Virtually One

Using VR to Increase Empathy in the Palestinian-Israeli Conflict

Eliana M. Lauder

An undergraduate thesis submitted to the Department of Psychology and Neuroscience for honors

Duke University

Durham, North Carolina

2019
Abstract

Two cameras were sent to two 23-year-old boys living parallel lives in Tel Aviv, Israel and Ramallah, Palestine. Each of them filmed a full day of their lives from the first-person perspective while narrating their story. These videos were given to Palestinian and Israeli study participants in Jerusalem to watch through a virtual reality headset (with the exception of 10 control participants who watched the video on a computer screen). This study analyzes their response to these videos and thus the degree to which a VR experience has the power to elicit an empathic response in a region of extreme social polarization and turbulent conflict. Empathy was measured behaviorally, attitudinally and altruistically across five markers: strength of personal identification to ingroup, prejudice towards the outgroup, positive affect associated with the outgroup, degree of perceived similarity to the outgroup, and openness to social proximity with outgroup members in the future. The results of this study showed that when the 3-minute video was viewed from the first-person perspective in virtual reality, all empathy markers increased, and strength of personal identity group and prejudice markers decreased (which was not the case in the control condition). This study has powerful implications for the potential of this technology to bring unlikely peoples together through perspective-taking in the face of deepening societal rifts that challenge our world today. This study has been done in hopes of spurring a conversation about our shared humanity and this technology’s potential for good.
Preface

Did your parents let you play Call of Duty or Grand Theft Auto? Do you let your kids play these video games? Reluctantly so? My parents had a strict rule against violent video games and movies growing up because they knew an ancient piece of wisdom: monkey see, monkey do.

There has been a copious amount of research done on this very topic: should we let our children play violent video games? Will it make them more likely to engage in violent behavior in their real lives? Many researchers say that it will, and it could even effect children on a longitudinal scale (Anderson et al., 2008). This, research has shown, is likely due to the hostile expectation bias that these games instill in children at a young age: they expect people to respond to them with hostility, as the avatars do in the games, and thus assume hostile and defensive attributes, as well (Bushman & Anderson, 2002). Further studies have shown that the more immersive the gaming experience is, the more heightened these effects are (Persky & Blascovich, 2007). This is all very dystopian to think about, especially given the rise of gaming culture in American society—particularly highly immersive VR gaming, which is projected to reach $32.8 billion by 2023 (Imarc, 2018). However, what if we could turn all of this on its head? Given that these immersive experiences clearly have access to our subconscious and longitudinal behavioral change, what if we could harness these deeply influential experiences, and instead use them to instill positive attitudes, behaviors, and habits (Anderson et al., 2010)? What if instead of instilling a hostile expectation bias, we could use this technology to instill a helping expectation bias? Could the experience of being a superhero and saving a life in an immersive video game transfer the same way the experience of being a soldier with an AK-47 or a thief on the run would? Behavioral scientists at Stanford have put this very question to a study and found that, participants indeed model the prosocial behavior that they embody in VR when...
they exit the experience and re-enter reality (Rosenberg, Baughman & Bailenson, 2012). My study hopes to extrapolate from this model, and many others who have pioneered the space, and begin to answer some of the questions posited above.

**Introduction**

Can virtual reality (VR) be used to increase empathy in the form of prosocial behavior, social distance re-evaluation, and altruistic giving in the Palestinian-Israeli conflict? If so, through what mechanism would such an effect operate? It may seem to be an ambitious question, but a host of previous research suggests that virtual reality may be a robust tool to elicit empathy through perspective-taking. To investigate this question, I have designed an experiment in which I examine whether the degree of immersivity of viewing visual stimuli, either (a) through a VR headset or (b) on a flat computer screen has an effect on the viewer’s empathic response. The empathic response is characterized by three empathic markers, (a) prosocial behavior towards an outgroup member, (b) the perceived social distance between the participant and the outgroup, and (c) the allocation of funds away from ingroup, towards the outgroup or towards a mutually beneficial cause. I hypothesized that higher immersivity would have a direct relationship with all three empathic markers listed above. More specifically, I hypothesized that participants who view the video in the VR headset (i.e. those experiencing the, virtual reality perspective-taking, “VRPT condition”) would have increased prosociality, decreased perceived social distance, and increase the quantity of money that they choose to allocate away from their ingroup and towards the outgroup or a mutually beneficial cause. Secondly, with regard to comparison across nationality, I hypothesized that the Palestinian participants would be slightly more receptive to the VR experience than the Israelis and thus score higher on empathy. I will further flesh out rationale for these hypotheses in the discussion section.
Background

The Palestinian-Israeli Conflict. Crucial to understanding this project is a general understanding of the Palestinian-Israeli conflict in which this study took place. The Palestinian-Israeli conflict is an ongoing dispute over highly coveted land in the Middle East. Both sides believe they have rights to the land, and despite a majority plea for peace, a two-state solution, or any form of peaceful reconciliation, neither the Israeli government nor the Palestinian Authority will budge to each other’s satisfaction (despite many attempts) (Slone, Lavi, Ozer, & Pollak, 2017). Whether due to the Israeli military draft, the limitations on the quality of life in the Palestinian territories, or just general social strain, there are few people in the region that the constant violence and tension doesn’t touch. As a result, a deep societal rift exists between Arab and Jewish communities that manifests in occasional violence and animosity, but mostly just a general distrust and lack of empathy (Slone, Lavi, Ozer, & Pollak, 2017).

Both Palestinian and Israeli societies are pluralistic and intersectional ones in which each individual may not be tied to a single religious, ethnic or racial identity due to the constant flux and movement in the region. However, in order to simplify for the purposes of this paper, there are 3 main populations that this experiment samples from: Israeli-Jewish, Arab Israeli, and Palestinian people (who can both be Muslim or Christian). There is also much movement between Israel and the West Bank (less in Gaza) for reasons such as work and family, which blurs the lines of nationality. For example, sometimes Arab-Israelis (who live in Israel and have Israeli citizenship) will identify as being Palestinian. Many, but not all, Arab-Israelis living in East Jerusalem, for example, feel similar social rifts that Palestinians would feel in the West Bank. In fact, many would argue that the rifts cut even deeper for the Arab-Israelis cohabiting the divided and emotionally charged city of Jerusalem. Nuances such as these complicate the
binary that one might assume structures this society. In this study, some participants were Israeli-Jews, some were Arab-Israeli Christians, some were Arab-Israeli Muslims, some were Muslim Palestinians, and some were Christian Palestinians. For purposes of concision, I will be referring to the latter four groups as “Palestinians” as a grouping system in this paper. I hope to investigate each of these groups individually for comparison in future studies.

These populations have been pitted against one another and inculcated with polarizing stimuli for generations. This makes the deep-seated outgroup biases that exist in this society extremely difficult to curtail. This effect has only become increasingly socially and politically relevant within our current national and international socio-political climates. In 2014 (even before Trump), political scientist and American Enterprise Institute scholar, Norman Ornstein described the national political climate with the term, *tribalistic*, characterized by two juxtaposed parties, and both sides assuming the sentiment, “if you are for it, then I am reflexively against it, even if I was for it yesterday,” (2014). Racial segregation, gender inequality, war in the name of religion: why is our society stratified by these binary ingroup/outgroup rifts? Many theorize that this question ties back to our evolutionary inclinations around trust.

**Roots of ingroup/outgroup division.** Homophily, our gravitation towards similar others, stems from an evolutionary survival benefit for those who kept their kin close and strangers at a distance (Masuda & Fu, 2015). For ancestral humans, familial networks existed as a precondition to cooperation to avoid possible threats as well as seemingly benign free-loaders who would leach resources and hinder survival in various ways (Krupp, Debruine & Barclay, 2008). We are hardwired to look out for our kin first for survival purposes, so a subtle cue of genealogical relatedness elicits preferential treatment and even group cooperation (Krupp, Debruine & Barclay, 2008). Such parasites, or defectors, rarely were intrafamilial and as a result, humans and
many other species began to see them, and anyone else who bore little resemblance to the familial genetic phenotypes that family members carry as a potential threat to their genetic proliferation, and evolved to avoid them (Sigmund, 2009). At the time, hostility towards these defectors would benefit evolutionary success, by halting their evolution (Masuda & Fu, 2015), but today the primary outcome is a deep emotional divide between peoples. As humans have continued to evolve and our social contexts have changed, these principles for survival have loosened and expanded as our communities have grown past the scope of our own immediate families or villages. However, remnants of this fundamental evolutionary statute are still visible in our society. It is these constructed psychological divisions that I am referring to with the terms ingroup and outgroup bias.

If the root of ingroup and outgroup bias lies in a sense of interpersonal distance and thus value, then it is this quantifiable variable that, if manipulated correctly, could, instead of fighting this evolutionary tendency, harness it, and use it to reduce social distance. It is my argument in this paper that everything I have mentioned above could actually be a binding force rather than a divisive one.

The amount that individuals value others is often based on their social proximity. Tina Strombach et al. used the term social discounting to refer to the relationship between social distance and social value between individuals and the way we discount our value of others as a function of the perceived distance between us (2015). Strombach et al. claim that the likelihood of individuals performing altruistic acts towards one-another decreases as social distance between these two individuals increases (2015). Social discounting works both ways, however; the more distant the individual feels, the less they are valued and the less likely one is to empathize with that individual or act altruistically towards them—this also means that the closer
someone feels to another, the more highly they are valued and the more altruistically they are treated. This begs the question of whether social distance is malleable. If so, someone with previously high social distance could become closer leading to more altruistic decision making towards that individual. We all know that the answer is yes: of course, someone can transition from high social distance to low social distance by nature of circumstantial changes such as a thoughtful first conversation or a chance insight into their mind. With the right questions, a stranger at the bus stop can become an acquaintance, or even friend, in a matter of minutes. This is the power of humanization.

**Empathy: Prosociality, Social Proximity & Empathy-Altruism.** Humanization is the attribution and acknowledgment of uniquely human qualities and the recognition of another’s worthiness of basic human rights (Majdandžić et al., 2012; Murrow & Murrow, 2015). Humanization is often better characterized by its antonym, *dehumanization*, which is the stripping of the perception these qualities and rights and abstracting an individual to his or her group or an entity value (Majdandžić et al., 2012). It is easy to accidentally dehumanize an entire population of individuals by grouping them together through stereotyping. In fact, due to social distancing and outgroup biases, anyone outside of our immediate ingroup can very easily slip into the realm of becoming depersonalized and stereotyped and therefore, dehumanized (Strombach et al. 2015; Waytz, Zaki, & Mitchell, 2012). One fundamental way to humanize a dehumanized individual is to mentalize (Tusche, Böckler, Kanske, Trautwein, & Singer, 2016). Mentalization is both the acknowledgement that others have mental states and complex emotions, as well as the cognitive perspective-taking and attempt to understand their mental states and emotions (Majdandžić et al., 2012; Frith & Frith, 2006). The difference between mentalizing and empathizing is that mentalization has no affective component: one merely
assumes the target’s perspective and attempts to understand what he or she is thinking. Empathy, on the other hand, is a more visceral and affective adoption of the emotional state of the target (Tusche, Böckler, Kanske, Trautwein, & Singer, 2016). For the sake of explanation: mentalizing assumes the mind of the target, where empathy assumes the heart—figuratively speaking, of course. While they are conceptually related, empathy and mentalizing are functionally different. It’s clear they can be separated because some people have one without the other. For example, some patients with autism spectrum disorders struggle with perspective-taking, but have an instinctive, affective, empathic response, whereas many psychopaths do not feel empathy but have no trouble assuming different perspectives (Tusche, Böckler, Kanske, Trautwein & Singer, 2016). Another key difference between empathy and mentalization is the part of the brain used in these functions. Empathizing is more closely linked to the activation of the anterior insula (AI) and the anterior cingulate cortex (ACC), associated with bodily state and physical feeling, whereas mentalizing is more closely linked to the activation of the temporoparietal junction (TPJ) and medial prefrontal cortex (mPFC), associated with cognitive perspective-taking (Tusche, Böckler, Kanske, Trautwein & Singer, 2016).

