

Panda Diplomacy: A Quantitative Analysis of Public Diplomacy

Mamoru Uesugi

Public diplomacy is actively used in contemporary world, and recent studies have reported various findings about it. Nevertheless, quantitative analysis about the effects of public diplomacy is not always straightforward and still insufficient. This study concurs with the efforts by recent studies and estimates the effects by using a new case: China's 'panda diplomacy.' Even after 2005, at least 40 pandas arrived at 20 foreign countries or territories including Taiwan, Hong Kong and Macau from mainland China. I hypothesize that the panda diplomacy has a positive effect on public opinions of the recipient countries about China. I test this hypothesis by analyzing the effect of panda arrivals on public opinions about China in Global Attitudes Survey by Pew Research Center, and using both difference-in-difference (DID) for G8 and G20 countries and regression discontinuity design (RDD) for the case of Malaysia. I show that the panda diplomacy is effective to strengthen the opinion favorable to China. These findings suggest that the public diplomacy can be especially effective for winning the heart of foreign citizens.

Panda Diplomacy: A Quantitative Analysis of Public Diplomacy

Mamoru Uesugi

1. Introduction

Although the effects of culture or emotion on international relations have long been discussed in the academic field, the topic remains an important concern both for scholars and practitioners under the names of public diplomacy or soft power ¹. Ultimately, governments use public diplomacy “to communicate with and attract the publics of other countries, rather than merely their governments” (Nye, 2008, p. 94).

However, does public diplomacy actually have the expected effect? Studies about public diplomacy have mainly used qualitative analysis (for example, Adler-Nissen and Tsinoi (2019); Fitzgerald (2018)). For them, rigorous causal identification is not

¹ In the academic field, Nye has been suggested the existence of the effects by using the concept of ‘soft power’ (2008). Despite the critiques against his argument (e.g., Noya (2006)), Nye has incited an active discussion about the effects. Practically, for example, the U.S. spent \$2.28 billion for public diplomacy in fiscal year 2017. See U.S. Department of State. November 20, 2018. “2018 Comprehensive Annual Report on Public Diplomacy and International Broadcasting: ACPD ANNUAL REPORT.” <https://www.state.gov/2018-comprehensive-annual-report-on-public-diplomacy-and-international-broadcasting/>. Accessed on December 27, 2020.

necessarily straightforward. Even though some recent quantitative studies such as Chapman and Gerber (2019) address the problem, the scope of the quantitative studies is still limited for now; the quantitative studies exclusively focus on human subjects such as state leaders. Therefore, despite the attention to public diplomacy, analysis about the effectiveness of public diplomacy is not always straightforward and still insufficient.

This study concurs with the efforts by recent studies and estimates the effects of public diplomacy on public opinions quantitatively.² Importantly, this study extends the scope by analyzing a new case of public diplomacy: ‘panda diplomacy’ by China. After 1939, pandas became animals that cannot be transferred to foreign countries without permission of Chinese government (Ienaga 2011, pp. 52-57). The case of panda diplomacy aiming at publics of the U.S. was started in as early as 1941 to send a message to obtain support from the U.S. (Ienaga 2011, pp. 52-60). Even after 2005, at least 40 pandas have arrived at 20 foreign countries or territories including Taiwan, Hong Kong and Macau.

A difficult but an important problem in the analysis about the panda diplomacy is

² On the other hand, Goldsmith and Horiuchi (2012) have already suggested that public opinions actually influenced on outcomes in international relations such as the start of Iraq war.

the nonrandom assignment of pandas³. For example, if China sent pandas to countries whose public opinion was already favorable to China, the feature of the recipient countries may influence the estimates of the effects of panda diplomacy.

This study addresses the problem by using both difference-in-difference (DID) and regression discontinuity design (RDD). DID can account for time-invariant confounders. Likewise, RDD also can mitigate the problem by analyzing the outcome variable (in this case, public opinions) immediately before and after the cutoff date (in this case, a date of a panda arrival). By using both DID and RDD, we can control potential confounders, and infer rigorous causal relationships.

I hypothesize that the panda diplomacy has a positive effect on public opinions about China in the recipient countries. I test this hypothesis by analyzing the effect of panda arrivals on public opinions favorable to China in Global Attitudes Survey by Pew Research

³ The other observational studies also have to confront similar problems (Goldsmith, Horiuchi and Matush, 2020).

Center.⁴ I made an original dataset about panda arrivals for this study.⁵ This study uses both difference-in-difference (DID) for G8 and G20 countries except a few countries and RDD for the case of Malaysia. For DID, I use annual data of the surveys and a binary (dummy) variable about whether pandas arrive or not in the year. For RDD, I exploit the fact that two pandas arrived during the period of the Global Attitude Survey in Malaysia, referring to Goldsmith, Horiuchi and Matush (2020). Analyzing individual-respondent level, daily data of the survey enables me to infer the rigorous causal relationship between the public opinion and the panda arrival. Also, as Goldsmith, Horiuchi and Matush(2020) mentioned, by using only the Global Attitude Survey, which has consistency and a broad scope, I can compare different countries with the same method of survey measurement, and can “use real-world data to test general hypotheses that underlie the broader field of public diplomacy” (ibid, p.3).

Both DID and RDD suggest significant effects toward the expected directions.

According to DID, a panda arrival increases average favorability rate by about 6%. On the

⁴ Pew Research Center. 2020. "Opinion of China."
<https://www.pewresearch.org/global/database/indicator/24/>. Accessed on May 19, 2020.

⁵ The sources of this dataset are listed in Appendix 1.

other hand, results of RDD imply that a panda arrival raise average favorability rate by about 1.5 ranks on a scale of one (very favorable) to four (very unfavorable), though the results of RDD are somewhat unstable. I test the validity of the DID analysis by conducting a placebo test, which uses public opinion about Russia as a placebo outcome. I also check the robustness of the fixed effects by using models without the fixed effects. These findings suggest that public diplomacy can be especially effective for winning the heart of foreign citizens.

