

# Organ donation video messaging: differential appeal, emotional valence, and behavioral intention

Rodrigue JR, Fleishman A, Vishnevsky T, Fitzpatrick S, Boger M. Organ donation video messaging: differential appeal, emotional valence, and behavioral intention.

**Abstract:** Video narratives increasingly are used to draw the public's attention to the need for more registered organ donors. We assessed the differential impact of donation messaging videos on appeal, emotional valence, and organ donation intentions in 781 non-registered adults. Participants watched six videos (four personal narratives, one informational video without personal narrative, and one unrelated to donation) with or without sound (subtitled), randomly sequenced to minimize order effects. We assessed appeal, emotional valence, readiness to register as organ donors, and donation information-seeking behavior. Compared to other video types, one featuring a pediatric transplant recipient (with or without sound) showed more favorable appeal ( $p < 0.001$ ), generated more positive emotional valence ( $p < 0.01$ ), and had the most favorable impact on organ donor willingness ( $p < 0.001$ ). Ninety-five (12%) participants clicked through to a donation website after viewing all six videos. Minority race (OR = 1.94, 95% CI = 1.20, 3.13,  $p = 0.006$ ), positive change in organ donor readiness (OR = 0.26, 95% CI = 0.14, 0.48,  $p < 0.001$ ), and total positive emotion (OR = 1.05, 95% CI = 1.03, 1.07,  $p < 0.001$ ) were significant multivariable predictors of clicking through to the donation website. Brief, one-min videos can have a very dramatic and positive impact on willingness to consider donation and behavioral intentions to register as an organ donor.

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The benefits of organ transplantation are now commonly known, and the general public has favorable attitudes toward organ donation (1). However, these favorable attitudes do not always translate into actionable decisions about organ donation. Only 42% of all licensed adult drivers in the United States are registered organ donors (2) and, in the absence of documented donation intentions, family members of the recently deceased are less likely to consent to organ donation (3, 4). Consequently, public education campaigns continue to be the cornerstone of efforts to increase awareness about the need for more organ donors and to help the public translate favorable attitudes into donor registrations (5, 6).

The motor vehicle (MV) office increasingly has become an important venue for delivering organ donation messaging. In all 50 states, the organ donation question is required to be asked at the time of a driver's license transaction. Harrison

et al. (7), for instance, showed that training MV clerks, using point-of-decision materials about organ donation, and the presence of organ donation volunteers in the MV office led to substantial increases in donor registrations. In a statewide clinical trial, Rodrigue et al. (8) demonstrated that a comprehensive intervention focused on staff education and direct interactions with the public in Florida MV offices led to more donor registrations compared to passively displaying donation materials. In a more recent clinical trial, Thornton et al. (9) found that Ohio MV customers who viewed a five-min iPod informational video about organ donation were significantly more likely to register as organ donors than those who did not view the video.

The New England Organ Bank has developed a strong partnership with MV administrators in several states, which has been leveraged to provide video donation messaging in MV waiting rooms

throughout New England. In Massachusetts, for instance, four professionally produced videos with narratives by individuals affected by donation or transplantation and one informational video without personal narratives (DoNation, <http://www.organdonor.gov/materialsresources/videos.html>) are played on a continuous loop on TV monitors installed in some MV offices. While all videos were produced with sound, MV offices typically require that they be shown without sound (i.e., silent and subtitled) to avoid disrupting the workplace environment. Despite the emerging use of such videos to deliver donation information to the general public, there is a paucity of data about their effectiveness.

In this study, we sought to evaluate the individual and collective impact of the donation videos being used in some Massachusetts MV offices. Specifically, we were interested in examining whether the videos differed in appeal, emotional valence, and organ donation intentions in adults who were not currently registered as organ donors and who represent the primary targets of MV-based interventions about organ donation. We also wanted to determine whether the silent videos were equivalent to the sound videos on these outcomes. We had three primary hypotheses: (i) The pediatric transplant recipient video would be viewed as more appealing, trigger a more positive emotional response, and lead to stronger behavioral intentions to register as organ donors than the other videos because it highlights most directly the positive outcomes of organ transplantation through donation; (ii) Videos with personal narratives would be viewed as more appealing, trigger a more positive emotional response, and lead to stronger behavioral intentions to register as organ donors than the informational appeal DoNation video; and (iii) The sound videos would be viewed more favorably overall than the silent videos.

