

## Supplementary Materials

### Does Financial Compensation Need to Be Accompanied by Verbal Apologies?

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## Pilot Study: Materials

The pilot study in fact consisted of two separate studies: The Liancourt Rocks study (reported in the main text) and the northern territories study. The northern territories refer to four of the Kuril Islands. Although the Japanese government claims its sovereignty over the four islands, they are currently inhabited by Russians (see McKirdy, 2019). The northern territories study included a sample of 600 participants (266 females and 334 males, mean age  $\pm$  *SD* = 45.05  $\pm$  11.55 years). There was no overlap between the Liancourt Rocks study sample and the northern territories study sample. The northern territories study sample was also recruited

through an online survey service provided by Cross Marketing Inc., Japan. Below, I explain the procedures of the two pilot studies (i.e., the Liancourt Rocks study and the northern territories study).

Participants imagined that a hypothetical peace deal involving both sides' significant compromises over the focal issue was under consideration to avoid a serious armed clash with the other country. The Liancourt Rocks scenario described co-management of the islands with South Korea (see Ohtsubo, 2019, for the notion of co-management). The northern territories scenario described Russia returning control over two of the four disputed islands to Japan (i.e., Japan would lose sovereignty over the other two islands).

The questionnaire of the pilot study consisted of the following sections: (1) Assessment of participants' moral commitment to the disputed islands, (2) hypothetical peace deal scenario; (3) assessment of participants' emotions about the peace deal, and (4) participants' supportive attitudes toward the peace deal measured by three items: their own support for the peace deal, estimate of the proportion of Japanese citizens who support it, and estimate of the deal's probability of success. The main text reports only the fourth section variables. The items in the first and third sections were adapted from Ginges, Atran, Medin, and Shikaki's (2007) study. The first section asked participants the following question: "Considering every possible situation, are there any extreme situations in which Japan would have no choice other than to abandon sovereignty over the Liancourt Rocks [the northern territories] and hand them over to South Korea [Russia]?" Participants answered this item with dichotomous alternatives of either "yes" or "no." Those who chose "no" were considered moral absolutists.

The second section involved the experimental manipulation. Participants read one of the three hypothetical peace deal scenarios. In the Liancourt Rocks study, the scenario read "To

avoid an armed clash over the Liancourt Rocks, the islands will be co-managed by Japan and South Korea.” In the control condition, participants read only this sentence. In the apology condition, the co-management scenario was followed by “In exchange for Japan approving the co-management, South Korea publicly apologizes to Japan for having unjustly controlled the Liancourt Rocks since 1953.” In the compensation condition, the original sentence was followed by “In exchange for Japan approving the co-management, South Korea pays one trillion Japanese yen to Japan as financial compensation.” In the northern territories study, the scenario read, “To avoid an armed clash over the northern territories dispute, Shikotan and Habomai Islands are returned to Japan and Kunashir and Iturup formally belong to Russia.” In the control condition, participants read only this sentence. In the apology condition, this sentence was followed by “In exchange for Japan approving Russia’s sovereignty over Kunashir and Iturup, Russia publicly apologizes to Japan for not having returned the two islands [Shikotan and Habomai Islands] that have not belonged to the Kurile Islands since the Treaty of San Francisco was ratified.” In the compensation condition, the original sentence was followed by “In exchange for Japan approving Russia’s sovereignty over Kunarhir and Iturup, Russia pays one trillion Japanese yen to Japan as financial compensation.”

In the third section, participants were asked the following question: “If the Japanese prime minister were to sign this peace treaty, how would you feel?” Participants chose one from the following five options: pity, disgust, approval, anger, and nothing in particular. Following Ginges et al. (2007), the choice of either disgust or anger was coded as a negative emotional reaction. In the fourth section, participants responded to the three items reported in the main text. The three items asked about participants’ support for the peace deal, estimate of the proportion of

Japanese citizens who support the deal, and estimate of the deal's probability of success on a 101-point scale (0 to 100).

