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Disgusted by Value, Unseen by the System: Moral Appeals, Emotions, and Vaccination

Following a decade of profound political and economic instability in Europe, Greece emerged during the COVID-19 crisis as a unique setting for examining moral persuasion in public health. This experimental study explored how different moral framings, utilitarian, deontological and value-based, shaped vaccination-related beliefs and intentions. Utilitarian appeals were most persuasive overall, especially for immediate behavioral intent. Yet, deontological messages proved effective among individuals with low trust in institutions and high fatalistic tendencies, suggesting that appeals to duty resonate when faith in systemic order erodes. In contrast, value-based appeals unexpectedly triggered stronger disgust responses, which in turn weakened vaccine acceptance. Here, disgust acted not just emotionally but symbolically, as a form of moral distancing from messages seen as intrusive or paternalistic. These findings reveal that persuasion is not neutral, it is filtered through affective and ideological schemas. The effectiveness of moral appeals depends on how they align or clash with recipients' lived moral frameworks.

Keywords: moral appeals, ideology, vaccination, COVID-19, emotions

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The COVID-19 pandemic has presented the world with one of the greatest public health challenges of the 21st century and its impact has not only been limited to health, but has also extended to social, economic and political levels. As countries battled the virus, vaccines have taken on a central role in restoring normality. However, the success of vaccination initiatives depends largely on the ability of advocacy campaigns to communicate the vaccination message within each country's specific social and political context.

The success of vaccination programs depends largely on the persuasive impact of pro-vaccination campaigns (Priyanka et al., 2021), that face challenges, since appeals to promote vaccination may provoke backlash, as citizens may perceive these campaigns as attempts to suppress their personal freedom (Plachouras et al., 2014). In general, vaccination campaigns include presenting scientific data (Gigerenzer, 2008), personal narratives (Betsch et al., 2013), informative messages from reliable sources (Haase et al., 2015) as well as moral appeals (Giubilini et al., 2018), but less attention has been given on the pro-vaccination moral appeals.

Moral messages have been found to shape not only attitudes and intentions, but also to evoke emotions such as anger, guilt, or disgust, which in turn modulate how individuals evaluate and act upon the persuasive content (Feinberg & Willer, 2019; Pizarro et al., 2015). Building on this literature, aim of this study is to investigate the relationship of moral appeals and beliefs, attitudes and intentions to vaccinate and test to what extent persuasive messages based on moral appeals evoke emotions to individuals, that have a positive or negative effect on vaccination intention. Previous research has focused on persuasion and moral appeals, as well as persuasive messages based on emotions (eg fear, or hope), but less attention has been given to the emotions evoked by persuasive moral appeals and their mediating effects on individuals' attitudes towards vaccination and intention to vaccinate. Therefore, this study focuses on the importance of persuasive messages and the emotional basis of their construction, but mostly on the emotional responses of individuals that face persuasive moral appeals.

In conclusion, the integration of local social dynamics and the adaptation of public health messages to the Greek reality as well as to social realities that showcase similar social characteristics are imperative for the success of vaccination campaigns and other health interventions.

Moral Appeals, Socio-Political Orientations and Emotions

Moral appeals as persuasive strategies utilize moral principles to inspire behaviors that are aligned with social values and include three main categories, namely utilitarian, deontological and value-based (Huang, 2024; Stohr, 2006). While these three categories are analytically distinct,

their persuasive impact is filtered through both emotional reactions and socio-political attitudes. Theories such as reactance theory (Brehm, 1966), cognitive dissonance theory (Festinger, 1957) and affective intelligence theory (Marcus et al., 2000) explain why messages can sometimes elicit emotions like anger or disgust instead of compliance (Anakpo & Mishi, 2022; Hajek & Häfner, 2021).

More particularly, reactance theory (Brehm, 1966) argues that when individuals perceive their freedom of choice as being threatened or restricted, they experience an emotional state, namely reactance, aimed at restoring their autonomy, especially when they perceive a message as controlling or paternalistic. These counterproductive responses include anger, irritation and disgust, which in turn undermine message acceptance (Dillard & Shen, 2005; Rains, 2012).

Cognitive dissonance theory (Festinger, 1957) explains how psychological discomfort arises when individuals perceive inconsistencies between their values, beliefs and behaviors. To reduce this discomfort, they may reject the message, alter their cognitions or exhibit emotional reactions such as disgust (Harmon-Jones, 2019). In the context of this study, when moral appeals conflict with individuals' core values, such as autonomy or fairness, cognitive dissonance can manifest as emotional disengagement, e.g. disgust can operate as a distancing mechanism that helps individuals resolve their inner tension between external demands and internal beliefs.

Affective intelligence theory (Marcus et al., 2000) highlights the role of emotions in attention, evaluation and behavior, since it is argued that emotions act as signals that direct cognitive resources. Emotions such as disgust serve as cues for avoidance, signaling that a message is threatening, morally objectionable or socially irresponsible. Thus, according to this theory, emotion is not a byproduct of persuasion but an internal driver of how individuals process and respond to messages.

Taken together, these three theories provide complementary insights into the mechanisms through which moral appeals influence persuasion. Reactance theory clarifies why messages when perceived as coercive trigger resistance, Cognitive dissonance theory explains how messages may produce discomfort that can be expressed by emotional and behavioral reactions and affective intelligence theory situates these emotions as signals that shape information processing and behavior.

At the same time, socio-political orientations such as legitimization of the social order or belief in personal mobility shape the extent to which individuals perceive messages as fair, legitimate, or threatening (Sanmarchi et al., 2022; Skitka & Morgan, 2014). Integrating both dimensions, emotions and ideology, into the analysis of each moral appeal type offers a stronger theoretical rationale for the study's hypotheses.

Utilitarian Moral Appeals

Utilitarian moral appeals refer to an approach to ethics that evaluates actions based on their consequences, seeking the greatest well-being for the greatest number of people and has been widely used in the field of public health. In the context of vaccination, utilitarian moral appeals are used to justify the need for vaccination, highlighting the benefits that accrue from protecting public health and achieving herd immunity (Gesser-Edelsburg et al., 2022; McClung et al., 2020). The impact of utilitarian moral appeals on vaccination is multidimensional. For example, as governments and public health organizations promote persuasive messages on vaccination programs, they often focus on benefits that stem from vaccination coverage, such as reducing disease transmission (Blasi et al., 2015). On the contrary, utilitarian moral appeals may raise concerns about the ethical dimension of mandatory vaccination or create a sense of injustice, especially if citizens feel that decisions are being made without their participation (Fiske et al., 2022; Giubilini et al., 2021). In the case of COVID-19 pandemic, campaigns that focused on the benefits of vaccination for society, such as avoiding serious diseases and restoring a sense of normality, have been proven to be persuasive (Arshanapally, 2023; Sprengholz et al., 2021). In conclusion, utilitarian moral appeals play a crucial role in promoting pro-vaccination behaviors but their effectiveness depends on the ability of persuasion campaigns to manage ethical issues and enhance public trust. In contemporary public health communication, such consequence-based messages represent a widely used, “default” framing that emphasizes pragmatic costs and benefits (e.g., reduced transmission, avoidance of severe illness) (Van Bavel et al., 2020; Childress et al., 2002; Kass, 2001). For this reason, utilitarian appeals were used as the reference category in the present study, against which the more normatively loaded deontological and value-based frames could be compared.

From an emotional perspective, utilitarian appeals are generally associated with pragmatic evaluations and tend to evoke fewer strong negative emotions compared to more moralizing appeals (Soveri et al., 2023). This relative neutrality makes them less likely to trigger psychological reactance, as the focus on collective outcomes reduces perceptions of coercion (Hajek & Häfner, 2021). However, the absence of strong emotional arousal does not guarantee universal effectiveness. Cognitive dissonance can still emerge when individuals perceive a gap between collective benefits and their personal risks, especially in contexts of institutional distrust (Anakpo & Mishi, 2022). Moderators such as belief in individual mobility may also condition responses, since those who feel that effort and autonomy are decisive in life outcomes may discount collective arguments, whereas individuals with weaker mobility beliefs may resonate more with utilita-

rian reasoning (Wu et al., 2020). These considerations highlight both the strengths and the limitations of utilitarian appeals, justifying the need to compare them systematically with deontological and value-based appeals.

