



# Benevolent personification of the MoH increases compliance with an emergency polio vaccination



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## ABSTRACT

**Objective:** Parental compliance is crucial to the success of mass vaccination campaigns targeting children. Relying on psychological/neuroscientific research concerning the role of personification (i.e., viewing the inanimate as human) in behavior, the authors examined the effect of parents' personification of the Israeli Ministry of Health (MoH) on compliance with a publicly controversial mass vaccination campaign, which was aimed at stopping the spread of a wild poliovirus.

**Methods:** Participants were 555 parents of children aged 9 or younger, residing in the center/north of Israel, an area covered by Phase 2 of the campaign. **T1** assessment, employed two days prior to Phase 2, tapped into demographics, attitudes towards vaccination, intent to comply, and a benevolent personification of the MoH (i.e., "The MoH is caring") vs. a malevolent personification of the MoH ("The MoH is hysteric"). **T2** assessment, transpiring four months after the end of the campaign, addressed presence and reasons for (non-)compliance.

**Results:** The study's overall compliance rate was 61.8%. The principal reason for compliance was "adherence to the recommendations of the MoH" (68.49%). In a multivariate logistic regression analysis, prospective predictors of compliance were: an early intent to comply (O.R. = 2.56,  $p = 0.000$ ), being male (O.R. = 1.51,  $p = 0.023$ ), and a benevolent personification of the MoH (O.R. = 1.21,  $p = 0.019$ ).

**Conclusion:** Parents who experienced the Israeli MoH as a benevolent protagonist were more likely to comply with the mass vaccination campaign. Findings highlight the role of leadership in public health campaigns during emergencies.

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## 1. Introduction

Parents are usually hesitant to comply with mass vaccination campaigns [1–4]. Such non-compliance stems from ideological reasons, fear of the vaccine's adverse effects, and distrust of vaccinating agencies [5–7]. An overlooked aspect of trust in vaccinating agencies is citizens' *personifications* of governments. Psychological/neuroscientific research suggests that humans possess a tendency to personify the world [8–10]. Governed by brain structures involved in mentalizing about others (e.g., the Medial

Prefrontal Cortex [MPFC]), personification is predicated upon humans' need to control an unpredictable environment [10]. Thus, people personify chronic illnesses [11–13] and hurricanes [14] with negative/malevolent personifications, undermining adaptation and positive/benevolent ones bolstering it. Herein, we hypothesized that a malevolent personification of vaccinating agencies will derail parental compliance with vaccination campaigns, whereas a benevolent personification will bolster compliance.

### 1.1. The recent Israeli Polio event

With the introduction of the inactivated polio vaccine (IPV) and the oral polio vaccine (OPV) in the 1950s, polio was eradicated in Israel by 2004. OPV is less costly than IPV, and it provides excellent immunity in the intestine, ultimately preventing infection and an epidemic spread [15]. Throughout the years, OPV became the main vaccine around the world. However, the increase in OPV use

Abbreviations: MoH, Ministry of Health.

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resulted in a corresponding increase in vaccine-associated paralytic polio (VAPP) cases. Although rare, these cases propelled healthcare systems to either switch to exclusive IPV use or to combine IPV and OPV [16]. In Israel, between 1990 and 2004, the polio vaccination program was based on combined IPV and OPV. In 2004, due to the polio eradication, Israel moved to an IPV only vaccination program. As described in [17–19], in May 2013, wild poliovirus was detected in swage samples in several sites of the Israeli Negev (in the South of the country). Thus, part of the population was at risk of contracting polio, including individuals who were never vaccinated and babies who had not yet received the complete IPV schedule. Consequently, Israel decided to launch a national OPV vaccination campaign to vaccinate all non-OPV previously vaccinated children, first covering the Negev (Phase 1), and then the center/north of Israel (Phase 2). Importantly, the campaign was highly challenging from a risk-communication perspective because it introduced an emergency use of OPV in an IPV-only vaccinated country, without any identification of clinical poliomyelitis cases. This stirred hostility from anti-vaccination movements and suspicion in the general public. To address these, the MoH officials intensively appeared in the media, explaining the risks and urging parents (of children born after 2004) to comply with the ensuing campaign. Fortunately, the campaign was highly successful, covering between 73 and 92% of the eligible population, thus essentially eradicating the risk [17–19].