Another key term is Premack and Woodruff’s concept of the Theory of Mind, which essentially enfolds mentalizing and empathizing into one, characterized by visual, cognitive, and affective perspective-taking (1978; Imuta, Henry, Slaughter, Selcuk & Ruffman, 2016). In their studies of chimpanzees, Premack and Woodruff found that Theory of Mind even exists across species: they found that chimps were able to understand the mental states, desires and motivations of a human (on video) and engaged in prosocial behavior to help the human in the video (1978). For example, if the human in the video seemed to be hungry and without access to food, the chimp knew to provide the human with a banana; if the human was locked in a cage,
the chimp knew to provide the human with a key (Premack & Woodruff, 1978). If animals can act prosocially across species due to exposure to the plight of a human, why couldn’t humans do the same across social stratifications: ingroups and outgroups?

Empathy is a qualitative and non-linear metric, which makes it difficult to accurately measure, and thus has been the object of much social psychological thought and intellectual debate. Empathy is rooted in van Loon et al.’s concept of experience sharing, which is the vicarious adoption of someone else’s sensorimotor, visceral, and affective states, and self-other merging and embodiment, the incorporation of someone else’s bodily existence into one’s own self-perception (van Loon, Bailenson, Zaki, Bostick, & Willer, 2018; Batson, 1997). A crucial distinction to make is the difference between empathy and sympathy. Empathy is the adoption of someone else’s mental state, good or bad, whereas sympathy is a sense of sorrow for another’s misfortune. Sympathy doesn’t involve departing from one’s own mental state to enter another’s, nor is sympathy relevant to the same spectrum of emotions that empathizing has access to. In fact, sympathy increases social distance, whereas empathy decreases it (Zhang & Zhao, 2017). Social distance is a function of the similarities one believes one shares with the second party (increasing social proximity) or alternatively, the differences that lie between them (decreasing social proximity) (Boguñá, Pastor-Satorras, Díaz-Guilera, & Arenas, 2004). However, this is not to say that if an individual is empathizing, they cannot then feel concern for that person. In fact, this is called empathic concern, and it has been argued to produce empathy-altruism (Batson, 1991). Altruism is defined as doing for others, at cost to oneself, due to genuine concern for their wellbeing. Empathy-altruism, as described in the empathy-altruism hypothesis, states that empathic concern produces altruistic motivation, which Batson argues might lead someone to perform an act of generosity towards another at no personal gain (Batson, 1987; Batson, 1997,
Batson, 2010; Batson, Lishner, & Stocks, 2015). All actions, including, but not limited to these are considered prosocial in nature. *Prosociality* is defined as kind or warm demeanor or acts that connote an intention of increasing others’ well-being in some way (Tomasello, Melis, Tennie, Wyman & Herrman, 2012; Zaki & Mitchell, 2013). In summary, Theory of Mind allows for mentalization, which is the mechanism for empathy, the metric of interest for this study. Empathy is different from sympathy with regard to social proximity, and when employed can lead to more intrinsically motivated empathic responses such as empathy-altruism and prosocial behavior. If this is true, how might one elicit empathy?

**Perspective-taking interventions.** This is not the first study to experiment with perspective-taking as a means to elicit an empathic response. There are two primary forms of perspective-taking interventions: *experiential* interventions and *expressive* interventions (Weisz & Zaki, 2017). The prior intervention type includes tasks that involve mentalizing, or “tuning in” to a target’s mental state, whereas the latter intervention is focused on how the perceiver might more effectively convey his or her empathic response to the target (Weisz & Zaki, 2017). This study will employ the prior type of perspective-taking intervention, an experiential intervention. Previous experiential perspective-taking interventions have been done to help doctors better assess the pain of their patients, regardless of age, race or gender through imagining what they are thinking and feeling, to increase empathy for individuals with disabilities by experiencing what it is like to spend a day in a wheelchair, to reduce weight-bias through writing a journal entry written from an obese individual’s perspective, and many more (Wandner, Torres, Bartley, George & Robinson, 2015; Clore & Jeffery, 1972; Gloor & Puhl, 2016). All of these forms of perspective-taking require a certain degree of imagination and can still be interfered with (and skewed) by inherent biases or simply limited by a lack of knowledge of the target’s lived
experience. Therefore, degree of imaginativeness and empathy quotient, or one’s quantified ability to empathize, can add extraneous variables that may limit the accuracy of such a study (Lawrence, Shaw, Baker & Baron-Cohen, 2004). However, there is a new technology that has emerged that removes these variables by making someone else’s perspective able to be much more objectively experienced: virtual reality.

**Virtual reality perspective-taking (VRPT).** Virtual reality is broadly defined as any virtual space that provides an alternate reality (El Beheiry et al., 2019). However, the specific kind of VR that this study deals with involves an individual wearing a headset that includes a digital screen that displays this alternate reality in a sensorially immersive way. The alternate reality that is experienced can be viewed from various perspectives, but with VRPT, the viewer sees from the first-person perspective of the target (i.e. the viewer sees and hears exactly what the target would be seeing and hearing, and if the viewer looks down, he/she will see the body of the target as his/her own). There are two main mediums of VR experiences: a computer-generated, rendered experience and a 360° filmed experience. Both have their drawbacks in that the prior can feel less realistic and the latter doesn’t allow the viewer to control the body and movements of the target, other than the gaze. Both are, however, valid mediums of VRPT.

Again, one of the primary benefits of moving perspective-taking interventions to this technology is that it allows experimenters to control for participant variation in imagination and control a bit more for overall ability to mentalize (Blascovich et al., 2002). VRPT also allows viewers to experience perspectives and realities that would be prohibitively challenging or impossible to view without the existence of this technology (i.e. experiencing going to North Korea, or being a different race or being an animal, or even being in a rendered universe that doesn’t exist (Groom, Bailenson, & Nass, 2009; Ahn et al., 2016). The first person perspective
is also commonly explored in forms of gaming and is thus potentially familiar to the participant. Additionally, for use in experimental contexts, VR technology allows the researcher greater precision and consistency across his/her experimental trials. For example, in a normal perspective-taking intervention without the presence of VR, when told to imagine what it would be like to be disabled, different participants may imagine entirely different disabilities of varying degrees of physical limitation, which would affect the data. With VR as a tool, the perspective for the participant to experience can be held consistent across participants and trials (van Loon, Bailenson, Zaki, Bostick, & Willer, 2018).

As a result of these benefits, many studies have been conducted using VRPT. These studies suggest that VRPT can lead to increased prosociality, reduced outgroup bias and thus increased social proximity, decreased prejudice, and much more (Slater, et al., 2013; Peck, Seinfeld, Aglioti & Slater, 2013; Maister, Sebanz, Knoblich, & Tsakiris, 2013; Banakou, Hanumanthu, & Slater, 2016; Oh, Bailenson, Weisz, & Zaki, 2016). However, few studies look at more than one of these variables for a more comprehensive picture of induced empathy. While a correlative relationship has been found between empathy and altruism, little research has been done on whether VRPT rather than just PT could drive altruistic behavior, much less financial altruism. Furthermore, most VRPT empathy tests have been one-directional (Banakou, Hanumanthu, & Slater, 2016). For example, in Stanford’s Virtual Human Interaction Lab (VHIL), researchers conducted a study where a participant could experience what it looks, sounds, and feels like to have one’s home taken away, to live on a bus and to become homeless (Asher, Ogle, Bailenson, & Herrera, 2018). Many previous studies follow this model of aiming to induce empathic-concern by providing an experience to a participant of someone who is likely less privileged than they are. While this has been proven a very effective way to measure
whether VRPT can elicit empathy, rigorous evidence has yet to be brought to bear on the question of whether the same effect can be seen mutually (in both directions) in a single study: not just person A empathizing with person B, but person B also empathizing with person A. I have designed this study to fill these gaps and answer these questions: can VPRT elicit a bi-dimensional empathic response across prosociality, social distance, and financial altruism in one sample population in a single study? Can it do this mutually across two groups? What if these two groups are two of the most deeply polarized and politically charged populations in the world?

Methods

The study

I am testing if virtual reality, as a medium of viewing visual stimuli, has the power to elicit a reciprocal empathic response in a region of extreme social polarization and turbulent conflict, in a way that the same video, when viewed on a standard flat screen does not. The dependent variable in question is the empathy elicited, measured across three components of empathy: behavioral, attitudinal, and altruistic. The primary independent variables are the degree of immersivity (VR vs. flat screen) and socio-national identity (Palestinian vs. Israeli) (See Table 1 for a graphical visualization of study design.

Variables

The three primary measures of empathy seen in Table 1 are a behavioral measure (prosocial behavior), an attitudinal measure (social distance) and an altruistic measure (empathy-altruism). To measure pro-social behavior before and after the manipulation, we noted empathic behavioral markers such as eye contact, smiling, gratitude and warmth while interacting with an outgroup
member. To measure prosocial behavior, two questionnaires were crafted with questions that fit into the five categories seen in table 1. To measure ingroup bias, we asked participants to rank from strongly disagree (1) to strongly agree (5) questions that would measure their ingroup favoritism and strength of their ingroup pride such as “I am proud to be Israeli.” To measure outgroup prejudice and stereotyping, participants were asked for their stance on statements such as “Israelis tend to be entitled.” To measure positive affect towards the outgroup we asked questions like “I feel happy when Arab people at my school/job succeed” or “I feel anxious when I can tell I am the only Jew around.” To measure perceived similarity to outgroup, we asked questions like “I believe I share similar values and interests with Palestinian and Arab-Israeli people” or “Jews do very different things every day than I do.” To measure openness to social proximity, we asked questions like “I would approve of my child marrying a Jew” or “If I could, I would be open to living in Ramallah” (for more detail and to read surveys, please see appendix 10). Ingroup selfishness, altruism and symbiotic altruism were measured through financial allocation decisions (see appendix 11 for specifics).

I hypothesized that there would be an effect across all measures of empathy in the VRPT condition for both sample populations, except for on measures of ingroup bias and outgroup prejudice and no effect in the control condition. Additionally, I hypothesized that the effect size would be larger for Palestinian participants than for Israeli participants.

There were two primary methodological steps of this project: the creation of the videos (part 1) and the execution of the study (part 2). For the sake of replicability, I will outline both for all sections below.
Participants

Part 1. First, I had to find people to wear the cameras on their heads for a full day of their lives to get the footage for the VR experience: one Israeli and one Palestinian. I recruited these individuals by posting in multiple Facebook groups based in Tel Aviv and Ramallah describing what I was looking for, offering compensation of $15 per hour, and linking an application form. See appendix 4 for screenshots of these posts and appendix 1 for the filming application. After I received all my applicants, I began to reach out to the individuals who seemed best fit for the job. The more experience they had filming, the better. It was important to me to find a pair of videographers who lived fairly parallel lives in Tel Aviv and Ramallah in order to control that aspect of the experiment. I ended up finding two 23-year-old males who seemed to have similar personalities and attitudes on the project. Edo, my Israeli videographer, studied film in Tel Aviv and Wiz, my Palestinian videographer, studied journalism with a focus in documentary studies in Ramallah.