### **Pilot Study: Results (Additional Analyses)**

#### ***Main Results of the Northern Territories Study***

In the main text, we only report the results of the Liancourt Rocks study. We first report the comparable analyses of the northern territories study data. The responses to the three items (in the fourth section) were mutually highly correlated ( $r_s > .57$  and Cronbach's  $\alpha = .82$ ) and thus aggregated as the single score indicating participants' favorable reaction to the hypothetical peace deal.

The favorable reaction score was submitted to a one-way analysis of variance (ANOVA). The main effect of the condition was significant,  $F(2, 597) = 5.28, p = .005, \eta_p^2 = .018$  (see Figure S1 for the distribution, mean, and median of the favorable reaction as a function of the conditions; Figure S1 contains both the Liancourt Rocks data and the northern territories data to facilitate the comparison of the two studies). A series of post hoc tests showed that favorable reaction in the compensation condition ( $29.32 \pm 21.44$ ) was significantly lower than that in the apology condition ( $36.12 \pm 20.84$ ), but only marginally significantly lower ( $p = .051$ ) than that in the control condition ( $34.41 \pm 22.99$ ). Thus, the robust pattern (which is consistent with the results of the Liancourt Rocks study) was that Japanese participants reacted more favorably to the peace deal entailing an apology than to financial compensation.

