

# Ready to Help, No Matter What You Did: Responsibility Attribution Does Not Influence Compassion in Expert Buddhist Practitioners

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Within western social psychology and neuroscience, compassion is described as being conditioned by cost-benefit appraisals, such as the attribution of responsibility for the causes of suffering. Buddhist traditions maintain the possibility of cultivating and embodying unconditioned and universal forms of compassion. Whereas a growing body of empirical literature suggests that Buddhist-inspired compassion-based programs foster prosociality and well-being in healthy and clinical populations, there is no evidence that such compassionate disposition toward others can become unconditioned from moral judgment. To address this question, we collected and integrated self-report and behavioral data from expert Buddhist practitioners and trained novices using a previously validated within-subject experiment that manipulates contextual information to influence moral judgment toward suffering others and a newly designed approach-avoidance task. We found that context manipulation impacted responsibility and blame attribution in both groups and that experts' reported willingness to help was higher and less influenced by context, compared to novices. Partial correlation networks highlighted a negative relationship between blame attribution and willingness to help in novices, but not in expert practitioners. Self-reported willingness to help was correlated to reaction times when approaching suffering stimuli. Approach behavior was modulated by context in novice, but not in experts. This study provides initial evidence of a dissociation between moral attributions and prosocial attitude in expert Buddhist practitioners and challenges established evolutionary accounts of compassion in western psychology.

## Public Significance Statement

This study provides initial evidence for a dissociation between moral judgment and prosocial attitude in expert Buddhist practitioners. Findings are in line with Buddhist theories on compassion and contemplative training and expand established theories in social psychology.

**Keywords:** mindfulness, prosocial motivation, altruism, evolutionary, comparative ethics

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administration, supervision, validation, writing—original draft, and writing—review and editing, contributed equally to software, and served in a supporting role for funding acquisition. Oussama Abdoun served as lead for software and served in a supporting role for data curation, project administration, validation, writing—original draft, and writing—review and editing. Constanza Baquedano contributed equally to validation and served in a supporting role for data curation, formal analysis, funding acquisition, investigation, project administration, supervision, writing—original draft, and writing—review and editing. Antoine Lutz served as lead for funding acquisition and resources and served in a supporting role for conceptualization, formal analysis, methodology, supervision, writing—original draft, and writing—review and editing. Enrico Fucci and Constanza Baquedano contributed equally to conceptualization. Enrico Fucci, Oussama Abdoun, and Constanza Baquedano contributed equally to methodology. Enrico Fucci and Oussama Abdoun contributed equally to visualization and formal analysis.

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331. O king, through compassion you should Always generate just an attitude of altruism Even for all those embodied beings Who have committed awful ill deeds....

Nagarjuna—Ratnāvalī (Precious garland)

The growing number of environmental issues—including the recent outbreak of COVID-19—is revealing, with unprecedented clarity, the fundamental interconnectedness of human societies. We are facing dramatic changes on a global scale: from increasing socioeconomic disparities to mass migrations and political polarization. A zeitgeist defined by some as a “precipice,” a crossroad for humanity, that could thrive or succumb in response to a rising existential risk (Ord, 2020). The need for facilitating value-based decision making and for building collective agency and resilience has led to a growing concern to apply insights and practices from contemplative traditions in social, organizational, and policy-making contexts (Bristow & Bell, 2020). In parallel, there is an increasing interest in the fields of social, emotional, evolutionary psychology, and neuroscience to investigate practices and populations with the aim of expanding our understanding of how individuals deal with others’ suffering and of what factors influence prosocial motivation. For some scholars, this is a necessary step to promote a societal transition toward “global compassion,” or the “concern to alleviate the suffering of anyone, regardless of their nationality, language, culture, or religion” (Ekman & Ekman, 2017). A concept that does not take much space in western psychology, but that constitutes a pillar of many contemplative traditions, being especially developed and theorized in Buddhist psychology (Ricard, 2015). In this context, the challenge for fundamental research is to foster a dialogue, supported by empirical evidence and sound methods, that can question established theories on social motivation and guide applicative programs.

### Forms of Compassion and the Weight of Moral Judgment

Within social psychology, the attribution of responsibility for the causes of suffering and the associated blameworthiness of the sufferer are considered as playing a major role in shaping responses to others in need (Goetz et al., 2010). The link between responsibility attribution, moral judgment, and helping behavior has been widely investigated in the context of the social psychological theory of attributions (Weiner, 2006). When a person is perceived as having control over the causes of their suffering, this in turn elicits less sympathy and more anger in the observer, resulting in less willingness to help compared to a situation when the person is perceived as a victim of external causes (see Rudolph et al., 2004 for a meta-analysis of 39 studies on helping intentions). Recently, we highlighted a negative correlation between willingness to help and blame attribution in a within-subjects experiment, adding to the idea that moral judgment and compassion are tightly related (Fucci et al., 2021). This evidence supports the view of compassion in evolutionary psychology as a conditional process, constrained by cost and benefit dynamics (Goetz et al., 2010). From this perspective, a compassionate act would be perceived as more or less beneficial by the helper, depending on the appraisal of the sufferer’s responsibility and blameworthiness.

Buddhist traditions, however, sustain the possibility for an individual to pursue and embody a different attitude toward suffering. One that is based upon the recognition that all beings are equally conditioned by and suffer from a lack of insight into the impermanent and illusory nature of phenomena, including our sense of unchanging

and independent self (Makransky, 2021). Rooted in this pervasive and universal view of suffering (Pali dukkha), Buddhist practitioners cultivate the wish of freeing their mind from maladaptive patterns of reification, attachment, and aversion, and to help others attain the same.

Despite theories and practices in different schools of Buddhism being shaped by different perspectives on the role of compassion in the spiritual path (Goodman, 2009; Lavelle, 2017; Makransky, 2021), all practitioners aim to cultivate a compassionate stance which is unbounded, unconditional, and encompassing all living beings (Tenzin Gyatso, the 14th Dalai Lama, 2001). Thus, compassion is complemented by the nurturing of equanimity (Pali upekha), intended in this context as an impartial stance toward the misfortunes of individuals, who are the same in their suffering and in their wish and potential for freedom from distress (Makransky, 2021). This is facilitated by practices that aim to extend compassion from close ones to neutral people, to strangers, to persons who have caused harm, and, ultimately, to all beings. These practices, albeit in different forms, are common in all Buddhist traditions and in many secular programs adapted for clinical and social settings (Lavelle, 2017).

Furthermore, within Tibetan schools of Buddhism, boundless and impartial compassion is described as being an essential quality of one’s fundamental awareness. As such, it is present in all individuals, only obscured by dualistic and conditioned mind patterns. From this perspective, realizing and experiencing the natural state of mind (also described as “open presence”; Lutz et al., 2007) naturally leads a practitioner to embody a form of compassion defined as “nonreferential” (Tibetan wiley: “mig mey nying jey,” Kalu Rinpoche, 1986). In its nonreferential form, compassion transcends subject–object duality and there is no distinction between helping oneself or others (Ekman & Ekman, 2017). The state of nonreferential compassion has been described as an “unconditional readiness and availability to help living beings” (Lutz et al., 2004). Practices cultivating open presence and nonreferential compassion are embedded into a broader ethical and spiritual context, referred to as the Bodhicitta aspiration in Mahayana Buddhism, which encompasses in particular the aspiration to recognize this nondual state in order to help every being to free themselves from suffering and its causes (P. Rinpoche, 1993).

In Buddhist traditions, attaining unconditional compassion is not only possible, but it is a necessary condition that supports a practitioner and infuses the mind when freed from maladaptive patterns. In this sense, someone who causes harm to oneself and others is seen as being afflicted by a greater deal of delusion and as generating more suffering due to the consequences of their actions. For this reason, they equally, if not more, deserve to receive compassion compared to those who suffer due to inescapable causes (Goodman, 2009).

The divergent views on compassion between western and Buddhist psychology constitute a fertile ground for questioning and expanding theories of social cognition and prosocial motivation. Based on these different accounts, we can ask whether responsibility and blame attributions play a fundamental role in shaping human helping behavior, or whether a different “phenotype” could be observed in individuals who undergo a contemplative path yearning to engage with suffering unconditionally and universally. This is not a purely theoretical question, as it can elucidate and influence the way we deal with suffering and stigmas in today’s societies. Blame attribution determines, for instance, how healthcare professionals engage with patients (Guo

et al., 2022; Philip et al., 2014) and the reaction to victims of cyberbullying (Weber et al., 2013). Our very systems of justice are built upon views of punishment that depend on the relation between attribution, morality, and help (Goodman, 2009, ch. 8). Despite its theoretical and practical relevance, this question has not yet been the object of investigation by empirical research.

### Empirical Research on Compassion as a Trainable Skill

A growing body of evidence supports the idea that compassion is a trainable skill. Secular programs inspired by Buddhist teachings and meditation practices have been shown to modulate individuals' affective responses to the suffering of others, enhancing positive emotions and empathic concern (e.g., Ashar et al., 2021; Klimecki et al., 2013, 2014; Trautwein et al., 2020; Weng et al., 2017). Compassion-based interventions, when implemented in clinical settings, affect individual measures of well-being and help coping with psychopathological conditions such as anxiety and depression (see Kirby et al., 2017 for a meta-analysis of randomized controlled trials). Compassion and mindfulness training have the potential of reinforcing prosocial behaviors, as demonstrated in experimental paradigms using charitable donations (e.g., Iwamoto et al., 2020; Weng et al., 2013), games that prompt social interactions (e.g., Berry et al., 2018; Leiberger et al., 2011) and in two studies measuring the frequency of helping responses to individuals in need (Condon et al., 2013; Lim et al., 2015).