Deontological Moral Appeals

Deontological moral appeals refer to an ethical approach that focuses on following rules and obligations, regardless of the consequences that may arise from actions and are closely related to the work of Immanuel Kant, who argues that certain actions are morally right and wrong based on their nature rather than their consequences. The impact of deontological appeals on vaccination is significant, as these appeals can reinforce individuals' sense of moral obligation to vaccinate. For example, health professionals often invoke the moral obligation to vaccinate to protect not only themselves but also their patients, especially the vulnerable ones (Tseng & Wang, 2021). This approach can enhance acceptance of vaccination, as individuals feel that their participation is necessary to protect public health and society. However, deontological appeals can also provoke reactions, especially when the obligations arising from these appeals conflict with individuals' personal beliefs or concerns (Piazza & Landy, 2013). In these cases, deontological appeals may not be persuasive to hesitant vaccinators, namely to those who are not entirely opposed to vaccination but delay, question, or feel uncertain about getting vaccinated, as moral obligation may be considered less important than their personal values. On the other hand, especially in times of cognitive ambiguity, deontological appeals can be effective by reducing uncertainty and allowing people to move towards their final decision without excessive analysis (Caughron et al., 2011). This approach can contribute to the internal validation of the need for action strengthening the individual's moral code, since the personal moral code of the "right thing to do" is being evoked, activating the persons moral identity (Pavey et al., 2024). In conclusion, deontological moral appeals play a crucial role in promoting vaccination, as they strengthen the sense of moral obligation and social responsibility, however, the effectiveness of these appeals depends on the ability of campaigns to manage individuals' ethical concerns and personal values.

From a theoretical perspective, deontological appeals are more likely than utilitarian ones to evoke strong negative emotions when perceived as coercive or paternalistic (Soveri et al., 2023). Reactance theory (Brehm, 1966) argues that when individuals experience vaccination as a "duty," they may feel their autonomy is under threat, responding with negative emotions. This highlights a potential weakness of deontological appeals compared to utilitarian, as they more easily activate defensive reactions. At the same time, cognitive dissonance theory (Festinger, 1957) clarifies why individuals disengage when moral duty conflicts with personal va-

lues, emotional reactions such as disgust serve to reduce the discomfort of inconsistency (Anakpo & Mishi, 2022). Affective intelligence theory (Marcus et al., 2000) indicating that emotions such as disgust can function as avoidance signals, highlights that when deontological messages are perceived as coercive, distrust not only reduced acceptance, but also redirects attention away from the source, thereby undermining compliance. Thus, disgust is not confined to value-based messages but can also emerge within deontological frames, underscoring its role as a cross-cutting mediator (Heffner et al., 2021).

In addition, the effectiveness of deontological appeals appears highly dependent on socio-political context. Research indicates that low legitimization of social order can strengthen the positive effect of duty-based appeals, since these bypass institutional distrust and appeal directly to internalized moral codes (Sanmarchi et al., 2022). Similarly, a strong need for fate control can amplify their persuasive impact, because individuals interpret the duty to vaccinate not as external imposition but as an expression of self-determined responsibility (Wu et al., 2020). Nevertheless, these conditions are not unique to deontological appeals, since similar dynamics may operate across different message types. For this reason, directional predictions (e.g., H2a) should be framed conservatively, recognizing that context may moderate all forms of moral communication, even if deontological frames are particularly sensitive to these influences.

Value-Based Moral Appeals

Value-based appeals refer to an approach to ethics that focuses on the values and principles that guide individuals' decisions and actions and emphasize the importance of ethical values, such as solidarity, justice, and responsibility, in understanding and evaluating ethical dilemmas. In the field of public health, value-based appeals are particularly important, as decisions about vaccination are influenced by people's values regarding social responsibility, and the protection of vulnerable groups (Prati et al., 2012; Sprengholz & Betsch, 2020). The impact of value-based ethical appeals on vaccination is multifaceted, since vaccination campaigns that focus on values such as solidarity and social responsibility have been shown to be effective in increasing vaccination rates. For example, campaigns that emphasize that vaccination protects not only the vaccinee but also those around them, such as children and immunocompromised people, reinforce a sense of social responsibility and solidarity (Korn et al., 2020). These appeals can motivate citizens to participate in vaccination programs, as they recognize that the act of vaccination has positive consequences for the community as a whole, however, value-based appeals can also encounter challenges since some individuals may oppose vaccination due to values related to their personal freedom or autonomy. In these cases, value-based

appeals may not be persuasive enough to convince reluctant vaccinators, as their personal values may conflict with the social values promoted by vaccination campaigns (Evans et al., 2021; Gesser-Edelsburg et al., 2022).

From a theoretical perspective, value-based appeals are especially prone to elicit resistance when perceived as moralizing or paternalistic. Based on reactance theory (Brehm, 1966) when these messages invoke collective virtues in ways that appear to constrain personal choice, individuals may experience reactance leading to negative emotions, such as disgust. At the same time, cognitive dissonance theory (Festinger, 1957) clarifies how value-based messages can create discomfort, when communal ideals clash with personal values. Finally, affective intelligence theory (Marcus et al., 2000) suggests that disgust directs attention away from the persuasive message, thus undermining compliance.

Compared to utilitarian appeals, value-based frames are more prone to elicit negative emotions when interpreted as moralizing or paternalistic. Unlike utilitarian appeals that focus on pragmatic outcomes, value-based appeals invoke ideals of virtue and solidarity, which can feel intrusive if they clash with personal autonomy (Feinberg & Willer, 2019; Pavey et al., 2024). While deontological appeals also stress obligation, they are typically tied to clear duties, whereas value-based appeals rely on broader moral expectations, leaving more room for recipients to perceive them as overreaching. This interpretive flexibility explains why value-based frames are expected to generate stronger negative emotional reactions, particularly disgust, that in this context, functions as a symbolic reaction that distances the individual from the implied moral authority of the message (Heffner et al., 2021; Pizarro et al., 2015). Importantly, disgust is not unique to value-based appeals, as it can also emerge when deontological appeals are perceived as coercive. However, value-based appeals appear especially vulnerable because they foreground social ideals that may not align with individual priorities.

Socio-political beliefs intensify these dynamics. Individuals with strong beliefs in personal autonomy or meritocracy may perceive value-based appeals as undermining self-determination, reinforcing reactance and rejection (Heffner et al., 2021; Skitka & Morgan, 2014). Conversely, when such beliefs are weaker, value-based messages may resonate more positively by reinforcing solidarity and communal responsibility. This variability underscores the need for cautious theoretical modelling: while value-based appeals are hypothesized to produce stronger negative affect, emotional and ideological filters can shape their impact across audiences, highlighting the complexity of moral persuasion in public health.

Current Research

This study was conducted in Greece, a country that before (and after) the COVID-19 pandemic was facing severe financial and political turbu-

lences. The Greek society is characterized by long-standing distrust of state institutions (Ervasti et al., 2019), questioning of the legitimization of political and institutional authority (Bratsis, 2010) and a general ambivalence towards the wider political system due to prolonged austerity (Theodossopoulos, 2017). The ongoing crisis has, furthermore, created a context where citizens question the legitimization of social order (Chrysosgelos, 2017) and has led to low beliefs in individual mobility (Prodromitis et al., 2017) thus creating a sense of social entrapment. In general, the consecutive austerity measures enforced in the country are related to the feeling that citizens have limited their ability to influence their own direction, an element that affects public psychology and participation in institutional processes (Karadimitriou & Pagonis, 2019). Research focusing on the public and institutional response to the Greek government's vaccination policies during the COVID-19 pandemic highlight a robust correlation between trust in Greek public health authorities and COVID-19 vaccination acceptance (Marinos et al., 2021) and emphasizes that increased trust in governmental and healthcare authorities correlates positively with support for mandatory vaccinations and intentions to get vaccinated (Giannouchos et al., 2021). Mouliou et al. (2021) suggest that stringent public measures can evoke stress responses, which may lead to increased vaccine hesitancy, highlighting that fear and uncertainty regarding policy implications can affect negatively vaccination update. The complexity of vaccine hesitancy in Greece that includes a multi-leveled interplay of trust, emotional responses, influenced by policy communications and the socio-demographic landscape is also discussed by Derdemezis et al. (2022), that suggest that socio-demographic variables should be taken into account by tailored public health strategies .