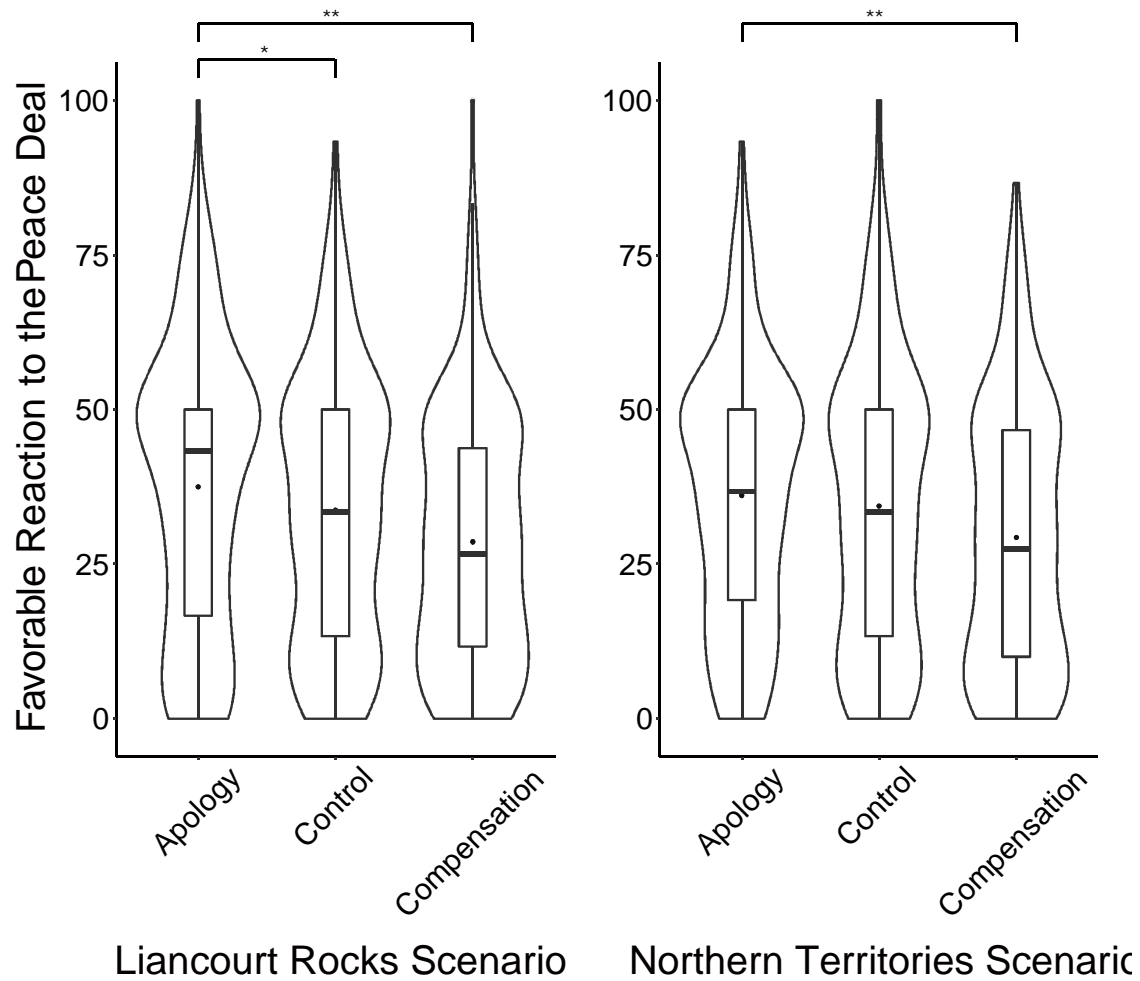


Figure S1.

Violin plots combined with boxplots showing the distribution, mean, and median of the favorable reaction score as a function of the condition (apology vs. control vs. compensation) for each scenario. The dot within each boxplot indicates the mean and the horizontal bar within each boxplot indicates the median.

*Commitment and Negative Emotions*

We first examined how many participants were committed to Japan's sovereignty over the Liancourt Rocks and the northern territories. We found that 493 out of 600 participants (.82) were committed to sovereignty over the Liancourt Rocks (i.e., they considered that there would be no circumstances in which Japan should abandon its sovereignty over the Liancourt Rocks) and 431 out of 600 participants (.72) were committed to sovereignty over the northern territories.

Figure S2 shows the frequency of participants who would feel a negative emotion (either anger or disgust) in response to imagining the Japanese prime minister signing the peace deal as a function of the condition and commitment. Two separate general linear models were used to analyze these data. The dependent variable was the dummy coded negative emotion (0 = "neither angry nor disgusted" and 1 = "angry or disgusted"). The apology and compensation conditions were represented by two dummy coded variables with the control condition as a baseline. General linear models included apology, compensation, commitment, apology  $\times$  commitment interaction, and compensation  $\times$  commitment interaction as the independent variables. For both the Liancourt Rocks and the northern territories scenarios, the effect of commitment was significant:  $b = 1.18$  standard error ( $SE$ ) = 0.43,  $p = .006$  for the Liancourt Rocks scenario;  $b = 0.85$ ,  $SE = 0.34$ ,  $p = .012$  for the northern territories scenario. As can be seen in Figure S1, in both scenarios, those who were committed to sovereignty over the respective islands (solid lines) reported negative emotions more frequently than did non-committed participants (broken lines). In addition, in the Liancourt Rocks scenario, the interaction between apology and commitment was significant,  $b = -1.09$ ,  $SE = 0.55$ ,  $p = .047$ . This effect is due to the smaller difference between the committed and non-committed participants in the apology

condition. However, we refrain from emphasizing this effect because a comparable pattern was not observed for the northern territories scenario. No other effects were statistically significant.

