




RESEARCH ARTICLE

The effect of psychological bias on public officials' attitudes towards the implementation of policy instruments: evidence from survey experiments

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Abstract

As implementers, public officials have historically enjoyed substantial influence in the public policy process, but little attention has been paid to the effect of psychological elements on their attitudes towards implementing policy instruments. The authors argue that from a behavioural public administration perspective, public officials' attitudes towards implementing certain policy instruments are not rational, but instead biased. Using two survey experiments on 1,024 Chinese public officials, this study examines the cognitive and motivational bias of public officials' attitudes towards implementing policy instruments. The findings indicate that when public officials are presented with risk information in a negative framing, they are more reluctant to implement indirect policy instruments than direct ones, and this phenomenon becomes more pronounced when their public interest orientation is activated, rather than their personal interest orientation. The findings contribute to the theoretical understanding of the effect of psychological biases on public officials' attitudes towards policy implementation.

Key words: cognitive bias; motivational bias; policy instrument; public interest orientation; survey experiment

Policy instruments are defined as a collection of approaches for implementing government policies (Smith and Ingram 2002; Burth and Gorlitz 1999), which are intended to achieve political goals, such as monitoring society (Hood 1983), maintaining the political fortunes of policymakers (Atkinson and Nigol 1989), and ameliorating social problems (Bressers and O'Toole 1998). According to the classification of Howlett and Ramesh (1993) and Salamon and Elliott (2002), two main types of policy instruments are available: direct policy instruments (e.g. direct provision by the government) and indirect policy instruments (e.g. indirect provision by outsourcing to a private company). Although policymakers determine which policy instrument to use, the attitude of public officials as implementers

towards a given policy instrument typically affects to what extent policy goals are met. Therefore, it is important to understand the causes of public officials' attitudes towards the implementation of direct and indirect policy instruments.

An earlier study has argued that objective factors such as “national policy style, the organisational setting of the decisionmaker, and the problem situation” have some effects on policy implementers' attitudes towards the implementation of policy instruments (Linder and Peters 1989, 35). Recently, a small but emerging literature has shown that subjective psychological variables, such as belief and public service motivation (PSM), are also important causes (Song *et al.* 2017; Kammermann and Angst 2018). For example, Song *et al.* (2017) argue that bureaucrats with higher PSM prefer to use direct instruments to better serve the public. Although these studies provide useful information on public officials' attitudes about policy instrument implementation, particularly about the recent focus on psychological factors, important questions remain.

First, are public officials' attitudes towards the implementation of direct or indirect policy instruments affected by information in different frames? Although public officials are sometimes perceived as rational decisionmakers (Atkinson and Nigol 1989; Slovic 2000), their attitudes towards implementation may be influenced by cognitive bias. An increasing amount of research on behaviour of public administration shows that, as in the case of ordinary people, public officials' attitudes are susceptible to information with different frames but of equal value (e.g. a 75% success rate and a 25% failure rate), a cognitive bias known as the “framing effect” (Belardinelli *et al.* 2018; Belle *et al.* 2018). This may imply that the framing effect could also affect public officials' attitudes towards the implementation of policy instruments. Importantly, public officials are more sensitive to negative framing information (Battaglio Jr *et al.* 2019; Hong 2020; Fuenzalida *et al.* 2020), which will likely lead to negativity bias in their attitudes towards implementing direct or indirect policy instruments.

Second, is the relationship between negativity bias and public officials' attitudes towards implementation influenced by interest motives? Public management research has long stressed the complexity of public services (Eppel and Rhodes 2018), where policy implementers not only make judgments based on “good” or “bad” information but also often make trade-offs between personal and public interests. Thus, a fundamental question concerns the interests that motivate public officials to act. The psychological literature states that cognitive and interest motivations are two key components in the analysis of individual behaviours and attitudes (Montibeller and von Winterfeldt 2015). Thus, the attitudes of public officials towards the implementation of direct and indirect policy instruments may be affected by a combination of framing effect and interest motivations (Perry *et al.* 2010).

This article approaches the debate by asking whether (and how) framing effect and interest motivation biases affect public officials' attitudes towards the implementation of direct or indirect policy instruments. Prior research has examined the effects of framing effects and motivational bias on policy implementers' attitudes towards implementing general policies separately (Belle *et al.* 2018; Perry *et al.* 2010), and most of them have been qualitative or observational studies. However, examining the effects of framing effect and motivational bias separately

may not reveal the full effect of psychological bias on implementation attitudes. Qualitative and observational studies are also problematic in terms of examining a causal relationship between psychological bias and implementation attitudes.

To respond to these challenges, we conduct two survey experiments among 1,024 public officials in local governments in China. The two experiments present participants with randomised risk information that contains different information framing, policy instruments, and interest cues, and then ask them to give their attitudes towards implementing the policy instrument. This approach allows us to use a unique and ideal sample to examine the causal effect of framing effect and interest motivations on attitudes towards policy instrument implementation.

The experimental data yield two primary findings. First, public officials' attitudes towards the implementation of direct and indirect policy instruments under the effect of negative framing are considerably different. This result extends previous findings from attitudes towards implementing general policies to a more micro-level policy instrument and thus confirms that public officials are not exceptions to the framing effect (Belle et al. 2018). Second, relative to personal interest, public interest reinforces the effect of negative risk information on public officials' reluctance to implement indirect policy instruments. Thus, this finding reveals how psychological bias impact implementing attitudes via the joint effect of framing effect and interest motivations.

Summing up, these findings advance our understanding of public officials' attitudes towards implementing policy instruments. The negative framing effect may reflect only one of the psychological biases that influence attitudes towards the implementation of policy instruments. More importantly, in the context of this study, public officials' attitudes towards the implementation of policy instruments are also related to the interests involved, and the framing effect and interest motivation biases appear to constitute an overall psychological bias that influences attitudes towards the implementation of policy instruments.