Part 2. Forty-eight total participants ($n = 48$) gave written informed consent to participate in this study, which was approved by the Duke University Campus Institutional Review Board. They were reimbursed with 65 NIS ($18.24$) for their participation, which lasted approximately 35 minutes. The 48 participants were comprised of 28 Israeli Jewish people and 20 Arab Palestinians (3 Christian, 17 Muslim). Of the Israeli Jews, 18 were male and 10 were female (mean age = 23 years; range = 18-27). Of the Arab Palestinians, 11 were male and 9 were female (mean age = 26; range = 18-47). These participants were recruited from the larger population of Jerusalemites with flyers (see flyers in appendix 5) that were posted at bus stops all over West and East Jerusalem (see postage in appendix 5), at Hebrew University (a University with large Israeli-Jewish and Arab populations, and at the Jerusalem YMCA (also a convening
place for interfaith individuals). The flyers had a scannable QR code that enabled people to immediately apply online to participate. I also recruited online by posting in four different Facebook groups (Secrets of East Jerusalem and Ramallah, and Secret Al Quds - East Jerusalem and two groups called Secret Jerusalem) with the same brief blurb and a link to the participant application (see participant application in appendix 6). All participants filled out the form with the knowledge that they were applying to come to the Jerusalem YMCA, watch a short documentary and answer some questions. I received a total of 117 participant applications and of those applicants, I chose 48 to participate. The participants had to be over 18 and have a minimum proficiency in English of 4 on a scale of 1-5 so that they could recognize subtle language nuances in the surveys that a 3/5 might not catch (and could, therefore, add a spurious variable). They must currently live in the region and have grown up there for the majority of their adolescence. They must answer no when asked if they have had any traumatic experiences associated with the conflict that might be triggered if questioned about it. They must be comfortable trying VR (didn’t hold this exclusion criteria for control participants, but no one ended up saying no). After going through the applications and excluding for the above criteria, I was left with 91 viable participants, to whom I reached out to schedule a time block to come in (through Dooodle.com). Of those 91 applicants, I made an effort to vary the sample as much as possible with as close to equal distributions of gender breakdowns, education level, religiosity level, political leanings, etc., to bring the number of participants down to a feasible amount during the limited amount of time I had to run the study. I employed a between-subjects design where participants completed 2 similar activities twice, once before and once after the

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1 Almost every city/school/community/etc. has a “secret” group that tends to serve as a digital bulletin board for that community. I had to apply to be a part of each of those groups and my posts had to be reviewed and accepted by group administrators before they were visible on the page.
manipulation. Ten participants, 5 Israeli and 5 Palestinian were randomly assigned to the controlled condition.

**Materials**

**Part 1.** To film, we used one Ricoh Theta camera (the only 360° camera sold in Tel Aviv at the time) and one Rylo camera mounted on two plain, black skateboard helmets (important to note that they must *not* be bike helmets as the helmet must be flat for the mount. Whether a skateboard helmet, a ski helmet, etc. is used is irrelevant, but must have a smooth, mostly flat top for the mount).

**Part 2.** For the VR experience, we used Facebook’s Oculus Go: a wireless VR headset that allows for three-dimensional, stereoscopic views of a fully immersive virtual reality environment. A charger for this device is also crucial (Micro-USB), because its battery life only endures about 6-8 participants without charge. Since it is wireless, however, videos must be viewed on YouTube (Vimeo, etc.) in its internal browser, and thus it is required to be connected to a strong internet connection to load and reload the video each time. If one has YouTube premium (or Vimeo, etc.’s equivalent) one can download the video in advance so that one would only have to load the video once, however YouTube Premium is not yet available in Israel, so we chose to just purchase a Wi-Fi booster instead. The Wi-Fi booster amplifies the Wi-Fi connection to make it stronger in one particular room or area. I used the wall-mountable TP-LINK RE450 Wireless Range Extender in the area of the study space where the participant would watch the VR experience.

We used printed consent forms, surveys (responses were written by hand), non-profit descriptions, and gave each participant an envelope with their 65 NIS compensation and a
printed debrief form at the end of the study (see all of these documents in appendix 11 & 12). This all must be printed and packed together in advance each morning. Additionally, one pen will be necessary to fill out the forms, and one more pen/pencil will be left on the reception desk for the pen-drop component of the behavioral measure.

To elicit the behavioral response of the participant believing that he/she was being greeted by a member of his/her outgroup, we used two identical white t-shirts, one with a Palestinian flag on it and the world “PALESTINE” in bold black letters (for the Israeli participants) and one with the Israeli flag and the word “ISRAEL” in the same lettering. These shirts we had made quickly in the local Jerusalem shouk (can be seen in appendix 9).

Lastly, it is best to have a laptop for the research associate/confederate who is checking the participants in and out so that he/she can record their behavioral data during their interaction.

**Procedure**

The following methods were all approved by the Duke Campus Institutional Review Board.

**Part 1.**

1. I recruited two videographers, one Palestinian and one Israeli videographer to wear my cameras around for a day. Please revisit part one of the participants section for more information about this recruitment process.

2. I purchased two 360˚ cameras and gave one to Edo and traveled to a Palestinian checkpoint to hand off the second one to Wiz.

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1 For the sake of concision, I have left out some customs shipping complications that might be helpful knowledge if an attempt is being made to replicate the study. For this information, please do not hesitate to reach out to me on my personal email at elianalauder@gmail.com

2 Again, for the sake of concision I have excluded information about complications involving traveling to a Palestinian checkpoint and the dangers and challenges of doing so. For this information, please email me.
3. Wiz and Edo filmed their days on the cameras and uploaded them to a Google Drive folder that I had sent them.

4. I edited the 360° footage in Adobe Premiere Pro:
   a. Edited the footage down to 3:30 seconds (both videos were identical in length) as longer durations of VR can be nauseating for participants.
   b. Overlaid wordless music (same music for both videos)
   c. Sent the videos to Wiz and Edo respectively to record a voice over regarding what they were thinking in the moments that I included in the videos

Part 2.

1. Before departing for Israel, I posted the participant application surveys in the Facebook groups listed in Participants part two section.

2. While Wiz and Edo were filming, I traveled around East and West Jerusalem to post flyers at every bus stop in sight as well as visited Hebrew University to post flyers on all bulletin boards and flat surfaces. The flyers included a QR code that linked to the participant application (see flyers in Appendix 5).

3. Participant responses began to flood in; in order to be considered to participate in this study, all participants completed a pretest survey through Google Forms in which they provided crucial inclusion criteria (mentioned in Participants section), basic demographic information and education level, details that helped gauge their current social proximity to their outgroup (i.e. number of Israeli, Arab-Israeli and Palestinian friends), and information about family background and how they were raised (family geographic origin, language(s) spoken at home, holidays they celebrate, parents’ social proximity to

\[\text{Reach out for more information and tips on how to do this.}\]
their outgroup etc.). This information both helped me diversify the sample and further analyze the data in the data analysis stage.

4. After I had received a sufficient number of applications, I followed up to schedule a time with each of the 91 eligible participants for the study the following week.

5. Upon arriving to the Jerusalem YMCA, Participants were guided with signs (see appendix 7) to the study room.

6. When the participants arrived, they were greeted by my research associate, who was wearing their outgroup t-shirt (see Materials part two section for more details about the t-shirt).

7. The RA welcomed them to the study and engaged in light conversation for 2-3 minutes, asking them how their day was, if they had to travel far to get to the YMCA, if they had ever been to the YMCA before, etc., in order to accumulate behavioral markers to enter into the spreadsheet. He then handed them the informed consent form, telling them I would be out in a minute to walk them through it, and gestured to me through a one-way window to come out and greet the participant.

8. I then guided the participant inside the study room and began to provide a verbal consent brief. When I finished summarizing the form, I asked the participant if they had any questions (they rarely did) and gave them a few minutes to read over the form themselves and sign it.

9. Once the participant signed and handed me their consent form, I handed them their first survey, according to their ingroup (Israeli or Palestinian), reminding them that all of their answers would be highly confidential, to answer as honestly as possible, to leave any
questions blank if a question made them feel at all uncomfortable, and to ask me any questions that they might have while they filled out the form.

a. **VRPT Condition (n = 38)**

i. While the participant was completing survey 1, I set up the VR experience by making sure the headset and controller had adequate battery and the video was loaded in the highest quality possible.

ii. Once the participant completed survey 1, I briefly described the videographer of the video they would be watching, VR and the (general) purpose of it in the study and double-checked that they were comfortable with undergoing a VR experience. I then gave a brief tutorial about how to use the controller and drew out a diagram on the back of their first survey of what to click in order to begin the VR experience, again, reminding them that they could exit the experience at any time.

iii. Once the participant was ready to begin the VR experience, I guided them to an open space and placed one of their hands on a chair next to them for balance. I helped adjust the headset so that it fit snugly on their head and guided them verbally through the first few steps of launching the video.

iv. Once the participant completed the VR experience, I brought them their second survey, reminding them again of confidentiality, honesty, and to ask any questions they might need.

b. **Control Condition (n = 10)**
i. While the participant was completing survey 1, I went outside the study room to grab the laptop from the research associate and prepare the video on the laptop.

ii. Once the participant completed survey 1, I brought them the laptop, briefly described the videographer of the video they would be watching and then began the video.

iii. Once the participant completed the video, I brought them their second survey, reminding them again of confidentiality, honesty, and to ask any questions they might need.

10. When the participant completed survey 2, I took it and I brought them the materials for the altruistic giving activity. I explained that the 100 NIS was real money that was going to be donated to the nonprofits of their choosing at the end of the study. I presented them with the nonprofit blurbs, laid out the nonprofit logos across the table, handed them the 100 NIS, and urged them to choose how they allocated the money wisely.

11. Once the participant completed this activity, I brought them back outside to be checked out by the RA, and quickly recorded their allocation choices.

12. As the RA reached for the envelope on the side of the table to give the participant their compensation, a pen fell to the floor directly between (equidistant) him and the participant. The RA would hesitate before reaching down to pick it up to give the participant a chance to if he or she so chose. The RA asked them how they enjoyed the study, what they thought of it, and informed them that inside the envelope would be their compensation and a debrief form to describe in more detail the purpose of the study, and
should they have any questions about the study or wish to see the results, to follow up with my email on the form.

13. I then came outside to bid the participant goodbye, at which time many participants asked if they could stay for a few minutes to discuss the study.

Design

This study employed a 2x2 factorial design (see Table 2) with nine total dependent measures to ensure the comprehensive measurement of the dependent variable, empathy, across independent variables of socio-national identity and immersivity. Each factor has two levels: I am looking at two socio-national identities (Israeli & Palestinian) and two levels of immersivity (virtual reality and a flat screen). See table 2 for factorial design visualization.

The study was designed keeping cultural sensitivities and the future shock associated with the technology close at mind. My goal was to dissect empathy as a measured value slightly more meticulously than it had been in previous literature. Thus, operationalizing empathy as my dependent variable involved dividing it into three primary measures: (1) behavioral empathy (manifested as prosocial behavior), (2) attitudinal empathy (manifested as social distance) with sub-measures of ingroup bias, existing prejudice towards outgroup, affect towards outgroup, perceived similarity, and openness to social proximity, and my final measure was (3) Empathy-Altruism (manifested as financial altruism) with sub-measures of ingroup bias, altruism, and symbiotic-altruism. There are countless components that comprise empathic motivation and activation, so while adding so many sub-measures complicated the coding and analysis portions of the study, it well worth it for a more reliable and holistic picture of empathic manifestation.
The 2X2 factorial design with nine dependent measures ensured the comprehensive measurement of the dependent variable, empathy, across independent variables of socio-national identity and immersivity.

**Analysis Strategy**

Initially, I had quite an ambitious analysis strategy. I had designed a MANOVA test and was running ordered logistical regression analyses for every measure of social distance and running stepwise regressions to include the pretest data like gender, political leanings, education level, etc. However, after reviewing all the data, reviewing previous literature and convening with mentors, I scaled back my analysis strategy. Since there were so many measures of the dependent variable already integrated into the study design, I knew the analysis would be sufficiently complicated for readers to digest. I was advised to forgo the inclusion of the regression results\(^5\) as to avoid drowning out the already sufficient, statistically significant and remarkably suggestive data that was analyzed with only t-tests. Please see these results below.

**Results & Discussion**

The purpose of this study was to determine whether virtual reality, as a medium of viewing visual stimuli, has the power to elicit a reciprocal empathic response in a region of extreme social polarization and turbulent conflict, in a way that the same video, when viewed on a standard flat screen does not. There were three primary measures of empathy across the VRPT and control conditions.

To return to my initial hypotheses:

\(^5\) However, I hope to publish some follow up work in which this will be included.
Hypothesis I. Increased immersivity will lead to increased prosociality, decreased perceived social distance, and an increased amount of money allocated away from participants’ ingroup and towards the outgroup or a mutually beneficial cause.

Hypothesis II. Palestinian participants will score higher on empathic measures than Israeli participants.