Based on our knowledge, only one study has investigated changes in blame attribution and helping behavior following compassion training. In Ashar et al. (2016), perceived blameworthiness has been shown to modulate, together with other emotional and cognitive factors, the amount participants donated to a charity. Blame attribution, however, did not change between pre- and posttraining for those participants who underwent a short compassion meditation program. This could be due to two factors that were not considered in Ashar et al. (2016) study. First, compassion training might not affect attribution processes, but rather the relationship between attributions and helping intentions. Buddhist ethics recognize responsibility in harmful acts and their consequences for the individual and the community (Goodman, 2009). Compassion training might then act on the resistances or "costs" that attribution and moral judgment generate for acting compassionately (Gilbert, 2019). Secondly, although secular compassion-based programs include practices that aim to increase compassion for others, independently of whether they cause harm (Lavelle, 2017), this might not be achieved in the context of a short intervention. Buddhist practitioners undergo years of study and practice, which encompass formal meditation, cognitive strategies, and behavioral training (Lutz et al., 2008). In this respect, it is more likely that forms of compassion which entail a different relationship between attribution and help can be observed in long-term practitioners rather than novices. To this date, however, research on long-term practitioners has not addressed this question, rather focusing on individuals' brain activity and affective responses to suffering stimuli (e.g., Lutz et al., 2008; Rosenberg et al., 2015) or on the neural correlates of nonreferential compassion as a state induced by advanced practices (Lutz et al., 2004; Schoenberg et al., 2018). In a behavioral study, McCall et al. (2014) showed greater recompensation of players treated unfairly and less punishment toward unfair players (but only when the meditators were the victim) in long-term Buddhist meditators compared to control participants in a Dictator

Game. Although this finding provides evidence of a different stance toward punishment, it does not elucidate the question at hand: Do responsibility and blame attribution influence willingness to help in long-term Buddhist practitioners?

### Compassion as Social Motivation Affecting Implicit Behavior

Most empirical research on mindfulness and compassion training, and on long-term practitioners from contemplative traditions, has been focusing on affective reactions to suffering stimuli or measures of prosocial behavior in economic and cooperation games, with few exceptions implementing behavioral measures in ecological settings (e.g., Berry et al., 2023, Condon et al., 2013; Lim et al., 2015).

In western psychology, compassion is defined and operationalized as a combination of a distinct emotional state and a motivational component. A widely implemented definition is the one provided by Goetz et al. (2010): "the feeling that arises in witnessing another's suffering and that motivates a subsequent desire to help" (p. 351). Such characterization of compassion as a distinct emotional state has played a major role in guiding research on this topic in psychology and neuroscience.

Buddhist accounts of compassion, however, differ substantially from this definition, to the point that its emotional aspect is not regarded as a fundamental element, as in Tenzin Gyatso (the 14th Dalai Lama, 2001): "True compassion is not just an emotional response but a firm commitment founded on reason. Because of this firm foundation, a truly compassionate attitude toward others does not change even if they behave negatively." This is also supported by theoretical models that see compassion training as acting on psychological processes that are more cognitive than affective, such as perspective-taking and reappraisal (Dahl et al., 2015).

Combining Buddhist and motivational psychology perspectives, Gilbert and Choden (2013) proposed a definition of compassion that rather emphasizes its motivational component: "...a sensitivity to suffering in self and others with a commitment to try to alleviate and prevent it" (p. 94). Such commitment to help is grounded in a motivational system that not only lies at the basis of compassionate behavior, but also prompts practitioners to actively learn how to be helpful through reasoning (Gilbert, 2019). In this view, emotional reactions to suffering are context-dependent and do not constitute the primary drive of helping behavior. In line with this definition, recent psychological models have included a motivational component, described as readiness to help (Jazaieri et al., 2013) or a disposition toward approaching suffering (Weng et al., 2017), as a fundamental aspect of compassion. Notably, the concepts of "readiness" and "availability" to help are of primary importance in Buddhist narratives of compassion (Lutz et al., 2004). Besides being more aligned to the traditional accounts found in the Buddhist literature, focusing on the motivational rather than emotional aspect of compassion can facilitate the study of complex factors, such as competing motivational drives, that condition compassionate responses to suffering and which remain unexplored by this field of research, as in the case of attribution processes (Gilbert, 2019). In this respect, implicit behavioral predispositions toward suffering stimuli, in the form of approach and avoidance tendencies, could be a promising marker. Paradigms measuring approach-avoidance behaviors have appeared in experimental psychology research several decades ago (Solarz, 1960) and have since evolved into tasks that rely more or less on sensorimotor contingencies

(e.g., lever task, [Chen & Bargh, 1999](#); joystick task, [Rinck & Becker, 2007](#); visual approach-avoidance task [VAAST], [Rougier et al., 2018](#)) or conceptual representations of movement (manikin task, [De Houwer et al., 2001](#)). Approach-avoidance tasks (AATs) have been used to study response tendencies (in the form of reaction times [RTs]) to affective stimuli (see [Phaf et al., 2014](#) for a recent meta-analysis), addictive stimuli (e.g., [Cousijn et al., 2011](#); [Peeters et al., 2013](#); [Wittekind et al., 2015](#)) and salient cues in individuals suffering of social anxiety (e.g., [Heuer et al., 2007](#); [Roelofs et al., 2009](#)), among other topics. More recently, AATs were implemented in studies showing how mindfulness-based interventions can affect food craving ([Baquedano et al., 2017](#); [Papies et al., 2012](#)) and responses to emotional stimuli in terms of valence-behavior associations ([Juneau et al., 2021](#)). The theoretical explanation of AAT effects is that faster or slower RTs to approach or avoid a stimulus represent implicit behavioral tendencies toward it, these tendencies being the manifestations of appetitive-aversive motivational processes ([Kozlik et al., 2015](#)). Interestingly, approach-avoidance effects have been proposed as a marker of attitudes toward ingroup-outgroup members ([Rougier et al., 2020](#)), relying on a classical definition of attitude as “neural state of readiness” ([Allport, 1935](#), p. 810), and there is evidence for an effect of prosocial motivation on approach RTs ([Kaltwasser et al., 2017](#)). Based on these premises, we figure that the “readiness” or motivational aspect of compassion could be operationalized in terms of approach and avoid behavioral responses to suffering stimuli and how they relate to individuals’ willingness to help.

## Introducing the Current Research

In the present study, we aimed to elucidate how compassion is modulated by responsibility and blame attributions in long-term Buddhist practitioners, both in terms of subjective experience and implicit behavioral attitudes toward suffering stimuli. Building on the current models of attribution in prosocial motivation and alternative perspectives on compassion found in Buddhist psychology, we formulated two predictions. First, we hypothesized that the correlation between attribution processes and willingness to help, observed in the general population, would not characterize subjective responses of long-term Buddhist practitioners to suffering stimuli. Secondly, that implicit behavioral (approach-avoidance) responses to suffering stimuli would be modulated by contextual information on blameworthiness and responsibility in the general population, but not in Buddhist practitioners. To elucidate these research questions, we designed a laboratory within-subject experiment consisting of the presentation of video stimuli depicting people in distress preceded by short stories (contexts) apt to manipulate the perceived responsibility of the sufferer (the context-video pairs were previously validated and made available online by [Fucci et al., 2021](#)). We investigated subjective responses to the video stimuli using self-report scales addressing participants’ attributions and helping intentions and modeling the relationship between self-report measures using within-subject partial correlation networks. Additionally, we collected RT data in the context of a novel version of VAAST (AAT) using short video clips derived from the same video stimuli. We investigated the relationship between approach and avoidance RTs with subjective measures of willingness to help via within-subject correlation analysis, as well as the effect of different contexts on participants’ responses.

In the experiment, we compared a group of selected long-term Buddhist practitioners (experts) with a control group of novice meditation practitioners that were introduced to the theories and practice of compassion in the context of a secular program. The task was carried out following short sessions of compassion meditation and of an active control practice designed to increase empathic resonance (in line with [Klimecki et al., 2013](#), see Meditation Practices and Training section for a detailed description of the practices). This state manipulation was included in the experimental design to assess whether short sessions of compassion practice could influence helping intentions and behavior independently of the degree of expertise of a practitioner. Based on the available literature on compassion training, we hypothesized that participants’ reported willingness to help would be higher following compassion practice and that this effect would be reflected on behavioral measures. We also expected compassion practice to downplay the effect of context on willingness to help and associated behavior. We did not formulate hypotheses on a possible interaction between the effect of the compassion session and the one of expertise given the paucity of empirical evidence on this topic, and the novelty of our paradigm. One possibility is that the state modulation specifically influences either the novices or the experts. We also considered an alternative scenario where short compassion practice would not modulate the effect of attributions on willingness to help and behavior; a short practice not being enough to influence novices and experts’ established motivational tendencies. In this sense, the analysis of practice effects was mainly exploratory.

## Method

### Participants

Thirty expert meditation practitioners ( $52 \pm 7.8$  years old, 13 females, 17 males, right-handed, all white Caucasians) and 34 healthy control participants ( $51 \pm 8$  years old, 14 females, 20 males, right-handed, all white Caucasians) participated in the study. Sex, gender, race, and ethnicity were not collected directly from the participants as they were not of high relevance to the present study; sex and ethnicity were inferred from our knowledge of the participants for the publication.

Control participants (novices) were recruited using flyers and posters in public places, on social media and mailing lists, and through notifications to online subject pools. They underwent a weekend-long introduction to meditation and practiced at home before participating in the experiment (see Meditation Practices and Training section for details). Experts were recruited and selected with the help of a long-term practitioner with extensive contacts within the Nyingma and Kagyü communities of Tibetan Buddhism. The present study was part of a larger research project that included several experimental sessions. A detailed description of the general inclusion and exclusion criteria for expert and novice practitioners is provided in a separate document ([Abdoun et al., 2018](#); accessible online at <https://doi.org/10.17605/osf.io/dbwch>). For this specific study, relevant exclusion criteria were: use of psychoactive medication, history of neurological or psychiatric conditions, severe hearing loss, and Beck Depression Inventory above 20. All participants presented proof of affiliation to social security, signed an informed consent before the beginning of the experiment, and were remunerated for their participation. Ethical approval was obtained from the appropriate



regional ethics committee on human research (CPP Sud-Est IV, 2015-A01472-47).

Before the experiment, all control participants and expert practitioners filled a number of psychological questionnaires (see the list at <https://doi.org/10.17605/osf.io/dbwch>), including the Balanced Inventory of Desirable Responding (BIDR; Hart et al., 2015).