This article proceeds as follows: The logic by which we elicited our research questions is explained in the next section. We then present our design of the two experiments, the process of data collection, and the results. After that, we discuss the theoretical contribution and practical implications of our findings. Finally, we highlight the study's limitations and potential research areas, as well as summarise the whole work.

Theoretical framework

Public officials' attitudes towards the implementation of policy instruments

The attitude of public officials, as implementers, is considered to be an important variable affecting the effectiveness of policy implementation (Desmidt and Meyfrootd 2021; Andersen and Jakobsen 2017; Ajzen and Fishbein 2005). Although policymakers have the authority to develop policies, policy objectives must be met by frontline public officials via the application of policy instruments. As such, the attitude of public officials towards a particular instrument directly affects the extent to which the policy objectives are achieved (Petersen 2020). For example, when public officials believe that road maintenance should be

outsourced to private companies, they may be reluctant to implement direct instruments which get them personally involved, resulting in symbolic implementation (Matland 1995).

Previous research has mostly concentrated on objective factors to understand what influences public officials' attitudes regarding the implementation of policy instruments. For example, Linder and Peters (1989) emphasise the role of objective factors, such as national policy style, organisational culture, and policy domain. Atkinson and Nigol (1989) offer a neo-institutional approach that takes context and organisational aspects into consideration. Capano and Lippi (2017) emphasise policy features such as legitimacy and instrumentality. Krause *et al.* argue that it is related to objective factors such as the "structure of the local governing body, characteristics of the community and target populations, and the nature of the policy problem" (2019, 477).

However, few studies have been able to examine the impact of subjective factors, such as psychological bias on attitudes towards policy implementation. Public officials are typically the ones who implement policies. Their attitudes about certain policy instruments may be easily influenced by psychological bias, even if they are unable to select the policy instrument they need to implement.

Research on the link between psychological bias and public officials' attitudes has produced a tiny body of evidence. For example, Song *et al.* (2017) argue that direct policy instruments are preferred by bureaucrats with a high level of PSM. Kammermann and Angst (2018) state that beliefs are likely to have a significant effect on instrument preferences. However, the literature on psychological bias is silent on the attitudes of public officials towards the implementation of policy instruments, in particular the trade-off between direct and indirect policy ones.

As has been discussed at the beginning of the introduction, public officials often implement a variety of direct and indirect policy instruments, but we know very little about the underlying psychological mechanisms that lead to their attitudes towards policy implementation. Thus, we examine how two psychological factors – cognitive and motivational bias – affect public officials' attitudes towards the implementation of policy instruments.

Cognitive bias in attitudes towards the implementation of policy instruments

Cognitive bias originates from the dual systems theory (Kahneman and Frederick 2002), which suggests that human thought processes rely on two systems: System 1 and System 2 (Evans 2003). System 1 is involved in making unconscious and intuitive judgments without deep thought (Alraja *et al.* 2019), whereas System 2 is involved in solving complex problems by using thoughtful, rational reasoning. System 1 is particularly useful in risk situations because it leads individuals to make simple judgments regarding complex tasks quickly and frugally, by relying on heuristic principles (Tversky and Kahneman 1974); it is thus, by definition, error-prone (Gigerenzer and Gaissmaier 2011), ultimately leading to cognitive bias (Tversky and Kahneman 1974). Since the publication of Herbert Simon's seminal work on bounded rationality (1956, 1947), more than 175 cognitive biases have been identified across disciplines (Nagtegaal *et al.* 2020), such as anchoring (Belle *et al.*

2017), asymmetric dominance (Huber et al. 1982), status quo (Kahneman et al. 1991), and, with relevance to our focus here, the framing effect (Kahneman 2011).

The framing effect refers to the claim that “individuals tend to react in a systematically different manner to the same piece of information, depending on how it is presented to them” (Belle et al. 2018, 830). For example, when describing an event, emphasising a subset of positive aspects, rather than a subset of negative aspects, can have a different impact on individuals’ decisions and judgments (Tversky and Kahneman 1981). Although positive events are perceived as occurring more frequently, negative events are perceived to be more influential than positive events of the same magnitude (Fuenzalida et al. 2020). A large body of literature has repeatedly shown that individuals tend to assign more weight to negative events than to positive events, resulting in negativity bias (Olsen 2015b). Research on this phenomenon has yielded broad and consistent empirical findings in decision situations (James and Moseley 2014).

One empirical way to identify negativity bias is to compare logically equivalent positive and negative events. For instance, an 80% survival rate and a 20% death rate may lead to systematically different decision outcomes (Levin et al. 1998). To measure precisely whether a positive or a negative event has an asymmetrical impact, it is necessary to be rigorous about employing a neutral reference point (Olsen 2015a). For example, Christensen et al. (2021) employ neutral performance information as the reference category to distinguish the effect elicited by negative and positive performance information on citizens.

Substantially, both the positive and negative outcomes of an event are commonly presented in the form of risk information in the decision-making process. Public officials’ risk decisions occur when the probabilities of the potential positive or negative consequences of a decision are known in advance (Tepe and Prokop 2018). Because empirical studies show that public officials are more risk-averse than their private sector counterparts (Buurman et al. 2012), they may thus have different patterns of attitudes under risk information in a positive frame (e.g. an 80% success rate) and in a negative frame (e.g. a 20% failure rate). However, there is limited understanding of whether and to what extent risk information in a positive or negative frame influences public officials’ attitudes towards the implementation of policy instruments.

