Article

Gender Stereotypes on Leader's Traits, Styles and Technological Skills: Analyzing Civil Servants' Preference for Leaders Through Conjoint Experiment in the Kyrgyz Republic

Elvira Isaeva[†]

Declaration of ethics

　Ritsumeikan University Research Ethics Review Committee Regulations for Human Subjects approved this study in April 2024（ID 2023–128）. Participants were given a consent page outlining the purpose of the survey and a consent form before the survey instrument was introduced. The study's participants were made fully aware that their participation was entirely voluntary and that they might leave the study at any time without incurring any penalties. A unique ID code was assigned to each respondent in order to protect participant confidentiality. The response data was carefully separated from the personal information to maintain strict data confidentiality guidelines and guarantee anonymity. All information was password-protected and kept in places without network connectivity; only the lead investigators had access.

Abstract:

　This study investigates the influence of leaders' gender and gender-stereotypical attributes on civil servants' preferences in the Kyrgyz Republic, where gender equality remains a significant issue. We conducted a conjoint survey experiment with 793 public sector employees to analyze preferences for leaders based on gender, leadership styles（transactional vs. transformational）, traits（agentic vs. communal）, and technological proficiency. Our findings reveal a general preference for male leaders, particularly among male civil servants, suggesting that gender stereotypes significantly affect leader perceptions. Both male and female respondents favored transformational leadership, with female civil servants showing a heightened preference for transformational leaderchip characteristics. Additionally, while

[†]IT department, Ministry of Economy and Commerce of the Kyrgyz Republic Graduate School of Economics, Ritsumeikan University, Japan
gr0602se@ed.ritsumei.ac.jp

both genders preferred technologically proficient leaders, female civil servants are more sensitive to technological proficiency characteristic of leaders. These findings highlight the necessity for targeted leadership development initiatives that address stereotypes, foster inclusive leadership styles, and improve technological skills, which are crucial for advancing gender equality in leadership within public organizations.

1．Introduction

Despite the increasing presence of women in the workforce, men continue to dominate leadership roles more frequently than women （Badura et al., 2018）. In 2020, women held only 29% of senior management positions globally （Thornton, 2020）, with their representation diminishing at higher levels of organizational hierarchy （Mercer, 2020）. One rationale behind the lower participation of women in top leadership roles is rooted in the role congruity theory. Role congruity theory addresses how gender stereotypes affect perceptions of both women and men in leadership roles. The theory suggests that the mismatch between traditional female gender roles and leadership roles results in biased assessments of women in leadership positions （Eagly and Karau, 2002）. Gender stereotypes arise from observing individuals in roles that are typical for their sex — particularly, men in breadwinner and higher-status positions, while women are often seen in homemaker and lower-status roles （Eagly et al., 2000）.

Different leadership styles and traits are also frequently viewed as either masculine or feminine. For example, communal traits are commonly linked to women include qualities like caring and understanding, while agentic traits are typically associated with men and successful leaders encompass agentic attributes such as assertiveness, dominance, and self-confidence （Burgess and Borgida, 1999; Eagly and Carli, 2003; Eagly et al., 2014; Eagly and Karau, 2002; Heilman, 2001）. This creates incongruence when women use leadership trait typically linked to men, like directive approaches （Eagly and Johannesen-Schmidt, 2001）. Furthermore, Bass et al. （1996） revealed that women tend to exhibit a more transformational leadership style, whereas men are more often associated with a transactional approach. Transactional leadership is defined as a mutually beneficial relationship where leaders provide rewards or impose penalties based on the performance and needs of their followers （Kuhnert and Lewis, 1987; Yukl and Van Fleet, 1992; Eagly et al., 2003）. Transformational leadership cultivate followers' awareness of key issues and inspire them to grow beyond self-interest, encouraging a shared vision and commitment to the organization's goals （Bass & Avolio, 1990; Jensen et al., 2019）.