## Meditation Practices and Training

Experts and novices differed for their training contexts, amount of daily practice and of practice before the experimental sessions. In the following sections, we provide information relevant for the current study (which was part of a larger project, as mentioned in the previous section). Detailed information on the meditation experience and daily practice of experts and on the structure of the training weekend and home practice of novices can be found in separate report (Abdoun et al., 2018; accessible online at <https://doi.org/10.17605/osf.io/dbwch>; Abdoun et al., 2019)

### Experts Training

All expert practitioners had a minimum of 10,000 hr of meditation practice in their lifetime, participated in at least one 3-year meditation retreat under the Nyingma and Kagyü traditions of Tibetan Buddhism, and maintained a daily practice of at least 45 min during the year prior to their recruitment.

For expert Buddhist practitioners belonging to the Nyingma and Kagyü schools of Tibetan Buddhism, the practice of compassion is tightly linked to objectless meditations apt to cultivate the nondual state described as open presence (Dunne, 2011; Lutz et al., 2007). It is described, for instance, by Dilgo Khyentse, a teacher and practitioner, as “the simplicity of the natural state, beyond all concepts and intellectual limitations, out of which spontaneous, objectless compassion arises, benefiting all sentient beings” (P. Rinpoche, 1993). This state does not require concentration on particular objects, memories, or images. Because “benevolence and compassion pervade the mind as a way of being,” this state is called “pure compassion” or “nonreferential compassion” (dmigs med snying rje in Tibetan; Lutz et al., 2008). Being familiar with this quality of mind is supposed to facilitate the embodiment of an “unconditional readiness and availability to help living beings.” Complementing this practice, during their training, practitioners undergo a number of different contemplations focusing on particular persons or groups, based on precise instructions and using mental imagery and memories. A typical practice entails the cultivation of compassion “on an object,” or support, where a practitioner repeats the mental phrasing of wishes to alleviate a person’s distress and aspirations for their well-being and freedom from suffering. The practice gradually extends the object of compassion from oneself to closed ones, to persons with whom the practitioner has difficult relationships and strangers. Ultimately, the aim of the practice is to cultivate compassion for all living beings. Importantly, this practice is not reduced to a repetition of mantras directed to mental images, but is permeated by the cultivation of mindful inquiry of the subjective experience generated from the exercise (Hofmann et al., 2011). This style of practice dates back to early forms of Theravāda Buddhism and has been adapted to modern, secular meditation-based programs (Lavelle, 2017) as well as being adopted in laboratory research settings

with novice practitioners (e.g., Klimecki et al., 2014; Weng et al., 2013).

### Novices Training

In the present study, novice meditation practitioners were introduced to object-oriented styles of compassion practice (see above) during a weekend-long training program (the structure of the training weekend is described and discussed in detail in Abdoun et al., 2019). The workshop was based on a secular meditation program derived from the teachings embedded in the Kagyü and Nyingma schools of Tibetan Buddhism (The joy of living, Y. M. Rinpoche & Swanson, 2007; <https://tergar.org/>).

During the introductory weekend, and inspired by previous research protocols (Klimecki et al., 2014), novice practitioners were also guided to reflect on the difference between empathic resonance and compassion through experiential exercises. Facing highly emotional pictures of people in physical and psychological distress, they were first asked to connect and resonate with their suffering. Subsequently, they were invited to cultivate compassion toward the characters of the images through the generation of wishes and aspirations as described above. Both exercises were followed by sessions where participants could share their experience with the group and the teacher. Following the exercises, they were formally introduced to a practice that entailed the cultivation of compassion toward different people and groups, from oneself to all living beings.

Novice practitioners were asked to practice at home until the date of the experiment using audio supports (the average time between training weekend and the data collection was 63.1 [31.7] days. Table 1 shows the average total and daily home practice. See Abdoun et al., 2019 for additional analysis on home practice and compliance).

### Practices During the Experiment

On the day of the experiment, both expert and novice practitioners underwent guided practices of compassion and empathic resonance at different stages of the paradigm using audio supports (available online in French version at <https://doi.org/10.17605/osf.io/h9byg>). The practice of compassion consisted in the same support used by novice meditators for their home practice. The practice of empathic resonance presented the same structure as the one of compassion, but asked participants to resonate with the suffering with the aid of mental expression such as “I feel your pain,” “you suffer, I suffer with

**Table 1**

*Average Daily and Total Amount of Home Practice for Novice Participants Between the Training Weekend and the Experimental Sessions*

Practice style	Daily average (minutes)	Average total practice time (hours)
Focused attention	6.2 (3.3)	5.7 (3.2)
Open monitoring	7.3 (3.8)	7.9 (5.9)
Compassion	4.2 (2.6)	4.3 (3.5)
Total	18 (7.7)	18.3 (10.9)

*Note.* In the training weekend, novices were familiarized with different styles of meditation.

you” (in line with the “empathy training” practices implemented in Klimecki et al., 2014).

## Stimuli

Participants were confronted with several videos depicting people in emotional and physical distress (emotional videos), as well as videos showing individuals performing everyday life activities (neutral videos). Each emotional video is paired with two versions of a short story (contexts) that, when displayed before the video, aim at manipulating the perceived responsibility of the sufferer for being in their condition. The different context–video pairs were previously validated in terms of their ability to manipulate perceived responsibility (see Fucci et al., 2021 for details). Emotional and neutral videos are derived from a subset of the stimuli used in the socioaffective video task (Klimecki et al., 2013).

For the AAT, we created four different short video clips out of each emotional and neutral video. Video clips last between 4 and 5 s. For videos shorter than 16 s, a video clip start can overlap with the previous one. The clips used in the present study are available online at <https://doi.org/10.17605/osf.io/h9byg>, together with information on their onset relative to the reference video, their duration, and the timing of AAT cues.

## Paradigm

The task ran on a desktop computer using Presentation software (Version 18.0, Neurobehavioral Systems, Inc., Berkeley, California; <https://www.neurobs.com>).

Participants sat on a comfortable chair in a sound-shielded room, wearing a pair of headphones, and used a Playstation controller to perform the AAT. They received verbal instructions and underwent two training trials before starting the experiment.

The paradigm counted two equally structured sessions (session order was counterbalanced between subjects). Each session started with a 10-min-long guided practice (empathic resonance or compassion). The practice was followed by the task (see Figure 1 for a schematic representation). After each session, participants underwent 15- to 20-min-long interviews (this data will be described elsewhere). Importantly, participants were verbally instructed to approach the experimental task while trying to maintain the same attitude cultivated during the guided practice.

Each trial started with the presentation of a video preceded by one of the two possible contexts associated with it. Following the video presentation, participants were asked to answer questions on a 1–9 Likert scale. They tapped into different dimensions of the participant’s subjective experience of each video: valence, arousal, empathy, perceived responsibility, deservingness judgment, and willingness to help (questions and scales are shown in Table 2 and are available online at <https://doi.org/10.17605/osf.io/h9byg>).

Following the questions, participants underwent the AAT. It consisted in the presentation of short video clips ( $N = 4$ ) extracted from the video. A few seconds after the start of each clip, a visual cue appeared in the middle of the screen. Participants were instructed to react as fast as possible to the cue by pulling or pushing the right analog stick of the Playstation controller. Depending on the response, the clip was stopping and either zooming toward (after pulling) or zooming away (after pushing) from the participant. Cues characterized by a circle shape were prompting approach

(pulling) responses while squared cues prompted avoid (pushing) responses. Cue onset timing was randomized between 2.5 and 3.5 s after the start of each video clip.

Each session comprised 20 trials, consisting of 10 emotional (five responsible and five not-responsible contexts) and 10 neutral videos. The inclusion of specific videos in the first or second session and the trial presentation order within each session were randomized for each subject. The association of emotional or neutral video with one of the two contexts was counterbalanced between subjects.

## Analysis

All statistical analyses were performed using R (V. 4.1.1, R Core Team, 2021). Raw data and analysis code are available on Open Science Framework (<https://doi.org/10.17605/osf.io/h9byg>).

Due to technical issues (errors in video display, joystick malfunctioning, and stimuli duplicate for both conditions), we excluded full data from an expert practitioner, data from the empathy condition for two participants (one expert and one novice), and data from some videos for two novice participants (nine and 11 videos, respectively). This first step of data preparation resulted in a total of  $N = 2,459$  trials.

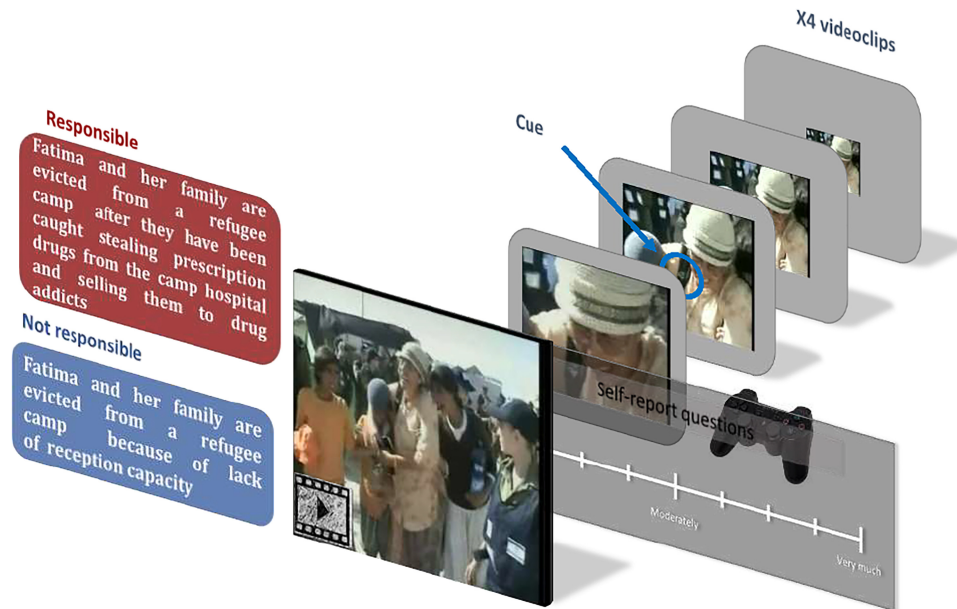
## Statistical Power

The present study was part of a larger project, the European Research Council-funded Brain&Mindfulness project (documentation accessible online at <https://doi.org/10.17605/osf.io/dbwch>) which comprised a total of 15 tasks, all completed by the same pool of participants. As such, the number of participants available for the study was constrained by project-level resources and criteria. The number of trials per condition was chosen to limit the total duration of the experiment to 4 hr.