In terms of public officials’ attitudes towards the implementation of policy instruments, the framing of risk information can play a role in several ways. First, risk information in a negative frame, rather than a positive frame, may enhance public officials’ concerns about shouldering the responsibility. This is because risk information in negative frames can usually awaken public officials’ unpleasant memories, such as service failures and the resulting personal responsibility. With regard to policy instruments, indirect instruments are usually associated with the risk of service failures, because profit-driven market instruments are prone to opportunistic behaviour (Song et al. 2017), whereas direct policy instruments empower the public sector to assume control of service delivery, thereby reducing the risk of service failure. Conversely, risk information in positive frames is less likely to awaken public officials’ negative memories associated with the use of indirect instruments. Based on the above considerations, public officials may be more

reluctant to implement indirect rather than direct policy instruments in the negative frame condition.

Second, risk information in a negative frame rather than a positive frame may inspire public officials to defend the reputation of public organisations. Although citizens inherently have some negative perceptions of public organisations, such as inefficiency and the lack of competitive pressure which would cause public services to improve, they also believe that market-based instruments, driven by profit, hurt the quality of services and equal access to them (Song *et al.* 2017). In addition, the use of indirect instruments may reinforce citizens' negative perceptions of the government, because along with the government's shifting from service providers to purchasers, it is difficult for public officials to provide direct and timely explanations for failing services (Song *et al.* 2017). In this sense, to protect the organisation's image, mission-driven public officials may be inclined to employ direct policy instruments rather than indirect ones when presented with risk information in a negative frame.

Third, when confronted with negative risk information, public officials may be more inclined to implement direct policy instruments with which they are more familiar to demonstrate their expertise. Compared to private organisations, public organisations are more oriented towards improving social welfare, and hence, public officials – particularly those who are self-sacrificing – may care about the control of the service process to provide better public goods (Song *et al.* 2017; Perry and Wise 1990). To that end, public officials are commonly inclined to use direct instruments, such as “command-and-control,” which allows them to leverage their expertise to avoid service failures (Keohane *et al.* 1998), whereas they are reluctant to take the time to learn and use indirect instruments with which they are not familiar. Thus, when confronted with risk information about service failure, negative framing may be ameliorated by direct policy instruments – that is, negative framing makes public officials potentially more willing to implement direct policy instruments rather than using indirect ones. Therefore, we propose the following hypothesis for an empirical test:

Hypothesis 1: Public officials are more likely to be reluctant to implement indirect policy instruments than direct policy instruments when confronted with risk information in a negative frame.

Despite our theoretical understanding of the effects of negative framing on public officials' attitudes towards the implementation of policy instruments, we still do not know what motivates public officials to be more reluctant to implement indirect instruments under negative framing. Therefore, the following discussion will focus on indirect policy instruments and the motivational mechanisms underlying public officials' reluctance to implement indirect policy instruments. In other words, this study will explore how motivational factors affect the relationship between framing effects and implementation attitudes.

Motivational bias in attitudes towards the implementation of indirect policy instruments

As two necessary components of attitudinal and behavioural analysis, the cognitive reflects only simple individual mental processes, whereas motivation involves an examination of the subconscious (Montibeller and von Winterfeldt 2015). As such, studies that place cognitive and motivational factors in the same analytical framework are common in the relatively established psychological literature. However, in fledgling research on behavioural public administration, scholars have rarely included cognition and motivation in a unified analytical framework. Thus, further research into the effects of motivation and its interaction with cognition (a negative framing effect) on the implementation of indirect instrumental attitudes could not only advance our overall understanding of the psychological mechanisms underlying the implementation of attitudes by public officials but also provide a useful research paradigm for behavioural public management research.

Motivation typically includes extrinsic motivation (e.g. behaviour-driven by interests) and intrinsic motivation (e.g. behaviour-driven by self-efficacy). In real life, policy actors often share both internal and external motivation (Sulkin 2009). Motivational bias refers to the fact that an individual's decision preferences or attitudes are influenced by the desirability or undesirability of interest outcomes or self-efficacy outcomes (Kunda 1990). As we plan to convey the trade-offs of the interests of implementing indirect policy instruments through a risk information framework, we focus on the effect of interest-motivational biases.

In general, public officials' attitudes towards implementing particular policy instruments are driven by two types of motivation: personal (or stakeholder) interest and public interest. On the one hand, according to the rational choice model, public officials are perceived as economic profit maximisers, whose implementation attitudes are motivated by pure self-interest (Sezer et al. 2015). On the other hand, PSM theory argues that public officials are public interest-oriented and are willing to engage in self-sacrifice in the public interest (Perry 1996). PSM is considered "a desirable aspect of the motivational basis of public employees" (Tepe and Prokop 2018, 185). Indeed, in reality, public interests would not only be more visible, but they may be both aligned with private interests, and policy implementers are more likely to be punished by the public if public interests are not attended to. Thus, while the mere investigation of personal and public interests cannot be fully representative of real-life situations, we still expect to find that the public interest is given more consideration.

In addition, behavioural ethics theory provides further insight into the motivation for public officials' attitudes towards the implementation of policy instruments (Bazerman and Gino 2012). Behavioural ethics scholars have not completely denied the existence of self-interested behaviour by public officials, but rather have pointed out that the motivations for public officials' attitudes and behaviours may be biased by decision-making situations involving conflicts of interest (Atkinson 1957). In situations where conflicts of interest are less prominent, and unethical decisions are less easily detected, public officials may engage in automatic and unconscious self-interested behaviour (Bereby-Meyer and Shalvi 2015). When the public benefits of a decision significantly outweigh the personal benefits, or in other words, when

public interest orientations are activated, it becomes more difficult for decision-makers to conceal self-interested behaviour, and thus, they tend to make ethical decisions that are in the public interest (Feldman 2014).