Hypothesis I

\[ H_1 = \text{if immersivity is increased: } \Delta \text{prosociality} > 0, \Delta \text{social distance} < 0, \text{Outgroup + Symbiotic} > \text{Ingroup} \]

\[ H_0 = \text{if immersivity is increased: } \Delta \text{prosociality} = 0, \Delta \text{social distance} = 0, \text{Outgroup + Symbiotic} < \text{Ingroup} \]

The outcome variable that I examined for prosociality and social distance was the change from post to pre-manipulation scores. The outcome variable I examined for empathy-altruism was the percentage given to each of the three categories (amount given to ingroup, outgroup or towards peace).

\[ \Delta \text{prosociality} > 0 \]

A paired-samples t-test was conducted to measure change in prosociality in the control condition versus the VRPT condition across both sample populations. Results of the t-test showed a significant difference in the scores for the VRPT (M = 4.32, SD = 2.03) and control (M = 1.80, SD = 0.92) conditions (t(46) = -3.80, p < 0.05). The difference between Israeli and Palestinian scores across conditions was found to not be statistically significant (\( p_{\text{control}} = 0.52, p_{\text{VRPT}} = 0.55 \)).

These results, seen in Figure 1, illustrate the significant effect of VRPT on prosociality and real and immediate behavioral change. On average, participants in the VRPT condition maintained longer eye contact with the confederate outgroup member on their way out after the manipulation 59% more, smiled 51% more, expressed gratitude towards the confederate outgroup member
45% more, and were 71% more warm. Participants in the VRPT condition picked up the dropped pencil 73% of the time whereas participants in the control condition only picked up the pencil 40% of the time (see Figure 1).

Since $\mu_{\Delta \text{prosociality}} = 4.32$, I reject my null hypothesis in this measure.

$\Delta \text{social distance} < 0$

Five paired samples t-tests were conducted to measure change in social distance in the control condition versus the VRPT condition across both sample populations. Results of the t-test showed a significant difference in the scores for the VRPT condition: $(|\mu_{x\bar{x}}| = 0.43, \mu_{\sigma} = 0.74)$

$\Delta \text{Prejudice} (M = -0.12, SD = 0.78, t(46) = 0.62, p > 0.05)$

$\Delta \text{Ingroup bias} (M = -0.33, SD = 0.47, t(46) = 2.76, p < 0.05)$

$\Delta \text{Outgroup positive affect} (M = 0.89, SD = 1.12, t(46) = -2.40, p < 0.05)$

$\Delta \text{Perceived similarity} (M = 0.81, SD = 0.72, t(46) = -2.77, p < 0.05)$

$\Delta \text{Openness to social proximity} (M = 0.07, SD = 0.62 t(46) = -2.62, \ p > 0.05)$

The difference between Israeli and Palestinian scores across conditions was found to not be statistically significant across any of the measures ($p_{\text{prejudice}} = 0.07, p_{\text{ingroup bias}} = 0.24, p_{\text{outgroup affect}} = 0.15, p_{\text{similarity}} = 0.10, p_{\text{proximity}} = 0.24$) so I have not included the individual means by sample population.

The manipulation decreased Israeli declared prejudice towards Palestinians by about 12% compared with only 7% in the control group. Similarly, declared prejudice towards Israelis decreased by about 4% before and after the manipulation.

The manipulation decreased the ingroup bias across the board across the VRPT conditions. Coming into the study, Palestinians were on average higher than Israelis in strength of personal identity group, but after the manipulation, decreased by about 14%, while Israeli’s
strength of identity group only decreased by about 7% in VRPT conditions. In control groups, the strength stayed about the same, and in the case of the Israeli control participants, strength increased by about 8%. This was the only social distance measure not initially predicted to change before and after the manipulation. Questions for this measure included questions such as “I am proud to be Israeli” or “I am never ashamed of being Arab-Israeli” etc. I did not initially predict that empathizing with the outgroup would make anyone less proud to be a part of their ingroup. However, the results showed a statistically significant (p = 0.008) change in ingroup identity strength for the VRPT condition. I speculate that this effect must be an inherent seesaw inversion effect due to the greater identification with the outgroup and self-other merging that the experience elicited. An experiment would have to be conducted to test this hypothesis, however, as this may be a spurious effect.

The manipulation increased the positive affect associated with the outgroup across both VRPT conditions, the Israelis by about 28% and the Palestinians by about 13%. The positive affect associated with the outgroup for the control groups, however, remained fairly constant before and after the manipulation with an increase of about 16% for the Israeli control group and a decrease of about 20% for the Palestinian control group (since the rating scale was 1-5, a 16% was only a 0.6 difference).

The manipulation increased the degree of perceived similarity for both VRPT groups, the Israelis by about 16% and the Palestinians by about 28%. The degree of perceived similarity for the control groups, however, remained fairly constant before and after the manipulation with an increase of about 4% for the Israeli control group and a decrease of about 1.5% for the Palestinian control group.
The manipulation increased the openness to social proximity for the Palestinian participants by about 5%, though remained fairly constant for the Israeli participants. In contrast, both control groups scored lower or the same on openness to social proximity after the manipulation.

These results (seen Figures 2 and 3) illustrate the significant effect of VRPT on social distance:

Since $\mu_\Delta$ social proximity = 0.43, and social distance is the inverse of social proximity, therefore $\mu_\Delta$ social distance = -0.43, thus I reject my null hypothesis in this measure.

Three paired samples t-tests were conducted to measure change in empathy-altruism in the control condition versus the VRPT condition across both sample populations. Results of the t-test showed a difference in the scores for the VRPT condition: ($|\mu_{x_\Delta}| = 0.33$, $\mu_{x_\Delta} = 0.27$), however it was not statistically significant (see Table 3).

Though not statistically significant, Israelis gave 8% less money to just Israeli-benefiting non-profits, 7% more money to their outgroup (Palestinian-benefiting non-profits) and 26% more money to non-profits benefiting the peace process in the VRPT condition compared with the control condition.

Palestinians gave 1% less money to just Palestinian-benefitting non-profits, 7% more money to their outgroup (Israeli-benefitting non-profits) but 5% less to non-profits benefiting the peace process in the VRPT condition compared with the control condition.

These data are likely not statistically significant because the correlations were weaker due to the presence of the third measure of empathy-altruism, symbiotic-altruism. I hypothesized that if
there were only two options, the choice to give to either one’s ingroup or outgroup, correlations would have been stronger. It is possible that this is due to the overrepresentation of symbiotic-altruism (peace-benefitting) non-profits (four instead of two). If I were to re-design the study, I would have only included two peace-benefitting non-profits as options to maintain consistency across options. Other than there being four options instead of just two, it is unclear what the exact mechanism would be that would drive participants to donate to peace over donating to their outgroup or vice versa. It is also not clear whether the participants who donated to the symbiotic-altruism options were deciding between that option and giving to their ingroup or outgroup (i.e. which group the money was being reallocated from).

When I graphed the data (see Figures 4 and 5), I noticed an interesting deviation from all other data: for the first time, the pattern differed between Israelis and Palestinians. Despite the statistical insignificance of this difference, it is clear that this was a real pattern visible in the donations data. Why do Palestinians seem to be reserving more money for their ingroup than Israelis are? One can only speculate that this is due to a sense of ingroup need that Palestinian people may feel in a way that Israelis do not. This question is one I hope to investigate further in future studies.

The initial hypothesis was that in the VRPT condition, symbolic-altruistic giving would be the most popular in total, then altruism and ingroup selfishness respectively. While the hypothesis was accurate in regard to symbiotic-altruism, ingroup selfishness was far more popular than altruism, despite it being the VRPT condition. I speculate that this is because every participant will give at least some money (around 1/3, at least) to his or her ingroup then split the rest up based on his or her particular biases or inclinations about the other six organizations. Altruism and symbiotic-altruism seem to “split the vote” here as every participant seems to be
partially generous and partially selfish. Given that, the ingroup selfishness measure is sure to get a donation from (almost) every participant, whereas every participants’ “generosity vote” will be split between the six less “selfish” alternatives.

Given this, it seems that when picking their generosity vote, both Israelis and Palestinians are inclined to give to a symbiotic organization so they can mutually benefit. Regarding why the control group in the Palestinian sample population was more ready to give symbiotic-altruistically than the VRPT group, I would postulate that is due to the small sample size and other experimental error. Regardless, the standard error is such that this information is not significant.

The last bit of hypothesis I was that $\text{outgroup} + \text{symbiotic} > \text{ingroup}$:

\[\text{Since } 36 \text{ NIS} + 24 \text{ NIS} + 85 \text{ NIS} + 64 \text{ NIS} = 209 \text{ NIS} > 79 \text{ NIS} + 88 \text{ NIS} = 167 \text{ NIS},\]

\text{therefore, I can reject my null hypothesis in this measure (though statistically insignificant).}

**Hypothesis II**

\[
\begin{align*}
H_1 &= \Delta \text{VRPT Condition}_{\text{Palestinian}} > \Delta \text{VRPT Condition}_{\text{Israeli}} \\
H_0 &= \Delta \text{VRPT Condition}_{\text{Palestinian}} \leq \Delta \text{VRPT Condition}_{\text{Israeli}}
\end{align*}
\]

Between Israelis and Palestinians, none of data skews nor trends varied visibly—except for the statistically insignificant mirroring effect that was seen in the symbiotic-altruism measure. But to be sure, I ran a few more t-tests. Behaviorally, the differences in prosocial behavioral change between Palestinian participants and Israeli participants, across both conditions was \emph{not} statistically significant ($p_{\text{prosociality}} = 0.35$). Attitudinally, the difference between social distance measures before and after the manipulation between Palestinian participants and Israeli participants, across both conditions was \emph{not} statistically significant ($p_{\text{prejudice}} = 0.07, p_{\text{ingroup bias}} = 0.24, p_{\text{outgroup affect}} = 0.15, p_{\text{proximity}} = 0.10, p_{\text{proximity}} = 0.24$). Lastly, altruistically, the differences in allocation
decisions between Palestinian participants and Israeli participants, across both conditions was not statistically significant, either ($p_{ingroup\ selfishness} = 0.12, p_{altruism} = 0.23, p_{symbiotic} = 0.88$).

Since there is no statistical significance to the differences between respective Palestinian and Israeli measures of change in empathy, I fail to reject my null hypothesis in this measure.

In summary, participants who watched the video in the immersive virtual reality perspective-taking condition exhibited more prosocial behavior ($M = 4.32$), reported information that signified a decrease in social distance ($M = -0.43$) and tended to act more altruistically with the funds ($M = 0.30$) than those who watched the film on a flat screen. These differences suggest that immersivity of the video played a significant (for the most part) role in empathic response.

The purpose of this study was to see if the findings of previous studies that virtual reality can trigger an empathic response both reciprocally across two sample populations and in a region of heightened conflict (the results of which, I will refer to as finding I). I was also interested to see if responses would differ across these two sample populations since they consider themselves so different from one another (the results of which, I will refer to as finding II). Both research questions were answered, the prior supporting my alternative hypothesis and the latter supporting the null hypothesis.

**Finding I.**

Building off of previous studies that provide strong evidence for VRPT’s capacity to elicit generally empathic responses, this study suggests that three possible mechanisms for empathy may be prosocial behavior towards the target (with immediate effect after empathic experience), social distance as a metric for the change in empathy towards the target after an empathic experience, and empathy-altruism as a metric for measuring the degree to which we are willing
to self-sacrifice for our outgroup due to an empathic experience. It is not surprising that the evidence showed the weakest correlation for the latter metric given the degree of self-sacrifice involved, as well as the experimental design splitting altruistically inclined participants across two choice outcomes. Overall, sufficient significant evidence has been brought to bear to suggest that virtual reality perspective-taking has the capability to elicit significant behavioral and attitudinal change in participants and showed trends of altruistic responses, though not statistically significant.

**Finding II.**

My final hypothesis was that Palestinian people would be more receptive to the VR experience and there would be more of an effect with this sample population. I had hypothesized this given two main circumstances of the study. First, a limitation to the study was that most of my Palestinian participants, I had thought, were currently living in Jerusalem and might possibly be more open-minded as a result. This ended up not being the case. While many (but not all) of the Palestinian participants were currently living in Jerusalem, this did not mean that they had different opinions or reduced biases as compared to their counterparts living in the Palestinian territories. I also hypothesized this because typically, if you show someone of greater privilege the poverty of their neighbor, it would lead to a certain degree of guilt. I had hypothesized that Israelis might be distracted by this guilt of their (general) inherent privilege, and that this would be an intervening variable that would interrupt the empathic response, and actually increase social distancing. I did not hypothesize that it would increase social distance enough to reach the control group’s social distance score, but I did hypothesize that it might be significantly different from the Palestinian social distance score. This alternative hypothesis was wrong, however: the difference between Palestinian and Israeli empathic scores across all measures was not
statistically significant. In fact, it is quite remarkable how wrong it was: across all nine sub-measures, not a single one revealed a statistically significant difference between Palestinian and Israeli responses. I would argue this to be a meaningful outcome, with implications almost as powerful as the outcome in finding I. It is remarkable that in the end of an experiment about tracing and highlighting the similarities between these two polarized groups, one of the primary, and unexpected findings is just how similar they are.