We estimated the statistical power conferred by the sample size of the study a priori, that is, based on effect sizes reported in the literature and motivated theoretical assumptions, described separately below for each of the analyses. We used the pwr package (Champely et al., 2018) to compute power of correlation analyses and the simr package (Green & MacLeod, 2016) for linear mixed models to simulate data sets from generative models reflecting the experimental design, featuring expected patterns of means, with variance parameters informed by relevant literature. Details can be found below and in Sections S1–S3 in the online supplemental materials.

**Statistical Power: Self-Reports.** The availability of fixed and random effects estimates from a previous validation study (Fucci et al., 2021) facilitated the simulation-based estimation of statistical power for the analysis of self-reports. In the current study, the effect of interest is the group by context interaction, with experts expected to show a weaker context effect on some scales (e.g., willingness to help). The statistical power to detect such an interaction depends on the magnitude of effect reduction in experts: the smaller the effect of context in experts compared to novices, the higher the gap between the two groups and therefore the higher the power to detect the interaction. In practice, simulations suggested that group-related reductions as small as 25% can be detected with 80% power on scales with large effects of context (willingness to help, responsibility, and deservingness). More pronounced reductions are needed to be reliably detected in other scales, for which the effect of context was found small by Fucci et al. (2021). The complete demonstration

**Figure 1**  
Visual Representation of a Trial of the Experimental Task



*Note.* Each trial started with the presentation of a video stimulus preceded by either a “responsible” (red/light gray) or “not-responsible” (blue/dark gray) context. After watching the video, participants answered questions on a 9-point Likert scale. This was followed by the presentation of a video clip extracted from the video. Circle or squared cue appeared at the center of the video clip, prompting pulling or pushing, respectively, the controller stick as quickly as possible. The video clip stopped and zoomed in or out depending on the controller input. Four video clips were presented in each trial. The still shots in the figure are adapted from, one of the stimuli, *Data and Analysis From: Ready to Help, No Matter What You Did: Responsibility Attribution Does Not Influence Compassion in Expert Buddhist Practitioners*, by E. Fucci, O. Abdoun, C. Baquedano, and A. Lutz, 2022 (<https://osf.io/h9bygf/>). CC0 1.0 Universal. See the online article for the color version of this figure.

and profiles of statistical power as a function of effect sizes can be found in [Section S1 in the online supplemental materials](#).

When we used partial correlation analysis to determine the relationship between self-report measures, a network was estimated for each group of participants separately, based on approximately 300 available trials. Such sample size allowed for the detection of correlation coefficients as low as .16 with 80% statistical power (.19 at 90%).

**Statistical Power: Approach Avoidance Task.** Effect sizes reported in the literature of AATs, as well as typical intraindividual trial-to-trial variability of response times in perceptual discrimination tasks, could be exploited to estimate the statistical power of detecting experimental manipulations on approach-avoid RTs. We focused in particular on the hypothesized reduction, in expert compared to novice practitioners, of the context (responsible, not-responsible) by cue (approach, avoid) double difference. Simulations indicate that the statistical power for moderate (~40 ms) to strong ( $\geq 50$  ms) effect sizes was largely sufficient (around 90% and close to 100%, respectively), but dropped rapidly below 50% for small effects (<30 ms). Methodological details and complete results can be found in [Section S2 in the online supplemental materials](#).

**Statistical Power: Correlation Analysis Between Behavior and Self-Reports.** Based on the same information drawn from the literature and used to compute the statistical power for approach-avoidance RT data (see previous paragraph), we could expect the correlation between self-ratings and behavioral measures to be anywhere

between .06 and .20. Our design and sample size offer a statistical power of 80% for this range of values (see [Section S3 in the online supplemental materials](#) for a complete demonstration).

### Self-Report Data Analysis

Neutral videos were excluded from the analysis of self-report data. Relevant questions regarding the effect of contexts on self-reports in response to neutral and emotional videos (i.e., that different contexts affect attributions and willingness to help in emotional, but not neutral videos) were already explored in the stimuli validation study (Fucci et al., 2021) and were not reiterated in the context of the present paradigm.

Data from one novice participant was excluded from the analysis of self-reports due to joystick malfunctioning. For questions on responsibility, deservingness, and willingness to help, trials with the response 5 (corresponding to “not relevant”) on the 1–9 scale were excluded from further analysis (responsibility = 243 trials; deservingness = 253 trials; willingness to help = 97 trials). For those questions, values from 6 to 9 were mapped onto the 5–8 range. Additionally, one response for the Arousal scale and one response for the arousal scale, and 42 responses for the valence scale were excluded due to joystick issues and one subject in empathic resonance condition misunderstanding the scale.

**Linear Mixed-Effects Models.** Linear mixed-effects models (R package lme4; Bates et al., 2014) were used to investigate the

**Table 2**  
*Questions and Self-Report Scales Presented After Each Context–Video Pair*

Question (English)	Scale (English)
Évaluez le contenu émotionnel de la vidéo que vous venez de voir	1 = Très négatif ( <i>very negative</i> ) 5 = Neutre ( <i>neutral</i> ) 9 = Très positif ( <i>very positive</i> )
Please rate the emotional content of the video you just watched	
Quelle était l'intensité de votre ressenti émotionnel lorsque vous regardiez cette vidéo?	1 = Pas du tout forte ( <i>not strong at all</i> ) 5 = Moyennement forte ( <i>mildly strong</i> ) 9 = Très forte ( <i>very strong</i> )
How strong was your affective response while watching the video?	
À quel point étiez-vous ému(e) par les émotions exprimées par le ou les sujets principaux de la vidéo?	1 = Pas du tout ému(e) ( <i>not at all</i> ) 5 = Modérément ému(e) ( <i>moderately</i> ) 9 = Très ému(e) ( <i>very much</i> )
To which degree were you moved by the emotions of the main character/s of the video?	
Selon vous, à quel point le ou les sujets principaux sont responsables de la condition dans laquelle ils se trouvent?	1 = Pas du tout responsable(s) ( <i>very not responsible</i> ) 5 = Aucun des deux ( <i>neither one nor the other</i> ) 9 = Très responsable(s) ( <i>very responsible</i> )
In your opinion, to which degree is the main character/s responsible for his/her/their condition?	
Selon vous, à quel point le ou les sujets principaux méritent de se retrouver dans cette condition?	1 = Pas du tout ( <i>not at all</i> ) 5 = Aucun des deux ( <i>neither one nor the other</i> ) 9 = Beaucoup ( <i>very much</i> )
In your opinion, to which degree does the main character/s deserve to be in his/her/their condition?	
À quel point voudriez-vous aider le ou les sujets principaux?	1 = Pas du tout ( <i>not at all</i> ) 5 = Aucun des deux ( <i>neither one nor the other</i> ) 9 = Beaucoup ( <i>very much</i> )
To which degree do you will to help the main character/s?	

*Note.* Scales ranged from 1 to 9 with full unit intervals (i.e., a range of nine possible answers). Materials are reported in French first, as this was the language used for the vast majority of participants.

effects of experimental manipulations on self-reports, separately for each response scale. Holm's family-wise error rate controlling procedure was used to account for multiple tests (Holm, 1979). The effects and interactions of each model were estimated using a Type II *F* test with Satterthwaite's method for approximation of degrees of freedom. Paired *t* tests, corrected for multiple comparisons using Tukey honestly significant difference test, were used as post hoc tests comparing estimated marginal means using the R package emmeans (Lenth et al., 2020). We report conditional and marginal  $R^2$  as measure of models' total explanatory power and that of fixed effects alone, respectively (calculated using the `r2_nakagawa` function from R package performance; Nakagawa & Schielzeth, 2013). Effect sizes for post hoc tests are reported as values and 95% confidence intervals (CIs) of estimated marginal mean difference.

For each response scale, we fitted models including context (responsible, not-responsible), group, condition (empathic resonance, compassion) and their interactions as fixed effects. Context by condition interaction was included as by-subject random slope and video stimuli were added as random intercept. The specification of random effects resulted from decreasing model complexity through multiple iterations until reaching model convergence stability. Models  $N = 965$  (responsibility), 955 (deservingness), 1,111 (willingness to help), 1,196 (valence), 1,207 (arousal), and 1,208 (empathy).

Following the results of the analysis of the "willingness to help" scale, we fitted a model that tested for a modulation of the group by context interaction by scores of the BIDR. Here, we included context, group, BIDR scores, and their interactions as fixed effects while keeping the random effects specification from the previous model (model  $N = 1,074$ ).

**Regularized Partial Correlation Networks.** We modeled the relationship between self-report measures using within-subject partial

correlation networks following the methodology already implemented in Fucci et al. (2021). We focused on data from emotional videos preceded by responsible contexts (data from the not-responsible contexts was excluded to avoid spurious correlations due to a general effect of context on all variables).

Between-subject variance was removed by centering each self-report variable on the participant's mean. Partial correlations between the six variables thus obtained were computed. To reduce the risk of overfitting, the resulting network was regularized using the LASSO, yielding a sparse network with many edges exactly set to 0. The best network was selected using the extended Bayesian information criterion, with  $\gamma = .5$ . Nonparametric bootstrap (resampling rows with replacement) was used to create 1,000 samples to estimate edge weights and their CIs. All these operations were performed using the qgraph (Epskamp et al., 2012) and bootnet (Epskamp & Fried, 2018) packages for R.

Networks were estimated separately for each group of participants (novices, experts). To further assess potential differences between the two groups in edge weights (i.e., partial correlation strengths), tests comparing independent correlations were performed using the `cocor` R package (Diedenhofen & Musch, 2015) for each edge retained by the regularization procedure.