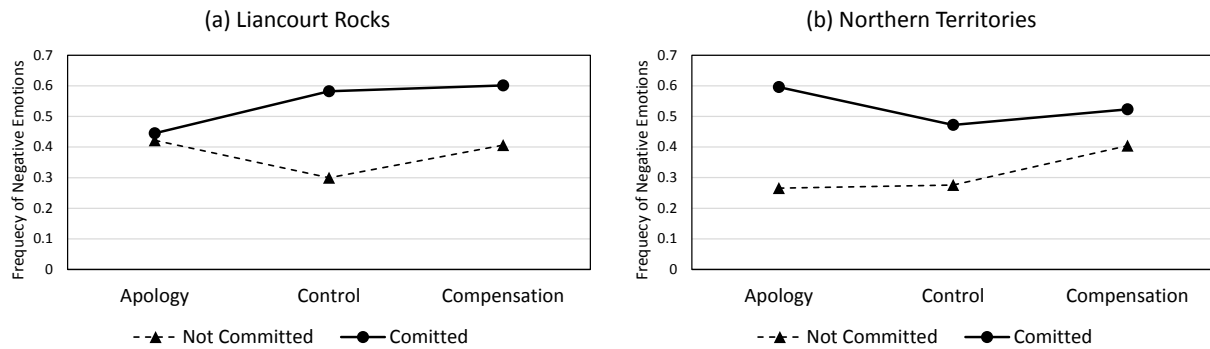


Figure S2.

Relative frequency of those who would feel a negative emotion (either anger or disgust) toward the prime minister signing the peace deal as a function of the condition and commitment to sovereignty over (a) the Liancourt Rocks or (b) the northern territories.

### ***Commitment and Favorable Reaction to the Peace Deal***

A favorable reaction to the peace deal (i.e., the aggregated score of the three items regarding participants' attitude toward the peace deal) was first submitted to a series of 3 (condition: control vs. apology vs. compensation)  $\times$  2 (gender)  $\times$  2 (commitment) ANOVAs. As shown in Table S1, in both scenarios, the main effect of gender and interaction effects involving gender were not significant. However, the main effect of gender was marginally significant in the Liancourt Rocks scenario,  $M \pm SD = 27.51 \pm 25.15$  and  $30.38 \pm 22.30$  for males and females, respectively. Female participants were slightly more favorable than male participants were to the Liancourt Rocks peace deal. The marginally significant interaction effect between the condition

and gender is due to the reversed favorability in the control condition: In the apology condition, females ( $38.76 \pm 20.61$ ) were more favorable than males ( $30.70 \pm 25.81$ ). In the compensation condition, females ( $29.03 \pm 20.79$ ) were more favorable than males ( $22.88 \pm 23.94$ ). However, in the control condition, males ( $28.37 \pm 25.06$ ) were more favorable than females ( $25.59 \pm 23.48$ ), although the difference was negligible. We do not interpret these results because neither of the effects was significant. Moreover, comparable effects involving gender were not observed in the northern territories scenario.

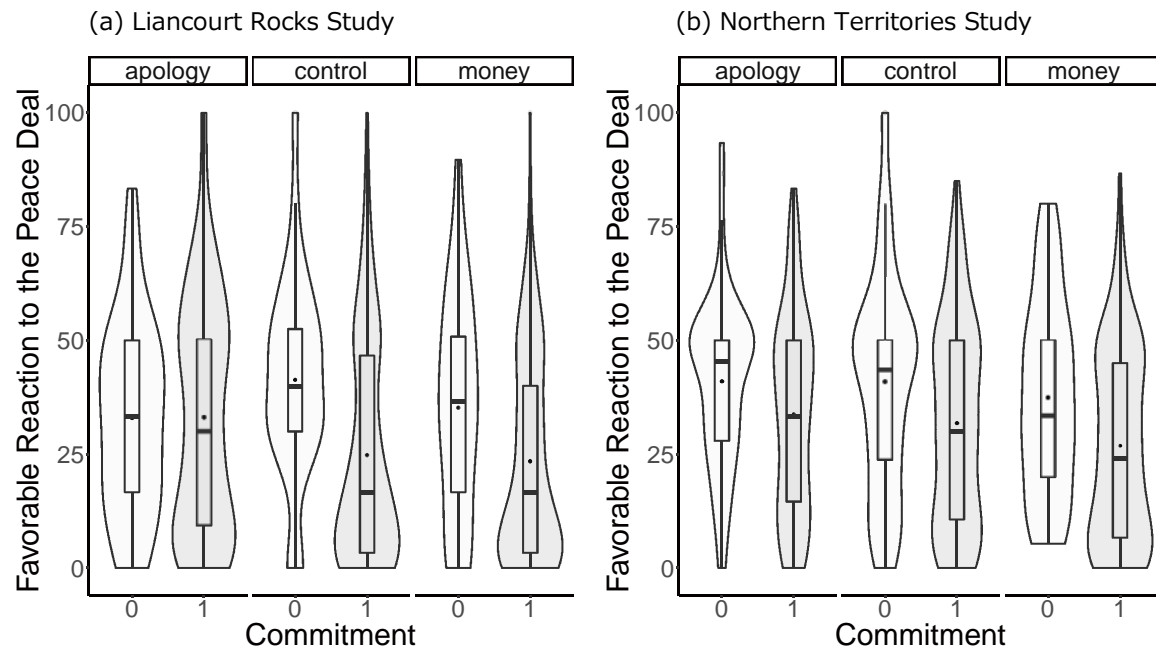
Figure S3 shows the distribution of the favorable reaction to the peace deal by combining violin plots and boxplots. As can be seen in Figure S3, in both scenarios, non-committed participants (commitment = 0) were more favorable than committed participants (commitment = 1). The significant interaction between the condition and commitment in the Liancourt Rocks scenario is partly due to the very small difference between the committed and non-committed participants in the apology condition (the difference score =  $-0.14$ , *ns*, by Tukey's HSD test) compared with the larger differences in the other conditions (the difference score was  $11.74$ ,  $p = .106$  in the compensation condition and  $16.54$ ,  $p = .006$  in the control condition). Since this effect was observed only in the Liancourt Rocks scenario, we refrain from emphasizing this interaction effect.