These results can be explained by the mechanisms outlined in the introduction, as well as partially due to various extraneous factors that must be recognized. This study had many inevitable limitations; many of which were imposed by my limited skills, capabilities, time, and access as I was completing it on my own outside of my native country. My time to complete part 1 and 2 of the project was extremely limited given my current status as a student at Duke University. Every day I spent there, I was missing class that had to be made up, so I had to dramatically rush the trip. This primarily limited the sample size I could accommodate along with other more minor factors. In future studies, it would be beneficial to increase the sample size to get the fuller picture. With regards to skills, I am by no means even an above average video editor, so the subpar quality of the video could have had an effect (for example, a participant could have had prior skills in video editing and could have been disgusted with my work and this may have affected the participants' second survey). Secondly, I do not speak Hebrew or Arabic, so I therefore had to limit the sample to only participants who were highly proficient or fluent in English. I had initially thought that while speaking English is by no means directly correlative to holding more liberal or open-minded beliefs, this limitation could have excluded possible participants who came from even more siloed backgrounds with less knowledge or visibility onto the other side of the wall and therefore lead to a left-leaning bias in
the sample. However counterintuitively, amongst the sample participants in this study, there was a correlation between fluency in English and degree of outgroup prejudice entering the study. This correlation is not statistically significant ($M_{\text{greater proficiency}} = 2.63, M_{\text{less proficiency}} = 2.38, p = 0.29$), however it seemed non-intuitive, so I investigated further. Upon further examination of pretest data, it seems that the more conservative (Hassidic and Orthodox) Jews, specifically, tended to have higher levels of English proficiency as well as more conservative and polarizing pre-existing notions and prejudices against Palestinian people, whereas less religiously observant and more liberal participants didn’t tend to have as strong of English proficiency. Additionally, I speculate that coming with a fluency in English is the ability, and possibly tendency, to consume American or European media surrounding the conflict. As this media, frankly, exaggerates the conflict and abstracts it down to a binary clash between two nationalities, the consumption of it could deepen the outgroup bias. Additionally, viewing the conflict from this outsider perspective may cognitively heighten the “rivalry” to a worldwide scale and spur a sense of nationalism and competitiveness knowing that the world is picking sides and feeling an inclination to defend one’s own side in a global arena. A study would need to be completed to test these speculations as I am uncertain of their validity as well as the effect they may have had on the results.

Additionally, it was Purim (a major Jewish holiday) in Israel at the time that the study was being held, which had a few effects. One possible effect of this would have been a potential shift in general zeitgeist amongst Israeli-Jewish participants, putting them in a more celebratory mood. I’m unsure of the effect this would have had on the results, but it could have either made them more optimistic in some way or could have strengthened the ingroup bias as Purim is a

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1 I also was initially planning to hold the study in two locations, Jerusalem and Ramallah. However, the status of the conflict prevented me from being able to go to the West Bank and therefore had to run the whole study on the Israeli side of the green line.
religious holiday. Since it could go either way, and the data didn’t skew in any particular direction that would make me suspicious of this effect, I merely hope to acknowledge it as a possible spurious variable. A definite result of Purim was that many of the Palestinian checkpoints were closed, preventing some Palestinian people from being able to come across the border to take part in the study, and skewing the Palestinian sample population more towards Palestinian-identifying Arab-Israelis living in East Jerusalem. This could also have affected the data in either direction and a study would have to be run to better understand the differences in mentalities between Arab-Israelis and Palestinians in order to analyze whether there was a resulting effect.

Since the study wasn’t completed in a facility specifically designed for research, the space was not soundproofed and there were sometimes the sounds of children running around the Kindergarten across the hall. In fact, we had to switch rooms for two days of the five-day study due to warnings of especially noisy days in the kindergarten. This was not ideal and could pose a threat to internal validity, but we set up a very similar environment in the second room.

Inherent to most pre-test post-test design studies, is the limitation of the inevitable bias that participants have answering similar questions on a similar survey in the post-test (survey II). The bias involves trying to recall what he or she had written on the pre-test survey (survey I), which retroactively interferes with the immediacy and accuracy of responses in a way that does not exist in for survey 1. I did instruct participants to avoid trying to recall what he or she wrote for survey one, but this is only preventable to a certain degree. This bias also often involves the participant trying to analyze the purpose of the study knowing that they are being measured before and after some central activity. Most participants didn’t seem to think so hard about it, but it is possible that some did, and this pre-test post-test bias has the potential to have affected the
results. On the other hand, another limitation in study design is how accurately the questions designed to correlate with one another on survey one and two match up with one another. There may be subtle nuances in phrasing that could have affected the way that the participant responded. I tried to control for this by adding more questions to decrease the importance of each question in order to see the bigger picture, but a limitation, nonetheless, still exists (to see survey question matching, see appendix 10).

Because the experiment included multiple different measures of the dependent variable, empathy, there is a possibility of carryover effect. For example, priming the participant with a member of his or her outgroup checking them in could have affected how they filled out the first survey. It could have increased their ingroup bias, for example, by immediately raising their discomfort with their outgroup to top of mind. It might be interesting to have a third condition in a future study without the behavioral measure, to see if this priming did have an effect.

While, for the most part, the data didn’t seem to reflect a significant difference between Palestinian and Israeli responses, the data could have been affected by a few inconsistencies. Firstly, wearing a Palestinian flag on a t-shirt in Jerusalem is far more shocking than wearing an Israeli flag. While the two shirts likely had similar outgroup bias-triggering effects, the added shock factor for Israeli participants is a limitation to validity. In a future study, ideally, the study might be run in Ramallah for Palestinian participants and Jerusalem for Israeli participants, so the Israeli t-shirt would have a more consistent an effect to that of the Palestinian t-shirt.

Secondly, the two VR experiences were slightly inconsistent between the Palestinian and Israeli samples. The Palestinian VR experience (viewed by Israeli participants) was filmed on a Ricoh Theta camera. This was the only 360˚ camera available in Tel Aviv at the time, so the options were limited, but the Ricoh Theta produces lower quality and more poorly stabilized videos.
Additionally, it is a long and thin camera which makes the point of view feel slightly more warped and especially high off the ground, which led the participant to spend most of the experience looking down. In contrast, the Israeli videographer used a Rylo 360° camera which produces slightly higher quality video (shoots in 2K) that is auto-stabilized and therefore easier to watch. However, the camera was much shorter so more of the helmet that the camera was mounted on was included in the shot, which could have been slightly distracting for the participant. It is unlikely that these differences had a large effect on the dataset, but these were indeed limitations and threats to the internal validity of the study.

More than anything, it is my hope that this study spurs others to engage in similar research and possibly even build off this study. In fact, it is my hope to pursue a larger scaled follow-up to this study. In a follow up study, it would be beneficial to be able to include participants who do not speak English fluently and only speak Hebrew or Arabic, etc. It would be best to have researchers and research associates who have fluency in those languages and ensure that consent and debrief forms, videos, surveys and all other study materials would be translated thoughtfully. Furthermore, instead of just holding the study in Jerusalem, it would be great to do what I had initially planned to do, by holding the study in Ramallah for Palestinian participants as well. While there, I came to understand the subtle nuances between Arab-Israelis living in East Jerusalem and the Palestinians who live in Ramallah, and I imagine it would be quite interesting to do this study with both Arab-Israelis living in Jerusalem as one sample population, Palestinians living in Ramallah as a second population and then even go on to have Palestinians living in more rural towns of Area B or C as a third sample population. Similarly, recruiting from Jews living in areas B and C of the Palestinian territories as well as Jews living in
more rural towns outside of Jerusalem might be able to paint a broader and more comprehensive picture.

Lastly, it would be quite enlightening to add a longitudinal component to this study. Follow-ups with the participants to track behavioral and attitudinal change over time would be quite illuminating as to the efficacy of this technology to have long-standing outcomes of reducing bias over time.

The purpose of this study was not to reach world peace. Nor are its findings able to be extrapolated widely due to the limited sample and the nuances that every human conflict has. Of course, it would be impossible to distribute VR headsets across vast populations so that everyone involved in a conflict could experience VRPT. But what this study does contribute, is a conversation about conflict, a conversation about empathy and a conversation about technology. My true metric of success for this study was not necessarily the statistical significance of the findings, though they were somewhat shocking and reaffirming; my metric of success was the overwhelming number of applications that I received to participate in the study, the follow-ups of participants both with long conversations following the study and emails even weeks later; my metric of success was the tearful voicemail I received from my Palestinian videographer, Wiz, after viewing the video about his world and knowing that his story would illuminate a dark place for people he was raised to hate. The implications of this study, and the studies that will follow it, extend far beyond the limitations of the lab. Virtual reality, a technology that is both inherently isolative and inevitable, has hope to become one of the most powerful tools of our generation for peace; and who knows what new technologies lay on the horizon.

Above all else, this study reminds us that even the most polarized and different groups of people are far more similar than they imagine. This exercise in empathy reminds us that when we
focus on what makes us human—the moments of chaos, joy, mundanity, heartbreak, spirituality, frustration, vulnerability and love—we actually have the power to build bridges over even the deepest of society’s trenches.

This study reminds us that we are all virtually one.
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Tables & Figures

Table 1. *Dependent variable hypotheses across conditions*

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<th>VRPT Condition</th>
<th>Dependent Measures</th>
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<td>Positive affect towards outgroup</td>
</tr>
<tr>
<td></td>
<td>Perceived similarity</td>
</tr>
<tr>
<td></td>
<td>Openness to social proximity</td>
</tr>
<tr>
<td></td>
<td>Ingroup selfishness</td>
</tr>
<tr>
<td></td>
<td>Altruism</td>
</tr>
<tr>
<td></td>
<td>Symbiotic Altruism</td>
</tr>
</tbody>
</table>

Note. The behavioral and social distance measures are measured in terms of their difference before and after the manipulation. Therefore, the triangles (▲ or ▼) denote an increase or decrease across pre and post manipulation measures and the approximate-equal signs (≈) denote consistency across both. However, the empathy-altruism measure is only measured post-manipulation. Therefore, I have replaced the triangles with an ordinal ranked numbers 1-3, one denoting that the participant will be the highest in that trait, 3 being the lowest. Also note that this table is not separated by socio-national identity. I hypothesize that these patterns will persist across sample populations, but hypothesize that when the VRPT condition participants score higher on empathic traits, the Palestinian participants will score significantly higher than the Israelis will.

Table 2. *Experimental factorial design: 2x2*

<table>
<thead>
<tr>
<th>Socio-National Identity</th>
<th>Israeli</th>
<th>Palestinian</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immersivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virtual Reality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flat Screen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Condition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3. Empathy-Altruism measures differences of means data across immersivity and socio-national identity

<table>
<thead>
<tr>
<th></th>
<th>Empathy</th>
<th>Altruism</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>P</td>
</tr>
<tr>
<td>Ingroup selfishness</td>
<td>VRPT</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.4</td>
</tr>
<tr>
<td>Altruism</td>
<td>VRPT</td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.16</td>
</tr>
<tr>
<td>Symbiotic-Altruism</td>
<td>VRPT</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>Control</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Note. The outcome variable I used for the t-tests was the percentage given to each of the three categories (giving to ingroup, outgroup or towards peace).