### Behavioral Data Analysis

For the analysis of RTs collected in the AAT, the original data set consisted of 9,836 trials ( $2,459 \times 4$ ) (no. of short clips for each video stimulus). A total of 530 trials were excluded due to issues with video clips display ( $N = 40$ ), missing ( $N = 320$ ), and incorrect responses ( $N = 170$ ). Additionally, abnormal RTs that fell below a



threshold of 200 ms were excluded ( $N = 8$ ). The remaining RT data consisted of  $N = 9,298$ .

**Within-Subject Correlations.** In order to characterize the relationship between self-reports and behavior as indexed by the AAT, we performed multilevel, within-subject correlational analyses between self-report ratings and trial-level RT data using the R package correlation (0.7.0). Data were rank-transformed so that reported coefficients are Spearman correlation coefficients and indicate the strength of monotonic relationships.

**Generalized Linear Mixed-Effects Models.** To account for the nonnormal distribution of RT data, we fitted a generalized linear mixed-effects model where RTs were modeled as an inverse Gaussian distribution, following the suggestion of Lo and Andrews (2015). The model included group, context, condition, cue (approach-avoid), and their three-way interactions as fixed effects. The presentation order of video clips was also added as a fixed effect not interacting with the other factors. Following the same procedure of simplification of random effects as in the self-report models, context, condition, and cue were included as by-subject random slopes. Variance due to variability across video stimuli was modeled with a by-video random intercept. Type II Wald  $\chi^2$  test was used for statistical inference. Paired  $z$  tests, accounting for multiple comparisons using Šidák correction, were used as post hoc tests comparing estimated marginal means using the R package emmeans (Lenth et al., 2020). We report conditional and marginal  $R^2$  as measure of models' total explanatory power and that of fixed effects alone, respectively (calculated using the `r2_nakagawa` function from R package performance; Nakagawa & Schielzeth, 2013). Effect sizes for post hoc tests are reported as values and 95% CIs of estimated marginal mean difference. Based on the specificity observed in the correlation analysis (see Within Subject Correlations Between Self-Reports and AAT RTs section), the model data were restricted to emotional videos only (model  $N = 4,607$ ). Additionally, we tested an additional model with the same structure, but modeling RTs as gamma distribution.

## Transparency and Openness

We report a detailed analysis of statistical power for each measure given the sample size, all data exclusions (if any), all manipulations, and all measures in the study. Stimuli and materials used in the present study are publicly available, along with raw data and analysis code, through the Open Science Framework repository (<https://doi.org/10.17605/osf.io/h9byg>). The article contains detailed information that should allow a replication of the task and findings. If further information is needed, please contact the corresponding authors. The experiment was not preregistered.

## Results

### Self-Reports

Hypotheses were formulated prior to the statistical analysis for questions on responsibility, deservingness, and willingness to help. For the latter, we expected an interaction between group and context, where willingness to help would be higher in response to videos preceded by not-responsible, compared to responsible contexts in novices but not expert practitioners. For responsibility, we expected an effect of context to be present for

both groups. For deservingness, we expected an effect of context to be present for novices and possibly for expert practitioners. Regarding a possible effect of practice, we expected willingness to help to be higher and the effect of context to decrease after compassion, compared to empathic resonance practice. No hypotheses were formulated for the analysis of valence, arousal, and empathy self-reports.

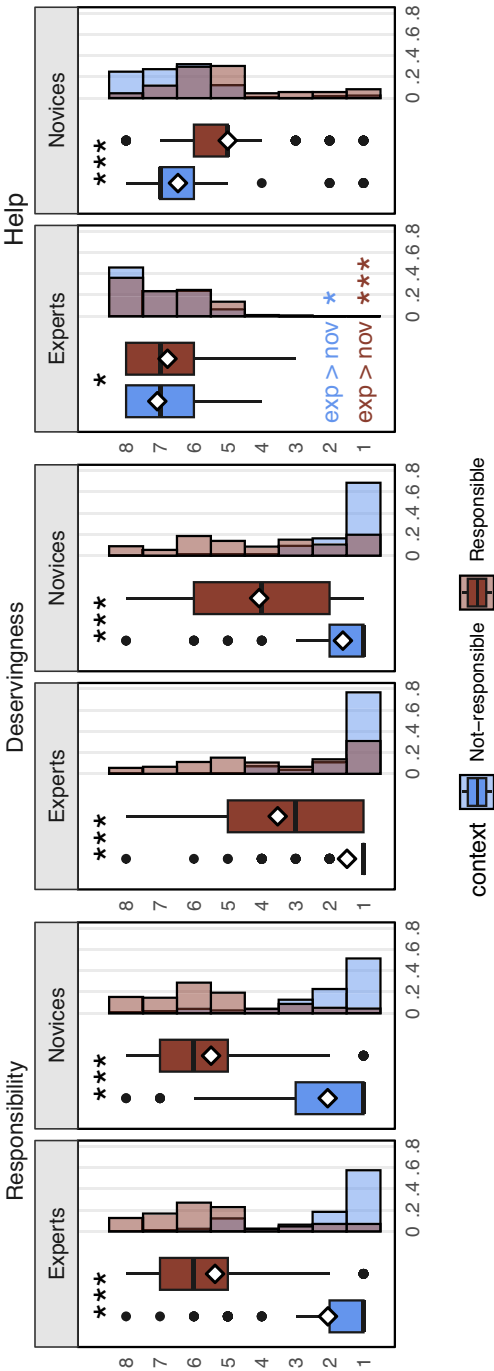
Figures 2 and 3 show the results of the analysis of self-reports in response to questions on responsibility, deservingness, and willingness to help. A context by group interaction was present for the "willingness to help" response scale,  $F(1, 59.2) = 20.89, p < .001$ ;  $R^2$  (full model) = .73,  $R^2$  (fixed effects) = .23. Although experts scored higher than novices in the BIDR questionnaire—experts' mean = 17.1, novices' mean = 12.7;  $t(58) = 2.26, p = .028$ , Cohen's  $d = 0.59$ , 95% CI [0.07, 1.12]—including the BIDR scores in the model did not alter the context by group interaction. Both novice and expert practitioners scored significantly higher in response to videos preceded by not-responsible, compared to responsible contexts. However, the difference between conditions was almost negligible for experts (0.35 difference on a 1–9 scale) and 4 times higher for novices, novices:  $t$ -ratio (60.8) = 8.8,  $p < .001$ , mean difference [CI] = 1.42 [1.09, 1.74]; experts:  $t$ -ratio (57.7) = 2.09,  $p = .041$ , mean difference [CI] = 0.35 [0.01, 0.69]. Additionally, experts' willingness to help was significantly higher than novices' in both contexts. However, the difference was higher in responsible compared to not-responsible contexts, exp–nov, responsible context:  $t$ -ratio (59.8) = 5.55,  $p < .001$ , mean difference [CI] = 1.64 [1.05, 2.23]; exp–nov, not-responsible context:  $t$ -ratio (59.8) = 2.14,  $p = .037$ , mean difference [CI] = 0.58 [0.04, 1.11].

The same model yielded a significant main effect of condition, willingness to help being slightly higher in both groups after compassion compared to empathic resonance practice,  $F(1, 57.9) = 11.67, p = .001$  (mean difference [CI] = 0.25 [0.10, 0.39]).

A main effect of context was present for the "responsibility" response scale, both groups reporting higher responsibility in responsible compared to not-responsible contexts— $F(1, 58.2) = 407.2, p < .001$ ,  $R^2$  (full model) = .65,  $R^2$  (fixed effects) = .48 (mean difference [CI] = 3.31 [2.98, 3.64]). The same main effect of context was present for the "deservingness" scale, both groups reporting higher deservingness in response to responsible compared to not-responsible contexts,  $F(1, 58.1) = 129.01, p < .001$ ,  $R^2$  (full model) = .63,  $R^2$  (fixed effects) = .29 (mean difference [CI] = 2.24 [1.84, 2.64]).

Across both groups, the valence of emotional videos was judged as less negative when they followed responsible, compared to not-responsible contexts,  $F(1, 59.4) = 8.25, p = .006$ ;  $R^2$  (full model) = .71,  $R^2$  (fixed effects) = .01 (mean difference [CI] =  $-0.22$  [ $-0.37, -0.07$ ]), while an interaction between group and context was present for the questions on arousal,  $F(1, 58.1) = 8.05, p = .006$ ,  $R^2$  (full model) = .58,  $R^2$  (fixed effects) = .03, and empathy,  $F(1, 58.7) = 11.39, p = .001$ ,  $R^2$  (full model) = .59,  $R^2$  (fixed effects) = .06 (graphs for valence, arousal, and empathy are displayed in Figure S4 in the online supplemental materials). Both groups reported higher arousal after watching videos preceded by not-responsible, compared to responsible contexts. However, this difference was bigger in novices compared to experts, novices:  $t$ -ratio (59.8) = 6.92,  $p < .001$ , mean difference [CI] = 0.83 [0.59, 1.07]; experts:  $t$ -ratio (58.1) = 2.65,  $p = .010$ , mean difference [CI] = 0.34 [0.08, 0.59]. Similarly, reported empathy was higher

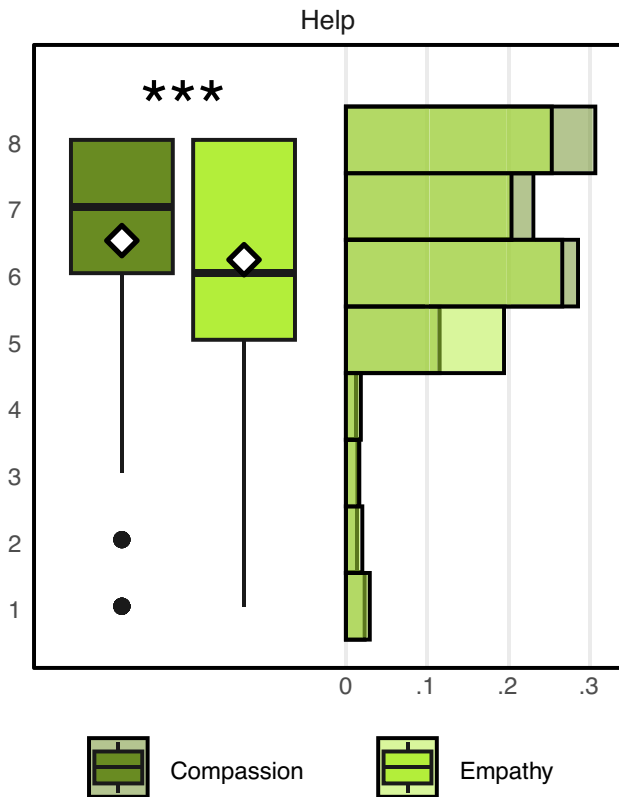
**Figure 2**  
*Effect of Different Context–Video Pairs on Self-Reported Measures of Responsibility, Deservingness, and Willingness to Help in Expert and Novice Practitioners*



*Note.* Box plots and histograms displaying means (white rhombi), medians (black horizontal lines), and distribution of responses to each question. See the online article for the color version of this figure.  
\*  $p < .05$ . \*\*\*  $p < .001$ .