Table S1

*Results of 3 (Condition) × 2 (Gender) × 2 (Commitment) Factorial Design ANOVAs for the Liancourt Rocks Study (Upper Panel) and the Northern Territories Study (Lower Panel)*

Liancourt Rocks	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>	
(1) Condition	2	6425	3213	5.78	.003	**
(2) Gender	1	1648	1648	2.97	.086	+
(3) Commitment	1	6151	6151	11.07	9.32×10 <sup>-4</sup>	***
(1) × (2)	2	3201	1600	2.88	.057	+
(1) × (3)	2	4361	2181	3.93	.020	*
(2) × (3)	1	1465	1465	2.64	.105	
(1) × (2) × (3)	2	224	112	0.20	.817	
Residuals	588	326695	556			
Northern Territories	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>	
(1) Condition	2	5009	2504	5.43	.005	**
(2) Gender	1	381	381	0.83	.363	
(3) Commitment	1	9243	9243	20.05	9.06×10 <sup>-6</sup>	***
(1) × (2)	2	1141	570	1.24	.291	
(1) × (3)	2	225	113	0.24	.783	
(2) × (3)	1	129	129	0.28	.598	
(1) × (2) × (3)	2	879	440	0.95	.386	
Residuals	588	271057	461			



*Figure S3*

Violin plots combined with boxplots to show the distribution, mean, and median of the favorable reaction score as a function of the condition (apology vs. control vs. compensation) and commitment for each scenario. Within each boxplot, the dot indicates the mean and the horizontal bar, the median. White plots represent non-committed participants and gray plots, committed-participants.

Throughout the additional analyses, most importantly, the main effect of the condition was significant in each scenarios of the pilot study even when the effects of commitment and gender were statically controlled for. Therefore, the inclusion of the northern territories study and the inclusion of commitment to the disputed islands did not substantially moderate the results reported in the main text.

### **Main Study: Method**

The main study employed the same materials as those of the Liancourt Rocks scenario of the pilot study, but it differed from the pilot study in three ways. (1) The most important difference was in the experimental condition. As stated in the main text, this main study employed a 2 (apology)  $\times$  2 (compensation) between-participants factorial design. Therefore, there were the following four conditions: the no apology/no compensation condition, the apology/no compensation condition, the no apology/compensation condition, and the apology/compensation condition.