Building on the reviewed literature, it becomes evident that different moral appeals can evoke both pragmatic evaluations and strong affective reactions regarding vaccine-related outcomes, namely beliefs, attitudes and intentions to vaccinate. In this study, vaccine beliefs and vaccination attitudes are analyzed separately: beliefs index cognitive appraisals of safety, efficacy and necessity, whereas attitudes capture the overall evaluative orientation toward vaccination (Fishbein & Ajzen, 2010; Ajzen, 1991). Considering both provides a nuanced view of whether moral appeals shift specific cognitions or broader evaluations. While value-based appeals are especially prone to triggering negative emotions when perceived as paternalistic, deontological appeals can also elicit resistance if interpreted as coercive. Likewise, disgust may mediate persuasion outcomes across all message types, though it is expected to be more salient for value-based frames. Accordingly, among the discrete emotions assessed in the present study, disgust was designated a priori as the focal candidate mediator linking moral appeals to vaccine-related responses. In terms of moderation,

deontological appeals may become more persuasive under conditions of low institutional legitimacy or high need for personal control, yet these dynamics could plausibly extend to other moral appeals as well. Informed by these theoretical considerations, the present study adopts an exploratory-experimental approach. While the hypotheses are grounded in prior research, the pattern of mediating and moderating mechanisms is examined in an exploratory manner, and the findings are therefore treated as hypothesis-generating rather than fully confirmatory.

For this reason, the following hypotheses are formulated:

H1: The type of moral appeal (utilitarian, value-based and deontological) will have a significant effect on individuals' beliefs about vaccines, attitudes towards vaccination and intentions to vaccinate.

H1a: Compared to utilitarian appeals, which reflect the prevalent pragmatic framing in public health messaging, value-based appeals will elicit stronger negative emotional responses, particularly disgust.

H1b: Disgust will mediate the effect of moral appeals on vaccine-related outcomes, such that moral appeals that elicit stronger disgust will be associated with less favorable beliefs, attitudes and intentions regarding vaccination.

H2: Socio-political and ideological beliefs will moderate the persuasiveness of appeals.

H2a: When legitimization of the social order is low, deontological appeals are expected to be relatively more persuasive than utilitarian appeals, whereas at higher levels of legitimization, utilitarian appeals should become more persuasive.

H2b: The relative persuasiveness of deontological (vs. utilitarian) appeals is expected to be stronger under low belief in individual mobility, whereas utilitarian appeals are expected to gain advantage under high mobility beliefs, consistent with a crossover effect.

H2c: The relative persuasiveness of moral appeals will vary with need for fate control such that deontological appeals are more effective at low need for fate control, whereas utilitarian appeals become more persuasive at high need for fate control.

Methodology

Pilot Study

To assess the conceptual clarity and perceptual accuracy of the three moral messages used in the main experiment, a pilot study ($N = 169$) was conducted. Participants were recruited through convenience sampling via social media postings and personal contacts and were randomly assigned to one of three experimental conditions derived from the three moral framings (utilitarian, value-based, deontological), using LimeSurvey. Parti-

cipation was voluntary and no financial or other incentives were offered. Following exposure to the stimuli, participants rated the extent to which each message conveyed specific moral constructs.

Three composite indices were developed to capture participants' perception of the dominant moral frame in each message: Utilitarianism, measured through perceived emphasis on cost–benefit reasoning and negative consequences of non-vaccination ($r = .67, p < .001$); Deontological morality, captured through perceived salience of duty and responsibility ($r = .60, p < .001$) and Value-based, indexed by agreement with statements reflecting virtue ethics and the concept of the morally exemplary citizen ($r = .68, p < .001$).

A series of two-way ANOVAs confirmed that participants clearly distinguished between the three moral framings. Value-based messages scored significantly higher on the morality-as-value index compared to both utilitarian ($p = .003$) and deontological ($p = .005$) conditions. Utilitarian messages were perceived as significantly more utility-focused than value-based ($p < .001$) and deontological messages ($p < .001$). While the deontological messages did not differ significantly across all indicators, they were consistently associated with higher ratings on duty/responsibility, particularly in the mixed responsibility condition.

Collectively, the manipulation check supports the conclusion that the moral framings were semantically and perceptually distinct, with internal consistency and participant feedback reinforcing the validity of the moral constructs embedded in each condition. These results justified proceeding with the main study using the current messages as operationalizations of distinct moral frames.

Main Study

Design and Participants

The independent variable in this experimental study is the type of moral appeal (with three values, Utilitarian, Value-Based, Deontological) and the dependent variables are (a) Beliefs on vaccines, (b) Attitudes towards vaccination and (c) Intention to vaccinate. To determine the required sample size, an a priori power analysis was conducted using the G*Power 3.1.9.7 software (Faul et al., 2009). The analysis was designed for an analysis of variance (ANOVA) with fixed effects, considering a medium effect size ($f = 0.25$), a significance level of $\alpha = .05$, and high statistical power ($1 - \beta = .95$). The parameters used were (a) Number of groups: 6 (b) Numerator degrees of freedom (df): 2 and (c) Denominator degrees of freedom (df): 245. The results indicated that the minimum required total sample size to achieve the desired power was $n = 251$. The analysis yielded a critical F value of 3.033 and a noncentrality parameter (λ) of 15.69. The actual computed power of

the test was 0.95, confirming that the proposed sample size was sufficient to detect statistically significant differences between groups.

The sample of this study consisted of 267 participants. The mean age of the participants was 37.01 years ($SD = 13.77$), with a range from 18 to 77 years. Regarding gender, 149 participants (55.8%) identified themselves as female, 116 (43.4%) as male, while 2 individuals (0.7%) chose not to specify their gender. The only inclusion/exclusion criterion was that participants had to be over 18 years of age. Participants were recruited using a convenience sampling method, meaning they were selected based on availability and willingness to participate and no financial or other incentives were provided.

Materials

Prior to the stimuli, the participants were given questionnaires regarding ideology and sociopolitical beliefs.

The scale regarding the participants' Ideology and Social Perceptions (Papastamou et al., 2022) consists of 16 items representing different perspectives on social order: *Empathy* (single item, "It hurts me when other people suffer"), *Life Satisfaction* (single item "I am satisfied with my life"), *Relative Deprivation* (one item; "I often find it difficult to get the things that I and my family need"), *Perception of the world as Dangerous* (single item, "At this time in our country, life is unpredictable and dangerous"), *Political engagement* (6 questions, $\alpha = .745$ "It has always been important to me to express publicly my political views" – the index was constructed after reversing negative questions), *Legitimization of social order* (2 questions, $r = .299$, $p < .001$, "In this country the power differences between social groups will never change", "Even if someone is qualified but does not come from the upper class, (s)he will not succeed), *Belief in individual mobility* (2 questions, $r = .481$, $p < .001$, "In our society, whoever tries hard succeeds in the end", "Everyone can change their own destiny and rise socially"), *Need for fate control* (single item, "I need to feel that I personally determine my own destiny") and *Belief in collective action* (single item, "Only together with others who are in the same position, can one strive to improve one's own position").