2. Literature Review

Although the concept public diplomacy is widely used by practitioners (e.g. U.S. Department of State),⁶ the definition of the public diplomacy itself has been an important discussion topic in the academic realm. One focus of the discussion has been the definition of the related term 'soft power' (Nye, 2008). According to Nye, soft power is "the ability to affect others to obtain the outcomes one wants through attraction rather than coercion or payment" (Nye, 2008, p. 94). The soft power "is a staple of daily democratic politics" (ibid, p. 95). The key concept 'public diplomacy' is also understood in this context. In "international politics, the resources that produce soft power arise ...from the values an organization or country expresses in its culture" (ibid). 'Public diplomacy' is "an instrument that governments use to mobilize these resources to communicate with and attract the publics of other countries, rather than merely their governments" (ibid).

Although the concept 'soft power' is accepted and used by some researchers (Gill

⁶ See Footnote 1.

and Huang, 2006), it also elicits criticisms of other scholars, and thus activates the discussion about the effects of culture or emotion on international relations. One of the enduring problems about the soft power is that Nye's theory is difficult to test empirically (Goldsmith and Horiuchi, 2012, p.556). What is worse, Noya (2006) argues that the soft power is not a type of power at all; according to him, any resource including military can be soft if the objectives such as humanitarian aid are regarded as legitimate. Sun (2013) also states that "a good image does not necessarily mean soft power" (p. 221).

However, Nye counters to these critiques by arguing that whether "a particular asset is an attractive soft power resource can be measured through polls or focus groups" (Nye, 2008, p. 95). In fact, even though soft power itself is not measurable, the effects of public diplomacy can be measured by polls and public opinion surveys. Several quantitative studies use public polls to test the effectiveness of public diplomacy (Goldsmith, Horiuchi and Matush, 2020; Chapman and Gerber, 2019).⁷

Nevertheless, quantitative analysis about the effect of public diplomacy and its

⁷ In fact, about the criticism that "a good image does not necessarily mean soft power" (Sun, 2013, p.221), a recent study has already suggested that public opinions actually influenced on outcomes in international relations (Goldsmith and Horiuchi, 2012), as I noted before.

effects is still under development. Studies related to soft power or public diplomacy have mainly focused on qualitative analysis (for example, Adler-Nissen and Tsinovoi (2019); Fitzgerald (2018); Nye (2008)). The problem is that rigorous causal identification is not necessarily straightforward for the qualitative studies. For example, even if they can observe some correlations that seem to be effects of public diplomacy for citizens, the true cause of the effects may be the economic ties between the citizens and the conducting country of the practice of public diplomacy.

Quantitative studies can also have a similar problem. Confirming correlation (e.g. Jones and Mattiacci (2019)) does not necessarily mean confirming causality, because there may be reverse causality or other variables which correlate with both the independent variables and the dependent variables; a country which can use a larger amount of money can spend the money both to public diplomacy and to hire citizens of another country.

Recent quantitative studies have addressed the endogeneity. For example, Chapman and Gerber (2019) utilized measured Russian language capacity as an instrumental variable (IV) of Russian TV exposure. Because the IV is related to the independent variable (Russian TV exposure) but not related to the potential confounder (opinions favorable to Russia) which is related to both the independent variable and

dependent variable, it allowed them to identify the rigorous causal relation between the independent variable and dependent variable (opinions for Russia and Russia-related world events). Similarly, Goldsmith, Horiuchi and Matush (2020) used regression discontinuity design (RDD) to estimate the causal effect of high-level visits by national leaders to other countries on public opinions (ibid). RDD enables to estimate the causal effect by comparing a randomly assigned treatment group and a control group immediately before and after the treatment. Although the cases they analyzed are different from panda diplomacy, I also adopt RDD as a part of this study, because this method is suitable to estimate causal effects.

The scope of the quantitative analyses is, however, still limited. For now, the quantitative studies exclusively focus on human subjects. Although there are various quantitative studies, a large part of them focuses on human subjects such as state leaders (Balmas 2018; Goldsmith and Horiuchi 2009). Other studies have analyzed media (Chapman and Gerber 2019) and foreign aid (Horiuchi and Wood 2014). Nevertheless, other important topics, such as panda diplomacy, have not been studied sufficiently.

We should also note that effects of public diplomacy may vary with recipients. Some media studies already suggest it (e.g. Sheaffer, Shenhav, Takens, and Atteveldt, 2014).

However, as Goldsmith, Horiuchi and Matush (2020) mentioned, “establishing an effect on foreign media frames is not the same as showing the impact on foreign opinion itself,” and this study concurs with the efforts to show the impact on foreign opinion.

3. Panda Diplomacy

This study concurs with the efforts by recent studies and estimates the effects of public diplomacy quantitatively. I extend the scope of recent quantitative studies by analyzing a new case of public diplomacy: 'panda diplomacy' by China. In this study, the term panda diplomacy means transfers of pandas (giant pandas) from mainland China to other places including Taiwan, Hong Kong and Macau with permission of the Chinese government.

Although it seems to be less common, panda diplomacy is a typical and classic case of public diplomacy. As I noted before, public diplomacy is an instrument that governments use to mobilize resources which produce soft power, and hence attracts the publics in other countries. Pandas became animals that cannot be transferred to foreign countries without permission of Chinese government after 1939 (Ienaga, 2011, pp. 52-57). Then the case of panda diplomacy aiming at the publics' support to China was started in 1941 as a message for obtaining support from the society of the U.S. (Ienaga, 2011, pp. 53-60). In addition, several qualitative studies have already suggested the political importance of panda diplomacy as a part of China's public diplomacy (For example, Hartig (2013)).

It is true that the other causal relations related to coercion or payment rather than attraction can exist about panda diplomacy theoretically, but because this study uses public opinion and panda diplomacy, they are not so plausible. One of the alternative explanation will be that panda diplomacy affects not through attraction but through a kind of opportunity cost: people in a recipient country may have been evaluated the opportunity cost of China to send the rare animal(s), panda(s), to the recipient country highly. However, it is not so plausible that ordinarily people who answered in surveys calculated the political opportunity cost when they saw the pandas.