**Figure 3**

*Effect of Practice on the Self-Reported Measure of Willingness to Help Across Both Groups of Participants*



*Note.* Box plot and histogram displaying means (white rhombi), medians (black horizontal lines), and distribution of responses. See the online article for the color version of this figure.

\*\*\*  $p < .001$ .

in responsible, compared to not-responsible contexts in both groups, but this difference was bigger in novices compared to experts, novices:  $t$ -ratio (59.7) = 7.56,  $p < .001$ , mean difference [CI] = 1.17 [0.86, 1.48]; experts:  $t$ -ratio (58.4) = 2.51,  $p = .015$ , mean difference [CI] = 0.41 [0.08, 0.74]. All effects on self-reports remain significant after a Holm correction for multiple comparison.

### Partial Correlation Networks

We have shown that the manipulation of context had effects on all self-rated scales but how do the scored variables interrelate? In particular, which dimensions are reliably associated with willingness to help? We addressed these questions using partial correlation networks computed separately for each group and focusing on self-report data from emotional videos preceded by responsible contexts (Figure 4). We hypothesized that the pattern of connectivity in novices would roughly replicate the one described in our previous study (Figure 3 in Fucci et al., 2021). On the other hand, we expected experts to exhibit weakened associations between willingness to help on one hand, and empathy and deservingness on the other hand, reflecting the nonemotional basis and unconditionality, respectively, of the motivation of Buddhist practitioners to alleviate suffering of others.

The results displayed in Figure 4 largely corroborate our hypotheses, with one exception: After partialing out other variables, empathy is not associated with willingness to help. Connections common to both groups are of similar strengths, and weights in the network computed for novices are very close to those reported in Fucci et al. (2021). The correlation strength between willingness to help and deservingness differed significantly across the two groups of practitioners ( $\Delta r[\text{nov-exp}] = -.32$ , 95% CI [-0.47, -0.17], Fisher's  $z = -4.22$ ,  $p < .001$ ), but not the correlation between responsibility and deservingness ( $\Delta r[\text{nov-exp}] = .05$ , 95% CI [-0.09, 0.18], Fisher's  $z = 0.67$ ,  $p = .50$ ) nor the one between empathy and arousal ( $\Delta r[\text{nov-exp}] = -.08$ , 95% CI [-0.19, 0.03], Fisher's  $z = -1.37$ ,  $p = .17$ ).

### Within-Subject Correlations Between Self-Reports and AAT RTs

We hypothesized that the RTs to approach emotional trials would negatively correlate with self-reported willingness to help. We ran a similar analysis for each expertise group separately to test whether they differed in terms of self-reports-behavior association. Additionally, we performed control and specificity analyses by examining the correlation between help ratings and RT to avoid emotional trials, between help ratings and RT to approach neutral trials, and between other self-reports and RT to approach emotional trials.

Self-reported willingness to help in response to emotional videos significantly correlated with the response time to approach cues on the same videos (Spearman's  $\rho$   $r_s$  [CI] =  $-.09$  [-0.13, -0.05]),  $t(2081) = -4.20$ ,  $p < .001$ , with no significant differences between the two groups of participants (novices:  $r_s$  [CI] =  $-.10$  [-0.16, -0.04], experts:  $r_s$  [CI] =  $-.08$  [-0.14, -0.02]). This association between willingness to help and behavioral response time was specific to emotional videos (for neutral videos:  $r_s$  [CI] =  $.00$  [-0.06, 0.05]),  $t(1302) = -0.16$ ,  $p > .87$ , and specific to the approach trials (for avoidance trials:  $r_s$  [CI] =  $-.04$  [-0.08, 0.00]),  $t(2093) = -1.74$ ,  $p = .083$ .

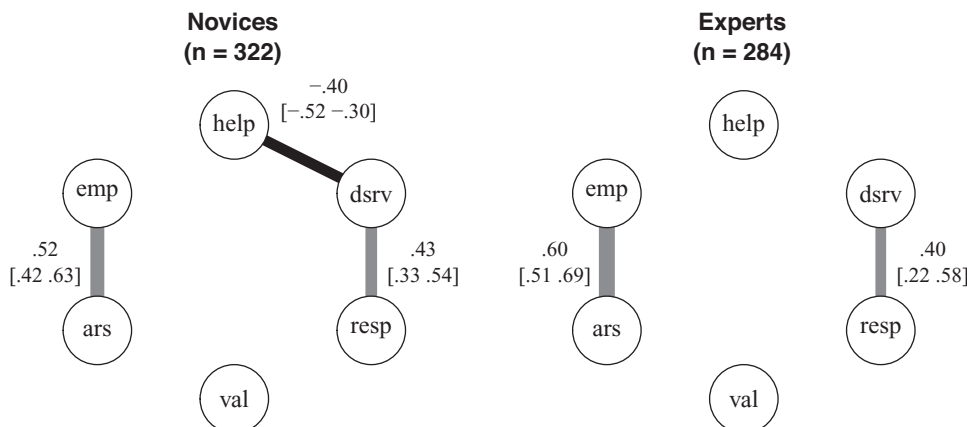
As a last verification, we estimated the strength of correlation between other self-rated scales and the approach behavior to emotional videos. It appeared that all scales correlated significantly with the approach RTs (all absolute  $r_s$  between .07 and .09, all  $p < .004$ ). However, while all these correlations shrunk after controlling for willingness to help ratings (all absolute  $r_s$  between .01 and .04, all  $p > .10$ ), the correlation between approach RTs and willingness to help remained significant even after controlling for all other scales simultaneously ( $r_s$  [CI] =  $-.05$  [-0.10, 0],  $p = .038$ ). These results indicate that the relationship between willingness to help and approach RTs is highly specific and rule out the possibility that it could be spuriously induced by the covariance with other self-rated dimensions.

Taken altogether, the pattern of correlational results suggests that the approach RT as implemented in our study in response to emotional videos is a reliable and specific behavioral marker of participants' willingness to help the suffering protagonists of the videos.

### Effect of Context, Group, and Condition on AAT RTs

We hypothesized that different contexts would modulate approach-avoidance RTs differently for novices and expert practitioners. We also expected to observe a main effect of practice

**Figure 4**  
Regularized Partial Correlation Networks for Expert and Novice Practitioners



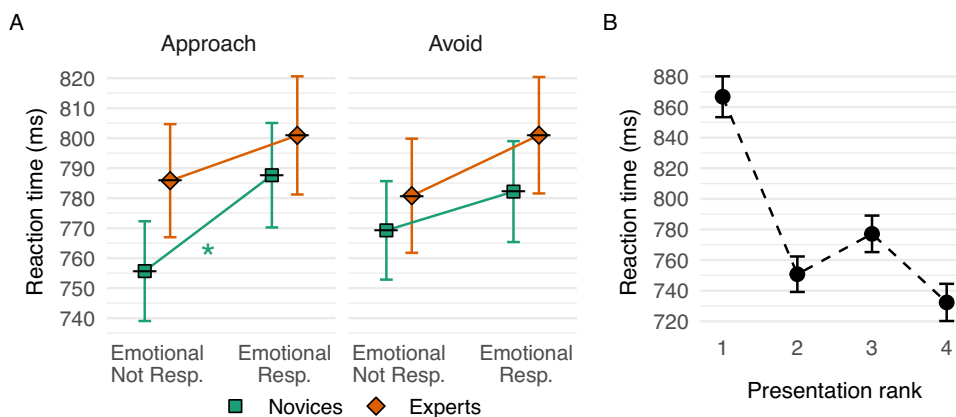
*Note.* Edges represent partial correlations that survived a regularization step designed to avoid spurious associations without loss of power. Values indicate estimates and 95% bootstrap confidence intervals between brackets. Gray and black colors are associated, respectively, with positive and negative correlation values. val = valence; ars = arousal; emp = empathy; resp = responsibility; dsrv = deservingness; help = willingness to help.

(compassion vs. empathic resonance) on the RTs. We did not formulate a priori hypotheses on the mechanisms driving these effects (although correlation analysis pointed toward a possible effect on RTs following the approach rather than the avoidance cue).

Model estimation yielded a statistically significant interaction between group, context (responsible, not-responsible), and cue (approach, avoid) (Figure 5a),  $\chi^2(1) = 4.07$ ,  $p = .044$ ,  $R^2$  (full model) = .03,  $R^2$  (fixed effects) = .01. Post hoc pairwise comparisons showed increased RTs to approach emotional videos preceded

by responsible, compared to not-responsible contexts in novices but not in expert practitioners, while there was no difference in RTs following avoid cues (Table 3). A main effect of video clips presentation order was also present (Figure 5b),  $\chi^2(3) = 393.78$ ,  $p < .001$ , due to a general decrease in RTs from the first to the fourth presentation (mean RT [CI]: Video Clip 1 = 912 ms [854, 970], Video Clip 2 = 794 ms [737, 852], Video Clip 3 = 816 ms [758, 873], Video Clip 4 = 768 ms [710, 825]). No interaction between practice (compassion, empathic resonance), context, and cue was present,  $\chi^2(1) =$

**Figure 5**  
Effect of Experimental Factors on AAT Reaction Times



*Note.* (A) Novices responded faster to approach emotional, not-responsible videos compared to responsible videos. Such difference between context conditions was not statistically significant for approaching videos in experts, nor was there any difference between context conditions in avoiding videos. (B) Four video clips were extracted from and presented after each video (twice for approach, twice for avoid, in a random order); reaction times decreased across presentations, with responses being slower in the first presentation compared to the subsequent ones. Discrepancies with estimates reported in the main text are due to differences in estimation methods (from the fitted model vs. from raw data). Error bars indicate 95% confidence intervals after removing intersubject variability. AAT = approach-avoidance task; Resp. = response. See the online article for the color version of this figure.

