

Supplemental Information

Opposing effects of oxytocin on moral judgment in males and females

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1. Sample characteristics

Subjects were recruited by local advertisement at the University Bonn and provided written informed consent before study enrollment. All participants were naive to prescription-strength psychoactive medication and had not taken any over-the-counter psychoactive medication in the past 4 weeks. All female participants were not pregnant, not lactating and used oral contraceptives. Participants were asked to maintain their regular bed and wake times and to abstain from caffeine and alcohol intake on the day of the experiment. In Experiment 1, contraindications for MRI scanning were additional exclusion criteria. Neuropsychological testing before study enrollment included the German version of the RAVLT (Rey Auditory Verbal Learning Test) (Helmstaedter et al., 2001; Rey, 1941) to assess verbal learning skills, the DST (digit-span test) derived from the revised Wechsler adult intelligence scale (Wechsler, 1997) to assess working memory performance, the LPS 4 ('Leistungspruefsystem Subtest 4') (Horn, 1983) to assess nonverbal reasoning IQ, the MWT-B ('Mehrfach-Wortschatz-Intelligenztest Teil B') (Lehrl et al., 1995) to assess verbal IQ based on lexical decisions, and the trail-making test (TMT) (Raitan, 1958) parts A and B to assess visual attention and task-switching performance. In Experiment 2, ethical ideology was assessed by Forsyth's Ethical Position Questionnaire (Forsyth, 1980). One subject in the fMRI experiment had to be excluded because of structural brain abnormalities. OXT treatment also had no effect on mood or anxiety as measured by the Positive and Negative Affective Scale (PANAS) (Watson et al., 1988) and the State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1970) (all p values > 0.05 ; for details see Tables S1 and S2). After the experiments, participants were asked to guess whether they had received OXT or PLC; again, there were no significant group differences (Experiment 1: correct estimates OXT $n = 12$, PLC $n = 13$, $\chi^2_{(1)} = 2.25$, $p = 0.13$; Experiment 2: males, correct estimates OXT $n = 7$, PLC $n = 25$, $\chi^2_{(1)} = 0.49$, $p = 0.48$; females correct estimates OXT $n = 10$, PLC $n = 23$, $\chi^2_{(1)} = 1.19$, $p = 0.28$). Two subjects in the PLC session and two different subjects in the OXT sessions reported side effects (slight headache). The random allocation sequence (for the double-blind OXT/PLC treatment) was

generated by D.S., C.S. and A.W. enrolled all participants and assigned participants to the treatment based on the random allocation plan. All behavioral and fMRI data were collected in Bonn, Germany.

2. Experiment 1

The fMRI session started with an unrelated non-aversive passive-viewing task that lasted ten minutes and is reported elsewhere. The mean interval between the two fMRI sessions was 34 days (minimum 21 days, maximum 56 days).

2.1 Set-up and stimuli

For the fMRI task, two picture sets (A and B), each with 30 disgusted, 30 neutral and 30 happy faces were taken from the validated Karolinska Directed Emotional Face database. Both sets featured an equal number of male and female faces. An independent sample of 20 male volunteers (mean age \pm SD: 29.6 ± 4.33) were recruited to rate their own arousal and the arousal intensity of the depicted person for both picture sets on a 1 (minimum) to 9 (maximum) scale. A repeated measures ANOVA with the self-regarding arousal ratings as dependent variable and valence (disgusted, neutral, and happy) as well as picture set (A and B) as within-subject factors yielded a main effect of valence ($F_{(2,28.57)} = 36.98, p < 0.01, \eta^2 = 0.66$), but no main or interaction effect of picture set (all $P_s > 0.05$). Disgusted (Set A: 5.28 ± 1.46 , Set B: 5.01 ± 1.45) and happy facial expressions (Set A: 4.85 ± 1.02 , Set B: 4.96 ± 1.16) elicited stronger arousal reactions than neutral ones (Set A: 2.83 ± 0.88 , Set B: 2.71 ± 0.80). Similarly, a repeated measures ANOVA with the other-regarding arousal ratings as dependent variable and valence (disgusted, neutral and happy) as well as picture set (A and B) as within-subject factors showed a main effect of valence ($F_{(2,38)} = 122.44, p < 0.01, \eta^2 = 0.87$), but no main or interaction effect of picture set (all $p_s > 0.05$). For disgusted (Set A: 5.73 ± 1.17 , Set B: 5.76 ± 1.00) and happy facial expressions (Set A: 5.13 ± 0.79 , Set B: 5.27 ± 0.94), higher arousal ratings were assigned to the depicted person than for neutral ones (Set A: 2.05 ± 0.74 , Set B: 2.00 ± 0.68). The instructions and picture sets were counterbalanced so that the subjects never had to make the same decision in response to a particular stimulus twice.

2.2 *fMRI data acquisition and analysis*

A Siemens Trio MRI system (Siemens, Erlangen, Germany) operating at 3T was used to obtain T2*-weighted echoplanar (EPI) images with blood-oxygen-level-dependent contrast (TR = 3000 ms, TE = 35 ms, matrix size: 64 x 64, pixel size: 3 x 3 x 3 mm, slice thickness = 3.0 mm, distance factor = 10%, FoV = 192, flip angle = 90°, 36 axial slices). In addition, high-resolution anatomical images were acquired on the same scanner using a T1-weighted 3D MPRAGE sequence (imaging parameters: TR = 1570 ms, TE = 3.42 ms, matrix size: 256 x 256, pixel size: 1 x 1 x 1 mm, slice thickness = 1.0 mm, FoV = 256, flip angle = 15°, 160 sagittal slices).