Panda diplomacy is also important for practitioners. For example, an article of Los Angeles Times about two giant pandas' arrival in San Diego reported that the zoo invested \$500,000 in the pandas' accommodations alone and expected 1.5 million people to see the pandas (Scott, July 24, 1987). Even only after 2005, at least 40 pandas arrived at 20 foreign countries or territories including Taiwan, Hong Kong and Macau from mainland China⁸. Moreover, China itself is an important country as a member of G20 with over one billion

⁸ Strictly speaking, Taiwan, Hong Kong, Macau are not foreign countries. However, because this study uses data for G20 countries and Malaysia, whether we include them or not does not affect the conclusion of this study.

population.

Nevertheless, to my best knowledge, there is no quantitative analysis about panda diplomacy. Only one exception is Huang and Wang (2020). However, scope of their analysis is still limited. Although they focus only on twitter tweets, panda diplomacy also has various effects on the real world through medias such as zoos or newspapers, as the article of Los Angeles Times (Scott, July 24, 1987) suggests.

In fact, a critical problem in the analysis about the panda diplomacy is nonrandom assignment of pandas. Buckingham, David, and Jepson (2013) suggest that the panda diplomacy can be divided into three phases. In the phase 2 after 1978, the gifts of pandas were “gift loans involving a capitalist lease model based on financial transactions” controlled by the state (ibid, p.263). The phase 3 after the 2008 Sichuan earthquake “is characterized by panda loans to nations supplying China with valuable resources and technology that are located in few countries” (ibid, p.265). In such cases, variables other than the panda diplomacy may have influenced results of analyses, because China may have transferred pandas to countries which have some common features such as a common culture or a common geographical feature.

4. Hypothesis

I hypothesize that

Hypothesis 1 *The panda diplomacy has a positive effect on public opinion of the recipient countries about China.*

Whether a particular asset is an attractive soft power resource or not can be measured through polls, and by definition, one aspect of public diplomacy is mobilizing resources to attract the publics of other countries (Nye, 2008, p.95). Thus, if the panda diplomacy is effective, it should increase public opinions favorable to China.

An important point is that the panda diplomacy in 1941 was already a part of “international propaganda,” which aimed at manipulating the public opinion of the recipient country (Ienaga, 2011, pp. 63, 65). A psychological and cultural effect of pandas through their loveliness was already expected in 1941, when two pandas arrived at New York to attract the publics in the U.S. as a message for obtaining support from the society of the U.S. (ibid, pp. 53-56). In fact, Soong Mei-ling, the wife of Chiang Kai-shek, appealed the image of cuddly pandas in the ceremony at that time, and this is the first time that China appealed it intentionally (ibid, pp. 53-55). This action aimed at acquiring sympathy of

justice from people all over the world (ibid, pp. 69-72).

Hartig (2013) also suggests the effect of panda diplomacy on public opinion through media coverage (p. 65), referring to a model of public diplomacy proposed by Gilboa (2001). These facts also suggest that if the panda diplomacy has the expected causal mechanism it should increase public opinions favorable to China.

.

5. Data and Method

As the data of public opinion, this study uses the data of Global Attitudes Survey by Pew Research Center from 2005 to 2019⁹. The Global Attitude Survey¹⁰ provides annual data of public opinion in multiple countries. Furthermore, I got daily, individual-respondent level data of Malaysia observed in 2014 for the purpose of the RDD. Although it asks several questions, I focus on the question "Please tell me if you have a very favorable, somewhat favorable, somewhat unfavorable or very unfavorable opinion of China." Pew Research Center asked the question in 60 countries between 2002 and 2019, and has disclosed percentages of responding favorable for each country. Favorable answers include "very favorable" and "somewhat favorable" responses. Unfavorable answers include "very

⁹ Pew Research Center. 2020. "Opinion of China." <https://www.pewresearch.org/global/database/indicator/24/>. Accessed on May 19, 2020.

¹⁰ Using this survey causes several limitations of this study. One example is that I can conduct RDD only for Malaysia. However, because it is not plausible that pandas are assigned based on the date of the survey, systematic bias caused by the limitation is implausible.

unfavorable" and "somewhat unfavorable." The positive effect on public opinion is qualified as the rise of the percentages of favorable opinions. Because the data of 2002 are available in only four countries and no data are available in 2003 and 2004, I use the data in 2005 and later. Likewise, although the raw data include 60 countries, I conduct the DID analysis only for G8 countries and some of G20 countries. The reason is that some countries other than G20 have only one or two datapoints.¹¹ Also, by using G8 and G20 countries, I can secure the sample size to analyze quantitatively, and the countries themselves have practical importance as members of G20¹².

As the data of panda diplomacy, I made a new dataset of the dates of pandas' arrivals from China to recipient countries after 2005 as shown in Appendix 1. I used various sources also listed in the Appendix 1 to collect information about the panda arrivals. If the percentages of favorable opinions in the Global Attitude Survey rose immediately after the arrival of the pandas, the hypothesis is confirmed.

¹¹ Pew Research Center. 2020. "Opinion of China."
<https://www.pewresearch.org/global/database/indicator/24/>. Accessed on May 19, 2020.

¹² On the other hand, a systematic bias related to this selection is unlikely, because whether a country is a member of G8 and G20 is not decided only by attitude toward China.

The case of panda diplomacy provides unique analytical opportunities for quantitative analysis. After 2005, at least 40 pandas arrived in 20 foreign countries or territories including Taiwan, Hong Kong and Macau from mainland China. The frequency of panda arrivals ensures the sufficient variation in the explanatory variable.

This study uses fixed effect model in the context of difference in difference (DID), which uses year fixed effect (τ_t) and country fixed effect (ϕ_i). Therefore, this study can mitigate the risk of unobserved confounders. This model is especially effective for this study, because the assignment of pandas is far from random.

$$opinion_{it} = \delta panda_{it} + \phi_i + \tau_t + e_{it} \quad (1)$$

The dependent variable ($opinion_{it}$) is the percentages of the favorable opinions of country i in given year t . The independent variable ($panda_{it}$) is a dummy variable, which takes 1 if a panda's or pandas' arrival (s) is/are confirmed at a given recipient country in a given year; otherwise it takes 0. I conduct the analysis both for G8 countries and G20 countries except China itself, EU, which is not a sovereign state, EU members that are not independent members of G20, Saudi Arabia, whose survey data is not available. Although I have data for some other countries, they often have only one or two datapoints.