Messages

Participants were randomly exposed to three different moral appeals deontological/value based/utilitarian paragraphs that aimed to act as persuasion stimuli in favor of vaccination (see Appendix A). For example, "You need to get vaccinated because the sacrifices you might make now are nothing compared to how much worse the consequences will be if you don't. Think about the consequences of not getting vaccinated. Think about what you stand to lose if you don't. Getting vaccinated is the only

way to gain as much as possible now and face as little risk as possible in the future.” (Utilitarian appeal). After having read the text, participants were asked to answer questions regarding their emotional response and their attitudes towards vaccines and vaccination.

Post Measures

Emotions

To capture participants' emotional responses, the Discrete Emotions Questionnaire (Harmon-Jones et al., 2016) was used, asking participants to indicate their emotional experience after reading the stimuli (1 not at all – 7 an extreme amount) from a list of emotions. The questionnaire consists of eight indicators (each indicator includes four questions, totaling 32 items): Anger ($\alpha = .943$, Anger, Rage, Mad, Pissed off), Disgust ($\alpha = .832$, Grossed out, Nausea, Sickened, Revulsion), Fear ($\alpha = .923$, Terror, Scared, Panic, Fear), Anxiety ($\alpha = .831$, Dread, Anxiety, Nervous, Worry), Sadness ($\alpha = .684$, Sad, Lonely, Empty, Grief), Desire ($\alpha = .821$, Wanting, Desire, Craving, Longing), Relaxation ($\alpha = .832$, Easygoing, Chilled out, Calm, Relaxation), Happiness ($\alpha = .857$, Happy, Satisfaction, Enjoyment, Liking).

Beliefs on Vaccines, Attitudes Towards Vaccination and Intention to Vaccinate

To measure beliefs and attitudes toward vaccination the scale of Askelson et al. (2010) was employed and two different indicators were used, Beliefs on vaccines (4 items, $\alpha = .945$) vaccines are (a) effective, (b) necessary, (c) safe, (d) important and Attitudes towards vaccination (3 items, $\alpha = .935$) vaccination is (a) necessary, (b) a good idea, (c) beneficial. Intention to vaccinate was measured with four different questions (a) “I have not received any dose of the COVID-19 vaccine and I do not intend to get vaccinated any time soon., (b) “I have not received any dose of the COVID-19 vaccine, but I intend to get vaccinated soon.”, (c) “I have received one or more doses of the COVID-19 vaccine, but I do not intend to receive another dose any time soon.” and d) “I have received one or more doses of the COVID-19 vaccine and I intend to receive another dose soon.”

The analysis of all the above variables enables the exploration of cognitive, emotional, and social factors influencing vaccination intentions, providing valuable data for public health strategies.

Procedure

After having received the approval of the Committee for Research Ethics and Integrity of the Aristotle University (Ref. Nr. 75815/2023) the

researchers called for participants through social media and personal contacts. Participants were randomly assigned to different experimental conditions, using Limesurvey software. At the beginning of the procedure, participants were informed regarding the nature of the study, were given assurances regarding the anonymity of their participation and that they were free to withdraw their participation anytime, as well as that their answers would be used only for scientific and academic purposes. The emails of the researchers were also provided and all participants were thanked for their intention to participate. By clicking “I agree” the participants were transferred to a new page the Ideology and Social Perceptions Scale was provided. After the completion of the two questionnaires the participants were randomly assigned to one of the three different experimental conditions and were asked to carefully read a text that was framed correspondingly. After carefully reading the text, participants were asked to fill the DEQ questionnaire and after that, questions regarding their perceptions and attitudes towards vaccines and vaccination. Lastly, their demographic data was asked. After the completion of the study participants were debriefed and thanked for their participation reminding how important their contribution was.

Table 1

Descriptive Statistics and Pearson Correlations Among Study Variables (N = 267)

Variable	M	SD	1	2	3	4	5	6
1. Beliefs about vaccines	3.22	1.24	—					
2. Attitudes toward vacc.	3.18	1.33	.93***	—				
3. Int1: No dose/intend no	2.64	2.16	-.69***	-.65***	—			
4. Int2: Intend to vaccinate soon	2.35	1.81	.08	.06	.01	—		
5. Int3: Doses, no further	4.28	2.39	-.12	-.11	-.10	.05	—	
6. Int4: Vaccinated, intend another	2.96	2.09	.54***	.52***	-.36***	.29***	-.36***	—

Note. Composite scores were used for beliefs (Vac1–Vac4, $\alpha = .945$) and attitudes (Vac1–Vac3, $\alpha = .935$). Int1–Int4 = vaccination intention items.

* $p < .05$, ** $p < .01$, *** $p < .001$.

The experiment lasted from April 10th, 2023 to December 12th, 2023. Data was then coded and statistical analyses were employed using SPSS 25 software.

Results

This section presents the results of the statistical analyses conducted to investigate the hypotheses. Initially, the main effects of the different types of moral appeals (deontological, utilitarian, value-based) on beliefs on vaccines, attitudes towards vaccination and intention to vaccinate are examined. Then the moderation role of ideological variables was examined as well as the mediation role of emotional reactions based on moral appeals on beliefs, attitudes and intention is investigated.

Descriptive Statistics

Means, standard deviations, and Pearson correlations for all variables are presented in Table 1. The correlation analysis among the main dependent variables revealed several significant relationships. Beliefs on vaccines and attitudes towards vaccination were found to be strongly and positively correlated ($r = .93$), indicating that individuals who perceive vaccines as effective, necessary, and safe also tend to hold favorable attitudes towards vaccination in general. These two variables were also negatively correlated with Int1 (participants who had not received any vaccine dose and did not intend to get vaccinated soon), with coefficients of $r = -.69$ for beliefs and $r = -.65$ for attitudes, respectively. This suggests that stronger beliefs and more positive attitudes are associated with a lower intention to avoid vaccination.

Conversely, both beliefs and attitudes showed moderate positive correlations with Int4 (participants who had already been vaccinated and intended to receive another dose), with values of $r = .54$ and $r = .52$ respectively. This pattern further supports the view that favorable cognitive evaluations of vaccination are associated with a higher likelihood of continued vaccine uptake.

However, correlations between beliefs or attitudes and Int2 (intending to get vaccinated soon) and Int3 (received one or more doses but do not intend to get another soon) were weak and non-significant, suggesting these intermediate positions are less clearly linked to underlying cognitive appraisals. Lastly, as expected, Int1 and Int4 were moderately negatively correlated ($r = -.36$), reflecting their opposite poles regarding vaccination intentions.

Main Effects of the Independent Variable

A one-way multivariate analysis of variance (MANOVA) was conducted to examine whether the type of moral appeal (Utilitarian, Value-Based,

Deontological) affected a set of six dependent variables related to vaccination intentions and attitudes. These included four behavioral intention items and two composite variables: positive beliefs about vaccines and positive attitudes toward vaccination. The overall multivariate effect was statistically significant, Wilks' $\Lambda = .93$, $F(12, 520) = 1.95$, $p = .037$, partial $\eta^2 = .04$, suggesting that the form of moral appeal influenced the combined dependent variables.

Although beliefs about vaccines and attitudes toward vaccination were operationalized as composite variables, we retained them as separate outcomes. This decision was grounded in theoretical distinctions widely recognized in health and social psychology: beliefs capture cognitive appraisals regarding the safety, effectiveness, and necessity of vaccines, whereas attitudes reflect a broader evaluative orientation that integrates affective, cognitive, and motivational elements (Ajzen, 1991; Maio & Haddock, 2015). While the two constructs were indeed highly correlated in the present data ($r = .93$), previous research has shown that they can exert distinct predictive effects on health intentions and behavior (Fishbein & Ajzen, 2010; Conner & Sparks, 2015; Betsch et al., 2017). We therefore chose to analyze them separately to remain consistent with theoretical models of health behavior, while acknowledging the strong empirical overlap observed here. To further examine the effect of moral appeal on each dependent variable separately, we conducted six univariate ANOVAs corresponding to beliefs, attitudes, and the four intention items. The results are summarized in Table 2.