Stimuli were presented to the subjects by means of liquid crystal display (LCD) video goggles (Nordic NeuroLab, Bergen, Norway) connected to a PC running Presentation 14 (Neurobehavioral Systems Inc., Albany, CA). The fMRI data were preprocessed and analyzed using SPM8 software (Wellcome Trust Centre for Neuroimaging, London) implemented in Matlab 7 (The MathWorks Inc., Natick, MA). The first five volumes of each functional time series were discarded to allow for T1 equilibration. Images were corrected for head movement between scans by an affine registration. For realignment, a two-pass procedure was used, by which images were initially realigned to the first image of the time-series and subsequently re-realigned to the mean of all images. For spatial normalization the mean EPI image of each subject was normalized to the current Montreal Neurological Institute (MNI) template (Evans et al., 1992; Holmes et al., 1998) using the unified segmentation function in SPM8. This algorithm combines image registration, tissue classification, and bias correction within the same generative model. All images were hereby transformed into standard stereotaxic space and resampled at 2 x 2 x 2 mm voxel size. The normalized images were spatially smoothed using a 6-mm FWHM Gaussian kernel. Raw time series were detrended by the application of a high-pass filter (cut-off period, 128 s). On the first level, the twelve conditions (for OXT and PLC: ‘DisgustedSelf’, ‘NeutralSelf’, ‘HappySelf’, ‘DisgustedOther’, ‘NeutralOther’, ‘HappyOther’) were modeled by a boxcar function convolved with a hemodynamic response function (Friston, 1995). The movement parameters were included as confounds in the design matrix. Each condition was compared relative to the low level baseline. Non-specific effects

of OXT were analyzed by comparing all items with the low level baseline. Differences between each condition were computed separately for the OXT and PLC sessions. To specifically examine the modulatory effects of OXT we built the contrasts [DisgustedOXT>NeutralOXT] > [DisgustedPLC>NeutralPLC] and [HappyOXT>NeutralOXT] > [HappyPLC>NeutralPLC] separately for the “self” and “other” conditions. Parameter estimates for a contrast were subjected to one-sample t-tests on the second level for the whole-brain with a significance cluster threshold of $p < 0.05$, corrected for multiple comparisons (family-wise error (FWE)). To examine whether the OXT effect was more pronounced for the “self” than for the “other” condition, we compared the contrasts of the specific self and other conditions with one-sample t-tests on the second level. A region-of-interest (ROI) analysis was performed for 5mm spheres around the insula coordinates (MNI x, y, z: $\pm 38, 22, 4$) taken from our previous OXT study (Striepens et al., 2012).

2.3 Supplemental results

Across all valence categories subjects had stronger feelings for the other person than for themselves. Additionally, in both perspective conditions emotional faces yielded higher intensity ratings than neutral ones. Post hoc paired *t*-tests revealed that the interaction was due to significantly higher ratings for disgusted compared to happy faces (OXT: $t_{(22)} = 4.18, p < 0.01, d = 0.69$; PLC: $t_{(22)} = 2.91, p < 0.01, d = 0.60$) in the ‘other’ condition and no significant difference in the ‘self’ condition (all $ps > 0.60$).

On the neural level, we also investigated whether OXT had any overall effect on the BOLD signal in the anterior cingulate, precuneus, and insula during the periods where no face stimuli were displayed. This revealed no significant effects of OXT vs. PLC on basal activity in any of these regions ($p > 0.36$ in all cases).

3. Experiment 2

3.1 Set-up and stimuli

In a pilot experiment, 145 healthy volunteers (93 females and 52 males; mean age \pm SD; 20.19 \pm 3.28 years) served as independent judges and rated the extent to which each dilemma comprised a potential self-benefit for the rater on a 1 (very small) to 4 (very large) scale irrespective of any moral considerations or their own choice preferences. The results of this pilot study are shown in Supplementary Table S5. The ratings were highly intercorrelated (estimated correlation $\rho = 0.89$) indicating an adequate consensus regarding the extent to which a scenario entails a potential self-benefit. Based on the item median of these judgments two subsets of self- and non-self-benefit dilemmas were generated. An example of the non-self-benefit category is the classical runaway trolley dilemma, in which a trolley is heading for five railway workers and the subjects are asked to decide whether it is appropriate to divert the trolley to another track where only one worker will be killed. In this scenario a strong conflict between utilitarian and deontologic decision-making arises, but no direct self-benefit is evident. In contrast, if the scenario is about the decision to keep money which you have found on the street or to return it to the owner, the conflict is between self-interest and moral values.

Subjects were seated approximately 100 cm in front of a computer screen and a 26 point “Calibri” style font was used for the scenario texts. All scenarios were taken from Greene et al. (2001) and were translated into German by the author N.S.. A second author (D.S.) translated these texts back into English and consulted a native English speaker to ensure the correspondence of the original and translated English scenario texts.

3.2 Supplemental results

To confirm that the self-benefit effect of OXT was specific to moral dilemmas we also analyzed the median-dichotomized non-moral dilemmas. This showed that OXT did not influence endorsement of either self-benefit (mean % endorsed, ♀ OXT = 76.15 \pm 7.65%, ♀ PLC = 74.87 \pm 6.04%, $p = 0.47$; ♂

OXT = $75.05 \pm 6.12\%$, ♂ PLC = $76.92 \pm 6.28\%$, $p = 0.20$) or non-self-benefit (mean % endorsed, ♀ OXT = $32.86 \pm 15.98\%$, ♀ PLC = $34.76 \pm 15.32\%$, $p = 0.64$; ♂ OXT = $32.05 \pm 16.29\%$, ♂ PLC = $35.14 \pm 14.91\%$, $p = 0.40$) non-moral dilemmas, thereby confirming that the OXT effect is specific to self-benefit in a moral decision-making context.

Furthermore, the importance of the self-benefit/non-benefit distinction is corroborated on the item level by correlations (men: $r = 0.44$, women: $r = -0.37$; cf. Figure S2) between the self-benefit ratings and the OXT effect (difference between the endorsement within the OXT and PLC groups for each item).

4. Statistical analysis

Demographical, neuropsychological, and behavioral data were analyzed using SPSS 20 (SPSS Inc., Chicago, IL, USA). Quantitative behavioral data were compared by mixed-model analysis of variance (ANOVA) and Pearson's product-moment correlation was used for correlation analysis. Eta-squared and Cohen's d were calculated as measures of effect size. The assumption of normality for all target variables was assessed separately for the OXT and PLC sessions using Kolmogorov-Smirnov tests. All target data were derived from normally distributed populations (all $ps > 0.05$). The assumption of sphericity was assessed with Mauchly's test, and for significant violations Greenhouse-Geisser's correction was applied. For qualitative variables Pearson's chi-squared tests were used. All reported p -values are two-tailed, if not otherwise noted, and p -values of $p < 0.05$ were considered significant.