## Methods

### Participants

We recruited potential participants on Amazon Mechanical Turk (commonly known as mTurk, [www.mturk.com](http://www.mturk.com)). mTurk is an online crowd sourcing worksite where workers can complete “tasks” (e.g., surveys, review photographs or videos, translations, etc.) for a nominal payment. Requesters post Human Intelligence Tasks (HITs) and workers can respond to those that they are interested in completing. mTurk is increasingly used in the social and behavioral sciences, as it

yields results that are comparable to more traditional survey methods (10–12).

### Procedures

Following Institutional Review Board approval, we posted a HIT request for two d on mTurk. We informed potential workers that we were conducting a study about how people feel after watching several brief videos about organ donation. Study-eligible workers had to be  $\geq 18$  yr old, living in the United States, in possession of a valid U.S. driver’s license, able to read English, and not registered as an organ donor. mTurk workers interested in study participation clicked through and answered demographic questions (e.g., age, sex, race/ethnicity, state of residence, and possession of driver’s license) and a question asking them to characterize their current thoughts and readiness about organ donor registration (Pre-contemplation = I am not thinking about or considering registering to be an organ donor; Early Contemplation = I have started to think about registering to be an organ donor; Late Contemplation = I have thought about registering to be an organ donor and I am seriously considering it; Behavioral Intention = I have decided to register to be an organ donor; and Behavioral Action = I have already registered to be an organ donor). Workers who were too young, non-U.S. residents, did not have a driver’s license, or who selected the Behavioral Intention or Action readiness classification for organ donation registration were prohibited from advancing to the next phase of the study.

Eligible study participants then were directed to watch six short videos (Table 1), either with or without sound, but not both. The sound and silent videos were otherwise identical. To minimize the likelihood of an order effect, the sequence in which the videos appeared was randomly generated for each participant. As noted previously, four videos featured local individuals personally affected by chronic disease, organ transplantation, or organ donation, one video (DoNation) highlighted the societal need for more organ donors but did not feature any people personally affected by organ donation, and one video included time-lapsed landscapes from around the world and did not contain any organ donation messaging. In selecting the themes for the four videos featuring local individuals, we wanted to highlight individuals who are impacted by organ donation (or non-donation) in some way. Organ procurement organizations often use individuals personally impacted by donation/transplantation in their education and outreach programming, yet there are no empirical

Table 1. Description of videos

Title	Video description
Transplant recipient	A healthy six-yr-old girl who received a liver transplant from a registered organ donor. Her grateful mother describes the life-saving benefits of organ transplantation and the love they have for the donor and his family.
Waiting for transplant	A 37-yr-old woman on the waiting list for a kidney transplant describes life on dialysis, the long wait for an organ, and the uncertainty of survival without a transplant for her and her young children.
Waiting list death	The family of a 20-yr-old woman who died while waiting for a liver transplant describes the heartbreak of losing a loved one because of the shortage of registered organ donors.
Organ donor family	Parents describe the positive benefits of donating their 18-yr-old son's organs who registered as a donor prior to his death in a car accident, as well as how his donor registration status made their donation decision easier.
DoNation	An upbeat organ donation informational video produced by the U.S. Department of Health and Human Services that highlights the benefits of a national response to the organ donation shortage.
Non-donation (Sham)	An affectively neutral compilation of time-lapsed landscapes from around the world.

data to suggest that one is a more effective theme than another. Therefore, we chose to highlight transplant recipients (pediatric, adult), a family of a transplant candidate who died due to the shortage of organ donors, and a family whose child died and whose donation decision was made easier because his donor registration status was known. This time-lapsed landscape video was used as a validity check to ensure that respondents watched the videos (described below). All videos were in English and approximately 60 s in duration. To prevent early termination of any video, participants were not able to click through to post-video questions until the video ended. Finally, at the end of the study, we asked participants if they took the study seriously (yes-no) and if the videos played properly when being viewed. This allowed us to eliminate those who admitted to not watching the videos, did not take the survey seriously, or who experienced technical problems when attempting to watch the videos. Participants were paid \$1 upon completing the study.

#### Outcome measures

*Appeal.* General appeal was assessed by asking participants immediately after watching each video whether they “liked” or “disliked” it. Such a global assessment of message appeal has been found in marketing research to be a critical indicator of message effectiveness (13, 14).