Follow-up univariate analyses indicated a statistically significant effect of moral appeal on beliefs about vaccines, $F(2, 264) = 3.19$, $p = .043$, partial $\eta^2 = .024$. Participants in the utilitarian condition reported higher positive beliefs ($M = 3.50$) compared to those in the value-based ($M = 3.11$) and deontological ($M = 3.07$) conditions. However, post hoc comparisons using Bonferroni adjustment did not yield statistically significant pairwise differences ($ps > .05$). In contrast, the effect of moral appeal on attitudes toward vaccination did not reach significance, $F(2, 264) = 2.17$, $p = .117$.

Regarding vaccination intentions, significant effects were observed on two of the four items:

(a) the intention to get vaccinated soon among those currently unvaccinated ($F(2, 264) = 4.21$, $p = .016$, partial $\eta^2 = .031$), and (b) the intention to receive an additional vaccine dose among already vaccinated participants ($F(2, 264) = 4.08$, $p = .018$, partial $\eta^2 = .030$).

In both cases, the utilitarian condition was associated with stronger vaccination intentions relative to the other two conditions. The remaining two intention items showed no significant differences between groups ($ps > .05$).

In total, six univariate ANOVAs were conducted, corresponding to the two composite variables (beliefs and attitudes) and the four intention items. Of these six models, three showed statistically significant main effects of moral appeal (beliefs, Intention 2, Intention 4). Results for the non-significant models are also reported for transparency. Given the relatively small number of dependent variables and the exploratory status of the mediation and moderation analyses in this dataset, we did not apply additional alpha-level corrections beyond the initial MANOVA. We acknowledge, however, that the absence of familywise error correction increases the risk of Type I error, and we interpret the univariate results with appropriate caution. Importantly, the initial MANOVA already controlled the Type I error rate at the multivariate level, which further justifies the use of univariate follow-ups without applying overly conservative corrections.

Table 2

Univariate ANOVAs Testing the Effects of Moral Appeal on Vaccine-Related Beliefs, Attitudes, and Intentions (N = 267)

Dependent variable	<i>F</i>(2, 264)	<i>p</i>	partial η^2
Beliefs about vaccines	3.19	.043	.024
Attitudes toward vaccination	2.17	.117	.016
Int1: No dose / intend no	1.02	.361	.008
Int2: Intend to vaccinate soon	4.21	.016	.031
Int3: Doses, no further	0.85	.429	.006
Int4: Vaccinated, intend another	4.08	.018	.030

Note. Int1-Int4 = vaccination intention items. Statistically significant effects ($p < .05$) are presented in bold.

Mediating Role of Disgust

To examine whether the effects of moral appeals on vaccine-related outcomes were mediated by emotional responses, we conducted a series of mediation analyses using PROCESS (Model 4; Hayes, 2022). In line with the theoretical rationale outlined in the introduction, disgust was treated as the primary candidate mediator in the main analyses, because it is closely linked to perceptions of moral contamination and rejection of a message's implied moral authority. The remaining emotions were included both to reduce demand characteristics and for exploratory purposes, allowing us to examine whether other negative emotions (e.g., anger, fear, anxiety) would show comparable patterns. However, only disgust was entered in the *a priori* mediation models reported in the main text. For completeness, we also explored analogous models using other negative emotions from the DEQ (anger, fear, anxiety) as mediators. These additional analyses did not reveal robust or systematically stronger indirect effects than those observed for disgust, and no consistent pattern emerged that would call for an alternative focal mediator. Given our theoretical focus on disgust and the exploratory nature of these supplementary tests, we therefore concentrate on the disgust models in the main text. The independent variable was type of moral appeal, coded with utilitarian appeal as the reference category and two dummy contrasts (value-based vs. utilitarian; deontological vs. utilitarian). Disgust was entered as the mediator, and the dependent variables were beliefs about vaccines, attitudes toward vaccination and the four intention items.

This analytic approach allowed us to estimate two sets of mediation pathways (one for each contrast) for every dependent variable. Table 3 reports the complete results, including the *a* path (appeal $\rightarrow$ disgust), the *b* path (disgust $\rightarrow$ outcome), the direct effect of appeal (*c'*) and the indirect effect (*ab*) with 5,000 bootstrap samples and 95% bias-corrected confidence intervals. Indirect effect sizes are presented as completely standardized indirect effects (*abcs*; Wen & Fan, 2015).

As shown in Table 3, value-based appeals elicited significantly more disgust than utilitarian appeals. This heightened disgust was associated with lower vaccine beliefs and attitudes and produced opposite effects across vaccination intentions: it reinforced avoidance among participants who had not received any dose and did not intend to vaccinate (Intention 1), while it also reduced the intention to receive another dose among vaccinated participants (Intention 4). No significant indirect effects were observed for the deontological contrast or for Intention 3.

Table 3

Mediation Analyses Testing the Indirect Effects of Moral Appeals on Vaccine-Related Outcomes Through Disgust

Outcome	Contrast (vs utilitarian)	a: Appeal→Disgust b (SE)	b: Disgust→Y b (SE)	c': Direct b (SE)	ab: Indirect b (BootSE) [95% CI]	abcs
Beliefs	Value-based	0.57 (0.24)*	-0.43 (0.04)***	-0.14 (0.15)	-0.25 (0.11) [-0.46, -0.04]	-0.09
Beliefs	Deontological	0.01 (0.25)	-0.43 (0.04)***	-0.42 (0.16)*	-0.01 (0.11) [-0.22, 0.21]	≈0
Attitudes	Value-based	0.57 (0.24)*	-0.46 (0.04)***	-0.13 (0.17)	-0.26 (0.11) [-0.48, -0.05]	-0.09
Attitudes	Deontological	0.01 (0.25)	-0.46 (0.04)***	-0.30 (0.17)†	-0.01 (0.11) [-0.23, 0.22]	≈0
Intention 1	Value-based	0.57 (0.24)*	0.61 (0.07)***	0.18 (0.29)	0.35 (0.16) [0.06, 0.69]	0.08
Intention 4	Value-based	0.57 (0.24)*	-0.40 (0.08)***	-0.08 (0.30)	-0.23 (0.10) [-0.43, -0.03]	-0.05

Note. a = effect of moral appeal (contrast vs utilitarian) on disgust; b = effect of disgust on outcome; c' = direct effect of appeal controlling for disgust; ab = indirect effect with 5,000 bootstrap samples; abcs = completely standardized indirect effect (Wen & Fan, 2015), where values of approximately .01, .09 and .25 can be interpreted as small, medium and large effects, respectively. * $p < .05$, ** $p < .01$, *** $p < .001$, † $p < .10$.

The mediation analyses confirmed that disgust acted as a selective mediator of value-based appeals. Significant indirect effects emerged for beliefs, attitudes, Intention 1, and Intention 4, all in the direction of reduced vaccine acceptance. No mediation was observed for the deontological contrast or for Intention 3. Taken together, these findings indicate that disgust amplifies resistance when moral messages are framed in value terms, underlining its role as a pivotal but ambivalent mechanism in moral persuasion.

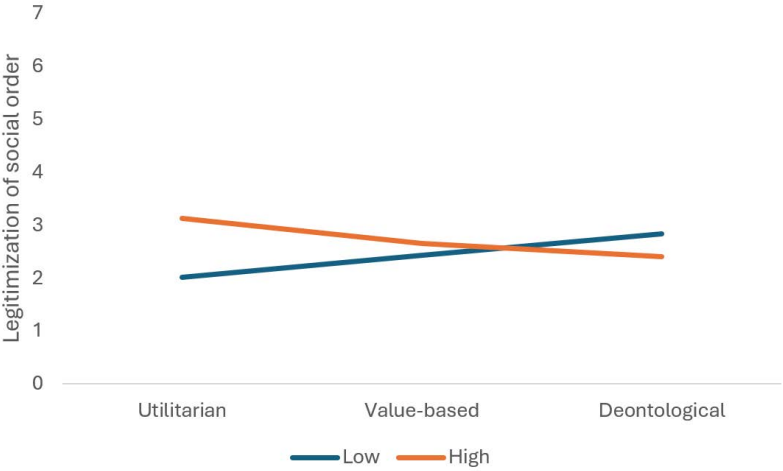
Moderating Role of Ideological Variables

Moderation analyses were conducted in PROCESS (Model 1; Hayes, 2022) with utilitarian appeals coded as the reference category. Two dummy contrasts were therefore created: value-based vs. utilitarian and deontological vs. utilitarian. The dependent variable in these models was vaccination intention (Int2), and the moderators were legitimization of the social order, belief in individual mobility, and need for fate control. Each model included the main effects of moral appeal and the moderator, as well as their interaction term.