Moreover, there is another stereotipical belief that men are more interested in and skilled in technological fields, while women are seen as less engaged with advanced tech-

nology (Cheryan et al., 2015). Several studies have shown that men tend to have more favorable attitudes towards computers than women (Coffin and MacIntyre, 1999; Whitley, 1997). Additionally, men generally experience less anxiety about technology (Coffin and MacIntyre, 1999; Cooper, 2006), feel more at ease using computers (Young, 2000), and are often more knowledgeable about various aspects of computer use (Durndell et al., 1987). Considering all these stereotypical beliefs, our study seeks to explore civil servants' perception on the influence of leaders' gender and gender-stereotypical attributes regarding leadership styles and traits on civil servants' preference for leader. Hence, the central research question of this paper is: How do (ⅰ)leaders' gender and (ⅱ)leader's gender-stereotypical attributes affect civil servant's preference for leaders ? To tackle this question, we conducted a conjoint survey experiment involving 793 public employees from the Kyrgyz Republic, representing the finance, economics, infrastructure, and public administration sectors.

This article seeks to contribute in at least three ways. First, unlike other literature that focuses solely on leaders' gender, we examine how the effects of a leader's gender and gender-stereotypical attributes on civil servants' preferences for the leader vary depending on the gender of the civil servants themselves. Several studies indicate that the gender dyads of civil servants and their leaders are crucial when analyzing gender stereotypes (Grissom et al., 2012). Second, this research specifically focuses on public organizations in developing country, the Kyrgyz Republic, where the gender equality index is 48.1 out of a possible 100 points, as assessed globally by the United Nation Development and Trade Organization (2020). In experimental studies, gender related studies concerning leadership has mainly been emphasized on developed countries. According to UN Development and Trade organization's report in 2020, developing countries lag behind in terms of gender equality, compared to developed countries. Several scholars notice that gender equality is connected with economic growth of the country (Santos and Klasen, 2021). Therefore, it is important to extend gender related research to developing countries for more thorough understanding of civil servants' preference for leadership worldwide.

Third, we employed a conjoint experiment, which is a novel method (Offringa and Groeneveld, 2023), to meet our goal of simultaneously analyzing the impact of various manager characteristics on civil servants' preferences for leaders. In contrast, many previous empirical studies on gender and leadership have typically relied on conventional survey methods, which can be prone to response bias. This bias can be particularly significant when investigating leaders' gender and gender-stereotipical attributes as respondents may hesitate to express their true opinions due to the somewhat sensitive nature of the topic (Collett et al., 2011). Additionally, survey experiments in public management typically include randomly selected citizens from online panels (James et al., 2017), but in our case we gathered experimental data from civil servants in public organizational settings, which is usually difficult to conduct survey experiments. Our current experimental study aims to

address this gap and enables us to investigate potential variations in leadership perceptions and preferences within the public sector.

Our analysis yields several important results. First, male leaders are generally preferred over female leaders by civil servants, regardless of gender, though male civil servants are perceived to be more influenced by a leader's gender than female civil servants. Second, civil servants, irrespective of gender, show a clear preference for transformational leaders over non-transformational ones, with female civil servants demonstrating greater sensitivity to a leader's transformational qualities. Third, technologically proficient leaders are favored by both male and female civil servants, though female civil servants are more influenced by a leader's technological expertise than their male counterparts.

The remainder of this document is organized as follows. Section 2 explores the theoretical framework and proposes hypotheses pertinent to our research. Section 3 details the methodology and sampling procedures. Section 4 summarizes the analysis and results. Final section offers the conclusions.

2．Hypothesis

2.1. Agentic and communal traits, Role congruity theory

We utilize the role congruity theory to propose that civil servants' preference for a leader depends on stereotipical beliefs about the leader's gender. Role congruity theory extends social role theory by examining the alignment between gender and leadership roles, and how this alignment affects perceptions and prejudice（Eagly and Karau, 2002）. Gender role, a key concept of this theory, refers to the stereotypical beliefs about the characteristics of men and women possess（Eagly and Karau, 2002）. This theory involves the explanation of agentic and communal traits of leaders. According to this theory, men are typically associated with self-confidence, ambition, dominance, assertiveness, competitiveness, independence, and forcefulness, which are termed agentic traits. In contrast, women are often linked to characteristics like caring, understanding, friendliness, helpfulness, sympathy, emotional expressiveness, affection, and interpersonal sensitivity, known as communal traits. Traditionally, most of the existing literature has suggested that men, with their agentic traits, are best suited for leadership roles（Eagly and Wood, 2012; Eagly et al., 2000; Eagly and Johannesen-Schmidt, 2001; Eagly and Karau, 2002）. Female faced rejection as a leader, because their leadership roles are perceived as conflicting with the traditional societal roles assigned to women. This concept represents the fundamental idea of role congruity theory. There are several literatures which are consistent with this idea. Grissom et al.（2012）discovered that teachers generally prefer working for male principals. Surveys conducted by Gallup（2013）indicated that subordinates tend to show a stronger preference for a male

boss over a female boss.