*Emotional valence.* Emotional valence was assessed by asking participants to indicate, after each individual video, how the video made them feel by selecting any of 21 adjectives (10 affect positive: empowered, trusting, altruistic, generous, motivated, empathic, loving, inspired, hopeful, and compassionate; 10 affect negative: disgusted,

angry, confused, discouraged, shocked, bored, irritated, suspicious, uneasy, and sad; and one affect neutral: indifferent). Scores were generated for positive emotion, negative emotion, and total emotion for each individual video and for all six videos combined.

*Impact on donation decision-making.* Four assessments were made to assess the individual or collective impact of the videos on participants' organ donation decision-making. First, after watching all six videos in the sequence, participants were asked to rank order the videos based on how effective they were in motivating them to think more seriously about registering as an organ donor (1 = the most effective video, 2 = 2nd most effective video... 6 = the least effective video). Second, after watching all six videos, we repeated the baseline question asking participants to characterize their current thoughts and readiness about organ donor registration (i.e., Pre-contemplation; Early Contemplation; Late Contemplation; Behavioral Intention; Behavioral Action). Third, after each individual video, we asked participants to tell us if being shown that video a few minutes before being presented with the donation question (e.g., at an MV office) would have no effect on their decision, make them more likely to register as donor, or make them less likely to register as donor. Finally, after watching all videos and answering all survey questions, participants were directed to a web page that thanked them for their study participation and that included the following statement: “Click here for more information about organ donation or to register to become an organ donor.” Participants who clicked through were directed to a website we created and then seamlessly redirected to Donate Life America ([www.donatelifeamerica.com](http://www.donatelifeamerica.com)), which

allowed us to capture a reasonable proxy measure of behavioral action (i.e., seek more information and/or donor registration). We were not able to verify whether the participant actually completed the donor registration process.

#### Statistical analysis

We based our sample size calculations on the proportional change in response to the question asking participants to classify their readiness about organ donor registration. Based on our collective experiences and prior organ donation research, we sought to detect an absolute difference of 10% between the percent of participants who self-classified their readiness about donor registration as Late Contemplation or Behavioral Intention at baseline vs. end of survey. Detecting this proportional difference with a two-tailed  $p$  level of  $p = 0.05$  and 85% power required approximately 360 participants. As we were examining the sound and silent videos separately, we targeted an overall sample of 720 participants. Because we were uncertain how many mTurk workers might be declared ineligible after responding to the HIT request, we planned to close enrollment after approximately 1000 mTurk workers responded to the HIT posting.

Descriptive analyses were first calculated to summarize sample baseline characteristics and study outcomes. Order effects were examined using paired samples  $t$ -tests, comparing the sequence of videos to determine whether the emotional valence declined over time regardless of video type. Fisher's exact or chi-square tests (categorical variables) or  $t$ -tests (continuous variables) were calculated to examine for differences on study outcomes based on video type, sound vs. silent, and sample characteristics. Family-wise Bonferroni correction was applied to reduce error rates due to multiple comparisons. As a measure of effect size, Cohen's  $d$  was calculated, with 0.2, 0.5, and 0.8 representing small, medium, and large effects, respectively. Finally, multivariable logistic regression was performed to examine predictors of donation information-seeking behavior (i.e., click through to Donate Life American website). Only those variables that were significant in the univariate analyses were included in the model, with non-modifiable demographic characteristics entered in the first step and modifiable variables entered in subsequent steps. PASW 17.0 (SPSS, Inc., Chicago, IL, USA) was used for all statistical analyses.

## Results

### Sample characteristics

A total of 1128 mTurk workers responded to the HIT request. Three hundred and twenty-five (29%) were ineligible because they were already registered organ donors and 15 (1%) were ineligible because they indicated on the baseline readiness question that they already decided to register as organ donors. Thus, 788 completed the entire study; however, seven participants were removed because they stated they did not take the study seriously. The final sample on which all analyses are based is 781 participants (391 sound videos, 390 silent videos).

Median age of the entire sample was 29 yr (range = 18–76), 41% ( $n = 316$ ) were female, and 24% ( $n = 186$ ) were non-white. Forty-five of 50 U.S. states were represented in the sample. Participants in the sound vs. silent video groups did not differ significantly on any sociodemographic characteristics ( $p \geq 0.05$ ).