## 1.2. The present study

Parents of children aged 9 years old and younger were assessed pre-and-post Phase 2 of the campaign. **T1** assessment focused on demographics, parental stress and distress, intent to (not) comply, attitudes towards vaccinations, and benevolent vs. malevolent personification of the MoH. Benevolent personification was assessed by asking participants whether they felt that the MoH is “caring” (or “positively concerned”) about them. Malevolent personification was measured by asking participants whether the MoH is “hysterical” about the campaign. Both items were selected by the last author (IG), who oversaw the campaign in his capacity as Director of Public Health Services at the MoH. Selection was based on focus groups with potentially non-compliant parents and on surveillance of internet sites of anti-vaccination movements. **T2** assessment (post-campaign) assessed presence and reasons for (non-) compliance. Our focus was on the prediction of **compliance** (assessed at **T2**) by benevolent and malevolent personifications of the MoH, while controlling for all other pertinent factors assessed at **T1**.

## 2. Methods

### 2.1. Participants and procedure

The Midgam Project Web Panel (henceforth, MIDGAM) is an Israeli company that specializes in providing infrastructure for internet research (<http://www.midgampanel.com/research/en/index.asp>). MIDGAM has access to dozens of thousands of Israelis who are interested in participating in online studies, either voluntarily or in exchange for monetary reimbursement. We contacted MIDGAM for the purpose of collecting the data for this study. Exclusion criteria were: not parenting a child aged 9 years old or younger, not residing in the Center or North of Israel, and not having a full command of the Hebrew language.

At **T1**, which commenced two days prior to Phase 2, 725 participants completed an online questionnaire tapping into demographics, emotional distress, parental stress, attitudes/behavioral intentions concerning the campaign, and personality variables

unrelated to this study. At **T2**, which transpired four months after the end of the campaign, participants were re-approached, and 555 responded (constituting a 76.5% rate). We assessed the presence and reasons for (non-)compliance.

### 2.2. Measures

#### 2.2.1. T1 battery

**2.2.1.1. Demographics.** A demographic questionnaire was constructed for this study, and inquired about participants' sex, age, place of birth, family status (1 = married, 2 = single, 3 = divorced, 4 = widowed), education (on a 13-point scale, encompassing no education to a Ph.D. degree), ethnicity (1 = Jews, 2 = Christian, 3 = Druz, 4 = other, 5 = no ethnic group), religiousness (1 = secular, 2 = religious, 3 = “traditional”, 4 = ultra-orthodox), and income (0 = no income, 1 = considerably below average, 2 = below average, 3 = average, 4 = above average, 5 = considerably above average). To simplify the presentation and based on extant distributions, we created binary variables for religiousness (“secular vs. some religiousness”), education (“some academic education vs. none”), and income (“average or above vs. below”).

**2.2.1.2. Pre-campaign attitudes and intentions.** This questionnaire, also constructed for this study, is a 5-point Likert scale ranging from 1 (not at all) to 5 (very much), and includes the following items: perceived stress related to the Polio issue, retrieval of information from the media, effectiveness of media information, and benevolent vs. malevolent personification (MoH as caring vs. hysterical). In addition, the following binary (yes/no) items were administered: intent to comply (“Do you intend to vaccinate your child against polio?”), ever vaccinated one's child using any sort of vaccine, objection to vaccination, consulted physicians regarding the vaccination campaign, and physicians' recommendation to vaccinate (or not).

**2.2.1.3. Parenting stress questionnaire – Short form [20].** This 36-item, 5-point Likert scale, self-report measure assesses parenting stress, based on three domains: *Parental Distress* (related to child-rearing;  $\alpha = 0.86$ ), *Parent-Child Dysfunctions* ( $\alpha = 0.92$ ), and *Child's Self-Regulation Difficulties* ( $\alpha = 0.83$ ).

**2.2.1.4. Depression, Anxiety, and stress scale – 21 item version (DASS – 21; [21]).** This 21-item, 4-point Likert scale, self-report measure taps into symptoms of depression, anxiety, and perceived stress transpiring over the last week ( $\alpha$ 's = 0.87, 0.77, and 0.89, for the three scales, respectively).

#### 2.2.2. T2 battery

Compliance was assessed via the following yes/no item: “Did you vaccinate your child against polio?”. Parents who answered “yes” were directed to the following binary (yes/no) items representing reasons for compliance: (1) “I adhered to the recommendations of the MoH”; (2) “I adhered to the recommendation of our pediatrician”; (3) “Friends have recommended that I vaccinate my child”; (4) “I feared that my child will contract polio (if not vaccinated)”; and (5) “I feared that another member of my family will contract polio if my child is not vaccinated”. Parents who answered “no” were directed to the following binary (yes/no) items representing reasons for non-compliance: (1) “Our pediatrician recommended that we do not vaccinate”; (2) “We object to the vaccination in principle”; (3) “This specific vaccination was unnecessary”; (4) “I thought that this vaccination might harm my child”; and (5) “I had a technical difficulty to arrive at the vaccination station”.

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