A crucial assumption of the DID is the parallel trend assumption; in this case,

trends of the public opinions should be parallel if there are no panda arrivals. About this study, because events in China such as changes of presidents can be observed by all countries at the same time, this assumption may be satisfied as long as such global events have similar effects on all countries. On the other hand, member countries of G20 and G8 have various different, time-invariant features such as their diplomatic relations, and the assumption may not be satisfied.

Because the DID relies on the parallel trend assumption, which may or may not be plausible in this application, I also conduct regression discontinuity design (RDD). On May 20, 2014, two pandas are arrived at Malaysia during the period of the Global attitude survey (April 10 to May 23). Whether a respondent answered the question immediately before or after the pandas' arrivals is considered to be as-if random¹³. Therefore, by comparing the opinions of respondents who answered the question immediately before the arrival with the opinion of respondents who answered the question after the arrival, we can plausibly estimate the causal effect of panda diplomacy. In this case, the independent variable

¹³ About the method of the survey, see Pew Research Center. January 8, 2019. "International Methodology." *Pew Research Center: Methods*. <https://www.pewresearch.org/methodology/international-survey-research/international-methodology/global-attitudes-survey/malaysia/2014>. Accessed on January 8, 2021.

(*pandai*) is a dummy variable which takes 1 only if an individual respondent i answered the survey after the panda arrival¹⁴ and a variable which indicates the dates of the response of i . The dependent variable (*opinion_i*) is the rank of public opinion favorable to China chosen by individual i in the daily, individual-responder level data of the Global attitude survey: 1 is the most favorable and 4 is the least.¹⁵ The running variable is the number of days from the panda arrival. If the value of running variable is more than 0, the value of independent variable becomes 1 automatically. This study uses two to four days as the bandwidths, because the last date of the survey, May 23, is three days after the cutoff date May 20¹⁶. By focusing on this short bandwidth, we can interpret any changes between opinions before the panda arrival and ones after the panda arrival as the changes caused by the panda arrival.

The function of RDD is as follows:

$$opinion_i = \beta_0 + \beta_1pandai + \beta_2date_i + e_i \quad (2)$$

,where *date_i* captures effects of dates.

¹⁴ All respondents in RDD analysis answered before or after the cutoff date, May 20, 2014; no one answered at the cutoff date.

¹⁵ Answer data of “Don’t know” or “Refused” are excluded from RDD analysis, as missing variables of DID.

¹⁶ In addition, there is a practical constraint about the bandwidth selection that the number of observations after the cutoff date is limited.

6. Results

DID

The results of the DID are presented in Table 1. Both of the coefficients are positive and significant, even after adding the year fixed effects and country fixed effects, despite the fact that the sample size is small, especially in the case of G8, although the significance level is 10%. These results suggest that the pandas' arrivals have positive effects on foreign public opinions. A panda arrival increases average favorability rate by about 6% in both G8 and G20 cases, according to the results. These results support the hypothesis. The 95% confidence interval for the case of G8 is from -0.946 to 13.6, and that for the case of G20 is from -0.768 to 11.8.

Table 1 Estimates of the Effect of Panda Arrivals on Foreign Public Opinion by DID

	G8	G20
Panda Arrivals	6.313 [†]	5.519 [†]
	(3.070)	(2.966)
N	106	195

Note: [†] <0.1, *0.05. Table entries are coefficients; cluster standard errors are in parentheses; year fixed effect, country fixed effect, and constants are included in both of the models but omitted from presentation. N means the number of observations (country-year). Because the public opinion data have some missing values, N is not equal to 15 (years) × 8 (countries) or 15 (years) × 20 (countries).

I also conducted a placebo test to confirm whether the panda arrivals are the causes of changes. The results are in Appendix 4. I used favorability rates toward Russia in G8 countries except Russia itself (G7)¹⁷. Both Russia and China are socialist states in the cold

¹⁷ Ideally, I should also conduct an analysis of G20, but the data are limited.

war era, permanent members of UN Security Council, members of G20, and neighboring countries each other. However, Russia is not a conductor of panda diplomacy. Therefore, even if the trend of the favorability rates toward Russia is similar to one toward China, the rates toward Russia should not be related to the effects of panda arrivals. In fact, the results of the placebo test suggest no correlation which is statistically significant between panda arrivals and public opinion favorable to Russia, although the sample size is small, as the main analysis.

RDD

The results of RDD are presented in Table 2. When I utilized 4 days as the bandwidth, I was not able to observe any significant effect. However, when I utilized smaller bandwidth, the results became more significant. As a result, I was able to observe a significant effect to the expected direction when I use 2 days as the bandwidth. This fact also implies the expected effect.

When I use 2 days as the bandwidth, the results suggest that a panda arrival raise average favorability rate by about 1.5 ranks on a scale of one (very favorable) to four (very unfavorable). The 95% confidence interval for the case of 4 days bandwidth is from -0.7606

to 0.8055, that for the case of 3 days bandwidth is from -1.4770 to 0.3408, and that for bandwidth 2 days is from -2.7178 to -0.2419.

However, the results are at least unstable. Indeed, if I relax some of the assumptions such as same slope in the trends of the public opinion before and after the cutoff date, I cannot observe the expected effects (See Appendix 3). One possible reason is that the number of samples after the pandas' arrival is small. In addition, the analysis is limited to Malaysia; we cannot test the effects in the other countries.

Table 2 Estimates of the Effect of the Panda Arrival on Malaysian Public Opinion by RDD

	Bandwidth 4 Days	Bandwidth 3 Days	Bandwidth 2 Days
Panda Arrivals	0.022	-0.568	-1.480*
	(0.395)	(0.458)	(0.618)
N (Before May 20)	119	98	56
N (After May 20)	13	13	10

Note: † <0.1, *0.05. The data are rounded off to the fourth decimal place. Table entries are coefficients; standard errors are in parentheses. The total number of observations is 1010; the number of observations before the cutoff is 997, after the cutoff is 13. No one answered at the cutoff date, May 20, 2014. Smaller numbers of the coefficients indicate more

favorable opinions; 4 indicates public opinion the least favorable to China, and 1 indicates public opinion the most favorable to China.