Based on the above analysis, we argue that, when the public interest orientation is activated, public officials may be inclined to use direct policy instruments rather than indirect policy instruments to make their judgments or behaviours seem more ethical. At this point, public officials' unconscious self-interested behaviour disappears, and they act in the public interest. The basis for this reasoning is also obvious. For example, Farazmand (2017, 203) states that "public administrators acting virtuously are considered ethically sound, and they serve the broad-based public interests, public good, and are accountable." From this point of view, direct policy instruments can be used to control the process of service delivery to act ethically and in line with the public interest (Ermasova *et al.* 2018), and thus, public officials may be reluctant to implement indirect policy instruments.

However, we cannot simply infer that public officials' reluctance to implement indirect policy instruments is driven by public or personal interest concerns, as decisions and judgments often occur in more complicated management situations. The public or personal interest is more likely to be motivated in risky circumstances. As such, we continue to explore further explanations of public officials' reluctance to use indirect policy instruments, by examining the interaction effect between the framing effect and public interest orientation.

Does public interest orientation strengthen the negativity bias in attitudes towards the implementation of indirect policy instruments?

We propose several possible explanations for how the interaction effect between framing effect and public interest orientation affects the attitudes of public officials about indirect policy instruments. First, public interest orientations may make public officials more risk-averse. Previous studies have demonstrated that employees in public sectors are more averse to risk than their counterparts in the private sector (Buurman *et al.* 2012) because, as Nielsen and Baekgaard (2015, 549) noted, "a key motive for politicians is to avoid blame and the ensuing negative media coverage that could damage their chances for reelection, [...], organization's autonomy and funding or could hurt their career prospects." To avoid the risk of being blamed, public officials either do nothing or, on the contrary, provide better services to the public. However, public officials often have to act in the public interest, especially when the public organisation requires them to do so, although it may not be voluntary for some public officials. In terms of attitudes towards the implementation of policy instruments, public officials may prefer to implement policy instruments involving more certain effects in order to reduce the risk of damaging the public interest and thus avoid blame (Geys and Sørensen 2018; Battaglio *et al.* 2019). Thus, when confronted with risk information about the public interest in a negative frame, direct policy instruments are likely to be well suited, as direct involvement in the service delivery process can reduce uncertainty about outcomes.

Second, the public interest orientation may reduce public officials' self-interested behaviour when confronted with risk information in a negative frame. In line with

the above discussion of behavioural ethics, when the public interest is threatened by a loss that may raise widespread concern, it is difficult for public officials “to use a host of mechanisms that would shield him or her from recognising the immorality of her decisions” (Zamir and Sulitzeanu-Kenan 2018, 585). This is because public officials commonly have to respond to critics and explain themselves, which means they are compelled to act in a more ethical, public interest-oriented manner. Hence, when confronted with risk information in a negative frame, public officials may be inclined to participate directly in the service process to prevent the public interest from being damaged to appear more ethical and therefore are reluctant to implement indirect policy instruments.

Third, public interest orientations may reinforce adherence to the values of the public organisation by public officials confronting the risk information in a negative frame. The aforementioned literature suggests that public officials are perceived to be morally sound and responsible in relation to the public interest (Farazmand 2017). Particularly for those employees with less professionalised, public interest orientation “appears to be positively correlated with ethical obligations rooted in virtue and integrity, or high road ethics” (Stazyk and Davis 2015, 627). In many countries, such as China and Korea, most public officials are recruited through civil service exams that consist of public service aptitude tests (Song et al. 2017). Public officials who pass the exam commonly have a stronger public interest orientation, and they tend to fulfil their professional obligations to promote the public interest (Georgellis et al. 2011). In light of this, public interest orientation may reinforce the “self-sacrificing” trait of public officials when they are faced with risk information in a negative frame (Perry 1996). They may thus be unwilling to implement indirect policy instruments. Given the above discussion, we propose the following hypothesis for an empirical test:

Hypothesis 2: When provided with risk information in a negative frame, public officials are more reluctant to implement indirect policy instruments when the public interest orientation is activated, than when the personal interest orientation is activated.

Research context and method

We examine the above hypotheses in the context of local government in China. Local governments in China have a hierarchical structure with roughly four levels of public officials: provincial (the highest), departmental, divisional, and sectional (the lowest) levels (Zhang 2021). Under the top-down system, top-level public officials set macro-level policy goals, such as gross domestic product, while lower-level public officials act as policy participants, implementing policy instruments to achieve policy goals. In China, although public officials need to implement the decisions of their superiors, their attitudes towards implementing specific policy instruments can change according to the situation. Understanding what factors can influence their attitudes towards policy implementation opens a window for the potential improvement of the effectiveness of the policy.

Indeed, in democratic systems, as in authoritarian contexts, the subjective attitudes of public officials play an equally important role in debates about the implementation of policy instruments (Tummers *et al.* 2012). For example, reluctance to implement, or even resistance to, indirect instruments may lead to the same consequences: policy failure, low public satisfaction, corrupt behaviour, and others. In democracies, the implementation of indirect policy instruments is not always successful, “in part due to resistance by bureaucrats” (Song *et al.* 2017, 37). Thus, evidence from authoritarian systems can, to some extent, inform the improvement of public officials’ implementation attitudes in democratic systems. In summary, Chinese public officials provide an ideal sample for the testing of our hypotheses.

Using the sample of Chinese public officials, we conduct two survey experiments with scenarios close to reality. Specifically, in Experiment 1, we focus on public officials’ attitudes towards the implementation of policy instruments by manipulating the risk information conditions with positive/neutral/negative frames related to the provision of a sports park. This allows us to explore whether public officials’ attitudes towards the implementation of policy instruments are moderated by framing information (Hypothesis 1). The purpose of Experiment 2 is to further explore why public officials are sensitive to negative framing in Experiment 1, by examining how interest motivation affects the relationship between framing effect and public officials’ reluctance to implement indirect policy instruments (Hypothesis 2).