### Appeal

All videos were “liked” by the majority of participants (sound: 74–92%; silent: 62–85%; Table 2). A significantly higher percentage of participants “liked” the Transplant Recipient video more than all other donation videos, with or without sound (all  $p < 0.001$ ). Three sound videos were “liked” significantly more than their silent counterparts: Transplant Recipient ( $p = 0.003$ ), Waiting List Death ( $p < 0.001$ ), and DoNation ( $p < 0.001$ ). More women than men “liked” the Transplant Recipient (96% vs. 89%,  $p = 0.004$ ), Waiting for Transplant (85–75%,  $p = 0.01$ ), and DoNation (83% vs. 71%,  $p = 0.006$ ) sound videos. There were no significant sex differences on appeal of the silent videos. Also, there were no significant age or

Table 2. Percentage of participants who “liked” vs. “disliked” the video segments

Video title	Sound ( $n = 391$ )		Silent ( $n = 390$ )		$p$
	Liked, %	Disliked, %	Liked, %	Disliked, %	
Transplant recipient	92.1	7.9	85.7	14.3	0.006
Waiting for transplant	79.2	20.8	72.4	27.6	0.03
Waiting list death	78.5	21.5	68.5	31.5	0.001
Organ donor family	74.1	25.9	70.3	29.7	0.26
DoNation	76.2	23.6	62.4	37.6	0.001
Non-donation	79.5	20.5	74.4	25.6	0.11

$p$  Values are from Fisher's exact tests.

race differences on appeal of either sound or silent videos ( $p > 0.05$ ).

Emotional valence

Table 3 presents mean total, positive, and negative emotions endorsed after viewing each video. The Transplant Recipient video had higher mean total and mean positive emotion scores and a lower mean negative emotion score than all other donation videos, with or without sound ( $p < 0.01$ ). The most commonly endorsed emotions after viewing the Transplant Recipient video were compassionate (69% sound, 64% silent), hopeful (57% sound, 52% silent), and inspired (52% sound, 51% silent). The mean positive emotion score for all donation videos was significantly higher than for the Non-donation video, both sound and silent versions ( $p < 0.001$ ). The number of positive, negative, or total emotions endorsed did not vary by video sequence ( $p > 0.05$ ), thus suggesting that the strategy used to minimize order effects was successful.

Compared to the silent videos, significantly more positive emotion was generated by the sound versions of the Waiting for Transplant ( $t = 3.6$ ,  $p < 0.001$ ,  $d = 0.26$ ), Waiting List Death ( $t = 3.5$ ,  $p < 0.001$ ,  $d = 0.25$ ), and DoNation ( $t = 2.5$ ,  $p = 0.01$ ,  $d = 0.18$ ) videos. The silent DoNation video generated more negative emotion than its sound counterpart ( $t = 2.6$ ,  $p = 0.009$ ,  $d = 0.19$ ). Age, sex, and race were not significantly associated with total, positive, or negative emotional arousal for any of the video segments ( $p > 0.05$ ).

Impact on decision-making

About half of all participants (49% sound, 53% silent) ranked the Transplant Recipient as the most effective in motivating them to think more seriously about registering as an organ donor (Fig. 1).

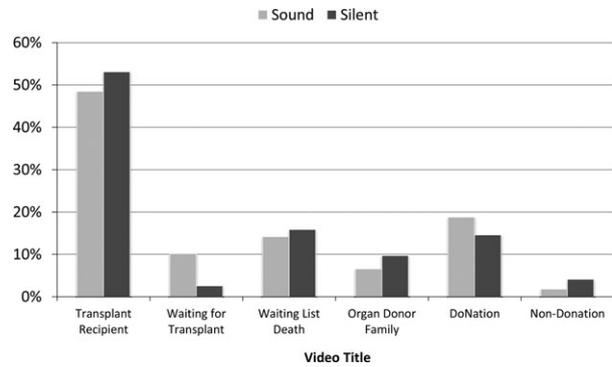


Fig. 1. Percentage of participants that ranked each donation video type as most effective in motivating them to think more seriously about registering as an organ donor.

In comparison, none of the other donation videos was ranked as most effective by more than 20% of participants.