7. Conclusion

I believe the findings provide a basis to the ongoing active academic debates about public diplomacy and soft power in international relations. Both RDD and the DID suggested positive and significant effects of panda diplomacy. This implies that a typical case of public diplomacy by China has the expected effect. Also, the results passed several tests, including placebo tests.

This study also has practical importance, from the perspective of evidence-based policy making, because countries such as China, the U.S, are implementing public diplomacy, and a large amount of money is spent for the public diplomacy or related activities.

Further implication of this study is that it suggests the effects of emotional or cultural activity in public diplomacy. Activities such as visits by leaders are not necessarily related to specific emotion. On the other hand, pandas only have loveliness. Pandas itself do not have direct military or economic power. Zoos, shops or some other actors may make profits from the pandas, but this is because of pandas' loveliness. Citizens in the recipients

buy a stuffed panda not because of its asset value but because it is cuddly. In this sense, the effects of panda diplomacy are considered to be emotional or cultural. I believe this study becomes a basis of further causal analysis of effects of public diplomacy.

References

- Adler-Nissen, Rebecca and Alexei Tsinoi. 2019. "International misrecognition: The politics of humour and national identity in Israel's public diplomacy." *European Journal of International Relations* 25(1): 3-29.
- Balmas, Meital. 2018. "Tell Me Who Is Your Leader, and I Will Tell You Who You Are: Foreign Leaders' Perceived Personality and Public Attitudes toward Their Countries and Citizenry." *American Journal of Political Science* 62(2): 499-514.
- Buckingham, Kathleen Carmel, Jonathan Neil William David, and Paul Jepson. 2013. "Environmental Reviews and Case Studies: Diplomats and Refugees: Panda Diplomacy, Soft "Cuddly" Power, and the New Trajectory in Panda Conservation." *Environmental Practice* 15(3): 262-270.
- Chapman, Hannah S., and Theodore P. Gerber. 2019. "Opinion-formation and Issue-framing Effects of Russian News in Kyrgyzstan." *International Studies Quarterly* 63(3): 756-769.
- Fitzgerald, John. 2018. "China in Xi's "New Era": Overstepping Down Under." *Journal of*

Democracy 29 (2): 59-67.

Gill, Bates, and Yanzhong Huang. 2006. "Sources and Limits of Chinese 'Soft Power'."

Survival 48(2): 17-36.

Gilboa, Eytan. 2008. "Searching for a Theory of Public Diplomacy." *Annals of the American*

Academy of Political and Social Science 616(1): 55-77.

Gilboa, Eytan. 2001. "Diplomacy in the Media Age: Three Models of Uses and Effects."

Diplomacy and Statecraft 12 (2): 1-28.

Goldsmith, Benjamin E., and Yusaku Horiuchi. 2012. "In Search of Soft Power: Does

Foreign Public Opinion Matter for US Foreign Policy?" *World Politics* 64(3): 555-585.

Goldsmith, Benjamin E., and Yusaku Horiuchi. 2009. "Spinning the Globe? U.S. Public

Diplomacy and Foreign Public Opinion." *The Journal of Politics* 71(July): 863-875.

Goldsmith, Benjamin E., Yusaku Horiuchi, and Kelly Matush. 2020. "Public Diplomacy

Increases Foreign Public Approval: A Regression Discontinuity Analysis."

<https://ssrn.com/abstract=3566347>.

Goldsmith, Benjamin E., Yusaku Horiuchi, and Terence Wood. 2014. "Doing Well by Doing

Good: The Impact of Foreign Aid on Foreign Public Opinion” *Quarterly Journal of Political Science* 9(1): 87-114.

Graham, Sarah Ellen. 2014. “Emotion and Public Diplomacy: Dispositions in International Communications, Dialogue, and Persuasion1.” *International Studies Review* 16(4): 522– 539.

Hartig, Falk. 2016. “How China Understands Public Diplomacy: The Importance of National Image for National Interests.” *International Studies Review* 18(4): 655–680.

Hartig, Falk. 2013. “Panda Diplomacy: The Cutest Part of China's Public Diplomacy.” *The Hague Journal of Diplomacy* 8(1): 49-78

Heng, Yee-Kuang. 2010. “Mirror, Mirror on the Wall, Who is the Softest of Them All? Evaluating Japanese and Chinese Strategies in the ‘Soft’ Power Competition Era.” *International Relations of the Asia-Pacific* 10(2): 275–304.

Huang, Zhao Alexandre and Rui Wang. 2020. “Panda Engagement’ in China’s Digital Public Diplomacy.” *Asian Journal of Communication* 30 (2): 118-140.

Ienaga, Masaki. 2011. *Panda gaiko: chugoku ha panda to iu 'shigen' wo dou katsuyoushi koku saishakai wo watatte kita ka?* Tokyo: Media Factory.

Jones, Benjamin T., and Eleonora Mattiacci. 2019. "A Manifesto, in 140 Characters or Fewer: Social Media as a Tool of Rebel Diplomacy." *British Journal of Political Science* 49(2): 739-761.

Noya, Javier. 2006. "The Symbolic Power of Nations." *Place Branding* 2: 53-67.

Nye, Joseph S. 2008. "Public Diplomacy and Soft Power." *The Annals of the American Academy of Political and Social Science* 616(1): 94-109.

Pew Research Center. 2020. "Opinion of China."

<https://www.pewresearch.org/global/database/indicator/24/>. Accessed on May 19, 2020.

Pew Research Center. January 8, 2019. "International Methodology." *Pew Research Center: Methods*. <https://www.pewresearch.org/methodology/international-survey-research/international-methodology/global-attitudes-survey/malaysia/2014>. Accessed on January 8, 2021.

Scott, Janny. July 24, 1987. "ZOO GETS SET FOR PANDAMANIA AS 2 LONG-AWAITED VISITORS ARRIVE; THE PANDAS ARE HERE!" *Los Angeles Times* (San Diego County Edition). Metro; Part 2; Page 1; Column 1; Metro.