Supplemental References

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Supplemental Data:

Figure S1

During the fMRI scanning in Experiment 1 subjects had to rate the intensity of their own arousal and the arousal intensity of the depicted person (A). OXT altered neither the self (B) nor the other-regarding (C) intensity ratings. Error bars indicate the standard error of the mean (SEM). Abbreviations: OXT, oxytocin; PLC, placebo; $**p < 0.01$.

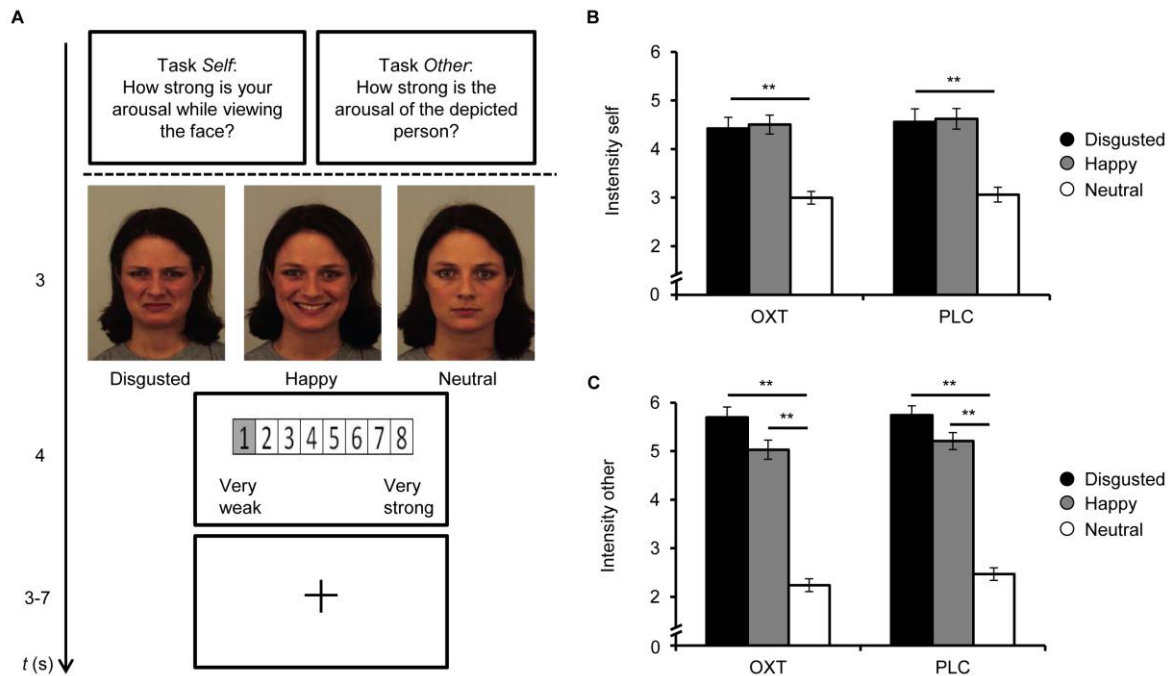


Figure S2

Item-based correlations between the self-benefit ratings and the OXT effects in Experiment 2. OXT increased the endorsement of dilemmas with higher self-benefit ratings in men, while it decreased the endorsement of dilemmas with higher self-benefit ratings in women. Abbreviations: OXT, oxytocin; PLC, placebo.

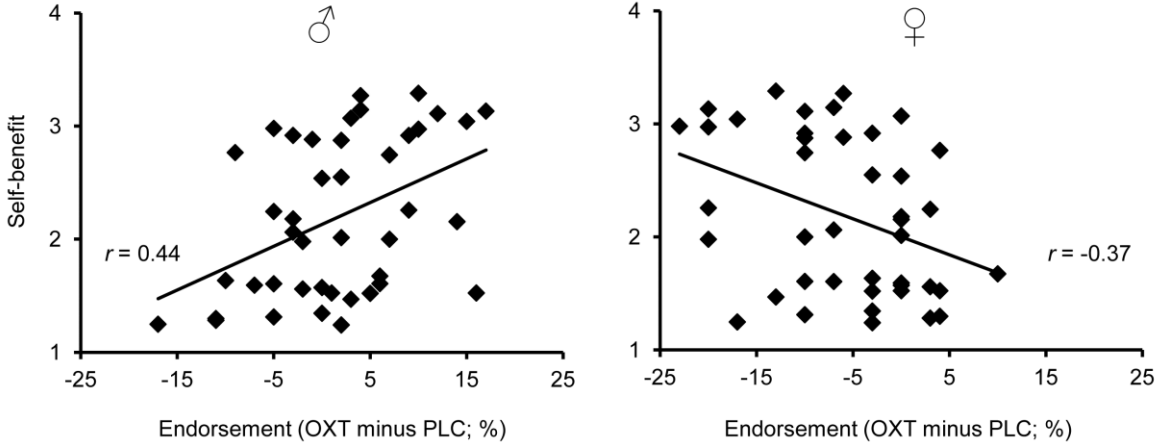


Table S1

Experiment 1: State measurements of anxiety and mood.

	OXT group Mean (\pm SD)	PLC group Mean (\pm SD)	<i>t</i>	<i>p</i>
STAI – pre ¹	32.00 (4.77)	32.55 (6.38)	-0.48	0.64
STAI – post ¹	33.52 (4.70)	33.71 (6.15)	-0.21	0.83
PANAS – positive – pre ²	30.22 (4.63)	28.82 (4.58)	1.38	0.18
PANAS – positive – post ²	26.23 (7.42)	25.59 (5.87)	0.65	0.52
PANAS – negative – pre ²	11.04 (1.30)	12.13 (6.49)	-0.82	0.42
PANAS – negative – post ²	11.09 (1.44)	11.22 (2.07)	-0.42	0.89

Notes. State anxiety before and after the experiment was assessed using the ¹STAI = State Trait Anxiety Inventory. Mood before and after the experiment was assessed using the ²PANAS = Positive and Negative Affect Schedule. Abbreviations: OXT, oxytocin; PLC, placebo.