Table 4 presents the interaction coefficients from the three moderation

Figure 1

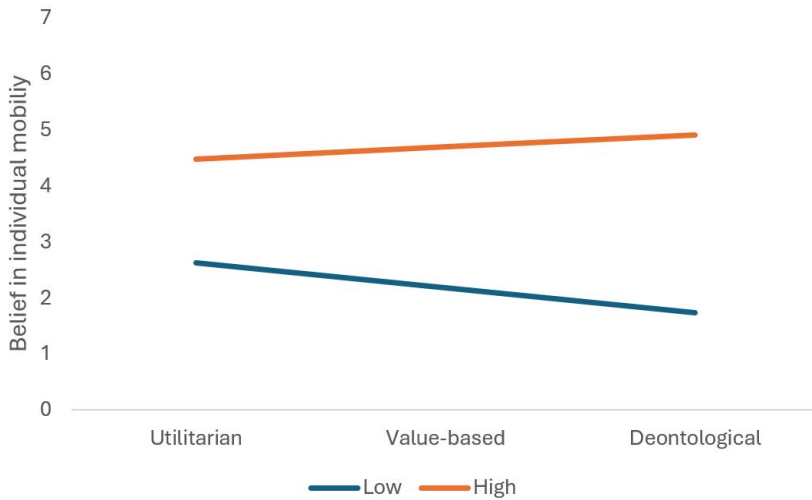
Moderation of Moral Appeals by Legitimization of the Social Order



Note. “Low” and “High” represent participants with low and high scoring on legitimization of the social order. Low scoring indicates individuals who deeply question the fairness of social power structures, whereas high scoring indicates greater acceptance of the existing social hierarchy.

Figure 2

Moderation of Moral Appeals by Belief in Individual Mobility



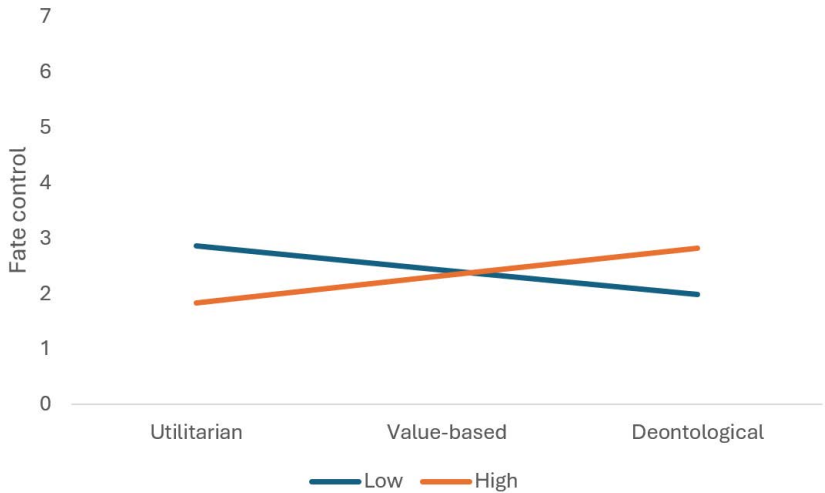
Note. “Low” and “High” represent participants with low and high scoring on belief in individual mobility. Low scoring reflects a strong belief in social entrapment and limited opportunities, while high scoring reflects a strong belief in meritocracy and that hard work leads to social rise.

models. Significant interactions emerged for legitimization of the social order ($b = -0.239, p = .015$), belief in individual mobility ($b = 0.368, p < .001$), and need for fate control ($b = 0.314, p = .003$), indicating that these ideological variables moderated the effect of moral appeals on vaccination intention.

Table 4 presents the full regression models for legitimization of the social order, belief in individual mobility and need for fate control as moderators of the association between moral appeals and vaccination intention (Int2). Each model included the main effects of moral appeal (dummy-coded with utilitarian as the reference category), the moderator and their interaction. Significant interactions were observed for legitimization of the social order ($b = -0.239, p = .015$), belief in individual mobility ($b = 0.368, p < .001$) and need for fate control ($b = 0.314, p = .003$). These findings indicate that the effect of moral appeals on vaccination intention varied depending on participants’ ideological beliefs.

Figure 3

Moderation of Moral Appeals by Need for Fate Control Determination



Note. “Low” and “High” represent participants with low and high scoring on the need for fate control. Low scoring represents a lower perceived need to personally determine one's life course, whereas high scoring represents a strong psychological need to feel in control of one's own destiny.

Simple-slope analyses showed that at low levels of legitimization of the social order (16th percentile), the deontological appeal predicted a significantly higher intention to vaccinate compared to the utilitarian appeal ($b = 0.83$, $SE = 0.39$, 95% $CI [0.07, 1.60]$). At higher levels of legitimization of social order (50th and 84th percentiles), this effect attenuated and was no longer significant, thus suggesting that the persuasive impact of moral appeals varies depending on participants’ perceptions of social order legitimacy.

Table 4

Moderation of Moral Appeals (Utilitarian Reference) by Ideological Variables on Vaccination Intention (N = 267)

Panel A. Legitimization of the social order as moderator

Predictor	<i>b</i>	<i>SE</i>	<i>t</i> (263)	<i>p</i>	95% <i>CI</i>
Constant	0.54	0.86	0.63	.531	[−1.15, 2.23]
Moral appeals	1.01	0.40	2.52	.012	[0.22, 1.80]
Legitimization of order	0.42	0.21	2.05	.042	[0.02, 0.83]
Moral Appeals x Legitimization	−0.24	0.10	−2.46	.015	[−0.43, −0.05]

$R^2 = .025$, ΔR^2 (interaction) = .023

Panel B. Belief in individual mobility as moderator

Predictor	<i>b</i>	<i>SE</i>	<i>t</i> (263)	<i>p</i>	95% <i>CI</i>
Constant	4.94	0.88	5.62	<.001	[3.21, 6.68]
Moral appeals	−1.55	0.43	−3.63	<.001	[−2.39, −0.71]
Individual mobility	−0.62	0.19	−3.29	.001	[−1.00, −0.25]
Moral Appeals × Individual mobility	0.37	0.09	4.03	<.001	[0.19, 0.55]

$R^2 = .063$, ΔR^2 (interaction) = .058

Table 4

Moderation of Moral Appeals (Utilitarian Reference) by Ideological Variables on Vaccination Intention (N = 267)

Panel C. Need for fate control as moderator

Predictor	<i>b</i>	<i>SE</i>	<i>t</i> (263)	<i>p</i>	95% <i>CI</i>
Constant	5.95	1.36	4.39	<.001	[3.28, 8.62]
Moral appeals	−1.70	0.60	−2.81	.005	[−2.89, −0.51]
Fate control	−0.66	0.23	−2.85	.005	[−1.11, −0.20]
Moral Appeals × Fate Control	0.31	0.10	3.04	.003	[0.11, 0.52]

$R^2 = .035$, ΔR^2 (interaction) = .034

Note. Unstandardized coefficients from three separate moderation models (PROCESS Model 1; Hayes, 2022) predicting vaccination intention (Beh2). Moral appeals were represented by a single ordinal predictor (ep2; 1–3) and interacted with each ideological variable in turn. Each model includes the main effects of moral appeals and the moderator, as well as their interaction term. R^2 denotes the total variance explained by the full model; ΔR^2 denotes the additional variance explained by the interaction term.