There was a significant shift in readiness about organ donor registration, both for the sound (Fig. 2A) and silent (Fig. 2B) videos, from baseline assessment (i.e., pre-videos) to the final assessment (i.e., post-videos). At baseline, nearly half of all participants (46%,  $n = 359$ ) were in Pre-contemplation about organ donor registration, one-third (33%,  $n = 259$ ) were in Early Contemplation, and 21% ( $n = 163$ ) were in Late Contemplation. Participants watching sound vs. silent videos did not differ significantly in their organ donor registration readiness ( $p \geq 0.05$ ). After watching all six videos, 62% ( $n = 221$ ) who were in Pre-contemplation, 62% ( $n = 164$ ) who were in Early Contemplation, and 47% ( $n = 76$ ) who were in Late Contemplation at the baseline assessment advanced at least one step toward organ donor registration. Importantly, 15% ( $n = 121$ ; 62 sound, 59 silent) reported that they had decided to register as organ donors after watching all six videos.

Table 3. Mean (SD) number of total, positive, and negative emotions endorsed following the video segment

Video title	Sound (n = 391)			Silent (n = 390)		
	Total	Positive	Negative	Total	Positive	Negative
Transplant recipient	4.8 (2.7)	4.1 (2.5)	0.8 (0.9)	4.6 (2.6)	3.9 (2.6)	0.8 (0.9)
Waiting for transplant	4.0 (2.6)	3.0 (2.5)	1.0 (1.1)	3.3 (2.3)	2.4 (2.2)	0.9 (1.1)
Waiting list death	4.1 (2.6)	2.7 (2.4)	1.4 (1.1)	3.7 (2.5)	2.1 (2.3)	1.6 (1.3)
Organ donor family	3.8 (2.6)	2.8 (2.6)	1.0 (1.1)	3.7 (2.6)	2.6 (2.6)	1.1 (1.1)
DoNation	3.8 (2.7)	2.9 (2.7)	0.9 (1.0)	3.5 (2.5)	2.5 (2.6)	1.1 (1.4)
Non-donation	2.5 (1.9)	1.8 (1.9)	0.6 (0.9)	2.2 (1.9)	1.4 (1.9)	0.7 (1.0)

Range for total emotions = 0–21.

Positive emotions (n = 10): empowered, inspired, compassionate, motivated, trusting, hopeful, generous, loving, empathic, and altruistic.

Negative emotions (n = 10): bored, confused, irritated, sad, uneasy, discouraged, angry, suspicious, disgusted, and shocked.

Neutral emotion (n = 1): indifferent.

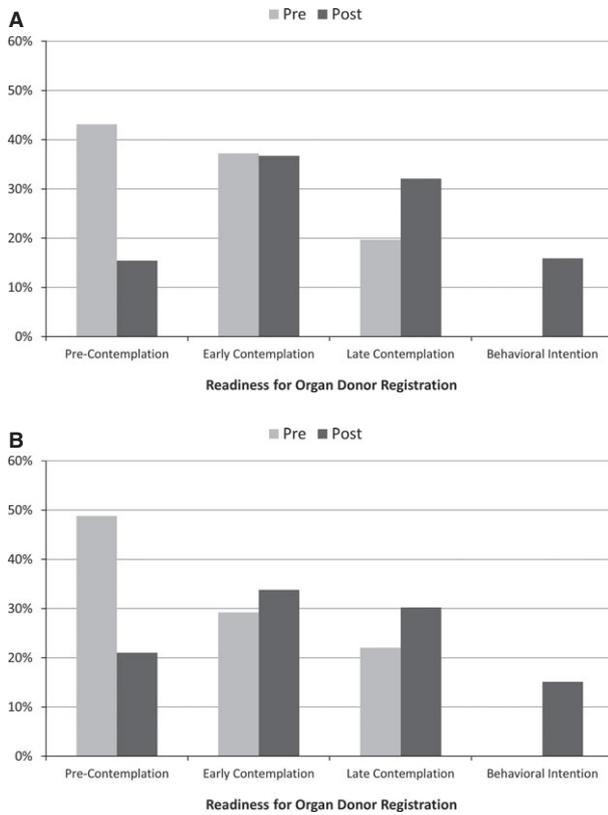


Fig. 2. Readiness to register as an organ donor before and after watching all six sound (A) and silent (B) videos.