Table S2

Experiment 2: State measurement of anxiety and mood.

	OXT group Mean (\pm SD)	PLC group Mean (\pm SD)	<i>t</i>	<i>p</i>
Males				
STAI ¹	34.95 (7.07)	35.20 (7.06)	-0.15	0.88
PANAS – positive ²	27.53 (6.30)	27.22 (7.43)	0.19	0.85
PANAS – negative ²	12.06 (2.32)	12.28 (2.68)	-0.38	0.71
Females				
STAI ¹	33.70 (4.56)	34.10 (5.11)	-0.32	0.75
PANAS – positive ²	26.93 (7.19)	26.07 (6.77)	0.48	0.63
PANAS – negative ²	10.60 (0.81)	11.03 (1.67)	-1.28	0.21

Notes. State anxiety after the experiment was assessed using the ¹STAI = State Trait Anxiety Inventory. Mood after the experiment was assessed using the ²PANAS = Positive and Negative Affect Schedule. Abbreviations: OXT, oxytocin; PLC, placebo.

Table S3

Self-benefit ratings of the dilemmas in the pilot study

No.	Dilemma	Greene's taxonomy	Self-benefit ratings	Categorization
1	Transplant You are a doctor. You have five patients, each of whom is about to die due to a failing organ of some kind. You have another patient who is healthy. The only way that you can save the lives of the first five patients is to transplant five of this young man's organs (against his will) into the bodies of the other five patients. If you do this, the young man will die, but the other five patients will live. Is it appropriate for you to perform this transplant in order to save five of your patients?	1	1.52	1
2	Footbridge A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. Is it appropriate for you to push the stranger on to the tracks in order to save the five workmen?	1	1.28	1
3	Country Road You are driving along a country road when you hear a plea for help coming from some roadside bushes. You pull over and encounter a man whose legs are covered with blood. The man explains that he has had an accident while hiking and asks you to take him to a nearby hospital. Your initial inclination is to help this man, who will probably lose his leg if he does not get to the hospital soon. However, if you give this man a lift, his blood will ruin the leather upholstery of your car. Is it appropriate for you to leave this man by the side of the road in order to preserve your leather upholstery?	1	2.01	1
4	Architect You are a young architect visiting one of your construction sites with your boss. Your boss is a despicable individual who makes everyone around him miserable including you. It occurs to you that if you were to push him off of the building you are inspecting he would fall to his death and everyone would think it was an accident. Is it appropriate for you to push your boss off of the building in order to get him out of your life?	1	2.18	1
5	Lifeboat You are on a cruise ship when there is a fire on board, and the ship has to be abandoned. The lifeboats are carrying many more people than they were designed to carry. The lifeboat you're in is sitting dangerously low in the water-a few inches lower and it will sink. The seas start to get rough, and the boat begins to fill with water. It seems to you that there is only one way to stop the boat from sinking, and that is to start throwing other passengers overboard, starting with old people who are too weak to resist. Is it appropriate for you to throw some of your fellow passengers overboard in order to save yourself and the remaining passengers?	1	3.07	2
6	Hard Times You are the head of a poor household in a developing country. Your crops have failed for the second year in a row, and it appears that you have no way to feed your family. Your sons, ages eight and ten, are too young to go off to the city where there jobs, but your daughter could fare better. You know a man from your village who lives in the city and who makes sexually explicit films featuring small children such as your daughter. He tells you that in one year of working in his studio your daughter could earn enough money to keep your family fed for several growing seasons. Is it appropriate for you to employ your daughter in the child pornography industry in order to feed your family?	1	2.87	2
7	Smother for dollars You are in hospital lounge waiting to visit a sick friend. A young man sitting next to you explains that his father is very ill. The doctors believe that he has a week to live at most. He explains further that his father has a substantial life insurance policy that expires at midnight. If his father dies before midnight, this young man will receive a very large sum of money. He says that the money would mean a great deal to him and that no good will come from his father's living a few more days. He offers you half a million dollars to go up to his father's	1	2.74	2