Participants and procedure

We designed our research in early July 2020 and registered it with the Center for Open Science (see more details: <https://osf.io/29ekx/>). Our formal survey experiments were conducted between August and October 2020. Both survey experiments were conducted in Chongqing, China, with section-level public officials from major government public sectors: the Finance Bureau, the Education Committee, the Health Committee, the Sports Bureau, the Development and Reform Commission, the Urban Management Bureau, the Culture and Tourism Committee, and the Transportation Bureau. We distributed questionnaires in government sector buildings, covering nine administrative districts of the main city of Chongqing.

Before the survey, we submitted the questionnaire to the head of the public sector or their representative and received permission from them. Furthermore, we had a contact person in each part of the public sector to help with our questionnaire distribution. Before requesting that they respond to the questionnaires, we informed potential participants that their participation was voluntary and that their answers would be kept confidential and not be shared with anyone. We distributed the questionnaires to public officials at each of the public government departments. The public officials filled out the questionnaires in their offices. It takes about 15 minutes to complete the questionnaire. Participants were paid for their participation in the form of a gift (valued at 15 CNY, or about 2 USD).

We distributed 1,200 questionnaires, which yielded 1,024 survey responses, and a response rate of 85%. The proportion of female participants was about 51.0%, and the proportion of the 30–39 age group was about 41.6%. The percentage of those

Table 1. Descriptive statistics of participants

Variable	N (%)
Gender	
Female	522 (51.0%)
Male	502 (49.0%)
Age	
Below 29	413 (40.3%)
30–39	426 (41.6%)
Above 40	185 (18.1%)
Education	
Bachelor or below	732 (71.5%)
Master or above	292 (28.5%)
Job Years (mean) \pm SD	8.0 \pm 7.7

Note: The total number of observations is 1,024.

educated to the level of a bachelor's degree or below was 71.5%. The respondent's average length of time in their current job was about 8 years ($SD = 7.7$). Albeit slightly younger and with a greater share of graduates with a bachelor's degree or less (rather than a master's degree or greater), the sample was also roughly representative of public officials at the regional government level in China. Table 1 shows descriptive statistics for the sample.

Experiment 1: The effect of risk information framing on attitudes towards the implementation of policy instruments

The purpose of the first experiment was to test whether public officials' attitudes towards the implementation of policy instruments were moderated by policy instrument-embedded framing risk information, particularly risk information in a negative frame (Hypothesis 1).

Experimental design and procedure

Experiment 1 constituted a 3×4 between-subjects design. Participants randomly received two types of treatment: three different policy instrument conditions and four different risk information conditions (Table 2, see Appendix Tables A1 and A2 for more details). Before receiving the manipulation information, all subjects were provided with a virtual scenario for building a sports park with a particular policy instrument. First, participants were randomly assigned to different policy instruments. These included indirect and direct policy instruments, which were operated following Song et al. (2017). Additionally, we added mixed policy instruments, such as government-business partnerships (Marvel and Girth 2016) as an extension to refine the actual types of policy instruments. Specifically, the manipulation of policy instruments included "direct policy instruments (i.e. full funding and provision by the public sector)," "Indirect policy instruments (i.e. fully marketable and provision by the private sector)," and "Mixed policy instruments

Table 2. Design of experiment 1

Policy instrument	Risk Information Frame			
	Positive	Neutral I	Neutral II	Negative
Direct	Condition 1 (n = 89)	Condition 4 (n = 76)	Condition 7 (n = 90)	Condition 10 (n = 95)
Indirect	Condition 2 (n = 61)	Condition 5 (n = 59)	Condition 8 (n = 87)	Condition 11 (n = 63)
Mixed	Condition 3 (n = 105)	Condition 6 (n = 117)	Condition 9 (n = 88)	Condition 12 (n = 94)

(i.e. public-private sector co-financing and collaboration in the delivery of public goods).”

Second, participants were then randomly assigned to four different risk information conditions. The four conditions were framed differently based on the risk information about the sports park project. The positive frame constituted the risk information of success probability, whereas the negative frame constituted risk information of failure probability. The success followed by the failure frame (neutral I) and the failure followed by the success frame (neutral II) were used as neutral reference points. If a difference was found between success or failure risk information, neutral I and neutral II were used to measure their asymmetrical impacts on participants’ attitudes (Druckman 2004). Consistent with Olsen (2015a) and Belardinelli *et al.* (2018), we used equivalence framing and considered a uniform distribution of the values. That is, for risk information in a positive frame, the probability of success uniform distribution ranged from 75% to 95% (values increasing by 5%). For risk information in a negative frame, the probability of failure uniform distribution ranged from 25% to 5% (values decreasing by 5%). Neutral I and neutral II conditions both exposed positive and negative frames, but in a different order.

To test whether respondents had effectively absorbed our manipulation of risk information, we conducted a pilot survey experiment among 40 public officials. Specifically, participants in the pilot survey experiment were randomly assigned to four treatment groups with different risk information materials and were then asked to answer questions unrelated to this study. At the end of the pilot survey experiment, participants were asked to recall the risk information that appeared in the treatment groups. Overall, more than 90% of participants correctly recalled the experimental materials (see Appendix Table A3 for details). The results suggest that our manipulation of risk information was successful. Based on this, we did not include manipulation checks in the formal experiment.

Dependent variable

After being presented with policy instrument-embedded risk information frame cues, participants were asked to give a score on a 101-point scale, ranging from 0 (*strongly disagree*) to 100 (*strongly agree*), based on the question “If you are the implementer of the project, to what extent do you favour or not favour the implementation of the policy instrument mentioned above?”