Desk<https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:3SJD-RMS0-001P-C4Y8-00000-00&context=1516831>. Accessed on November 24, 2020.

Shambaugh, David. 2015. "China's Soft-Power Push: The Search for Respect." *Foreign Affairs* 94(4): 99–107.

Sheafer, Tamir, Shaul R Shenhav, Janet Takens, and Wouter Van Atteveldt. 2014. "Relative Political and Value Proximity in Mediated Public Diplomacy: The Effect of State-level Homophily on International Frame Building." *Political Communication* 31(1): 149–167.

Sun, Jing. 2013. "Soft Power's Rise and Fall in East Asia." *Current History* 112: 217–223.

U.S. Department of State. November 20, 2018. "2018 Comprehensive Annual Report on Public Diplomacy and International Broadcasting: ACPD ANNUAL REPORT."
<https://www.state.gov/2018-comprehensive-annual-report-on-public-diplomacy-and-international-broadcasting/>. Accessed on December 27, 2020.

U.S. Department of State. "Under Secretary for Public Diplomacy and Public Affairs."
<https://www.state.gov/bureaus-offices/under-secretary-for-public-diplomacy-and-public-affairs/>. Accessed on December 6, 2020.

Wang, Yiwei. 2008. "Public Diplomacy and the Rise of Chinese Soft Power." *The Annals of the American Academy of Political and Social Science* 616(1): 257–273.

Appendix 1 Panda List with References

Confirmed panda arrivals are as follows. I was not able to decide only one date for some pandas used for DID, and the days the pandas arrived at airports and ones they arrived at zoos may be different. However, because DID uses annual data of panda arrivals and RDD uses only data of Malaysia, these fact does not influence over the main results.

States	Years	Months	Dates	Names
Australia	2009	11	28	Wang Wang
Australia	2009	11	28	Fu Ni
Austria	2019	4	16/17	YUAN YUAN
Canada	2014	3	25	Er Shun
Canada	2014	3	25	Da Mao

France	2012	1	15	Yuan Zi
France	2012	1	15	Huan Huan
Germany	2017	6	23/24	Jiao Qing
Germany	2017	6	23/24	Meng Meng
Hong Kong	2007	4	26	Le Le
Hong Kong	2007	4	26	Ying Ying
Japan	2011	2	21	Xian Nu
Japan	2011	2	21	Bi Li
Macau	2010	12	18	Xin Xin
Macau	2010	12	18	Kai Kai
Scotland	2011	12	4	Yang Guang
Scotland	2011	12	4	Tian Tian
Singapore	2012	9	6	Kai Kai

Singapore	2012	9	6	Jia Jia
Spain	2007	9	7	Bing Xing
Spain	2007	9	7	Hua Zui Ba
Taiwan	2008	12	23	Yuan Yuan
Taiwan	2008	12	23	Tuan Tuan
Malaysia	2014	5	20	XING XING (FU WA)
Malaysia	2014	5	20	LIANG LIANG (FENG YI)
Belgium	2014	2	23	HAO HAO
Belgium	2014	2	23	XING HUI
South Korea	2016	3	3	AI BAO (HUA NI)
South Korea	2016	3	3	LE BAO (YUAN XIN)*
Macau	2010	12	18	Shu Xiang
Indonesia	2017	9	28	Cai Tao

Indonesia	2017	9	28	Hu Chun
Russia	2019	4	29	RU YI
Russia	2019	4	29	DING DING
Finland	2018	1	18	HUA BAO (PYRY)
Finland	2018	1	18	JIN BAO BAO (LUMI)
Denmark	2019	4	4	Xing Er
Denmark	2019	4	4	Mao Er (Mao Sun)
Netherland	2017	4	12	Xing Ya
Netherland	2017	4	12	Wu Wen

*I regarded Lè bǎo as LE BAO.

I made this list by confirming the dates of arrivals of pandas in a panda list by Financial Times (A) and a website Giant Panda Global (B).

A: Pong, Jane and Jamil Anderlini. November 3, 2017. "The panda diaspora: where China shares its bears." *Financial Times*. <https://www.ft.com/content/eef55968-bebb-11e7-b8a3-38a6e068f464>. Accessed on May 28, 2020.

B: Jeroen Jacobs founded. 2000-2019. "ZOOS & BREEDING CENTERS." *Giant Panda Global/Quánqiú dà xióngmāo*. <https://www.giantpandaglobal.com/zoos/>. Accessed on August 27, 2020.

Additional sources or references of information about each pandas are as follows.

Wang Wang and Fu Ni

Adelaide Zoo. "ADELAIDE ZOO Animals: Giant Panda."

<https://www.adelaidezoo.com.au/animals/giant-panda/>. Accessed on May 28, 2020.

BBC (Xinhua). November 28, 2009. "China pandas arrive in Australia." BBC Monitoring

Asia Pacific - Political Supplied by BBC Worldwide Monitoring.

<https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:7X6B-BKK0-Y9M2-Y2B1-00000-00&context=1516831>. Accessed on August 22, 2020.

YUAN YUAN

PANDA INSTITUTE. August 23, 2020. "Sekai no panda." <http://panda.or.jp/sekai/>. Accessed on September 10, 2020.

Er Shun and Da Mao

Berlinger, Joshua. May 13, 2020. "Canada's Calgary Zoo to return two pandas to China because it can't get enough bamboo to feed them." *CNN travel*.
<https://edition.cnn.com/2020/05/13/world/calgary-zoo-pandas-intl-hnk-scli/index.html>. Accessed on June 2, 2020; March 25, 2013.

Calgary Zoo. 2020. "Giant Pandas - Not Available For Public Viewing At This Time."
<https://www.calgaryzoo.com/visit/animals/giant-pandas>. Accessed on 27, 2020.

Postmedia Breaking News. March 25, 2013. "Giant pandas arrive in Canada from China."

<https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5820-8C21-JDK3-91DW-00000-00&context=1516831>. Accessed on August 22, 2020.

Yuan Zi and Huan Huan

Cheng du Research Base of Giant Panda Breeding. January 13, 2012. "Yuan Zi & Huan

Huan are Ready to Travel to France."