\*  $p < .05$ .



**Table 3**

*Post Hoc Pairwise Comparisons of Reaction Times Following Emotional Videos Preceded by Responsible or Not-Responsible Contexts (Emotional Resp–Emotional NotResp)*

Responsible–not-responsible				
Cue	Group	z-ratio	p	$M_{diff}$ (ms) [95% CI]
Approach	Novices	2.16	<b>.031</b>	<b>29 [3, 55]</b>
	Experts	0.60	.55	9 [–19, 36]
Avoidance	Novices	0.04	.97	1 [–26, 27]
	Experts	1.36	.17	19 [–8, 47]

Note. CI = confidence interval; Resp = responsible; NotResp = not-responsible.  $p < .05$  highlighted in bold.

1.19,  $p = .28$ , nor one between practice and cue,  $\chi^2(1) = 1.25$ ,  $p = .26$ .

Nonetheless, when modeling RTs using a gamma instead of an inverse Gaussian distribution (see Generalized Linear Mixed-Effects Models section), we did not observe the interaction between group, context, and cue found in the main model,  $\chi^2(1) = 2.59$ ,  $p = .11$ ,  $R^2$  (full model) = .14,  $R^2$  (fixed effects) = .05.

## Discussion

The present study provides initial self-reported and behavioral evidence of a dissociation between moral responsibility attribution and compassion in expert Buddhist practitioners. This data challenges the established view in western psychology that compassion is conditioned by moral judgment and by cost and benefit appraisals. Despite its relevance to both fundamental research and applicative scenarios, no studies up to date have investigated this topic in the context of contemplative traditions and practices. Here, we used a previously validated within-subject manipulation of responsibility and deservingness attribution based on short stories associated with video stimuli depicting people in distress (Fucci et al., 2021). We collected self-reported measures of attribution and willingness to help and investigated their relationship using within-subject correlation networks. Finally, we introduced a new version of the AAT to investigate implicit behavioral attitudes in response to suffering stimuli and to elucidate the impact of context manipulation on RTs in novice and expert meditation practitioners. In the following, we discuss the findings and limitations of our study with the aim of initiating a dialogue between western and contemplative approaches to this sensitive and relevant subject.

## Self-Report Measures of Attributions and Willingness to Help in Novice and Expert Practitioners

Results from the analysis of self-reports in response to video stimuli (Figure 2) showed how, in novice practitioners, different contexts preceding emotional videos manipulated the perceived responsibility of the sufferer, judgments on the degree of deservingness for their suffering and participants' willingness to help the subject(s) of the video. In expert practitioners, different contexts had the same impact on responsibility attribution and deservingness judgment. However, experts' willingness to help was not modulated by contexts as much as it was for novices (in fact, the context effect size was almost negligible). Moreover, experts' willingness to help was higher than novices', especially for those

videos preceded by responsible contexts. Willingness to help was also higher for both groups after compassion compared to empathic resonance practice (albeit with a small effect size; Figure 3). Importantly, the partial correlation networks (Figure 4) highlighted a positive relationship between responsibility attribution and deservingness judgment in both groups. However, while there was a negative relationship between deservingness and willingness to help in novices, the same correlation was not present in the experts' correlation network. In our opinion, this is the most relevant finding of the present work, providing evidence in support of a dissociation between responsibility attribution and willingness to help in long-term Buddhist practitioners.

In novices, the magnitudes of effects are very close to those previously reported in a validation study of the experimental paradigm and stimuli (Fucci et al., 2021; see also Figure S5 in the online supplemental materials). More generally, the results are in line with previous between and within-subject studies on the effect of attributions on helping intentions and behavior (Baránková et al., 2019; Halkjelsvik & Rise, 2014; Kogut, 2011; Rudolph et al., 2004). They corroborate evolutionary theories on compassion and prosocial motivation as processes motivated by fostering kin-selection and reciprocal altruism (Stürmer & Snyder, 2009). From this perspective, compassion is a costly resource and it is less likely to be actualized in contexts that provide less chances for reciprocation and cooperation, as it is the case when the sufferer is considered responsible and blamed for their condition (Goetz et al., 2010).

According to attribution theory, the decreased willingness to help is mediated by feelings of anger arising when a sufferer is considered to be responsible for their actions (Weiner, 2006). Within philosophical analysis, moral emotions have been discussed as having a prominent role in shaping the shared social attitude of considering suffering as a deserved consequence for wrongdoers; a sentiment concretized in the many instances of retributive, rather than restorative, punishment that characterize our legal systems (Goodman, 2009, Chapter 9).

Within Buddhist traditions, affective responses of hatred and resentment are not only considered to be obstacles for compassion, but to result from a state of ignorance of the causes and conditions of human suffering (e.g., Halifax, 2011). A compassionate mind is regarded instead as being free from conditioning patterns (Makransky, 2021).

In order to counteract and transform aversive and disruptive emotional responses, Buddhist practitioners engage in formal practices aimed at cultivating forms of compassion that encompass all living beings independently of their relevance to the practitioner and with an impartial stance toward their past actions (e.g., Lavelle, 2017; Ricard, 2015).

The results from expert practitioners support this view and could be driven by specific psychological processes underlying meditation training.

While the study of psychological mechanisms of unconditional compassion is still in its infancy, recent models point to the engagement and modulation of both other- and self-oriented processes through a variety of complementary meditative practices which include deconstructive practices (e.g., open presence meditation), and a variety of constructive practices such as loving-kindness and compassion meditations, or the cultivation of ethical and spiritual values (Dahl et al., 2015; P. Rinpoche, 1993). The specific role of each practice is still speculative. Regarding constructive practices, Dahl et al. (2015) suggest that cognitive reappraisal and perspective-taking are two important mechanisms

characterizing meditation practices that aim to counteract and transform aversive and disruptive emotional responses. Together, these processes are proposed to reduce intergroup biases and to prompt the responding to aversive stimuli with compassionate concern. As a result of intensive and continuous practice, this response pattern would eventually become automatic and contribute to the formation of a stable behavior.

In addition, unconditional compassion could also be facilitated by recognizing and “letting go” of conditioning elements that characterize a dualistic mind, such as the distinction of self and others and a fixed sense of self as manifestations of an objective reality (Condon & Makransky, 2023). These deconstructive practices that cultivate nondual awareness have been proposed to facilitate this radical “letting go” by acting on cognitive predictive processes underlying perception and action, ultimately reducing the relying on prior knowledge to guide behavior and instead engaging with experience from a stance anchored in the present moment (e.g., Laukkonen & Slagter, 2021; Lutz et al., 2019). These two complementary supporting mechanisms of unconditional compassion meditation are possibly at place at different stages of a practitioner’s training. Future research is needed to delineate the specific contributions of these various practices as well as their synergistic effects so as to unpack the exact psychological factors that explain the difference between expert and novice practitioners.

Finally, our interpretation remains tentative due to two relevant issues. First, we do not know whether the dissociation between responsibility attribution and willingness to help in experts is mediated by differences in emotional responses. Compared to novices, experts had a significant but much smaller effect of context on subjective measures of arousal and empathy (Figure S4 in the online supplemental materials). However, none of these two subjective measures remained related to those of attribution or willingness to help in correlation networks after partialing out the shared variance between variables. This is surprising, especially for novice practitioners. A positive association between empathy and prosocial motivation has been widely described in the psychology literature (Klimecki, 2019 for a review), and it was previously observed in a partial correlation network based on a sample of nonpractitioners using the same experimental paradigm and stimuli (Fucci et al., 2021). A possible interpretation would be that the training followed by novices already induced some difference from the general population, in particular the fact that they had multiple opportunities to reflect on the difference between empathy and compassion. Nonetheless, it is difficult to provide a final interpretation until a broader spectrum of emotional responses are investigated in this context. In future studies, collecting reports of aversive affective reactions might help to better elucidate the role of moral emotions in mediating the relationship between attributions and help in experts and novices.

Secondly, the fact that experts judge subject(s) of videos preceded by responsible contexts as more deserving of suffering, compared to not-responsible ones, might look surprising under views of Buddhist’s aspiration for all being to be free from suffering. This result could be due to the fact that expert practitioners in the current study come from a European background, which might influence their stance on punishment. On the other hand, the notion of “deservingness” might be considered differently by the two groups. However, within the present study, we do not have access to information that can resolve this question. In this sense, we propose that future research could collect qualitative data through interviews apt to investigate differences in perspectives on blameworthiness and in the use of such scale between experts and novices.

## Operationalization of Compassion as Approach-Avoidance Behavior

Based on traditional Buddhist accounts and recent definitions of compassion that emphasize its motivational aspect (Gilbert, 2019; Gilbert & Choden, 2013; Jazaieri et al., 2013; Weng et al., 2017), we introduced in the present work a novel approach to investigate its behavioral correlates in laboratory, within-subject experiments. We hypothesized that a compassionate attitude would impact approach-avoidance RTs to suffering stimuli and that the same behavior would be modulated by contextual and group differences in the same way as observed in the analysis of subjective measures. Using a novel version of VAAST (AAT), we found that, within each subject and across both groups, subjective willingness to help was negatively correlated with RTs to approach video clips extracted from a suffering video preceding the AAT. This relationship was not present between self-reports and avoidance behavior. It was observed for emotional videos only and it was specific to willingness to help when partialing out the shared variance between this and the other subjective measures.