Table 4. Total NIS and percentages allocated to each nonprofit category hypothesis test

<table>
<thead>
<tr>
<th></th>
<th>Ingroup selfishness</th>
<th>Altruism</th>
<th>Symbiotic-Altruism</th>
</tr>
</thead>
<tbody>
<tr>
<td>VRPT condition</td>
<td>79</td>
<td>36</td>
<td>85</td>
</tr>
<tr>
<td>Control Condition</td>
<td>88</td>
<td>24</td>
<td>64</td>
</tr>
</tbody>
</table>

Note. Since each participant was given 100 NIS to allocate as they wished, percentages also correlate to NIS amounts. This table includes the results to compare with the initial hypothesis.

Table 5. Palestinian and Israeli Means Across Measures with P-Values

<table>
<thead>
<tr>
<th></th>
<th>Experimental Condition</th>
<th>Israeli $\mu$ (n = 23)</th>
<th>Palestinian $\mu$ (n = 15)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosocial Behavior</td>
<td></td>
<td>4.48</td>
<td>4.07</td>
<td>0.55</td>
</tr>
<tr>
<td>Social Distance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingroup bias</td>
<td></td>
<td>-0.26</td>
<td>-0.45</td>
<td>0.24</td>
</tr>
<tr>
<td>Prejudice</td>
<td></td>
<td>-0.30</td>
<td>0.17</td>
<td>0.07</td>
</tr>
<tr>
<td>Positive affect towards outgroup</td>
<td></td>
<td>1.11</td>
<td>0.57</td>
<td>0.15</td>
</tr>
<tr>
<td>Perceived Similarity</td>
<td></td>
<td>0.65</td>
<td>1.04</td>
<td>0.10</td>
</tr>
<tr>
<td>Openness to social proximity</td>
<td></td>
<td>-0.02</td>
<td>0.22</td>
<td>0.24</td>
</tr>
<tr>
<td>Empathy Altruism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingroup bias</td>
<td></td>
<td>0.32</td>
<td>0.47</td>
<td>0.10</td>
</tr>
<tr>
<td>Altruism</td>
<td></td>
<td>0.21</td>
<td>0.15</td>
<td>0.38</td>
</tr>
<tr>
<td>Symbiotic Altruism</td>
<td></td>
<td>0.46</td>
<td>0.39</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Note. $p \leq 0.05$. Notice that not one p-value in the t-tests is statistically significant. Therefore, Israeli and Palestinians responded reciprocally to the manipulation.
Figure 1.

Figure 1. Change in prosocial behavioral empathy markers across Palestinian and Israeli sample populations. This figure illustrates the difference in behavioral change before and after the manipulation between control condition and VRPT condition participants.

Figure 2.

Figure 2. Change in social distance markers for Palestinian sample population. This figure illustrates the change in each marker from control condition to VRPT condition.

Figure 3. Change in social distance markers for Israeli sample population. This figure illustrates the change in each marker from control condition to VRPT condition.

Figure 2 & 3. Presenting the data in this form creates the impression of movement from Control to VRPT rather than the movement within the VRPT condition relative to the movement within the Control condition. Please note that the further the graph lines are from the 0 center-point of the graph, the greater the change within the condition itself.
Figure 3

Financial Allocation

Palestinian

<table>
<thead>
<tr>
<th>Group</th>
<th>Control</th>
<th>VRPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingroup</td>
<td>45%</td>
<td>47%</td>
</tr>
<tr>
<td>Outgroup</td>
<td>35%</td>
<td>35%</td>
</tr>
<tr>
<td>Peace</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>

% of 100 NIS allocated towards

Change in Financial Allocation

Israel

<table>
<thead>
<tr>
<th>Group</th>
<th>Control</th>
<th>VRPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingroup</td>
<td>40%</td>
<td>45%</td>
</tr>
<tr>
<td>Outgroup</td>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>Peace</td>
<td>35%</td>
<td>30%</td>
</tr>
</tbody>
</table>

% of 100 NIS allocated towards

Note: The size of the error bars; these results are not statistically significant.

This figure illustrates that Palestinians in the VRPT condition were slightly lower on ingroup selfishness, slightly higher on altruism and lower on symbiotic-
Glossary:

Embodiment: the merging of one’s sense of physicality with another’s
Empathic-concern: an affectively motivated desire to increase the wellbeing of another individual due to an empathic experience
Empathy: the understanding and genuine experience of others’ internal states
Empathy-altruism: an act of generosity towards another at no personal gain, often caused by empathic concern
Empathy quotient: a self-report scale design to provide an empirical measurement of empathy
Experiential perspective-taking intervention: a perspective-taking intervention that feature tasks that encourage mentalizing or “tuning in” to targets’ internal states
Experience sharing: the vicarious adoption of someone else’s sensorimotor, visceral, and affective states
Homophily: ingroup favoritism and gravitation towards similar others
IVE: Immersive virtual environment – a field term referring to the virtual space that one enters when they enter VR
Mentalizing: The act of acknowledging another’s mental state and attempting to make meaning out of it
Other-oriented emotion: any emotion experienced regarding another person
Self-Other Merging: the incorporation of someone else’s lived experiences into one’s own
Social Distance/Proximity: the cognitive distance an individual feels lies between him/her and another person as a function of perceived difference/similarity
Socio-national Identity: the identification category for the purposes of this study that represents the nationality the participant identifies with socially
Symbiotic Altruism: forgoing personal gain to provide a resource that is mutually beneficial to oneself and someone else, without expecting anything in return
Sympathy: a sense of sorrow for another’s misfortune
Theory of mind: the ability to understand that mental states, such as beliefs, emotions, knowledge, and desires, are uniquely attributed to individual people, either oneself or others, and others’ mental states may be different from one’s own
Tribalism: in the context of this paper, a term used to refer to outgroup bias and ingroup favoritism and the primitive binary humans assume
VRPT: Virtual reality perspective-taking: using virtual reality visual aids to see from someone else’s perspective
Appendix 1: Filming Application

Filming Application

You would be wearing a 360˚ camera on a helmet on your head. Your face will never be in the shot (unless you look in the mirror), so it is totally anonymous. I have walked all over the world with this helmet and while sometimes I get silly looks, its not as embarrassing as it seems 😊

1. What’s your name?

2. Where are you from?

3. Where do you currently live?

4. Describe your previous film experience

5. What is a creative way you would spend the $60 you would earn for filming for four hours?
😊
Appendix 2: Filming instructions

Hey! Thanks so much for doing this. Now that you’re doing it let’s make it **freaking fantastic**.

Quick recap of the project:

I am measuring the power of that virtual reality perspective-taking may or may not have to elicit empathy across Israelis and Palestinians. To do this, you’re helping me generate the footage for 2 documentaries, filmed in the first-person with a 360° camera. By filming in 360°, the films can be watched in VR, which will literally allow the study participants to step into your body, see through your eyes and take a walk in your shoes. The footage you create will be a part of an exchange of perspectives, the metric of success being humanization.

Here are all the **materials** you should have:

- 1 x 360° camera + charger
- 1 x mount for the camera to the helmet
- 1 x 128gb micro SD card
- 1 x micro SD card adapter
- 1 x iPhone SD card reader
- 1 x helmet
- 1 x USB adapter for charging
- 1 x portable charger

Please let me know ASAP if anything is missing, but that should be everything!

Instructions:

*Feel free to add to these instructions as they are definitely not complete*

1. Upon receipt of camera, immediately plug in and charge up the camera
2. Once camera is adequately charged, double check that the micro SD card is in the camera
3. Read and follow the instructions to turn the camera on
4. Mount the camera to the helmet using the mount piece provided (can be somewhat complicated, let me know if you have any issues with this)
5. Start filming!
   a. Keep in mind, the camera must stay on the helmet. Please don’t film your face in the shot unless you’re looking in a mirror. I want to keep this as **anonymous** as possible.
   b. The 128g SD card will hold up to **70 min** of footage so if/when you run out, I have attached an SD card adapter and reader so that you can download the footage to your computer or phone to clear the card. Please be SURE that the footage is
saved somewhere before you delete it off the card. Losing the footage would be a B U M M E R.

c. The battery should last a similar amount of time (~60-70 min), so just try to make sure that the camera is charged up to complete one of the activities. You should also have a portable charger to charge up on the go when you need more batt.
That said, try to conserve battery when you can and turn the camera off when you’re not filming.

The purpose of all of this:

- To show that whatever your group is, it is comprised of humans. Humans who laugh at stupid jokes, who cry so hard into a pillow that their stomachs hurt, who listen to beautiful music, who love the feeling of sunshine on their skin, who can’t fall asleep at night because they can’t stop thinking about that one person, who shed a small tear when they spill the food they just purchased all over the floor, who make mistakes, who pick themselves back up, who wonder why we have eyebrows..or toe-nails, who get nervous, who feel an immense sense of release the moment the beat drops, who are afraid of dying, humans who would do just about anything for the people they love. It is too easy to forget that we are FAR more similar than we are different. The shared human experience is far more powerful than the fictions that divide us. At the end of the day, we all end up in the ground together and our time above ground is too precious to waste on focusing on our differences, differences our societies impose upon us, when we can focus on how much we have to be grateful for. We are all suffering through this difficult life on earth. Together.

- I know this all sounds very cliché, and this project in no way is meant to trivialize the immense emotion and pain associated with human conflict. That said, it is not going to be this project that brings us to world peace. This project is merely meant to provide a perspective of the earth from 10,000 meters up and an opportunity to, for just an hour of our lives, focus on what brings us together, rather than what tears us apart.

- These videos have the potential to be immensely powerful in their understatedness. The goal here is not to make the viewer cry, feel envious or sympathetic. In fact, all of those things only distance the viewer from you. The goal here is to acknowledge the differences, because they are what make up who we are, but focus on the similarities. I am not saying to pretend you live the life of an Israeli if you’re Palestinian or live like a Palestinian if you’re Israeli. I’m saying, instead of focusing on the wall that divides your community, focus on the memories of smoking your first j and laughing your head off with your best friends beneath that wall. Instead of focusing on the privileges that living on the beach brings you, focus on the closeness of the relationships that the conversations upon that beach have brought you.

- We all experience different things, but we all experience the same feelings. Focus on these.

The context in which the videos will be viewed:
- These videos will be watched only in the study, by opposing participant groups (i.e. Israelis will be watching the Palestinian video and vice versa)
- They will function independently in that no one will watch both.
- The purpose of maintaining parallels between the two videos is to control the experiment with similar emotions elicited by each video.
  - And maybe, to be watched side by side, if you guys are interested in publishing these videos in the future... tbd ;)

**Checklist for filming:**

- **A moment that encapsulates what you live for**
  - You can write it down on a piece of paper, you can get a tattoo, you can have a long conversation with a friend, whatever you want
- **Cooking a meal** with family or a loved one
  - Try to make something that will make the viewer’s stomach grumble ;)
- **A moment of laughter** with someone special to you
- **A moment of vulnerability & heartbreak**
  - Getting stood up
  - Getting broken up with
- **A moment of just annoyed frustration**
  - Getting a traffic ticket
  - Stubbing your toe
  - Burning your hand on the stove
  - Spilling coffee on your white t-shirt/important papers
- **A moment of sentimentality**
  - Re-reading an old letter from your grandma
  - Picking up an old picture of someone you’ve lost
- **A moment of routine/mundanity**
  - Folding your laundry
  - Brushing your teeth
- **A moment of open-heartedness**
  - Taking a moment to play with a little kid or a dog
- **A moment of momentum**
  - Running, skating, surfing, etc.
- **A moment of chaos**
  - Walking through the Souk to get groceries, etc.
- **A moment of spirituality**
  - Being somewhere spiritually meaningful to you. Ideally some place of worship.

**To keep in mind:**

- **The person who is viewing this HATES you.** Live like you’re trying to show someone who hates you why they they shouldn’t hate you.
● **Steer clear of the political.** I know this will be hard in the environment you live in and many things are inherently political, but the purpose of this documentary is to focus on similarities in the human experience, not garnering sympathy, making a political point or otherwise.
  ○ As an example: while I can empathize with human beings that happened to vote for Trump when their family member dies or they stub their toe, as soon as that Trump supporter shows me pictures of 1 week old baby’s hearts beating, I am immediately turned off because my brain regresses back to my values and political stance. Similarly, showing things that are politically-focused or in any way demonize the “other,” would be great for another documentary, but this one is meant to focus on commonalities and humanness more than juxtaposing the differences.