Table 3. Test of between-subjects effects in experiment 1, ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	33118.583 ^a	11	3010.780	7.999	.000
Intercept	5451878.870	1	5451878.870	14484.364	.000
Policy Instrument	5083.581	6	847.264	2.251	.037*
Risk Information	3703.216	2	1851.608	4.919	.007**
Policy Instrument * Risk Information	27454.422	3	9151.474	24.313	.000***
Error	380914.291	1012	376.398		
Total	6164287.000	1024			
Corrected Total	414032.874	1023			

Notes: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$. ^aR-squared = 0.80 (Adjusted R-squared = 0.70).

Empirical results

The balance test across the Experiment 1 groups showed no differences at the .05 level in terms of gender, age, education, and job level (see Appendix Table A2 for details). This indicates that the randomisation was successful.

The analysis of variance (ANOVA) analysis shows that the interaction between policy instruments and risk information is statistically significant for attitudes towards implementation (Table 3). We then conducted a simple effects test to examine the change in attitude scores at different levels of risk information framing and policy instruments, respectively. Given our focus on the link between attitudes among participants towards policy instruments and negative/positive risk information, we do not show results that include the category of neutral risk information in the text to make the interaction clearly, and the results that include the category of neutral risk information are illustrated in Appendix Figure A1, and we, therefore, compare across all types policy instruments separately in negative and positive subgroups.

Figure 1 shows that, in the negative risk information subgroup, participants' attitude scores towards implementing indirect policy instruments ($M = 57.25$, $SD = 23.42$) are significantly lower than those who were asked to evaluate their attitudes towards implementing direct policy instruments ($M = 68.16$, $SD = 21.06$; Cohen's $d = 0.49$, $p < .01$) and mixed policy instruments ($M = 71.57$, $SD = 18.77$; Cohen's $d = 0.67$, $p < .01$). We did not find a significant difference in the performance of direct, indirect, and mixed policy instruments in terms of attitude scores when people were confronted with positive risk information. Thus, these results accordingly support Hypothesis 1, indicating that the risk information in the negative framework may enhance the willingness of public officials to eliminate public service risks through direct policy instruments, thus making them reluctant to implement indirect policy instruments.

Summing up, the results of Experiment 1 examined the causal relationship between the framing effect (cognitive bias) and participants' attitudes towards the implementation of policy instruments, specifically their reluctance to implement indirect policy instruments rather than direct ones. Hence, to further reveal the underlying mechanisms of public officials' reluctance to implement indirect policy

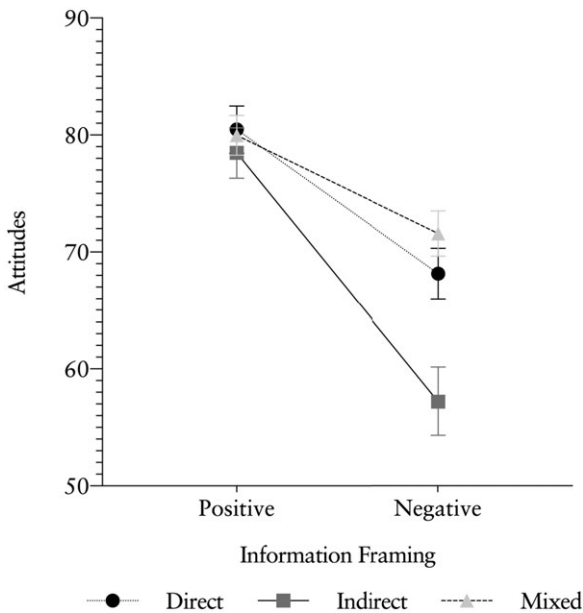


Figure 1 Attitude scores for direct, indirect, and mixed policy instruments conditional on risk information framework, with standard error bars.

instruments from the perspective of motivation, we conducted Experiment 2 to explore whether and how interests motivate public officials to be reluctant to implement indirect policy instruments under negative risk information conditions.

Experiment 2: What motivates public officials' attitudes towards the implementation of indirect policy instruments under risk information frame?

As our purpose was to explore how both framing effect and interest motivation affect public officials' attitudes towards the implementation of indirect policy instruments, the same set of samples was used for Experiment 1 and Experiment 2. In addition, to avoid the influence of the responses from Experiment 1 on Experiment 2, we inserted questions to collect participants' basic sociodemographic information between the two experiments.

Experimental design and procedure

Experiment 2 had a 5×4 between-subjects design. First, all participants were provided with a vignette about building a waste incineration power plant with the use of an indirect policy instrument. Following the vignette, participants were randomly assigned to two types of treatment groups: five motivational activation information groups and four risk information groups (Table 4, see Appendix

Table 4. Design of experiment 2

Motivation Activation	Risk Information Frame			
	Positive	Neutral I	Neutral II	Negative
Noninterest	Condition 1 (n = 58)	Condition 6 (n = 56)	Condition 11 (n = 65)	Condition 16 (n = 68)
Personal interest	Condition 2 (n = 52)	Condition 7 (n = 52)	Condition 12 (n = 50)	Condition 17 (n = 52)
Public interest	Condition 3 (n = 51)	Condition 8 (n = 48)	Condition 13 (n = 51)	Condition 18 (n = 50)
Personal & public interest	Condition 4 (n = 51)	Condition 9 (n = 45)	Condition 14 (n = 44)	Condition 19 (n = 46)
Public & personal interest	Condition 5 (n = 46)	Condition 10 (n = 40)	Condition 15 (n = 49)	Condition 20 (n = 50)

Table A5 and A6 for more details). Specifically, the motivational activation information consisted of five types: personal interest, public interest, personally followed by public interest (personal and public), the public followed by personal interest (public and personal), and no interest (the control group). The risk information conditions were divided into four categories: success frame (75% to 95%, values increasing by 5%), failure frame (25% to 5%, values decreasing by 5%), success followed by failure frame (neutral I), and failure followed success frame (neutral II).