	room and smother his father with a pillow. Is it appropriate for you to kill this man's father in order to get money for yourself and this young man?			
8	Safari You and a group of ecologists are studying the wildlife in a remote stretch of jungle when you are captured by a group of paramilitary terrorists. You are held hostage for several days. One of the terrorists takes a liking to you. He informs you that his leader intends to kill you and the rest of the hostages the following morning. He says that he is willing to help you escape, but that he needs some assurance that you will not go to the police. He devises the following plan. He will videotape you while you kill one of your sleeping colleagues. The tape will ensure your silence, making it possible for you to escape. Is it appropriate for you to kill your colleague in order to escape from the terrorists and save your own life?	1	3.11	2
9	Crying Baby Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables. Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death. Is it appropriate for you to smother your child in order to save yourself and the other townspeople?	1	2.92	2
10	Plane Crash Your plane has crashed in the Himalayas. The only survivors are yourself, another man, and a young boy. The three of you travel for days, battling extreme cold and wind. Your only chance at survival is to find your way to small a village on the other side of the mountain, several days away. The boy has a broken leg and cannot move very quickly. His chances of surviving the journey are essentially zero. Without food, you and the other man will probably die as well. The other man suggests that you sacrifice the boy and eat his remains over the next few days. Is it appropriate to kill this boy so that you and the other man may survive your journey to safety?	1	2.88	2
11	Hired Rapist You have been dissatisfied with your marriage for several years. It is your distinct impression that your wife no longer appreciates you. You remember how she appreciated you years ago when you took care of her after she was mugged. You devise the following plan to regain your wife's affection. You will hire a man to break into your house while you are away. This man will tie up your wife and rape her. You, upon hearing the horrible news, will return swiftly to her side, to take care of her and comfort her, and she will once again appreciate you. Is it appropriate for you to hire a man to rape your wife so that she will appreciate you as you comfort her?	1	2.54	1
12	Grandson A young boy is visiting his grandmother for the weekend. Usually she gives him a gift of a few dollars when he arrives, but this time she doesn't. He asks her why not and she says something about how he doesn't write her as many letters as he used to. Angered by this, the boy decides to play a trick on her. While his grandmother is busy cooking he removes a handful of pills from the medicine cabinet and puts them in his grandmother's teapot. Later that night, she makes her tea, and the dissolved pills make her sick. In the morning she is dead. Was it appropriate for this boy to put pills in his grandmother's teapot in order to play a trick on her?	1	1.34	1
13	Infanticide You are a fifteen-year-old girl who has become pregnant. By wearing loose clothing and deliberately putting on weight you have managed to keep your pregnancy a secret. One day, while at school, your water breaks. You run to the girls locker room and hide for several hours while you deliver the baby. You are sure that you are not prepared to care for this baby. You think to yourself that it would be such a relief to simply clean up the mess you've made in the locker room, wrap the baby in some towels, throw the baby in the dumpster behind the school, and act as if nothing had ever happened. Is it appropriate for you to throw your baby in the dumpster in order to move on with your life?	1	2.55	1
14	Preventing the Spread You are a doctor. One of your patients, whom you diagnosed as HIV positive, is about to be released from the hospital. He has told you, in the confidence of your doctor-patient relationship, that he intends to infect as many people as possible with HIV starting that evening. Because you are bound by doctor-patient confidentiality, there is no legal way to stop this man from carrying out his plan. It occurs to you that you could contaminate his medication with an untraceable poison that will kill him before he gets a chance to infect others. Is it appropriate for you to poison this man in order to prevent him from spreading HIV?	1	1.47	1
15	Lifeboat 2 You are on a cruise ship when there is a fire on board, and the ship has to be abandoned. The lifeboats are carrying many more people than they were designed to carry. The lifeboat you're in is sitting dangerously low in the water—a few inches lower and it will sink. The seas start to get rough, and the boat begins to fill with water. If nothing is done it will sink before the rescue boats arrive and everyone on board will die. However, there is an injured person who will not survive in any case. If you throw that person overboard the boat will stay	1	3.27	2

afloat and the remaining passengers will be saved. Is it appropriate for you to throw this person overboard in order to save the lives of the remaining passengers?

16	Preventing the Spread 2	1	1.52	1
	<p>You are a waiter. You overhear one of your customers say that he is about to go to jail and that in his last forty-eight hours of freedom he plans to infect as many people as possible with HIV. You know him well enough to know that he is telling the truth and that he has access to many potential victims. You happen to know that he has a very strong allergy to poppy seeds. If he eats even one he will go into convulsions and have to be hospitalized. for at least forty-eight hours. Is it appropriate for you to cause this man to have a serious allergy attack in order to prevent him from spreading HIV?</p>			
17	Safari 2	1	3.29	2
	<p>You are part of a group of ecologists who live in a remote stretch of jungle. The entire group, which includes eight children, has been taken hostage by a group of paramilitary terrorists. One of the terrorists takes a liking to you. He informs you that his leader intends to kill you and the rest of the hostages the following morning. He is willing to help you and the children escape, but as an act of good faith he wants you to kill one of your fellow hostages whom he does not like. If you refuse his offer all the hostages including the children and yourself will die. If you accept his offer then the others will die in the morning but you and the eight children will escape. Is it appropriate for you to kill one of your fellow hostages in order to escape from the terrorists and save the lives of the eight children?</p>			
18	Bomb 2	1	1.98	1
	<p>You are negotiating with a powerful and determined terrorist who is about to set off a bomb in a crowded area. Your one advantage is that you have his teen-age son in your custody. There is only one thing that you can do to stop him from detonating his bomb, which will kill thousands of people if detonated. To stop him, you must contact him over the satellite hook-up that he has established and, in front of the camera, break one of his son's arms and then threaten to break the other one if he does not give himself up. Is it appropriate for you to break the terrorist's son's arm in order to prevent the terrorist from killing thousands of people with his bomb?</p>			
19	Submarine	1	3.14	2
	<p>You are the captain of a military submarine travelling underneath a large iceberg. An onboard explosion has caused you to lose most of your oxygen supply and has injured one of your crew who is quickly losing blood. The injured crew member is going to die from his wounds no matter what happens. The remaining oxygen is not sufficient for the entire crew to make it to the surface. The only way to save the other crew members is to shoot dead the injured crew member so that there will be just enough oxygen for the rest of the crew to survive. Is it appropriate for you to kill the fatally injured crew member in order to save the lives of the remaining crew members?</p>			
20	Lawrence of Arabia	1	2.06	1
	<p>You are the leader of a small army that consists of warriors from two tribes, the hill tribe and the river tribe. You belong to neither tribe. During the night a hill tribesman got into an argument with a river tribesman and murdered him. The river tribe will attack the hill tribe unless the murderer is put to death, but the hill tribe refuses to kill one of its own warriors. The only way for you to avoid a war between the two tribes that will cost hundreds of lives is to publicly execute the murderer by cutting off his head with your sword. Is it appropriate for you to cut off this man's head in order to prevent the two tribes from fighting a war that will cost hundreds of lives?</p>			
21	Sophie's Choice	1	2.24	1
	<p>It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy's headquarters is a doctor who performs painful experiments on humans that inevitably lead to death. He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them. Is it appropriate for you to bring one of your children to the laboratory in order to avoid having them both die?</p>			
22	Sacrifice	1	2.77	2
	<p>You, your husband, and your four children are crossing a mountain range on your return journey to your homeland. You have inadvertently set up camp on a local clan's sacred burial ground. The leader of the clan says that according to the local laws, you and your family must be put to death. However, he will let yourself, your husband, and your three other children live if you yourself will kill your oldest son. Is it appropriate for you to kill your oldest son in order to save your husband and your other three children?</p>			