This result is in line with a recent body of research on approach motivation that highlighted how negatively valenced stimuli, and especially human signals of distress can be associated with approach tendencies. This is the case for images of faces in tears (Gračanin et al., 2018), as well as for faces displaying sadness compared to anger (Seidel et al., 2010). Importantly, a recent study showed how decreased RTs to approach faces expressing fear and sadness were related to individuals’ prosocial attitudes (Kaltwasser et al., 2017). This is in contrast with classical accounts of the AAT which rely on the so-called stimulus–response compatibility effect (Krieglmeyer et al., 2013), whereby negatively and positively valenced stimuli drive automatic avoidance and approach behaviors, respectively. Whereas this effect has been found consistently in the literature, several studies have demonstrated that traditional stimulus–response associations can be modulated by emotional states and cognitive processes that affect goals and motives driving behavior. It is the case for anger, which prompts approaching negatively valenced stimuli (Harmon-Jones et al., 2013) or mindfulness, which has been shown to disrupt approach tendencies to attractive food as well as classical valence–behavior relationships (Baquedano et al., 2017; Juneau et al., 2021; Papies et al., 2012). Accordingly, a compassionate motivation entails a disposition (or readiness) toward approaching suffering that, we believe, lies at the basis of the observed relationship between increased willingness to help and decreased RTs to approach emotional videos.

## Context Information Influences Approach Behavior in Novice, but Not Expert Practitioners

Following the correlations analysis, we explored the effects of the experimental variables on approach-avoidance RTs. Our best model, which included all experimental variables and accounted for the effect of stimulus presentation order, highlighted a statistically significant interaction between contexts and groups on approach-avoidance RTs. Novice practitioners were slower to approach videos preceded by responsible, compared to not-responsible contexts, while no difference was present for experts. The effect size (~30 ms) is in line with moderate effects observed in the literature on RTs in AATs (e.g., Papies et al., 2012; Rougier et al., 2020).

Adding to the correlation analysis, this result supports the validity of operationalizing compassion in terms of approach-avoidance behavior, relying on theoretical accounts that stress its motivational aspect.

Furthermore, it shows that attributional processes can influence behavioral attitudes. To our knowledge, this is the first data highlighting an effect of responsibility attribution on implicit behavior in a within-subject experiment, attribution theory relying heavily on models based on subjective measures collected through cross-sectional studies (e.g., Rudolph et al., 2004). The use of implicit behavioral measures to investigate social attitudes has been proven effective in related fields. For instance, Rougier et al. (2020) provided evidence for an effect of group membership on approach-avoidance behavior, showing how participants were faster in approaching first names belonging to their same ethnic group, an effect that was stronger for those who reported less trust toward outgroup members. If replicated, the present findings would contribute to the attribution theory and evolutionary accounts of compassion showing how responsibility attribution engages fundamental bodily processes. At the same time, they would show how the different stance toward suffering in Buddhist practitioners is embodied and not confined to a conceptual framework.

Nonetheless, we believe the present findings are not entirely conclusive due to issues prevalently related to the experimental design and statistical power. Specifically, the model estimation showed how most of the variability in our sample is accounted for by a general decrease in RTs over stimuli repetitions within the same trial. Moreover, *a priori* power analysis resulted in only ~70% statistical power to detect a moderate effect size for a three-way interaction including group, context, and cue (approach, avoidance). These issues possibly explain the sensitivity to modeling choices such as using inverse Gaussian or gamma distributions for RTs, the latter showing a strong effect of stimulus repetition but no interaction between groups and contexts on approach RTs. Finally, contrary to the self-reports on willingness to help, we did not observe any effect of expertise (e.g., faster RTs to approach videos preceded by either context in experts, compared to novices).

While we believe our model represents the best way to describe the present data (see Generalized Linear Mixed-Effects Models section), we also advise to interpret these specific results with caution until they are replicated by future research.

### Framing Trait and State Effects in the Context of Research on Compassion Training

In the analysis of self-reports, we observed both an effect of expertise and of practice (compassion, empathic resonance) on willingness to help. The effect of expertise is compatible with previous research showing increased self-reported prosocial attitude and behavior following compassion and mindfulness-based training programs (Berry et al., 2018; Condon et al., 2013; Donald et al., 2019; Iwamoto et al., 2020; Weng et al., 2013). To our knowledge, no previous study has shown an effect of short compassion practice on prosocial behavioral measures. However, there is evidence of increased helping behavior in a prosocial game after a short compassion-based intervention (1 day long) compared to an active control condition (Leiberg et al., 2011). Remarkably, a short compassion practice does not seem to be able to mitigate the effect of contextual information on self-reported willingness to help (as well as on approach RTs) in novice practitioners, who not only engaged in compassion meditation during the task, but underwent a weekend-long introduction to mindfulness and compassion and practiced regularly at home before the experiment.

Future longitudinal studies on secular compassion-based programs should investigate whether the decreased effect of context on self-

reported willingness to help, the lack of effect on approach RTs, and the dissociation between blame attribution and willingness to help is indeed confined to highly advanced practitioners. If so, it should be determined whether this is prevalently due to the “amount” of practice or, and as already suggested by some authors (e.g., Gilbert, 2019; Gilbert & Mascaro, 2017), by the fact that compassion-based programs should be extended to address attitudes and resistances that compete with prosocial motivation. Finally, it could also be the case that secular programs directed to lay practitioners might not be the right setting to cultivate and study attitudes toward suffering like the one characterizing experts’ profiles in the present research.

### Limitations

The current research presents some limitations that should be addressed in future studies. First, confounding effects could interact with the effect of context on responsibility attribution, deservingness, and willingness to help. In a previous report focusing on the validation of the set of stimuli implemented here (Fucci et al., 2021), we discussed how the video stimuli are characterized by a high degree of heterogeneity in terms of suffering situations displayed to account for possible confounds. However, we cannot entirely exclude that factors such as socioeconomic status of the depicted characters might interact with context manipulation in some videos, something that is worth exploring in future research.

Additionally, as mentioned in the Self-Report Measures of Attributions and Willingness to Help in Novice and Expert Practitioners section, the present study lacks information that could help elucidate the role of emotion regulation in the relationship, or lack thereof, between attributions and willingness to help in both groups of participants, as well as the perspective on deservingness judgments in expert practitioners. Both could be addressed in future research by collecting subjective accounts through self-report measures and semistructured interviews.

In addition, and most importantly, limited statistical power affected our analysis of the effects of experimental factors on RTs in the contexts of the AAT. Our sample of participants and trials was constrained by time and logistics of the larger project which the current study was part of. Nonetheless, the recruitment of a large sample of selected long-term Buddhist practitioners poses the same challenges affecting, for instance, studies on clinical or other special populations. In this sense, future research could benefit from international, multicenter efforts (including open databases) and/or from increasing the repetitions and variety of stimuli in within-subject designs.

The design of this study was cross-sectional, longitudinal studies will be required to investigate the role of extensive meditation training in shaping the trait differences observed here.

### Constraints on Generality

#### Participants

All participants were middle-aged but our results in the control group were consistent with the literature on attribution theory and willingness to help, which has been mostly carried out on younger samples. Therefore, we expect our results to generalize to other age groups. Expert Buddhist practitioners were recruited within the Tibetan Kagyü and Nyingma meditation traditions, which stand out by the way they connect compassion with the practice of objectless meditations. A direct replication should make use of samples with a



similar approach to the development of love and compassion and the similar level of expertise in this practice. Even so, the cultivation of unconditional and universal love and compassion, which we believe underlies the results reported here, is a common aim of many Buddhist contemplative traditions, so we expect the results to replicate in any sample of meditation practitioners who have achieved a comparable proficiency in the practice of universal love and compassion meditation. On the other hand, we have no evidence that merely holding the ethical value of universal love and compassion is enough to produce the reported behavioral effects.

### Stimuli

The set of video clips was dominated by highly emotional situations associated with morally charged contexts. We have no evidence that the results would generalize to a broader spectrum of suffering situations, especially low-arousal and everyday life contexts. Due to the laboratory setting and the use of video stimuli, we cannot know if the present findings translate into actual behavior in real-life scenarios. In particular, the self-report measures might not reflect the same attitudes of participants in more ecological settings. On the other hand, the correlation between self-reports and premotor attitudes represents a promising result in this direction.

### Procedure

The approach-avoidance effect is dependent on the visual stimulus being processed by participants. Therefore, direct replications should be attentive to the onset timing and relative position of the cue with respect to the video clip.

We have no reason to believe that the results depend on other characteristics of the participants, materials, or context.

### Implications and Future Directions

Over the recent years, empirical research has been providing increasing evidence of the benefits of cultivating compassion and cooperation on personal well-being and in clinical settings (e.g., Ricard, 2015). However, urgent and pressing societal issues demand us to reevaluate and possibly ameliorate the way we relate to each other's condition, and to reflect and work on how we tackle suffering in a highly interconnected world. This entails questioning and expanding our theoretical knowledge, as well as defining new pathways of applicative research. By providing initial evidence for the possibility of developing an unconditional stance toward suffering, the current research challenges established views in social and evolutionary psychology. It calls for a dialogue between contemplative traditions and western psychology and philosophy to integrate theories and practices that can refine our understanding of prosocial motivation. We can imagine the practical implications that embodying Buddhist ethics in our societies would have for our justice systems (e.g., Goodman, 2009; Chapter 8), but also for decision-making processes in policy, healthcare, and other settings.

In our view, future research on this topic should focus on replicating and increasing the understanding of the mechanisms behind the current findings. One question will be to investigate the consequences of this unconditional attitude, beyond implicit behavioral dispositions, as studied here, on complex real-life decision-making settings which require the integration of ethics and moral considerations.

Additionally, future works should investigate, through longitudinal studies, whether compassion-based programs can lead to unconditional forms of compassion in lay practitioners, whether such a profile might only be cultivated and embodied by highly trained individuals and if non-Buddhist practices can impact similar processes. Either way, we believe that concepts such as "global compassion" (Ekman & Ekman, 2017), supported by empirical evidence, theoretical justification, and practices, could have broad societal implications and we hope this is just a first step, among others, to guide research agendas in that direction.

Finally, the results of the analysis of behavioral data provide initial supporting evidence over the validity of using a modified version of a visual AAT to study prosocial motivation. Future research should focus on validating this approach by working with more adequately powered samples and possibly investigate the physiological correlates of compassion as a social motivation in laboratory and ecological settings.

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