Similarly, we tested our manipulation of interest motivation among 50 public officials using the pilot survey experiment. Overall, more than 90% of participants correctly recalled the type of interest motivation in the experimental materials (see Appendix Table A3 for details). The findings show that the manipulation of interest motivation was successful. Therefore, manipulation checks were not included in the formal experiment.

Dependent variable

After the scenario, participants were asked to give their attitude scores on a 101-point scale, ranging from 0 (*strongly disagree*) to 100 (*strongly agree*) based on the question “If you are the implementer of the project, to what extent do you favour or not favour the implementation of the indirect policy instrument mentioned above?” Notice that in Experiment 1, we manipulated three types of policy instruments and thus observed different attitudes of participants; in experiment 2, we only measured participants’ attitudes towards the implementation of indirect policy instruments, which is thus in line with the purpose of this study.

Empirical results

The randomisation checks showed that motivation activation types (personal, public, personal and public, public and personal, and none) and risk information frames (positive, neutral I, neutral II, and negative) were balanced, and did not differ by gender, or education at the .05 level, but differed slightly by age (Appendix Table A7).

Table 5. Test of between-subjects effects in experiment 2, ANOVA

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	44982.666 ^a	19	2367.509	6.336	.000
Intercept	5336639.823	1	5336639.823	14281.652	.000
Interest Motivation	1804.061	4	11672.862	31.238	.000***
Risk Information	35018.586	3	451.015	1.207	.306
Interest Motivation * Risk Information	8022.318	12	668.526	1.789	.046*
Error	375165.731	1004	373.671		
Total	5818365.000	1024			
Corrected Total	420148.397	1023			

Notes: * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$. ^aR-squared = 0.107 (Adjusted R-squared = 0.90).

The ANOVA analysis shows that the interaction between interest motivation and risk information is statistically significant for attitudes towards implementing indirect policy instruments (Table 5). We then conducted a simple effects test to examine the change in attitude scores at different levels of risk information framing and interest motivation, respectively. Like the analysis of Figure 1, we do not show the results of interactions including the “no interest,” “personal and public,” and “public and personal” motivation categories, and the neutral risk information category in the text. The full results are illustrated in Appendix Figure A2.

Figure 2 shows that in the negative risk information processing group, participants with a public interest orientation ($M = 52.46$, $SD = 24.61$) were more negative than those with a personal interest orientation ($M = 70.00$, $SD = 13.09$; Cohen's $d = 0.89$, $p < .01$) when asked to assess their attitudes towards the implementation of indirect policy instruments (results for all categories were comparison). In addition, we did not find a significant difference between attitudes and motivations in the positive information framing. Thus, the findings support Hypothesis 2, demonstrating that when provided with negative risk information, public officials are more reluctant to implement indirect policy instruments when the public interest orientation is activated than when the personal interest orientation is activated.

Discussion

This article investigated how framing effect and motivational biases affect public officials' attitudes towards the implementation of policy instruments. Using two survey experiments among Chinese section-level public officials, we find that the framing of the information and the type of policy instrument do affect public officials' attitudes towards implementation. When public officials were provided with risk information in a negative frame, they were more reluctant to implement indirect policy instruments than direct instruments and mixed instruments. Moreover, when public officials' public interest orientation was activated in the negative risk information condition, they were less willing to implement indirect policy instruments than when their personal interest orientation was activated.

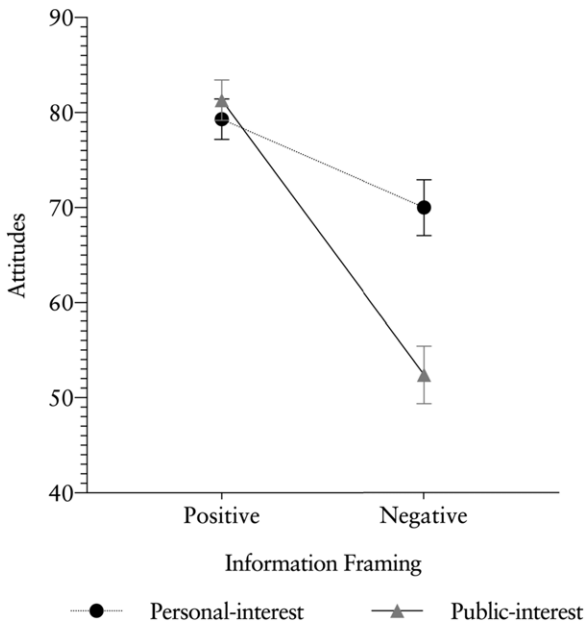


Figure 2 Attitude scores for personal interest and public interest orientations conditional on risk information framework, with standard error bars.

The first finding of this article identifies negativity bias of framing effect in public officials' attitudes towards the implementation of policy instruments (Hypothesis 1), which is consistent with the hypothesis that public officials are not an exception to cognitive bias (Belle et al. 2018). For example, in a recent study, Fuenzalida et al. (2020) found that public servant professionals are sensitive to framing effects. Specifically, when percentages of "job dissatisfaction" are offered, they regard federal agency performance more negatively than logically comparable percentages of "job satisfaction." As distinct from previous studies, our results provide new insights into the prevalence of cognitive bias literature among public officials so that, in addition to the attitudes of public officials towards the implementation of general policies, the effect of negativity bias is also apparent in the microdomain of public policy – namely policy instruments.

In addition, to our knowledge, no detailed investigation has examined the effects of both framing effect and interest motivations in a unified framework of public officials' attitudes towards the implementation of policy instruments. The second finding of our experimental investigation fills this gap by revealing that public officials' attitudes regarding the implementation of indirect instruments are asymmetric across various frames of risk information, which is moderated by motivational activation. Specifically, when providing negative risk information, public officials are more reluctant to implement indirect policy instruments when their public orientation is active than when their personal orientation is activated (Hypothesis 2). These findings are in accordance with negativity bias and motivated

reasoning theory among bureaucrats, civil servants, and public officials. Importantly, according to the findings, it is theoretically necessary to include both cognitive and motivational bias when examining the psychological mechanisms that affect attitudes towards implementation. Nonetheless, additional discussion is required to fully comprehend this finding.

