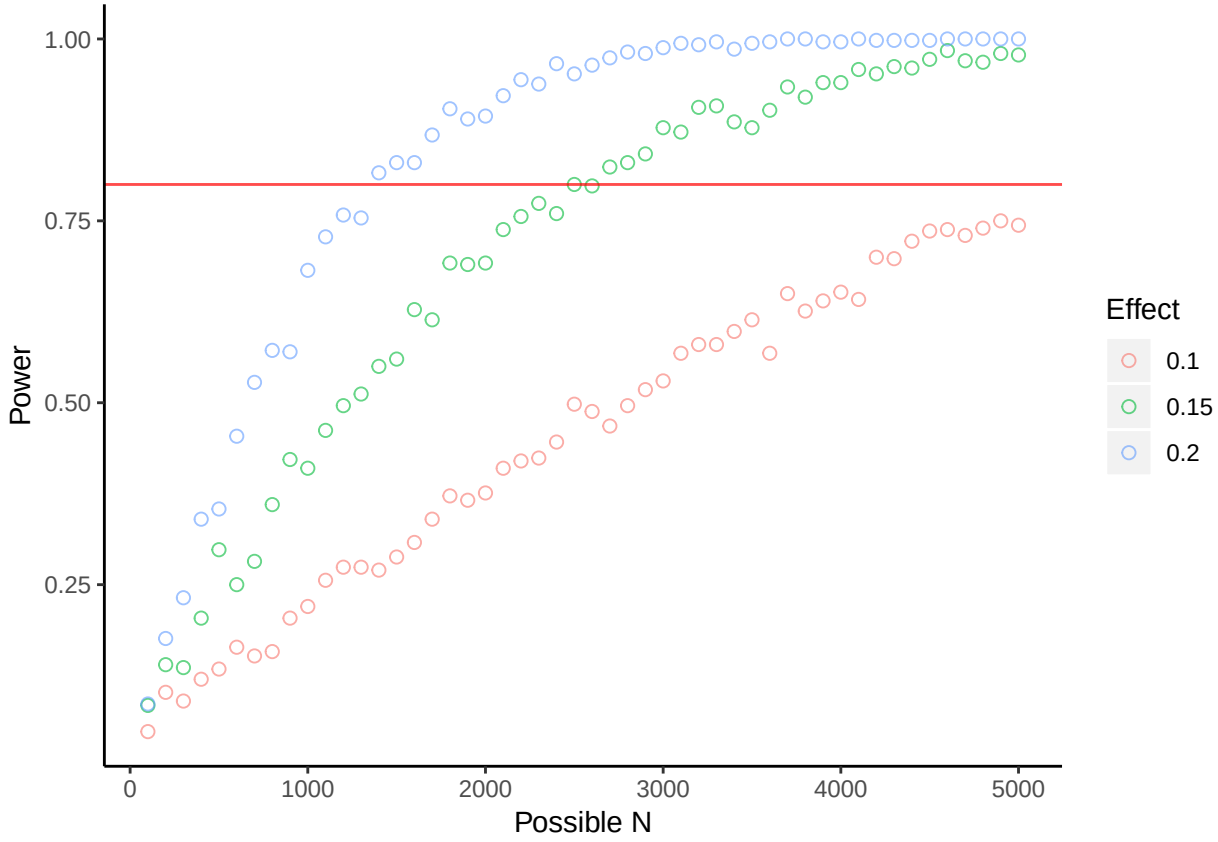
Clinic X has agreed to collect data for a period of 2-3 months. In this time period one can expect to reach approximately 4000 respondents.[16] Bellow, I run several power analyses. In these analyses, I seek to determine the number of respondents needed in order to detect an effect size of 0.1, 0.15, and 0.2 on a variable ranging from 1-4, with a mean of 2.4 and a standard deviation of 1.2.

As noted above, treatment is assigned within clinics, and patients from different clinics during different days have different likelihoods of being assigned to a Jewish or Palestinian doctor. Since I cannot predict probabilities of assignment to treatment within clinics ahead of time, and since I cannot predict the magnitude of my clinic, doctor and time fixed effects, I resort to a simple power calculation based on a linear regression with a 70% likelihood of assignment into treatment. I choose a 70% assingment probability, since about 70% of doctors in clinc X are Palestinian.

The figure bellow offers that with over 2,000 respondents, my study will be suitably powered to identify a 0.15 effect of my treatment on a central dependent variable. How-

[16] I base this expectation on my experience running a pilot study in August 2018.

ever, to detect smaller effects (or heterogeneous treatment effects), sample size must be substantially larger.[17] Regardless, the final decision to terminate data collection will depend on clinic X's CEO who is not contributing to data analyses.



[17] these estimates should be taken with a grain of salt since they do not account for the precise probability of assignment into treatment or my multiple fixed effects.

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