<http://www.panda.org.cn/english/news/news/2013-09-25/2516.html>. Accessed on June 3, 2020

ZOOPARC de BEAUBAL. (n.d.). "Panda géant."

<https://www.zoobeaupal.com/zooparc/liste-des-animaux/panda-geant>. Accessed on August 16, 2020.

Jiao Qing and Meng Meng

PANDA INSTITUTE. August 23, 2020. "Sekai no panda." <http://panda.or.jp/sekai/>.

Accessed on September 10, 2020.

Le Le and Ying Ying

Hong Kong Government. April 26, 2007. "Smooth arrival of giant pandas "Le Le" and "Ying Ying" in Hong Kong (with photos and video)." *Press Releases*.
<https://www.info.gov.hk/gia/general/200704/26/P200704260238.htm>. Accessed on August 24, 2020.

Ienaga, Masaki. 2011. *Panda gaiko: chugoku ha panda to iu 'shigen' wo dou katsuyoushi koku saishakai wo watatte kita ka?* Tokyo: Media Factory. p. 196.

Ocean Park Hong Kong. (n.d.). "Giant Panda Adventure."
<https://www.oceanpark.com.hk/en/experience/attractions/attractions/giant-panda-adventure%20>. Accessed on August 16, 2020.

Xian Nu and Bi Li

PANDA INSTITUTE. May 27, 2020. "Sekai no panda." <http://panda.or.jp/sekai/>. Accessed on August 17, 2020.

UENO ZOO. "UENO-PANDA.JP." <https://www.ueno-panda.jp/press/>. Accessed on August 17, 2020.

Zhang Qian. February 22, 2011. "Chinese giant pandas arrive at Ueno Zoo in Tokyo."

Rénmín wǎng English: People's Daily Online.

<http://en.people.cn/90001/90776/90883/7296199.html>. Accessed on June 3.

Xin Xin and Kai Kai

Cheong Kam Ka. , Xinhua/Photoshot, and Newscom. December 18, 2010. "***CHINA-

MACAO-PANDAS-ARRIVAL (CN)." *Photoshot*. [https://advance-lexis-](https://advance.lexis-com.remote.library.osaka-u.ac.jp:8443/api/document?collection=news&id=urn:contentItem:51RD-8GS1-F0B2-N2XY-00000-00&context=1516831)

[com.remote.library.osaka-](https://advance-lexis-com.remote.library.osaka-u.ac.jp:8443/api/document?collection=news&id=urn:contentItem:51RD-8GS1-F0B2-N2XY-00000-00&context=1516831)

[u.ac.jp:8443/api/document?collection=news&id=urn:contentItem:51RD-8GS1-](https://advance-lexis-com.remote.library.osaka-u.ac.jp:8443/api/document?collection=news&id=urn:contentItem:51RD-8GS1-F0B2-N2XY-00000-00&context=1516831)

[F0B2-N2XY-00000-00&context=1516831](https://advance-lexis-com.remote.library.osaka-u.ac.jp:8443/api/document?collection=news&id=urn:contentItem:51RD-8GS1-F0B2-N2XY-00000-00&context=1516831). Accessed on August 25, 2020.

Ienaga, Masaki. 2011. *Panda gaiko: chugoku ha panda to iu 'shigen' wo dou katsuyoushi*

kokusaishakai wo watatte kita ka? Tokyo: Media Factory. p. 196.

Macau Special Administrative Region Government. "Àomén dà xióngmāo/Panda Gigante

de Macau/Macao Giant Panda."

<https://www.macaupanda.org.mo/e/distinguish/detail.aspx>. Accessed on August

19, 2020.

Yang Guang and Tian Tian

Embassy of the People's Republic of China in the United Kingdom of Great Britain and

Northern Ireland. December 6, 2011. "Giant Pandas Tian Tian and Yang Guang

Arrives at Edinburgh Zoo." [http://www.chinese-](http://www.chinese-embassy.org.uk/eng/EmbassyNews/2011/t885205.htm)

[embassy.org.uk/eng/EmbassyNews/2011/t885205.htm](http://www.chinese-embassy.org.uk/eng/EmbassyNews/2011/t885205.htm). Accessed on June 4, 2020.

ZSS Edinburgh ZOO. (n.d.). "THE GIANT PANDA EXHIBIT." *GIANT PANDA*

EXHIBIT: VISIT THE UK'S ONLY GIANT PANDAS.

[https://www.edinburghzoo.org.uk/animals-and-attractions/main-](https://www.edinburghzoo.org.uk/animals-and-attractions/main-attractions/giant-panda-exhibit/)

[attractions/giant-panda-exhibit/](https://www.edinburghzoo.org.uk/animals-and-attractions/main-attractions/giant-panda-exhibit/). Accessed on August 19, 2020.

Kai Kai and Jia Jia

Wildlife Reserves SINGAPORE. 2015. "HELLO PANDA." *PANDA TALES*

<https://pandas.riversafari.com.sg/panda-tales.html#tale1>. Accessed on June 4,

2020.

Wildlife Reserves Singapore Group. 2020. "Giant Panda." *River Safari*.

<https://www.wrs.com.sg/en/river-safari/animals-and-zones/giant-panda.html>.

Accessed on January 7, 2021.

Bing Xing and Hua Zui Ba

PANDA INSTITUTE. May 27, 2020. "Sekai no panda." <http://panda.or.jp/sekai/>. Accessed on August 21, 2020.

Xinhua. March 26, 2018. "China-Europe: Pandas, stars of Madrid Zoo."

http://www.xinhuanet.com/english/2018-03/26/c_137067052.htm. Accessed on June 4, 2020.

Yuan Yuan and Tuan Tuan

Ienaga, Masaki. 2011. *Panda gaiko: chugoku ha panda to iu 'shigen' wo dou katsuyoushi kokusaishakai wo watatte kita ka?* Tokyo: Media Factory. p. 196.

PANDA INSTITUTE. May 27, 2020. "Sekai no panda." <http://panda.or.jp/sekai/>. Accessed on August 21, 2020.