23	Vaccine Test	1	2.26	1
	<p>A viral epidemic has spread across the globe killing millions of people. You have developed two substances in your home laboratory. You know that one of them is a vaccine, but you don't know which one. You also know that the other one is deadly. Once you figure out which substance is the vaccine you can use it to save millions of lives. You have with you two people who are under your care, and the only way to identify the vaccine is to inject each of these people with one of the two substances. One person will live, the other will die, and you will be able to start saving lives with your vaccine. Is it appropriate for you to kill one of these people with a deadly injection in order to identify a vaccine that will save millions of lives?</p>			
24	Vitamins	1	1.61	1
	<p>You are the leader of a mountaineering expedition that is stranded in the wilderness. Your expedition includes a family of six that has a genetically caused vitamin deficiency. A few people's kidneys contain large amounts of this vitamin. There is one such person in your party. The only way to save the lives of the six members of this family is to remove one of this man's kidneys so that the necessary vitamins may be extracted from it. The man will not die if you do this, but his health will be compromised. The man is opposed to this plan, but you have the power to do as you see fit. Is it appropriate for you to forcibly remove this man's kidney in order to save the lives of the six vitamin-deficient people?</p>			
25	Euthanasia	1	2.00	1
	<p>You are the leader of a small group of soldiers. You are on your way back from a completed mission deep in enemy territory when one of your men has stepped in trap that has been set by the enemy and is badly injured. The trap is connected to a radio device that by now has alerted the enemy to your presence. They will soon be on their way. If the enemy finds your injured man they will torture him and kill him. He begs you not to leave him behind, but if you try to take him with you your entire group will be captured. The only way to prevent this injured soldier from being tortured is to shoot him yourself. Is it appropriate for you to shoot this soldier in order to prevent him from being tortured by the enemy?</p>			
26	Standard Trolley	2	1.30	1
	<p>You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Is it appropriate for you to hit the switch in order to avoid the deaths of the five workmen?</p>			
27	Standard Fumes	2	1.25	1
	<p>You are the late-night watchman in a hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital's ventilation system. In a certain room of the hospital are three patients. In another room there is a single patient. If you do nothing the fumes will rise up into the room containing the three patients and cause their deaths. The only way to avoid the deaths of these patients is to hit a certain switch, which will cause the fumes to bypass the room containing the three patients. As a result of doing this the fumes will enter the room containing the single patient, causing his death. Is it appropriate for you to hit the switch in order to avoid the deaths of the three patients?</p>			
28	Donation	2	2.15	1
	<p>You are at home one day when the mail arrives. You receive a letter from a reputable international aid organization. The letter asks you to make a donation of two hundred dollars to their organization. The letter explains that a two hundred-dollar donation will allow this organization to provide needed medical attention to some poor people in another part of the world. Is it appropriate for you to not make a donation to this organization in order to save money?</p>			
29	Vaccine Policy	2	1.67	1
	<p>You work for the Bureau of Health, a government agency. You are deciding whether or not your agency should encourage the use of a certain recently developed vaccine. The vast majority of people who take the vaccine develop an immunity to a certain deadly disease, but a very small number of people who take the vaccine will actually get the disease that the vaccine is designed to prevent. All the available evidence, which is very strong, suggests that the chances of getting the disease due to lack of vaccination are much higher than the chances of getting the disease by taking the vaccine. Is it appropriate for you to direct your agency to encourage the use of this vaccine in order to promote national health?</p>			
30	Environmental Policy A1	2	1.56	1
	<p>You are a member of a government legislature. The legislature is deciding between two different policies</p>			

concerning environmental hazards. Policy A has a 90% chance of causing no deaths at all and has a 10% chance of causing 1000 deaths. Policy B has a 92% chance of causing no deaths and an 8% chance of causing 10,000 deaths. Is it appropriate for you to vote for Policy A over Policy B?

31	Environmental Policy A2	2	1.61	1
	You are a member of a government legislature. The legislature is deciding between two different policies concerning environmental hazards. Policy A has a 90% chance of causing no deaths at all and has a 10% chance of causing 1000 deaths. Policy B has an 88% chance of causing no deaths and a 12% chance of causing 10 deaths. Is it appropriate for you to vote for Policy B over Policy A?			
32	Sculpture	2	1.57	1
	You are visiting the sculpture garden of a wealthy art collector. The garden overlooks a valley containing a set of train tracks. A railway workman is working on the tracks, and an empty runaway trolley is heading down the tracks toward the workman. The only way to save the workman's life is to push one of the art collector's prized sculptures down into the valley so that it will roll onto the tracks and block the trolley's passage. Doing this will destroy the sculpture. Is it appropriate for you to destroy the sculpture in order to save this workman's life?			
33	Speedboat	2	1.63	1
	While on vacation on a remote island, you are fishing from a seaside dock. You observe a group of tourists board a small boat and set sail for a nearby island. Soon after their departure you hear over the radio that there is a violent storm brewing, a storm that is sure to intercept them. The only way that you can ensure their safety is to warn them by borrowing a nearby speedboat. The speedboat belongs to a miserly tycoon who would not take kindly to your borrowing his property. Is it appropriate for you to borrow the speedboat in order to warn the tourists about the storm?			
34	Guarded Speedboat	2	1.59	1
	While on vacation on a remote island, you are fishing from a seaside dock. You observe a group of tourists board a small boat and set sail for a nearby island. Soon after their departure you hear over the radio that there is a violent storm brewing, a storm that is sure to intercept them. The only way that you can ensure their safety is to warn them by borrowing a nearby speedboat. The speedboat belongs to a miserly tycoon who has hired a fiercely loyal guard to make sure that no one uses his boat without permission. To get to the speedboat you will have to lie to the guard. Is it appropriate for you to lie to the guard in order to borrow the speedboat and warn the tourists about the storm?			
35	Five-for-Seven Trolley	2	1.31	1
	You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a group of seven railway workmen. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to save these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the deaths of the seven workmen on the other side. Is it appropriate for you to hit the switch in order to avoid the deaths of the five workmen?			
36	Three-for-Seven Fumes	2	1.24	1
	You are the late-night watchman in a hospital. Due to an accident in the building next door, there are deadly fumes rising up through the hospital's ventilation system. In a certain room of the hospital are three patients. In another room there are seven patients. If you do nothing the fumes will rise up into the room containing the three patients and cause their deaths. The only way to save these patients is to hit a certain switch, which will cause the fumes to bypass the room containing the three people. As a result of doing this the fumes will enter the room containing the seven patients, causing their deaths. Is it appropriate for you to hit the switch in order to avoid the deaths of the three patients?			
37	Resume	2	1.52	1
	You have a friend who has been trying to find a job lately without much success. He figured that he would be more likely to get hired if he had a more impressive resume. He decided to put some false information on his resume in order to make it more impressive. By doing this he ultimately managed to get hired, beating out several candidates who were actually more qualified than he. Was it appropriate for your friend to put false information on his resume in order to help him find employment?			
38	Taxes	2	3.13	2
	You are the owner of a small business trying to make ends meet. It occurs to you that you could lower your taxes by pretending that some of your personal expenses are business expenses. For example, you could pretend that the stereo in your bedroom is being used in the lounge at the office, or that your dinners out with your wife			

are dinners with clients. Is it appropriate for you to pretend that certain personal expenses are business expenses in order to lower your taxes?