● **LEAN INTO** the moments where you realize you’re being filmed -- follow it
  ○ Someone comes and waves at the camera ➔ joke/laugh with them
  ○ You see yourself in the mirror ➔ make a funny face

**Appendix 3: Links to YouTube videos of VR Experiences**
Palestinian video: Wiz’s World https://www.youtube.com/watch?v=9k7QjfoKg4E
Israeli video: Edo’s World https://www.youtube.com/watch?v=IQV_X7trfYc

Appendix 4: Recruitment posts

First post (same across all FB groups)

Hello friends! I am a student at Duke in the US and for my senior honors thesis I will be holding a very interesting study next week from March 14-20 in Jerusalem. It is 1 hour and you will be watching a short 20 minute documentary and answering a few questions. The pay is $15 per hour.

If you're interested, please fill out the form below 😊

*Had the dates wrong
Follow up post 3 days before study began

4 Facebook groups

1. Secret Jerusalem (1)
2. Secret Jerusalem (2)
3. Secrets of East Jerusalem and Ramallah
4. Secret Al Quds – East Jerusalem

Appendix 5 – Recruitment flyers & postage
Get paid to watch a short documentary & participate in a Duke University study about VR, empathy and peace.

SCANN THIS WITH YOUR PHONE

or visit this website
https://goo.gl/forms/G2ib9K86pMwNp0563

Please contact eml41@duke.edu with any questions 😊
USING VIRTUAL REALITY TO INCREASE EMPATHY IN THE PALESTINIAN-ISRAELI CONFLICT

Flyers at bus stops around East and West Jerusalem

Flyers on the streets of East Jerusalem University

Flyers on bulletin boards at Hebrew
Appendix 6 – Study Participant Application

Duke Documentary Study Participant Application

Please fill out the following questions to the best of your ability! After we have received all applications

* Required

1. What's your name? *

2. What's your email? *

3. What’s your phone number?
   If you prefer to communicate via WhatsApp

4. Where are you from? *

5. How old are you? *

6. Where do you currently live? *

7. Could you get to the Jerusalem YMCA easily? *
   Address: King David 26, Jerusalem
   Mark only one oval.
   ☐ Yes
   ☐ No
8. **What languages do you speak?** *
   *Check all that apply.*
   - [ ] English
   - [ ] Hebrew
   - [ ] Arabic
   - [ ] Other: __________________

9. **How is your English?** *
   *Mark only one oval.*
   - [ ] I don’t speak English
   - [ ] I can speak a small amount of English
   - [ ] I can read, write, understand and speak in English proficiently
   - [ ] I am fluent in English (reading, writing, speaking & understanding)

10. **Gender** *
    *Mark only one oval.*
    - [ ] Female
    - [ ] Male
    - [ ] Prefer not to say
    - [ ] Other: __________________

11. **I have completed..** *
    *Check all that apply.*
    - [ ] Primary school
    - [ ] Middle school
    - [ ] High School
    - [ ] University
    - [ ] Graduate School

12. **Do you currently work for the government?** *
    *Mark only one oval.*
    - [ ] Yes
    - [ ] No
    - [ ] Other: __________________
13. Have you served in the military? *
   *Mark only one oval.
   ○ Yes
   ○ No

14. Have you ever experienced VR* before? *
   *Virtual Reality
   *Mark only one oval.
   ○ Yes
   ○ No
   ○ Other: 

15. Would you be comfortable with watching a short movie in VR? *
   *Mark only one oval.
   ○ Yes
   ○ No
   ○ Other: _______________________
16. Where does your family come from? *

17. Where were you born? *

18. What holidays do you celebrate in your home?

19. What religion do you identify most closely with (if any)? *

20. What languages do your parents speak?
   Mark only one oval.
   - English
   - Hebrew
   - Arabic
   - Other:

21. What political stances do you tend to take? *
   Mark only one oval.

22. How many Israeli-Jewish people do you count as good friends? *

23. How many Israeli-Jewish friends do you think your parents have?

24. How many Arab-Israeli people do you count as good friends? *
25. How many Arab-Israeli friends do you think your parents have?


26. How many Palestinian people do you count as good friends? *


27. How many Palestinian friends do you think your parents have?


28. I have experienced trauma regarding this conflict that might be triggered if questioned about it *
   Mark only one oval.
   
   ☐ Yes  ☐ No  ☐ Other: __________________________

Please fill out this form to include all your availability over the next week to come to the YMCA

https://doodle.com/poll/qyf8i97h9cwhvqg

Thanks for participating! We can't wait to meet you!
Appendix 8 – Informed Consent Form
**VRPT Condition Participants**

Eliana M. Lauder  
Psychology & Visual Media Studies Departments, Duke University

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**Informed Consent Form**

I, the undersigned ____________________________ , ____________________________,  
Name Contact information (E-mail)

A. Hereby declare that I agree to participate in a study on the subject of the effect of immersive visual media on cognitive & behavioral empathy and altruistic giving.

B. Hereby declare that I have been given an explanation of the study by a Duke University researcher Eliana Lauder

---

**Key Information:**

**Name of the Study:** The Effect of Immersive Visual Media on Cognitive & Behavioral Empathy and Altruistic Giving

**Name of the Responsible Researchers:** Eliana Lauder & Alec Waxman

**Purpose of the Study:** To determine whether the degree of immersion of visual media affects the degree to which a participant empathizes with a member of his or her out-group in an area of conflict.

I am aware that I have to be aged 18 and above in order to participate in this study.

The anticipated duration of my participation in this trial is about one hour and I will be compensated as promised for this time.

The location of conduct of the study is the YMCA in Jerusalem, Israel and I am completing the study in a room that I deem fit.

I am aware that all of my actions during this study are being documented, however none of this information will be shared outside of the study and my name, nor key identifiers of my identity will be shared at any point with anyone.

**Description of the procedures that will be used in the study:**

- I will enter the study and greet and be greeted by a research associate.
- I will complete an online survey.
- I will be briefed about VR and the short film I am about to watch.
I will watch the short film in an Oculus Go headset. 
I will complete another survey. 
I will be given 100₪ to allocate between 8 non-profits and I will allocate them how I see fit. 
I will exit the study room, collect my 65₪ compensation from the research associate.

Possible risks inherent in participation in the study: 
- Momentary dizziness due to exposure to virtual reality immersive experience. 
- Potentially emotional video content. 
- Fasting for one hour.

If I feel that any harm has been caused to me by the trial, I shall contact Eliana Lauder (contact details appear at the end of the form).

Possible benefit that could develop from this study: 
- Participant will receive 65₪ compensation for his/her time. 
- Real non-profits will be receiving the money donated by the participant in the Giving Activity. 
- Increased understanding and virtual exploration of a new place. 
- Could contribute to the understanding of a new perspective.

The procedures for maintaining confidentiality of the subjects, information concerning them and their identities:

The confidentiality of my research records shall be meticulously maintained. The information concerning me shall be saved in a researcher’s file and shall be identified by means of a code number. 
I have been assured of confidentiality regarding my personal identity in scientific publications.

Declaration concerning the right of the subject to cease participation in the study at any time without any penalty

Participation in the study is on a voluntary basis. I am free to choose not to participate in the study and I am free to terminate my participation in the trial at any time, without any harm to my rights, and without any penalty and without any sanctions being applied against me.

I have been assured of the willingness to answer questions that may be raised by me and the possibility to consult with someone else regarding the decision to participate in the study, or to continue with it. For inquiries concerning participation in the trial, for reports of problems connected with the study or any further questions:

Researcher: Eliana Lauder, eml41@duke.edu or telephone: +1(650) 269-5334
Duke Institutional Review Board: campusirb@duke.edu or +1(919) 684-3030

I hereby declare that this, my consent, was given of my own free will and that I have understood all the aforementioned.

Participant’s name: __________________________________________

Participant’s signature: _________________________________________

Date: ________________________________

The aforementioned consent was received by me after I explained to the participant in the trial all the aforementioned and I ensured that all my explanations were understood by the participant.

Researcher’s name: ________________________________

Signature: _________________________________________

Date: ____________________________________________

Honors Thesis · Psychology & Visual Media Studies · Duke University

Control Condition Participants
Eliana M. Lauder  
Psychology & Visual Media Studies Departments, Duke University

**Informed Consent Form**

I, the undersigned ____________________________ , ____________________________  
Name Contact information (E-mail)

A. Hereby declare that I agree to participate in a study on the subject of the effect of immersive visual media on cognitive & behavioral empathy and altruistic giving.

B. Hereby declare that I have been given an explanation of the study by a Duke University researcher Eliana Lauder

**Name of the Study:** The Effect of Immersive Visual Media on Cognitive & Behavioral Empathy and Altruistic Giving

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The location of conduct of the study is the YMCA in Jerusalem, Israel and I am completing the study in a room that I deem fit.

I am aware that all of my actions during this study are being documented, however none of this information will be shared outside of the study and my name, nor key identifiers of my identity will be shared at any point with anyone.

**Description of the procedures that will be used in the study:**

- I will enter the study and greet and be greeted by a research associate.
- I will complete an online survey.
- I will be briefed about the short film I am about to watch.
- I will watch the short film on a laptop.
I will complete another survey.
I will be given 100 ₪ to allocate between 8 non-profits and I will allocate them how I see fit.
I will exit the study room, collect my 65 ₪ compensation from the research associate.

**Possible risks inherent in participation in the study:**
- Potentially emotional video content.
- Fasting for one hour.

If I feel that any harm has been caused to me by the trial, I shall contact Eliana Lauder (contact details appear at the end of the form).

**Possible benefit that could develop from this study:**
- Real non-profits will be receiving the money donated by the participant.
- Increased understanding and virtual exploration of a new place.
- Could contribute to the understanding of a new perspective.

**The procedures for maintaining confidentiality of the subjects, information concerning them and their identities:**
The confidentiality of my research records shall be meticulously maintained. The information concerning me shall be saved in a researcher's file and shall be identified by means of a code number.
I have been assured of confidentiality regarding my personal identity in scientific publications.

**Declaration concerning the right of the subject to cease participation in the study at any time without any penalty**
Participation in the study is on a voluntary basis. I am free to choose not to participate in the study and I am free to terminate my participation in the trial at any time, without any harm to my rights, and without any penalty and without any sanctions being applied against me.

I have been assured of the willingness to answer questions that may be raised by me and the possibility to consult with someone else regarding the decision to participate in the study, or to continue with it. For inquiries concerning participation in the trial, for reports of problems connected with the study or any further questions:

Eliana Lauder, eml41@duke.edu or telephone: +1(650) 269-5334

I hereby declare that this, my consent, was given of my own free will and that I have understood all the aforementioned.

Participant's name: ________________________________
Participant's signature: ________________________________

Date: ________________________________

The aforementioned consent was received by me after I explained to the participant in the trial all the aforementioned and I ensured that all my explanations were understood by the participant.

Researcher's name: ________________________________

Signature: ________________________________

Date: ________________________________

Honors Thesis - Psychology & Visual Media Studies - Duke University
Appendix 9 – Research Assistant Confederate T-Shirts
Appendix 10 – Social Distance Surveys

Israeli Pre-Manipulation Survey 1

Survey 1

Please fill out the following survey as honestly as possible. The questions in this survey are complicated and deeply nuanced, but try to respond from your gut and do not read too far into the questions. To reiterate, everything you share today is anonymous & will never be shared. Your responses will further our scientific understanding of certain technologies and of human behavior.

My friends tend to share my social and political beliefs.

I believe I am quite different from Palestinian & Arab Israeli people.

Being Jewish is something I am never ashamed of.

I feel sad when I hear about bad news in Ramallah.

I would be open to living in East Jerusalem.

I would be open to having an Arab-Israeli or Palestinian person as a close friend.

I would prefer if my child married a Jew.
My religion is an important part of my personal and cultural identity.

If I was at a coffee shop and the only other person in the coffee shop was Arab, I would leave my things unattended while I went to the restroom.

I would host an Arab-Israeli person for dinner in my home.

I would be comfortable giving an Arab-Israeli a tour of my holy space where I pray.

I believe my values and interests are quite different from those of Palestinian and Arab-Israeli people.

I feel like I can connect better with people who share my religion.

Arab-Israelis tend to be warm.