Simple-slope analyses indicated that at low levels of belief in individual mobility (Figure 2), the deontological appeal was associated with stronger vaccination intention compared to the utilitarian appeal ($b = -0.45$, $SE = 0.19$, 95% $CI [-0.82, -0.08]$). In contrast, at high levels of mobility, the utilitarian appeal became more persuasive ($b = 0.66$, $SE = 0.20$, 95% $CI [0.27, 1.05]$). This pattern suggests that individuals with weaker beliefs in meritocracy responded more favorably to deontological reasoning, whereas those with stronger mobility beliefs aligned more with utilitarian arguments.

Finally, as shown in Figure 3, a significant moderation effect also emerged for need for determination of fate, $b = 0.314$, $SE = 0.103$, $t(263) = 3.04$, $p = .003$, 95% $CI [0.11, 0.52]$. Simple-slope analyses revealed that when the need for fate control was low, participants responded more positively to deontological appeals ($b = -0.44$, 95% $CI [-0.88, -0.01]$). In contrast, when the need for fate control was high, utilitarian appeals became more persuasive ($b = 0.50$, 95% $CI [0.12, 0.88]$). This crossover interaction suggests that the relative persuasiveness of moral appeals de-

depends on individuals' perceived need to exert control over their fate.

Figures 1–3 were generated from the PROCESS model and depict predicted values of vaccination intention at low (–1 SD), mean, and high (+1 SD) levels of the moderators. For legitimization of the social order, deontological appeals were more effective than utilitarian appeals when legitimization was low, but this difference diminished at higher levels. For belief in individual mobility, deontological appeals increased intentions when mobility belief was low, whereas utilitarian appeals were more effective at higher mobility. Finally, for need for fate control, deontological appeals strengthened intentions when the perceived need to control fate was low, whereas utilitarian appeals were more effective when the need of fate control was high.

Given concerns about power in moderation analyses, we conducted retrospective power analyses in G*Power (linear multiple regression: fixed model, R^2 increase; $\alpha = .05$; $N = 267$; tested predictor = 1; total predictors = 3). Achieved power was .51 for legitimization of the social order ($f^2 = .023$), .86 for individual mobility ($f^2 = .062$), and .66 for fate control ($f^2 = .035$). These results indicate adequate sensitivity for the latter two moderators, but limited power for the legitimization effect, which should therefore be interpreted with caution.

Discussion

Effects of Moral Appeals

The results of this study revealed significant differences in the effectiveness of moral appeals in enhancing positive attitudes and intentions to vaccinate. Specifically, utilitarian appeals led to higher levels of positive beliefs about vaccines, more positive attitudes towards vaccination, and stronger intentions to vaccinate, compared to deontological and value appeals. This finding confirms hypothesis H1. This underscores not only the statistical confirmation of H1, but also provides evidence that pragmatic, consequence-focused communication continues to resonate strongly in vaccine context. The effect was not uniform across all dependent variables, which highlights the need to consider both significant and non-significant results to capture the full pattern of findings. This may also be linked to a cultural tendency in the Greek context to favor pragmatic over normative discourses, particularly in the aftermath of prolonged political delegitimization and economic austerity (Bratsis, 2010; Karadimitriou & Pagonis, 2019). Given the exploratory-experimental nature of the design, these results should be interpreted as hypothesis-generating, especially with regard to the mediating and moderating mechanisms, rather than as definitive tests of a fully specified model.

In addition, the effectiveness of utilitarian appeals is consistent with previous findings showing that appeals based on the consequences of action, specifically, health protection and risk avoidance, are more persuasive, especially in individualistic cultural contexts or during times of crisis (Limbu & McKinley, 2025; Pavey et al., 2024). In contrast, deontological and value appeals, which are based on moral obligation, duty, or virtue, appear to be less effective, a finding also observed in studies such as Soveri et al. (2023), where such types of appeals were associated with emotional resistance and negative emotions, thus confirming the hypothesis H1a. This differentiation also invites reflection on the timing of the study. Data were collected in 2023, at a point when COVID-19 had receded as a dominant public concern. This temporal lag may have reduced the resonance of duty- or value-based messaging, amplifying instead pragmatic messages that fit with an audience fatigued by normative justifications. Reactance theory offers an explanatory basis for this differentiation: when individuals perceive a message as limiting their freedom of choice, they are more likely to react with rejection (Brehm, 1966). Deontological appeals, which present vaccination as a “duty” or “obligation,” are particularly likely to trigger such reactions. The same is true for value appeals when they are interpreted as invoking moral superiority or value pressure. Recent work on reactance in health contexts (Hajek & Häfner, 2024), shows how this dynamic was especially vivid during the pandemic, where normative claims often collided with perceptions of autonomy. This suggests that backfiring of value-based appeals in this study is not an isolated effect but rather fits within a broader theoretical framework.

Furthermore, cognitive dissonance theory can help to understand how individuals attempt to manage the internal conflict that arises when a moral message conflicts with their personal values, ideological identity, or sense of autonomy. As argued by Anakpo and Mishi (2022), when an individual feels that the message causes a discrepancy between their personal attitude and the expectation placed on them, they may react negatively as a mechanism to restore psychological balance.

The Mediating Role of Disgust

The analysis confirmed hypothesis H1a, since value-based appeals elicited significantly more disgust than utilitarian ones, and this emotional response was associated with less favorable attitudes, beliefs and intention. More specifically, higher levels of disgust were associated with lower beliefs on vaccines, more negative attitudes towards vaccination and lower intention to receive another dose to those participants that have already received at least one dose. This moderation was partial and did not hold across all outcomes, which underlines the importance of treating disgust as a context-dependent rather than universal mediator.

This finding aligns with Affective Intelligence Theory, since emotions such as disgust affect the behavioral reaction, especially when a message clashes with established belief systems, as shown by Marcus et al (2000). In this context, disgust may emerge not only as a response to the content, but as a rejection of what the message symbolically represents, since value-based appeals can be perceived as intrusive or patronizing. In environments characterized by institutional distrust, moralistic language may be perceived as condescending or even manipulative, prompting aversive responses.

What is intended as inspiration may thus be received as moral imposition. This interpretation is consistent with Reactance Theory (Brehm, 1966), which posits that emotional resistance arises when autonomy is threatened. In this case, disgust may be a proxy for a broader rejection, not just of the message content, but of the moral authority implied by the appeal. Similarly, from a dissonance perspective (Festinger, 1957), when a message confronts people with moral judgements that feel incompatible with their sense of self, disgust can serve as a signal of this rupture, enabling the individual to restore psychological coherence by rejecting the message itself, an affective rejection that is not merely reactive but also symbolic as it extends to the perceived authority of the speaker and the cultural frame they represent (Lakoff, 2003).

Sociopolitical and Ideological Variables

Regarding sociopolitical and ideological variables, hypothesis H2 was also confirmed, as results show that the effects of moral appeals on vaccine related outcomes was indeed moderated by sociopolitical and ideological beliefs. More particularly, hypothesis H2a was also confirmed, as the results show that when levels of legitimization of social order are low, deontological appeals are associated with increased vaccination intentions compared to utilitarian appeals. This finding is particularly important, given that individuals who reject the legitimacy or justice of social institutions often exhibit ambivalence or even emotional distance towards practical/utilitarian arguments presented as the logical consequence of an unjust social structure, as also argued by Sanmarchi et al. (2022). In this context, deontological appeals may offer a moral axis that bypasses the evaluation of institutions: they appeal to an internal sense of duty, individual responsibility, or dignity, elements that can function persuasively even in conditions of distrust or disillusionment with the social order. Research has shown that in such environments, where social inequalities are perceived as intense and persistent, appeals to collective duty can reduce resistance and enhance positive intentions (Anderson & Creanza, 2023). The above can also be interpreted through the theory of cognitive dissonance: when an individual feels that social structures are unjust, but wishes to act re-

sponsibly, resorting to a deontological-type moral framework can reduce internal tension, allowing them to maintain the coherence of their identity without feeling that they are conforming to an unjust system.