(2) The relationship value (Ohtsubo, 2019) of South Korea was manipulated for an exploratory purpose. At the very beginning of the study, participants engaged in the relationship value manipulation task, which was purportedly a test of their knowledge of Japanese trading partners. There were two levels: high vs. low relationship value. All participants were asked to guess the top three countries from which Japan imports three commodities (e.g., metal products, petroleum products) and the top three countries to which Japan exports three commodities (e.g., steel, plastic). Once participants provided their answers for each commodity, they received the correct answers. In the high relationship value condition, South Korea was included in the top three countries for all six commodities. In the low relationship value condition, South Korea was not included in the top-three countries for any of the six commodities. As we report in the results section of this supplementary text, there was no significant effect of this manipulation. To strengthen this manipulation, Ohtsubo (2019) had participants not only receive the correct answers but also type those correct answers themselves by providing space on the feedback page. In Ohtsubo's (2019) study, this manipulation successfully influenced participants' valuation of South Korea. The failure of this manipulation in the study was thus presumably due to

participants' insufficient attention to the correct answers. Therefore, in the main text, we do not mention this condition (and do not include it in the analyses).

(3) After the fourth section (i.e., three items assessing supportive attitude toward the deal), for an exploratory purpose, we included one more item asking about participants' sense of guilt if Japan would decline to sign the peace deal. This was measured on a 7-point scale (1 = "do not feel guilty at all" to 7 = "feel very guilty").

### **Main Study: Results (Additional Analyses)**

#### ***Commitment to the Liancourt Rocks***

We first checked how many participants were committed to sovereignty over the Liancourt Rocks. The vast majority of participants ( $.86 = 1,335/1,600$ ) were committed (i.e., they considered that there are no extreme circumstances in which Japan would abandon its sovereignty). This is almost comparable with the proportion of committed participants in the Liancourt Rocks pilot study ( $.82$ ),  $p = .915$  by Fisher's exact test.

#### ***Non-significant Effect of Relationship Value Manipulation***

We checked whether the relationship value manipulation had any effect on negative emotion, favorable reaction, and guilt. A negative emotion (either anger or disgust) was reported by 404 (of 800) and 408 (of 800) participants in the low and high relationship value conditions, respectively,  $\chi^2(df = 1) = .02$ ,  $ns$ . The mean favorable reaction to the peace deal was  $29.76 \pm 22.91$  and  $29.31 \pm 23.42$  in the low and high relationship value conditions, respectively,  $t(1598) = 0.39$ ,  $ns$ . Mean expected guilt (if Japan would decline to sign the peace deal) was  $2.49 \pm 1.61$  and  $2.54 \pm 1.67$  in the low and high relationship value conditions, respectively,  $t(1598) = 0.67$ ,  $ns$ . These results suggest that the relationship manipulation had almost no effect on the variables of

interest. Therefore, the analyses reported in the main text and the subsequent analyses in this supplementary document do not include relationship value.