AI BAO (HUA NI) and LE BAO (YUAN XIN)

Jeroen Jacobs posted. March 3, 2016. "GIANT PANDA PAIR ARRIVES IN SOUTH

KOREA." *Giant Panda Global/Quánqiú dà xióngmāo*.

[https://www.giantpandaglobal.com/zoo/everland-resort/giant-panda-pair-arrives-](https://www.giantpandaglobal.com/zoo/everland-resort/giant-panda-pair-arrives-south-korea/)

[south-korea/](https://www.giantpandaglobal.com/zoo/everland-resort/giant-panda-pair-arrives-south-korea/). Accessed on January 7, 2020. (The source of this article is an article

at http://news.xinhuanet.com/english/2016-03/03/c_135152973.htm

http://news.xinhuanet.com/english/photo/2016-03/03/c_135152768.htm.

However, on January 7, 2021, I cannot find this original article.)

Shu Xiang

Andi. (n.d.). "Panda News." <https://pandanews.org/index.html>. Accessed on October 2,

2020.

Cai Tao and Hu Chun

PANDA INSTITUTE. December 29, 2020. "Sekai no panda." <http://panda.or.jp/sekai/>.

Accessed on January 7, 2021.

RU YI and DING DING

XINHUANET.com. August 3, 2019. "Mosukuwa dobutsuenn de nito no panda ga tanjoubi."

Xīnhuá wǎng NEWS. http://jp.xinhuanet.com/2019-08/03/c_138280769.htm.

Accessed on January 7, 2021.

HUA BAO (PYRY) and JIN BAO BAO (LUMI)

Lennart Simonsson in Stockholm. January 18, 2018. "Giant panda duo with snow-themed

names land in frosty Finland." *dpa international (Englischer Dienst)*.

<https://advance.lexis.com/api/document?>

collection=news&id=urn:contentItem:5RF9-7Y71-DXFJ-54KY-00000-

00&context=1516831. Accessed on October 4, 2020.

Xing Er and Mao Er (Mao Sun)

Tracy You For Mailonline. April 5, 2019. "Welcome to your new home! Giant pandas 'Xing

Er' and 'Mao Sun' arrive in Denmark from China with half a tonne of their

favourite

snack." *MailOnline*. <https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:5VTH-44R1-F021-62DT-00000-00&context=1516831>.

Accessed on January 7, 2021.

Xing Ya and Wu Wen

ASSOCIATED PRESS. April 13, 2017. "Panda mania: Two giant pandas arrive in Amsterdam after a marathon 5,000 mile journey from China." *Mail Online*. <https://www.dailymail.co.uk/news/article-4408030/Giant-pandas-arrive-Holland.html>. Accessed on October 5, 2020.

Appendix 2 Estimates without Fixed Effects

When I used models without some or all fixed effects for DID, I cannot observe any significant effects as follows. This fact suggests that using the fixed effects is effective for this study to address the problem of potential confounders.

Table 3 Estimates of DID without Fixed Effects

	Non-Year	Non-State	Not at All	Non-Year	Non-State	Not at All
	G8	G8	G8	G20	G20	G20
Panda	6.274	6.772	6.788	4.271	7.628	6.664
Arrivals	(3.659)	(4.767)	(6.928)	(3.493)	(4.793)	(5.922)
N	106	106	106	195	195	195

Note: Table entries are coefficients; (cluster) standard errors are in parentheses; constants are included in both of the models but omitted from presentation. N means the number of observations (country-year). Because the public opinion data have some missing values, N is not equal to 15 (years) \times 8 (countries) or 15 (years) \times 20 (countries).

Appendix 3 RDD with Different Specification

When I use a different specification for RDD, I cannot observe any significant effects. This fact suggests the instability of the results of RDD.

Table 4 RDD Results of a Model $Opinion_i = \beta_0 + \beta_1 Pandai + \beta_2 Date_i + \beta_3 Pandai Date_i + e_i$

	Bandwidth 4 Days	Bandwidth 3 Days	Bandwidth 2 Days
Panda Arrivals	-0.373	-0.638	-0.803
	(0.530)	(0.552)	(0.684)
N (Before May 20)	119	98	56
N (After May 20)	13	13	10

Note: The data are rounded off to the fourth decimal place. Table entries are coefficients; standard errors are in parentheses. The total number of observations is 1010; the number of observations before the cutoff is 997, after the cutoff is 13. No one answered at the cutoff date, May 20, 2014. Smaller numbers of the coefficients indicate more favorable opinions; 4 indicates public opinion the least favorable to China, and 1 indicates public opinion the most favorable to China.

Appendix 4 Placebo Test

I conducted a placebo test (a DID analysis) by using favorability rates toward Russia in G8 countries except Russia itself (G7)¹⁸. Both Russia and China are socialist states in the cold war era, permanent members of UN Security Council, members of G20, and neighboring countries each other, but Russia is not a conductor of panda diplomacy. Even if the trend of the favorability rates toward Russia are similar to one toward China, the rates toward Russia should not be affected by panda arrivals. In fact, the results of the placebo test suggest no correlation which is statistically significant between panda arrivals and public opinion favorable to Russia. The source of the favorability rates toward Russia is

Christine Huang. December 16, 2020. "Views of Russia and Putin remain negative across 14

[https://www.pewresearch.org/fact-tank/2020/12/16/views-of-russia-and-putin-](https://www.pewresearch.org/fact-tank/2020/12/16/views-of-russia-and-putin-remain-negative-across-14-nations/)

[remain-negative-across-14-nations/](https://www.pewresearch.org/fact-tank/2020/12/16/views-of-russia-and-putin-remain-negative-across-14-nations/). Accessed on January 7, 2021. (The source of the

¹⁸ Ideally, I should also conduct an analysis of G20, but the data are limited, as I noted in Footnote 17.

Data is Pew Research Center. Summer 2020 Global Attitudes Survey. Q8c.)

Table 5 Results of Placebo Test

	G7
Panda Arrivals	-3.044
	(2.650)
N	77

Note: Table entries are coefficients; cluster standard errors are in parentheses; year fixed effect, country fixed effect, and constants are included in the model but omitted from presentation. N means the number of observations (country-year). Because the public opinion data have some missing values, N is not equal to 15 (years) \times 7 (countries)