I feel nervous walking in East Jerusalem.

I tend to get along with other Israeli people.
When I introduce myself to new people, being Israeli is one of the first things I mention.

Palestinian people do very different things every day than I do.

I am proud of my Israeli identity.

I would prefer to have a leader of my community that is more focused on empowering underprivileged Jewish communities than focused on peace between Palestinian and Israeli-Jews.

Being Jewish is one of my top 5 most important attributes.

I feel unsafe around Arab-Israelis.

There are more things that are similar between a Palestinian person and I than there are different.

*When you feel you are done, please knock on the window to summon the researcher*
Israeli Post-Manipulation Survey 2

Again, please fill out the following survey as honestly as possible. This survey is different from the prior survey, but the questions are equally difficult. Again, try to respond from your gut and do not read too far into the questions. To reiterate, everything you share today is anonymous & will never be shared. Your responses will further our scientific understanding of certain technologies and of human behavior.

I believe my social and political beliefs differ from those of my peers.

I believe I am in fact quite similar to Palestinian & Arab-Israeli people.

I am proud of my Jewish identity.

I feel happy when Arab people at my school/job succeed.

If I could, I would be open to living in Ramallah.

I could imagine myself getting along with an Arab-Israeli or Palestinian person.

I would approve of my child marrying an Arab-Israeli person.
Religion should be an important part of a person's identity and community.

I would trust an Arab-Israeli or Palestinian to babysit my child.

I wouldn't want an Arab-Israeli or Palestinian person to come into my home.

I would be uncomfortable to see an Arab-Israeli or Palestinian person in my synagogue.

I believe I share similar values and interests with Palestinian and Arab-Israeli people.

I cannot connect quite as well with people who do not share my religion.

Arab-Israelis tend to be cold.

I feel anxious when I can tell I am the only Jew around.

I tend to gravitate towards other Israeli people.
Being Israeli is one of my top 5 most important attributes.

Palestinian people do very different things every day than I do.

Being Israeli is something I am never ashamed of.

I would prefer to have a leader of my community that is more focused on peace between Palestinian and Israeli-Jews than focused on empowering underprivileged Jewish communities.

My Jewish identity explains a lot about why I am who I am.

I feel safe around Arab-Israelis.

There are more similarities than there are differences between Palestinian and Israeli-Jewish people.

When you feel you are done, please knock on the window to summon the researcher.
Palestinian Pre-Manipulation Survey 1

Psychology & Visual Media Studies Departments, Duke University

Survey 1

Please fill out the following survey as honestly as possible. The questions in this survey are complicated and deeply nuanced, but try to respond from your gut and do not read too far into the questions. To reiterate, everything you share today is anonymous & will never be shared. Your responses will further our scientific understanding of certain technologies and of human behavior.

My friends tend to share my social and political beliefs.

I believe I am quite different from Israeli-Jews.

Being Arab is something I am never ashamed of.

I feel sad when I hear about bad news in Tel Aviv.

I would be open to living in a Jewish neighborhood.

I would be open to having an Israeli-Jew as a close friend.

I would prefer if my child married an Arab.
My religion is an important part of my personal and cultural identity.

If I was at a coffee shop and the only other person in the coffee shop was Jewish, I would leave my things unattended while I went to the restroom.

I would host an Israeli-Jew for dinner in my home.

I would be comfortable giving an Israeli-Jew a tour of my holy space where I pray.

I believe my values and interests are quite different from those of Israeli-Jews.

I feel like I can connect better with people who share my religion.

Israeli-Jews tend to be warm.

I feel nervous walking in Jewish neighborhoods (not orthodox).

I tend to get along with other Arab people.
When I introduce myself to new people, my nationality is one of the first things I mention.

I am proud of my Arab identity.

I would prefer to have a leader of my community that is more focused on empowering underprivileged Arab communities than focused on peace between Palestinian and Israeli-Jews.

Being Arab is one of my top 5 most important attributes.

I feel unsafe around Israeli-Jews.

My religion is an important part of my personal and cultural identity.

There are more things that are similar between an Israeli-Jew and I than there are different.

When you feel you are done, please knock on the window to summon the researcher
Palestinian Post-Manipulation Survey 2

Psychology & Visual Media Studies Departments, Duke University

Survey 2

Again, please fill out the following survey as honestly as possible. This survey is different from the prior survey, but the questions are equally difficult. Again, try to respond from your gut and do not read too far into the questions. To reiterate, everything you share today is anonymous & will never be shared. Your responses will further our scientific understanding of certain technologies and of human behavior.

I believe my social and political beliefs differ from those of my peers.

I believe I am in fact quite similar to Israeli-Jews.

I am proud of my Arab identity.

I feel happy when Israeli-Jews at my school/job succeed.

I would be open to living in a Jewish community (not orthodox).

I could imagine myself really getting along with an Israeli-Jew.

I would approve of my child marrying an Israeli-Jew.
Religion should be an important part of a person's identity and community.

I would trust an Israeli-Jew to babysit my child.

I wouldn't want an Israeli-Jew to come into my home.

I would be uncomfortable to see an Israeli-Jew in my place of worship.

I believe I share similar values and interests with Israeli-Jews.

I cannot connect quite as well with people who do not share my religion.

Israeli-Jews tend to be entitled.

I feel anxious when I can tell I am the only Arab person around.

I tend to gravitate towards other Arab people.
Being Arab is one of my top 5 most important attributes to my identity.

![Agreement Scale]

Strongly Disagree  Strongly Agree

Israeli-Jews do very different things every day than I do.

![Agreement Scale]

Strongly Disagree  Strongly Agree

Being Arab is something I am never ashamed of.

![Agreement Scale]

Strongly Disagree  Strongly Agree

I would prefer to have a leader of my community that is more focused on peace between Palestinian and Israeli-Jewish people than focused on empowering underprivileged Arab communities.

![Agreement Scale]

Strongly Disagree  Strongly Agree

My Arab identity explains a lot about why I am who I am.

![Agreement Scale]

Strongly Disagree  Strongly Agree

I feel safe around Israeli-Jews.

![Agreement Scale]

Strongly Disagree  Strongly Agree

There are more similarities than there are differences between Palestinian and Israeli-Jewish people.

![Agreement Scale]

Strongly Disagree  Strongly Agree

*When you feel you are done, please knock on the window to summon the researcher*
Appendix 11 – Empathy-Altruism giving activity
Nonprofit descriptions

Giving Activity

I’ve handed you 100 NIS. Choose how you want to allocate it based on your values and what is important to you. This is real money that will be donated according to your choices.

The Parents’ Circle

The Parents Circle – Families Forum (PCFF) is composed of over 600 Palestinian and Israeli families, all of whom have lost a close family member as a result of the prolonged conflict. The members of the Parents Circle use their own painful stories of loss and forgiveness to help bring about dialogue and reconciliation.

Palestinian Happy Child Center

We strive to provide children with disabilities in Palestine with the specialized care and medical treatments they need in order to fulfill their potential and to facilitate their meaningful inclusion in all aspects of life. We are committed to improving their quality of life and promoting their rights.

Project Rozana

Project Rozana is committed to building bridges between Israelis and Palestinians through the field of healthcare, an area of civil society where both meet on a broad scale. Providing opportunities for Palestinian professionals and patients to access the Israeli healthcare system will build trust and promote mutual respect from which both communities will benefit.

Leket Israel

Leket Israel, the National Food Bank, is the leading food rescue organization in Israel. Unique among all other organizations that serve the poor in Israel and food banks worldwide, Leket Israel’s sole focus is rescuing healthy, surplus food and delivering it to those in need through partner nonprofit organizations to both avoid waste and also repurpose it for those who desperately need it.

Jerusalem YMCA

Jerusalem International YMCA’s mission is to give all Jerusalemites a place to call home, regardless of where they’re coming from and what they believe in. The YMCA provides high-quality programs in preschool education, extracurricular youth activities, cultural
social events and world-class fitness facilities where politics and divisions are put to rest. We offer people from both East and West Jerusalem a safe space to enhance their spirit, mind and body in one of the most complex cities in the world. Regardless of faith, nationality, socio-economic background or language, we aim to give equal opportunities in youth development, healthy living and social responsibility.

Bet Elazraki

Bet Elazraki Children’s Home houses at-risk children ages 6-18 to provide them with the support, protection, and promotion they need to grow into strong and thoughtful adults. Most of Bet Elazraki’s children were born to multigenerational welfare families, are referred to us from throughout Israel by welfare officials. Educational and counseling staff live on campus with the children making it a unique home that embraces and nurtures children lovingly while implementing a structured, professional work-model. We are working to break the cycle of despair.

Ultimate Peace

Ultimate Peace gives Israeli Arab, Israeli Jewish and Palestinian youth a chance to build friendships, trust, and leadership skills by playing Ultimate Frisbee. With year-round programs in the West Bank and Israel, Ultimate Peace engages 500 youth from 20 communities. Players learn conflict resolution by self-officiating their games and form deep cross-cultural bonds with other players.

MA’AN Development Center

MA’AN Development Center is an independent, non governmental, non partisan Palestinian development and training institution MA’AN’s work is informed by the necessity of creating independent, self-reliant initiatives that lead to the development of human resources for sustainable development, which incorporate values of self-sufficiency and self-empowerment.
Sample Results of Empathy-Altruism Activity
Appendix 12 – Debrief Form

Debrief Form

Thank you so much for participating in the study. As you read in the consent form, the purpose of this study was to measure the efficacy of immersive media to elicit an empathic response in individuals. If you watched the video in virtual reality (VR), then you were a member of our manipulated group. If you watched the video on a flat screen, then you were a member of our control group. We are testing to see if the more immersive the video, the more likely a participant is to engage in perspective taking, humanization, empathy, and overcome his or her in-group/out-group bias. We are fascinated by this topic for two reasons: first, because VR is such an inherently antisocial technology, we think it would be interesting to see if there might be a pro-social use case for the technology. Second, we believe empathy through perspective taking to be an incredibly powerful tool for peace. If we have the technology today to elicit an embodied experience, why not see if it could do good in the world? That said, our goal with this study was not to reach world peace nor to trivialize all the deep cultural & individual differences between the populations in question. This project is merely meant to give the participant a chance to see life through another human’s perspective and to provide an opportunity to, for just an hour of our lives, see what happens when we focus more on what we have in common than our differences.

In this study three of your responses were recorded: the survey you filled out before and after the VR experience, we noted how you interacted with the research associate who checked you in and out, and how much you chose to allocate to each organization in the philanthropic activity. Empathy is a tough thing to measure, but these forms of measurement were chosen to provide as holistic a picture as possible of the cognitive, behavioral, and emotional changes that the video either does or does not elicit. All of your responses are highly confidential and will not be shared.

Labs all over the world are interested in investigating this question, and I am not the first to design a study like this. Labs such as the Virtual Human Interaction Lab at Stanford University in California and the Tom Schonberg Lab at Tel Aviv University, among others, do very similar work about VR and behavioral change and have played important and influential roles in the design and execution of this study, along with the Psychology faculty at Duke.

If you’re interested in being updated on the results of the study once it is complete, please email eml41@duke.edu.

It was great meeting you and thanks again for participating in this exciting project ☺

Yours,

Eliana M. Lauder
Psychology & Visual Media Studies Departments, Duke University
Appendix 13 - Checklist of Materials

- At least 2 administrators of the study
  - 1 primary researcher
  - 1 research associate to act as confederate
- A room for the study (at least 2m x 2m)
- A separate space for participants to check in
  - A table for RA to stand/sit behind
  - A pen for pen-drop test
  - 48 informed consent forms
  - 48 envelopes with 65 NIS and a debrief form inside
  - Laptop to enter data (or notebook/smartphone if laptop unavailable)
- Oculus Go headset, controller & charger
- Wall-mountable TP-LINK RE450 Wireless Range Extender
- 96 printed surveys (24 Israeli Pre, 24 Israeli Post, 24 Palestinian Pre, 24 Palestinian Post)
- 2-3 pens or pencils in case
- Non-profit description sheet, 100 NIS in 20s and cut outs of each non-profit logo
- “PALESTINE” & Palestinian flag white T-shirt
- “ISRAEL” & Israeli flag white T-shirt