The majority of participants indicated that they would be more likely to register as an organ donor if shown any of the donation videos (with or without sound) a few minutes before being asked the organ donor registration question (Table 4). However, compared to all other donation videos, with or without sound, the Transplant Recipient video was identified as likely to have the most favorable impact on organ donor registration (all  $p < 0.001$ ). The vast majority of participants indicated that viewing the Non-

donation video was likely to have no effect on likelihood of organ donor registration.

Finally, after watching all six videos, 12% ( $n = 95$ ; 55 sound, 40 silent) clicked through to the Donate Life America website for more donation information and/or to register as organ donors. Video type was not significantly associated with visiting the website ( $p = 0.10$ ). In univariate analysis, women (16% vs. 10% for men,  $p = 0.01$ ), minorities (18% vs. 10% for whites,  $p = 0.005$ ), those who moved up one or more stages of organ donation readiness (18% vs. 4% for those whose readiness stage did not change,  $p < 0.001$ ), and those reporting higher total positive emotions (22.2 vs. 15.2,  $t = 6.1$ ,  $p < 0.001$ ,  $d = 0.44$ ) were more likely to click through to the organ donation website. Three of the four variables were retained in the subsequent multivariable prediction model ( $p < 0.001$ ): race (OR = 1.94, 95% CI = 1.20, 3.13,  $p = 0.006$ ), stage of readiness change (OR = 0.26, 95% CI = 0.14, 0.48,  $p < 0.001$ ), and total positive emotion (OR = 1.05, 95% CI = 1.03, 1.07,  $p < 0.001$ ).

Discussion

In this study, we examined the appeal, emotional valence, and cognitive/behavioral impact of several videos produced to heighten interest in organ donor registration. While all donation-related videos were viewed positively, the personal narrative of a pediatric transplant recipient was perceived most favorably, yielded a stronger positive emotional response, and was more likely to trigger participants to think more seriously about organ donor registration. Additionally, participants felt that the Transplant Recipient video, more than all other videos, would lead them to register as an organ donor if shown a few minutes before being asked the organ donor registration question. The

Table 4. Percentage of participants who indicated that being shown the video prior to presentation of the organ donor question would impact their donation decision (no effect, more likely, less likely)

Video title	Sound (n = 391)			Silent (n = 390)		
	No effect on donation decision, %	More likely to register as donor, %	Less likely to register as donor, %	No effect on donation decision, %	More likely to register as donor, %	Less likely to register as donor, %
Transplant recipient	24	74	2	26	73	1
Waiting for transplant	33	64	3	46	51	3
Waiting list death	31	65	4	31	64	4
Organ donor family	40	54	6	42	54	4
DoNation	35	59	6	39	53	8
non-donation	89	8	3	90	6	3

Rows within video type (sound, silent) may not add to 100% due to rounding.

highly favorable response to the Transplant Recipient video was not influenced by participant sex, age, or race.

There are several plausible explanations why the Transplant Recipient video yielded more favorable outcomes. People may respond more favorably to charitable appeals or personal narratives of children. Perhaps participants more easily identified with the mother of the child in the video, who was spared the grief and sorrow of losing her daughter by the generosity of an unknown organ donor. It is also possible that the gain-framed message (i.e., what is gained by donating organs) of a happy and energetic transplant recipient and her mother is more powerful than the loss-framed messages of a person awaiting transplantation or one who died while waiting. Skumanich and Kintsfather (15) found that written donation messaging that includes an empathy appeal of a transplant recipient is more likely to yield favorable donation attitudes and behavioral intentions than messaging without an empathy appeal. Also, Reinhart et al. (16) found that adults responded more favorably to written organ donation messaging that appealed to the benefits of organ donation rather than to the guilt of not donating. However, our study appears to be the first to directly compare the relative effectiveness of different video-based personal narratives on organ donation cognitions and behavioral intentions. Clearly, more research is necessary to examine which transplant recipient characteristics (e.g., pediatric vs. adult transplant recipient) are likely to have the most robust impact on organ donor registration.