39	Stock Tip	2	3.04	2
	<p>You are a management consultant working on a case for a large corporate client. You have access to confidential information that would be very useful to investors. You have a friend who plays the stock market. You owe this friend a sizable sum of money. By providing her with certain confidential information you could help her make a lot of money, considerably more than you owe her. If you did this, she would insist on canceling your debt. Releasing information in this way is strictly forbidden by federal law. Is it appropriate for you to release this information to your friend so that she will cancel your debt?</p>			
40	Illegal Lunch	2	2.98	2
	<p>You are a lawyer working on a big case. The judge presiding over the trial happens to be someone you knew from law school. The two of you were rather friendly back then, but now, decades later, it seems that your old friend barely remembers you. You're quite sure that if you were to talk to him over lunch, you could jog his memory and he would begin to see you as an old buddy, which would be very good for your work on this case. It's illegal for judges and lawyers working on the same case to meet socially. Is it appropriate for you to meet with this judge socially in order to help you win your case?</p>			
41	Lost Wallet	2	2.97	2
	<p>You are walking down the street when you come across a wallet lying on the ground. You open the wallet and find that it contains several hundred dollars in cash as well as the owner's driver's license. From the credit cards and other items in the wallet it's very clear that the wallet's owner is wealthy. You, on the other hand, have been hit by hard times recently and could really use some extra money. You consider sending the wallet back to the owner without the cash, keeping the cash for yourself. Is it appropriate for you to keep the money you found in the wallet in order to have more money for yourself?</p>			
42	Eyes	2	2.92	2
	<p>In the future, you are a veteran of a war during which both of your eyes were destroyed. Due to recent medical advances, it is now possible to perform eye transplants, but, much to your anger and amazement, there are no willing donors. A sympathetic black-market surgeon offers to help you. If you hire him, he and his associates will kidnap a randomly selected stranger, carve out one of his eyes, and transfer it to you. Is it appropriate for you to hire this surgeon to carve out a stranger's eye in order to help restore your vision?</p>			
43	Standard Turnips	3	3.36	2
	<p>You are a farm worker driving a turnip-harvesting machine. You are approaching two diverging paths. By choosing the path on the left you will harvest ten bushels of turnips. By choosing the path on the right you will harvest twenty bushels of turnips. If you do nothing your turnip-harvesting machine will turn to the left. Is it appropriate for you to turn your turnip-picking machine to the right in order to harvest twenty bushels of turnips instead of ten?</p>			
44	Plant Transport	3	3.32	2
	<p>You are bringing home a number of plants from a store that is about two miles from your home. The trunk of your car, which you've lined with plastic to catch the mud from the plants, will hold most of the plants you've purchased. You could bring all the plants home in one trip, but this would require putting some of the plants in the back seat as well as in the trunk. By putting some of the plants in the back seat you will ruin your fine leather upholstery which would cost thousands of dollars to replace. Is it appropriate for you to make two trips home in order to avoid ruining the upholstery of your car?</p>			
45	Scheduling	3	1.75	1
	<p>You are in charge of scheduling appointments in a dentist's office. Two people, Mr. Morris and Mrs. Santiago have called to make appointments for next Monday. The only available times for next Monday are at 10:00 AM and at 3:00 PM. Mr. Morris's schedule is rather flexible. He can have his appointment either at 10:00 AM or at 3:00 PM. Mrs. Santiago's schedule is less flexible. She can only have her appointment at 10:00 AM. Is it appropriate for you to schedule Mr. Morris for 3:00 PM so that both he and Mrs. Santiago can have their appointments next Monday?</p>			
46	Generic Brand	3	3.11	2
	<p>You have a headache. You go to the pharmacy with the intention of buying a particular name-brand headache medicine. When you get there you discover that the pharmacy is out of the brand you were looking for. The pharmacist, whom you've known for a long time and in whom you have a great deal of trust, tells you that he has in stock a generic product which is, in his words, "exactly the same" as the product you had originally intended to buy. Is it appropriate for you to purchase the generic brand instead of searching further for the</p>			

name-brand product you were looking for?