First, the differentiation of attitudes towards implementing indirect policy instruments under negative conditions may reflect public officials' blame-avoidance tendencies. Our results support the conjecture that when faced with negative risk information, the public interest orientation weakens public officials' attitudes towards implementing indirect policy tools, while the personal interest orientation improves public officials' attitudes towards implementing indirect instruments. This may be because when there is a risk of damage to the public interest (negative risk information), public officials tend to implement direct instruments to provide better public services and goods and thus reduce the risk of being held accountable for damage to the public interest. In contrast, when there is a risk of compromised personal interest, direct instruments are not a necessary option because there is no risk of being held accountable at that point. However, our causal inference cannot eliminate the effect of the incentive to take credit, because the use of direct policy instruments to defend the public interest may also be a means of taking credit. Therefore, future research needs to distinguish between credit-seeking and blame-avoidance motives implied by the divergence of public officials' attitudes towards the implementation of indirect policy instruments under negative conditions.

Second, the amelioration of negative framing by personal interest orientation may be related to public officials' ethical behaviour. This may imply that when personal interests are activated, public officials can avoid opportunistic behaviour by implementing indirect instruments, thus making their decisions appear more ethical; accordingly, when public interests are activated, only direct participation in the service process (direct instrumental) can reinforce public officials' ethical behaviour. Thus, attitudes towards implementing indirect instruments in the negative framework were ameliorated by personal interest orientation, while public interest orientation made public officials react more negatively to indirect instruments. This finding echoes previous research which found that public officials have the trait of willingness to self-sacrifice and commitment to the public interest (Perry 1996), and that "activating public employees' PSM can benefit public sector ethics" (Meyer-Sahling *et al.* 2019, 445). Therefore, a research question that would help us understand the findings of this article would be how to improve public officials' attitudes towards specific policy instruments by instilling high ethical standards (Zamir and Sulitzeanu-Kenan 2018).

There are several practical implications of this study. First, efforts should be made to enhance public officials' abilities to apply diverse policy instruments. Policy instruments are designed to achieve a variety of policy goals (Capano and Lippi 2017). The analysis of project feasibility is a method of informing public officials about the potential risks of delivering specific public services and goods, encouraging them to choose and implement the most effective tool, thus better serving the public. However, the findings of this research show that attitudes towards implementation are predictable based on the content of risk information

and the type of policy instrument used. This conclusion may imply that public officials choose “safe” policy instruments in a risk-averse manner rather than selecting the optimal alternative that fits the policy instrument with the policy goal. Hence, it may be especially difficult to influence public officials’ implementation attitudes if they are naturally risk-averse and unfamiliar with many effective policy instruments.

Second, when the risk of public service failure is recognised, financial incentives to encourage public officials to implement specific policy instruments may be ineffective; instead, attempts can be made to emphasise the potential risks to the public interest, thereby motivating public officials to choose the appropriate instruments and thus make greater efforts to achieve public values (Meyer-Sahling et al. 2019). Finally, the accountability system that goes along with the implementation phase of the policy instrument needs to be reassessed (Perez Duran 2016). In particular, this applies to providing insights into the design of fault-tolerant or blame-free mechanisms for the promotion of new policy instruments to encourage public officials to implement specific policy instruments in the face of the risk of service failure.

Limitations and future studies

We are aware of the study’s limitations. First, although our experiments provide solid evidence for the effects of information framing and interest motivation on implementation attitudes, the tiny intervention with simple sentences on interest motivation may underestimate the potential manipulation effects. Therefore, we suggest that future studies should be cautious about tiny interventions and improve the internal validity and statistical power of the experiments.

External validity is a second limitation. Although our results provide solid evidence of the effect of cognitive and motivational biases on public officials’ attitudes towards the implementation of policy instruments, we cannot guarantee their validity in real life (Belardinelli et al. 2018). In addition, there may be challenges in generalising our policy conclusions from an authoritarian to a democratic setting, and we, therefore, call for future studies to adopt our experimental design in order to obtain more evidence on cognitive and motivational bias in real-life and democratic contexts.

Furthermore, although our analysis contained a unique and difficult-to-obtain sample, the sample size assigned to each treatment group was relatively small, which led to a small effect size. However, the primary goal of the experimental study was to find a causal linkage. Despite the study’s minor effect sizes, it does provide causal evidence on risk information frameworks and motivational bias that affect public officials’ implementation attitudes. Nevertheless, we call for future studies to use larger samples to validate our findings.

Conclusion

In conclusion, our study reported two experiments on public officials’ attitudes towards the implementation of policy instruments. It provides evidence for the view that public officials, like ordinary people, do not always follow rational thinking,

either cognitive or motivational rational, in their decision-making processes. The study shows that public officials suffer from cognitive and motivational bias in their attitudes towards the implementation of policy instruments, and they tend to be reluctant to implement indirect instruments only in the face of negative risk information compared to direct and mixed policy instruments. Subsequent research further finds that, when confronted with situations in which risk information is framed negatively, public officials are more reluctant to use indirect policy instruments, only if their public interest orientation is activated, rather than their personal interest orientation. Summing up, these results indicate that both cognitive and motivational factors should be considered in order to facilitate an understanding of public officials' attitudes towards the implementation of policy instruments.

Supplementary material. To view supplementary material for this article, please visit <https://doi.org/10.1017/S0143814X22000319>

Data Availability Statement. Replication materials are available in the Journal of Public Policy Dataverse at <https://doi.org/10.7910/DVN/1VFTDW>

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