We also hypothesized that videos featuring an emotional appeal would be viewed more favorably than an informational video without a personal narrative (i.e., DoNation video). The Transplant Recipient video notwithstanding, this hypothesis was not supported. Overall, the DoNation videos performed as well as the personal narrative videos. On the surface, this finding is discordant with a study showing that personal narratives about organ donation evoke more positive emotions and are seen as more credible than informational or statistical donation messages (17). However, Feeley et al. used written messages and a more homogeneous college student sample, while we used video messages and a more heterogeneous sample, which account for the discordant findings. It is possible that informational messages delivered via video animation may be more appealing and yield more positive emotional valence than written informational messages.

Our third hypothesis was that the sound videos would be more effective than silent videos, and this

was generally supported. Perhaps spoken dialog can more easily convey an emotional story in a very brief time period than the written word. Also, it may have been more challenging for participant to emotionally connect with the individuals featured in the video when their focus and attention was detracted to the written subtitles. One interesting finding was that the silent version of the DoNation video was disliked more than any other video. This finding was surprising as there is no dialog in the animated DoNation video and subtitles were not necessary for the silent version. The only difference between the sound and silent versions of the video was the inclusion/exclusion of upbeat music. In general, organ donation messaging videos with sound should be used whenever possible. MV offices present a unique challenge because there is obvious concern about disrupting an already challenging environment. Thornton et al. (9) describe one innovative alternative to delivering sound-based video messaging (i.e., using iPods with headphones) in the MV environment, which had a positive impact on organ donor registration rates. However, this strategy may prove more difficult and costly to implement on a national level. Other more far-reaching and cost-effective alternatives may include video messaging on MV websites as increasing numbers of drivers are renewing licenses online and mobile applications that deliver video messaging upon entry into MV offices.

Before watching any videos, most study participants either were not thinking about organ donor registration at all or had just started to think about this possibility. However, we found that watching all six videos, with or without sound, was effective at moving participants toward more serious consideration of organ donor registration or a stated intention to register as a donor. However, translating behavioral intention into action may prove challenging, even if adults are provided with an immediate opportunity to register as a donor. Only 26% of those who endorsed a behavioral intention to register as a donor actually clicked through to the website we provided to facilitate donor registration. While we could determine who clicked through to the Donate Life America website, we were not able to determine whether they registered as a donor or even how much time they spent on the website. Future research is needed to more directly assess the relationship between exposure to donation video messaging and actual rates of donor registration.

mTurk may be a new concept to many transplant and organ donation professionals. As this study demonstrates, it provides a mechanism for recruiting a large number of heterogeneous

participants very efficiently and at a low cost (10–12). Additionally, it yields geographic diversity in a sample that is otherwise difficult to achieve using more traditional recruitment methods. Investigators can establish and set appropriate filters that best meet the inclusion and exclusion criteria for a particular study, use traditional online surveys and other media, and easily transfer data to common statistical software packages. Some have also used mTurk for the collection of longitudinal data (18). For organ donation researchers interested in evaluating attitudes, behavioral intentions, and/or piloting different strategies for increasing donor registration, mTurk may prove to be a valuable resource. However, further research is needed to examine whether collecting organ donation attitudes and behavioral data via mTurk yields comparable findings to using more traditional methods.

Findings from this study should be considered in the context of a few important limitations. First, the donation videos were produced for use in an ongoing educational initiative in Massachusetts and, therefore, not designed originally to answer the specific questions proposed in this study. It is possible that different personal narratives would yield very different results. Second, our measures of appeal, emotional valence, and readiness for organ donor registration were designed for this study and have not been independently validated. Also, because the readiness measure was repeated only 10 min after the initial baseline assessment, demand effects may have contributed to more movement toward organ donor readiness than is actually true. Third, we did not measure baseline organ donation attitudes or whether participants were previously registered as an organ donor, which may have influenced how they responded to the videos. Finally, the design of our study did not allow us to examine whether watching only one or a smaller combination of donation videos than the six that were viewed in this study would have a similar impact on certain outcomes (e.g., organ donor readiness).

The foregoing limitations notwithstanding, this study is one of the first to examine the impact of different donation video messages on a heterogeneous group of adults who are not currently registered as organ donors. Despite the pervasive use of video-based personal narratives by organ procurement organizations, other agencies, and social media (e.g., YouTube) to educate the public about the need for more organ donors, very little prior research has evaluated the effectiveness of such narratives. Findings from the current study provide guidance for organ donation researchers

considering the use of video messaging in settings such as MV offices. Brief, one-min videos can have a very dramatic and positive impact on willingness to consider donation and behavioral intentions to register as an organ donor.