47	Brownies	3	3.32	2
	<p>You have decided to make a batch of brownies for yourself. You open your recipe book and find a recipe for brownies. The recipe calls for a cup of chopped walnuts. You don't like walnuts, but you do like macadamia nuts. As it happens, you have both kinds of nuts available to you. Is it appropriate for you to substitute macadamia nuts for walnuts in order to avoid eating walnuts?</p>			
48	Train or Bus	3	3.42	2
	<p>You need to travel from New York to Boston in order to attend a meeting that starts at 2:00 PM. You can take either the train or the bus. The train will get you there just in time for your meeting no matter what. The bus is scheduled to arrive an hour before your meeting, but the bus is occasionally several hours late because of traffic. It would be nice to have an extra hour before the meeting, but you cannot afford to be late. Is it appropriate for you to take the train instead of the bus in order to ensure you are not being late for your meeting?</p>			
49	Computer	3	3.60	2
	<p>You are looking to buy a new computer. At the moment the computer that you want costs \$1000. A friend who knows the computer industry has told you that this computer's price will drop to \$500 next month. If you wait until next month to buy your new computer you will have to use your old computer for a few weeks longer than you would like to. Nevertheless you will be able to do everything you need to do using your old computer during that time. Is it appropriate for you to use your old computer for a few more weeks in order to save \$500 on the purchase of a new computer?</p>			
50	Survey	3	3.46	2
	<p>A representative of a reputable, national survey organization calls you at your home while you are having a quiet dinner by yourself. The representative explains that if you are willing to spend a half an hour answering questions about a variety of topics her organization will send you a check for \$200. Is it appropriate for you to interrupt your dinner in order to earn \$200?</p>			
51	Coupons	3	3.38	2
	<p>You have gone to a bookstore to buy \$50 worth of books. You have with you two coupons. One of these coupons gives you 30% off of your purchase price. This coupon expires tomorrow. The other coupon gives you 25% off your purchase price, and this coupon does not expire for another year. Is it appropriate for you to use the 30%-off coupon for your present purchase so that you will have another coupon to use during the coming year?</p>			
52	Scenic Route	3	3.06	2
	<p>An old friend has invited you to spend the weekend with him at his summer home some ways up the coast from where you are. You intend to travel there by car, and there are two routes that you can take: the highway and the coastal road. The highway will get you to your friend's house in about three hours, but the scenery along the highway is very boring. The coastal route will get you to your friend's house in about three hours and fifteen minutes, and the scenery along the coastal road is breathtakingly beautiful. Is it appropriate for you to take the coastal route in order to observe the beautiful scenery as you drive?</p>			
53	Reversed Turnips	3	3.38	2
	<p>You are a farm worker driving a turnip-harvesting machine. You are approaching two diverging paths. By choosing the path on the left you will harvest thirty bushels of turnips. By choosing the path on the right you will harvest fifteen bushels of turnips. If you do nothing your turnip-picking machine will turn to the left. Is it appropriate for you to turn your turnip-harvesting machine to the right in order to harvest fifteen bushels of turnips instead of thirty?</p>			
54	Investment Offer	3	2.86	1
	<p>You are at home one day when the mail arrives. You receive a letter from a reputable corporation that provides financial services. They have invited you to invest in a mutual fund, beginning with an initial investment of one thousand dollars. As it happens, you are familiar with this particular mutual fund. It has not performed very well over the past few years, and, based on what you know, there is no reason to think that it will perform any better in the future. Is it appropriate for you to invest a thousand dollars in this mutual fund in order to make money?</p>			
55	Broken VCR	3	2.79	1
	<p>You have brought your broken VCR to the local repair shop. The woman working at the shop tells you that it</p>			

will cost you about \$100 to have it fixed. You noticed in the paper that morning that the electronics shop next door is having a sale on VCR's and that a certain new VCR which is slightly better than your old one is on sale for \$100. Is it appropriate for you have your old VCR fixed in order to avoid spending money on a new one?

56	Choosing Classes	3	3.23	2
	You are beginning your senior year of college. In order to fulfill your graduation requirements you need to take a history class and a science class by the end of the year. During the fall term, the history class you want to take is scheduled at the same time as the science class you want to take. During the spring term the same history class is offered, but the science class is not. Is it appropriate for you to take the history class during the fall term in order to help you fulfill your graduation requirements?			
57	Raffle	3	3.08	2
	You've decided to buy a raffle ticket to support a local charity. They are separately raffling off two different cars: Car A and Car B. You have decided to buy one raffle ticket. You are a serious and knowledgeable car enthusiast, and you think that these two cars are equally good. Because there have been a lot of adds for Car B on TV recently, many more people have chosen to buy tickets for the Car B raffle. Since more people have bought tickets for the Car B raffle, your chances of winning are better in the Car A raffle than in the Car B raffle. Is it appropriate for you to buy a ticket for the Car B raffle in order to win a car?			
58	Jogging	3	2.76	1
	You intend to accomplish two things this afternoon: going for a jog and doing some paperwork. In general you prefer to get your work done before you exercise. The weather is nice at the moment, but the weather forecast says that in a couple of hours it will start to rain. You very much dislike jogging in the rain, but you don't care what the weather is like while you do paperwork. Is it appropriate for you to do your paperwork now with the intention of jogging in a couple of hours in order to get your work done before you exercise?			
59	Food Prep	3	2.67	1
	You are preparing pasta with fresh vegetables, and you are deciding on the order in which you will do the various things you need to do. You are in a big hurry. At the moment you have a slight urge to cut vegetables. If you first start the water boiling and then cut the vegetables you will be done in twenty minutes. If you cut the vegetables and then start the water boiling you will be done in forty minutes. Is it appropriate for you to cut the vegetables first and then start the water boiling in order to satisfy your slight urge to cut vegetables?			
60	Shower	3	2.72	1
	You are planning to attend a luncheon this afternoon, and before you go you will need to take a shower. You have some yard work that you would like to do before then, and doing this yard will cause you to perspire a fair amount. If you shower before you do your yard work you will have to take another shower before the luncheon. At the present time you could enjoy taking a shower. At the same time, you have a very strong commitment to lowering your water bill and to showering no more than once a day. Is it appropriate for you to shower before doing your yard work in order to enjoy a shower now?			
61	Errands	3	2.67	1
	You need to go to the bakery in the morning and the furniture store in the afternoon. You also need to go to the camera shop at some point. You prefer to do most of your errands in the morning, but you very much dislike doing unnecessary driving. The camera shop is near the furniture store and far from the bakery. As a result you will have to do less driving if you go to the camera shop in the afternoon when you go to the furniture store. Is it appropriate for you to go to the camera shop in the morning in order to do most of your errands in the morning?			
62	New Job	3	3.51	2
	You have been offered employment by two different firms, and you are trying to decide which offer to accept. Firm A has offered you an annual salary of \$100,000 and fourteen days of vacation per year. Firm B has offered you an annual salary of \$50,000 and sixteen days of vacation per year. The two firms and the two positions are otherwise very similar. Is it appropriate for you to take Firm B's offer in order to have two more days of vacation per year?			

Notes. Greene's taxonomy (1, Personal moral; 2, Impersonal moral; 3, Non-Moral); Self-benefit ratings (1, minimum; 4, maximum); Categorization (1, self-benefit; 2, non-self-benefit).