### ***Negative Emotions, Apology, Compensation, and Sacred Value***

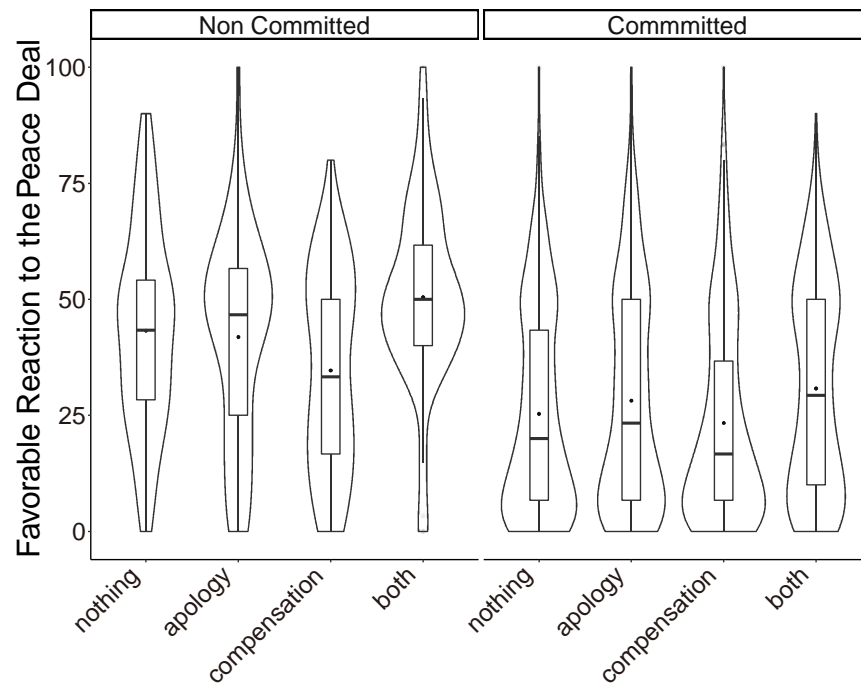
Negative emotion (dummy coded variable) was analyzed by a logistic regression analysis. It was regressed on commitment to the disputed islands, gender, apology, compensation, and apology  $\times$  compensation interaction. The effects of commitment ( $b = 1.21$ ,  $SE = 0.15$ ,  $p < .001$ ) and gender were significant ( $b = 0.40$ ,  $SE = 0.10$ ,  $p < .001$ ). Of 265 non-committed participants, 73 (.28) reported anger or disgust, while of 1,335 committed participants, 739 (.55) reported anger or disgust. Of 800 female participants, 368 (.46) reported anger or disgust, while of 800 male participants, 444 (.56) reported anger or disgust. The effect of apology  $\times$  compensation interaction was marginally significant ( $b = -0.39$ ,  $SE = 0.21$ ,  $p = .058$ ). This marginally significant effect parallels the result reported in the main text. The relative frequency of participants who reported anger or disgust was .53 in the no apology/no compensation condition. The offer of compensation increased the frequency of negative emotion to .57, while the offer of apology decreased it to .49. The offer of apology and compensation reduced it to .45 (thus, it was most effective), although the effect was small. In a model including the interactions between the apology/compensation condition and commitment, those interactions were not significant.

### ***Favorable Reaction, Apology, Compensation, and Sacred Value***

The favorable reaction score was submitted to a 2 (apology)  $\times$  2 (compensation)  $\times$  2 (gender)  $\times$  2 (commitment) ANOVA. Consistent with the results reported in the main text, the main effect of apology ( $F(1, 1584) = 24.87$ ,  $p < .001$ ) and the interaction between apology and compensation ( $F(1, 1584) = 9.39$ ,  $p = .002$ ) were significant. In addition, the main effects of

gender ( $F(1, 1584) = 20.52, p < .001$ ) and commitment ( $F(1, 1584) = 108.49, p < .001$ ) were significant. Favorable reaction was higher among female participants ( $32.10 \pm 22.52$ ) than male participants ( $26.97 \pm 23.53$ ). However, it is premature to conclude that women tend to have a favorable reaction to peace deals because the effect of gender was not significant in either scenario of the pilot study. Consistent with the pilot study, non-committed participants ( $42.44 \pm 21.79$ ) were more favorable than committed participants ( $26.98 \pm 22.57$ ) to the peace deal. Although the apology  $\times$  compensation  $\times$  commitment three-way interaction was significant ( $F(1, 1584) = 4.52, p = .034$ ), as can be seen in Figure S4, the apology  $\times$  compensation interaction pattern was not substantially modified by commitment (compare the left and right panels). The noticeable differences from the results reported in the main text are as follows: The difference between the apology/no compensation condition and the no apology/compensation condition became non-significant among the committed participants (difference score = 4.81,  $p = .091$ ) and the non-committed participants (the difference score = 7.22,  $p = .531$ ). The difference between the no apology/no compensation condition vs. the apology/compensation condition became non-significant among non-committed participants (the difference score = 7.09,  $p = .620$ ) but it remained significant among committed participants (the difference score = 5.46,  $p = .032$ ). One might wonder why the larger difference (7.09) was non-significant and the smaller difference (5.46) was significant. This is due to the difference in sample size: There were more committed participants (1,335) than non-committed participants (265). Nevertheless, the difference between the no apology/compensation condition and apology/compensation condition was significant among both committed (7.46,  $p < .001$ ) and non-committed participants (15.81,  $p < .001$ ). Therefore, although commitment slightly moderated the apology  $\times$  compensation interaction, the