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### Authors' contributions

James R. Rodrigue, Aaron Fleishman, Tanya Vishnevsky, Sean Fitzpatrick, and Matthew Boger: Study concept, and design; James R. Rodrigue, Sean Fitzpatrick, and Matthew Boger: Funding obtained; James R. Rodrigue, Aaron Fleishman, and Tanya Vishnevsky: Data collection; James R. Rodrigue, Aaron Fleishman, Tanya Vishnevsky, and Matthew Boger: Data analysis/interpretation; James R. Rodrigue and Tanya Vishnevsky: Manuscript draft; Aaron Fleishman, Sean Fitzpatrick, and Matthew Boger: Critical revision to the manuscript; All authors approved the final version of the manuscript.

### References

1. U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, HEALTH RESOURCES AND SERVICES ADMINISTRATION, HEALTHCARE SYSTEMS BUREAU, 2012. National Survey of Organ Donation Attitudes and Behaviors. Rockville, MD: U.S. Department of Health and Human Services, 2013.
2. DONATE LIFE AMERICA. National donor designation report card, 2013. [http://donatelife.net/wp-content/uploads/2013/07/DLA\\_ReportCardFinal\\_2013.pdf](http://donatelife.net/wp-content/uploads/2013/07/DLA_ReportCardFinal_2013.pdf).
3. SIMINOFF LA, GORDON N, HEWLETT J, ARNOLD RM. Factors influencing families' consent for donation of solid organs for transplantation. *JAMA* 2001; 286: 71.
4. RODRIGUE JR, CORNELL DL, HOWARD RJ. Organ donation decision: comparison of donor and nondonor families. *Am J Transplant* 2006; 6: 190.
5. CHILDRESS JF, LIVERMAN CT, eds. Organ Donation: Opportunities for Action. Washington, DC: The National Academies Press, 2006.
6. FEELEY TH, MOON S. A meta-analytic review of communication campaigns to promote organ donation. *Commun Rep* 2009; 22: 63.
7. HARRISON TR, MORGAN SE, DI CORCIA MJ. Effects of information, education, and communication training about organ donation for gatekeepers: clerks at the Department of Motor Vehicles and organ donor registries. *Prog Transplant* 2008; 18: 301.

8. RODRIGUE JR, KROUSE J, CARROLL C et al. A Department of Motor Vehicles intervention yields moderate increases in donor designation rates. *Prog Transplant* 2012; 22: 18.
9. THORNTON JD, ALEJANDRO-RODRIGUEZ M, LEÓN JB et al. Effect of an iPod video intervention on consent to donate organs: a randomized trial. *Ann Intern Med* 2012; 156: 483.
10. BOHANNON J. Human subjects research: social science for pennies. *Science* 2011; 334: 307.
11. GIBSON E, PIANTADOSI S, FEDORENKO K. Using mechanical turk to obtain and analyze English acceptability judgments. *Lang Linguist Compass* 2011; 5: 509.
12. BUHRMESTER M, KWANG T, GOSLING SD. Amazon's mechanical turk: a new source of inexpensive, yet high-quality, data? *Perspect Psychol Sci* 2011; 6: 3.
13. GREENE WF. Observations: what drives commercial liking? *J Advert Res* 1992; 32: 65.
14. MACKENZIE SB, LUTZ RJ, BELCH GE. The role of attitude toward the ad as a mediator of advertising effectiveness: a test of competing explanations. *J Mark Res* 1986; 23: 130.
15. SKUMANICH SA, KINTSFATHER DP. Promoting the organ donor card: a causal model of persuasion effects. *Soc Sci Med* 1996; 43: 401.
16. REINHART AM, MARSHALL HM, FEELEY TH, TUTZAUER H. The persuasive effects of message framing in organ donation: the mediating role of psychological reactance. *Commun Monogr* 2007; 74: 229.
17. FEELEY TH, MARSHALL HM, REINHART AM. Reactions to narrative and statistical written messages promoting organ donation. *Commun Rep* 2006; 19: 89.
18. CHANDLER J, MUELLER P, PAOLACCI G. Nonnaïveté among Amazon Mechanical Turk workers: consequences and solutions for behavioral researchers. *Behav Res Methods* 2014; 46: 112.