Another important finding of the present study concerns the hypothesis H2b, which is confirmed, that low belief in individual mobility enhances the effectiveness of deontological appeals on vaccination intention. The results showed that individuals with low individual mobility belief responded more positively to the deontological condition, indicating a greater intention to be vaccinated. For individuals who do not believe the system allows to move forward, this appeal may offer clarity and direction rooted in shared norms rather than transactional outcomes (Skitka et al., 2005). Furthermore, as suggested by Feldman (2003), when individual agency is perceived as limited, deontological appeals become more persuasive because they bypass pragmatic cost-benefit reasoning and resonate with deeper intuitions and moral codes.

Another interesting finding concerns the significant effect of the need to determine fate on the relationship between moral appeals and intention to vaccinate. More specifically, it was shown that when the need to determine fate is high moral appeals based on duty and responsibility are more effective than utilitarian appeals in strengthening the intention to vaccinate, thus confirming hypothesis H2c. This reinforces the idea that autonomy and control are not uniformly linked to utilitarian reasoning but can also be triggered by deontological appeals, when these resonate with personal responsibility. The need to determine one's fate is associated with the individual's desire to maintain control over decisions and to feel autonomous in situations of uncertainty. As supported by the study of Wu et al. (2020), individuals with a high need to control fate react more positively to persuasion strategies when they feel that their decisions are not imposed but are an expression of personal responsibility. Therefore, moral appeals that reinforce the sense of duty and personal responsibility seem to activate this need, leading to more positive attitudes towards vaccination. At the same time, according to Reactance Theory (Brehm, 1966), when individuals feel that their autonomy is threatened, they may react with denial or negative emotions. However, when the message does not impose external control but reinforces the personal sense of duty, as is the case with moral appeals, then reactivity is reduced, thus the need to determine fate reinforces the positive effect of moral appeals.

Summarizing the above findings, it becomes clear that sociopolitical and ideological beliefs actively affect the reception and effectiveness of moral appeals. The different aspects of the hypotheses H2a, H2b and H2c highlight that the moral strategy itself can be either reinforcing or deterrent, depending on the recipient's worldview and cognitive evaluations. deontological appeals can function as an internal moral compass that

substitutes for delegitimized state authority (H2a) and societal structures thus aligning the individuals to be persuaded by their own internal moral compass. These results demonstrate the importance of adapting ethical messages to the ideological and psychological profile of the recipients, in order to increase the effectiveness of persuasion strategies on public health issues, such as vaccination.

The findings of this study acquire additional significance when interpreted within the specific sociocultural and political context in Greece and can be given as example for societies that are characterized by a long-standing distrust in state institutions, a historical ambivalence towards authority and a sociopolitical context shaped by years of austerity and perceived disempowerment as showcased by previous works in the Greek context (Bratsis, 2010; Ervasti et al., 2019; Prodromitis et al., 2017; Theodossopoulos, 2017). However, beyond Greece, these dynamics resonate with broader global trends: across many democracies in the Global North and South, trust in government has been declining (Organisation for Economic Co-operation and Development, 2022), which raises the question of whether the observed moderation effects could be generalizable beyond this cultural setting.

The findings of this study aspire to contribute to a more nuanced understanding of how moral communication intersects with ideological beliefs and emotional responses in public health contexts. Rather than assuming a universal effectiveness of ethical framing, the results suggest that the persuasive impact of moral appeals depends heavily on how individuals perceive their own identity, fairness within the system and the legitimacy of those promoting the message. This observation aligns with the view that moral cognition is not detached from social positioning but is instead filtered through lived experience and affective resonance. Particularly, the mediating role of disgust challenges traditional assumptions about value-based appeals as inherently prosocial, showing that they may backfire when perceived as moralizing or disconnected from recipients' realities.

On a practical level, these insights have direct implications for the design of health campaigns. Messages that highlight pragmatic benefits may be better received in contexts marked by political fatigue or institutional distrust. At the same time, appeals to duty can still be effective if they are framed in a way that respects individual autonomy and speaks to a sense of personal responsibility, especially among those who feel disillusioned with collective narratives. Health communication practitioners should therefore avoid one-size-fits-all strategies and instead adopt segmented approaches that align message framing with ideological and emotional predispositions. Tailoring persuasive strategies to the audience's ideological landscape is not just a matter of effectiveness, but a matter of ethical communication. Rather than providing a definitive ranking of message

types, the present study offers an exploratory mapping of how different moral frames can interact with disgust and ideological beliefs to shape diverse facets of vaccine acceptance.

Future studies could explore how these dynamics operate across different cultural settings, or in response to other public crises. Longitudinal designs might also help clarify how changes in political climate or institutional trust influence the reception of moral messages over time. More broadly, this line of research points to the importance of developing communication strategies that are attuned to emotional undercurrents and social fracture, namely not simply to inform, but to connect.

Conclusion

In sum, the findings of the present study suggest that moral framing interacts meaningfully with individuals' beliefs regarding their position within the social system, activating different pathways of persuasion depending on perceived mobility. Moreover, the study reveals that emotional responses are crucial moderators in this dynamic. As evidenced by the mediating role of disgust, value-based messages provoked higher levels of disgust and were ultimately less effective, especially among individuals who may have felt morally judged or alienated. On the contrary, the deontological appeal was met with greater openness and behavior. This distinction suggests that disgust functions not merely as a reaction to content, but as a signal of moral distance, emerging when individuals perceive a mismatch between their own lived ethics and the values projected by the message. In societal contexts fractured by distrust, moral communication seems to be walking a delicate line, if it preaches, it repels, but if it invites, it resonates. What this research reveals is not just how to persuade, but that moral communication should speak to people who feel unseen, especially in times of crisis and ambiguity. That is perhaps the real measure of an ethical appeal, not how loudly it is communicated, but whether it listens first.

Authorship Details

Emmanouil Takas: research concept and design, collection and/or assembly of data, data analysis and interpretation, and writing the article, critical revision of the article, final approval of the article.

Antonis Gardikiotis: research concept and design, collection and/or assembly of data, data analysis and interpretation, and writing the article, critical revision of the article, final approval of the article.

Conflict of Interest Disclosure

The author reports no conflicts of interest.

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Research Ethics Statement

This study was approved by the Committee for Research Ethics and Integrity of the Aristotle University (Ref. Nr. 75815/2023). All participants were informed about the nature and purpose of the study, their right to withdraw at any time, and the confidentiality and anonymity of their responses. Informed consent was obtained digitally via LimeSurvey prior to participation. Participants were debriefed after the experiment and provided with contact information for the researchers. Participants were informed that they could withdraw at any point without any consequence. Consent was registered only if participants actively clicked the “I agree to participate” option before proceeding to the questionnaire.

Data Availability Statement

Data associated with this study are shared in a public, open-access repository: <https://zenodo.org/records/15542559>

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Appendix

Moral Appeals

Utilitarian Appeal

“You need to get vaccinated because the sacrifices you might make now are nothing compared to how much worse the consequences will be if you don’t. Think about the consequences of not getting vaccinated. Think about what you stand to lose if you don’t. Getting vaccinated is the only way to gain as much as possible now and face as little risk as possible in the future.”

Value-Based Appeal

“You need to get vaccinated because that’s what a virtuous person would do. Think of all the people you admire morally, what would they do? Your well-being depends on getting vaccinated, and you need to show courage and virtue that will lead you to a better future. Your vaccination is a moral value you need to demonstrate.”

Deontological Appeal

“You need to get vaccinated because it is the right thing to do. It is your duty and your responsibility to protect yourself. It is your duty as a citizen of a lawful country to ensure that you remain healthy and functional.”