most important result (i.e., compensation was not effective in itself, but it was effective when combined with an apology) remained intact.



*Figure S4*

Violin plots combined with boxplots to show the distribution, mean, and median of the favorable reaction score as a function of apology (present vs. absent) and compensation (present vs. absent). Within each boxplot, the dot indicates the mean, and the horizontal bar, the median. The left panel shows the results of the non-committed participants and the right panel shows those of the committed participants. In each panel, the no apology/no compensation condition (nothing), the apology/no compensation condition (apology), the no apology/compensation condition (compensation), and the apology/compensation condition (both) are ordered from left to right.

*Guilt, Apology, Compensation, and Sacred Value*

In this study, participants were asked how guilty they would feel if the Japanese government were to decline to sign a peace deal. The guilt score was first submitted to a 2 (apology)  $\times$  2 (compensation)  $\times$  2 (gender)  $\times$  2 (commitment) ANOVA. Although the main effect of commitment was significant ( $F(1, 1584) = 94.67, p < .001$ ; the non-committed participants reported greater guilt ( $3.38 \pm 1.79$ ) than the committed participants ( $2.35 \pm 1.55$ )), no interaction effects involving commitment were significant. Accordingly, for the sake of simplicity, we will report the ANOVA results not including commitment in the independent variables. The main effects of apology ( $F(1, 1592) = 6.48, p = .011$ ) and gender ( $F(1, 1592) = 26.84, p < .001$ ) were significant. Female participants reported higher guilt ( $2.73 \pm 1.58$ ) than male participants ( $2.30 \pm 1.68$ ). The main effect of apology was qualified by the significant apology  $\times$  compensation interaction ( $F(1, 1592) = 5.42, p = .020$ ), which parallels the comparable interaction effect on a favorable reaction. When neither apology nor compensation was offered, mean guilt was  $2.50 \pm 1.65$ . When an apology was offered, the guilt score changed little ( $2.52 \pm 1.68$ ). When compensation was offered, the guilt score slightly decreased ( $2.32 \pm 1.53$ ). When both an apology and compensation were offered, the guilt score was highest ( $2.71 \pm 1.68$ ). Tukey's HSD post hoc tests associated with a 2 (apology)  $\times$  2 (compensation) design revealed that the difference between the apology/compensation condition and the no apology/compensation condition was significant ( $p = .003$ ), but any other post hoc contrasts reached statistical significance. Again, although the effect was weaker, this analysis confirmed the most important conclusion of the main text: The offer of compensation alone was least effective, while the offer of both an apology and compensation was most effective.



### References

- Ginges, J., Atran, S., Medin, D., & Shikaki, K. (2007). Sacred bounds on rational resolution of violent political conflict. *Proceedings of the National Academy of Sciences of the USA*, 104(18), 7357-7360. doi:10.1073/pnas.0701768104
- McKirdy, E. (2019, January). Russia and Japan at odds over seven-decade-old Kuril Islands dispute. *CNN*. Retrieved from <https://edition.cnn.com/2019/01/21/asia/japan-russia-kuril-islands-intl/index.html>
- Ohtsubo, Y. (2019). Relationship value fosters conciliatory attitudes in international conflicts. *Peace and Conflict: Journal of Peace Psychology*, 25(3), 259-261. doi:10.1037/pac0000353