2.2. Transacitoinal and transformational leadership styles

In this study we use the concept of transactional and transformational styles of leadership for analysis. These leadership styles have been extensively examined in both general leadership literature and public management research (Jensen et al., 2019; Judge and Piccolo, 2004; Vogel and Masal, 2015). Transactional leadership is frequently characterized as a mutually beneficial exchange between leaders and their subordinates (Kuhnert and Lewis, 1987). In this exchange, the leader provides something valuable in return for the services the follower offers, based on the follower's needs (Yukl and Van Fleet, 1992). For example, transactional leaders reward employees with bonuses and benefits when they reach their goals and impose penalties when they fail (Eagly et al., 2003). The conditional nature of rewards and sanctions is crucial, meaning the exchanges between the leader and the employee must be directly tied to the employee's personal accomplishments (Jensen et al., 2019). Although many leadership studies point out the limitations of this approach, transactional leadership continues to be widely favored by leaders (Tavanti, 2008).

As for transformational leadership, rather than simply responding to immediate self-interests with rewards or punishments, these leaders foster a deeper awareness of critical issues, boosting followers' confidence and shifting their focus from mere survival to achieving growth and development (Bass and Avolio, 1990). Transformational leaders aim to develop, communicate, and uphold a vision for the organization, motivating employees to embrace and work towards the organization's goals (Jensen et al., 2019). Transactional leadership is typically associated with male leaders, while transformational leadership is often linked to female leaders (Eagly et al., 2003; Eagly and Johannesen-Schmidt, 2001; Koenig et al., 2011).

2.3. Preference for technologically proficient leaders

There is a prevalent stereotype suggesting that men are more interested and skilled in technology, whereas women are perceived as less involved with technology (Cheryan et al., 2015). Studies have demonstrated that men often show more positive attitudes towards computers compared to women (Coffin and MacIntyre, 1999; Whitley, 1997). Men generally experience less anxiety about technology (Coffin and MacIntyre, 1999; Cooper, 2006), find using computers more comfortable (Young, 2000), and tend to have more knowledge about various aspects of computer use (Durndell et al., 1987). Historically, there has been a stereotipical belief that female are more likely to have negative attitudes toward technology and its application than male (Canada and Brusca, 1991).

2.4. Leader-subordinate dyad and preference for a leader

For many years, researchers in organizational studies have examined the influence of de-

mographic similarities on both organizations and their members（Lawrence, 1997; Pfeffer, 1983; Williams and O', 1998; Douglas, 2012）. Tsui and O'Reilly（1989）created the term "relational demography" to explain the similarities and differences in background between people in pairs or groups who interact regularly. This idea is especially important for understanding relationships between leaders and their subordinates. Relational demography research posits that the greater the demographic similarity between individuals in a dyad or within a work group, the more likely positive outcomes will emerge for the individual, the dyad, or the group as a whole（Tsui et al., 1992; Tsui and O'Reilly, 1989）.

Social identity theory shares a similar perspective. Originally proposed by Tajfel（1959）, it asserts that individuals categorize others based on social characteristics such as nationality, gender, religion, or ethnicity, helping to define others' identities in relation to their own, which contributes to their self-concept. According to this theory, people classify themselves into ingroups（those with similar characteristics）and outgroups（those with differing traits）. This similarity reduces uncertainty, as individuals feel more confident in predicting the behavior of those who are like them（McAllister, 1995）. Demographic similarities foster mutual affinity, increasing interpersonal attraction and leading to positive outcomes（Tsui and O'Reilly, 1989）. These arguments imply that subordinates more accept leaders who shares the same demographic characteristics.

Based on the above discussions, we propose the following hypothesizes:

Hypothesis1A: Male civil servants perceive male leaders more favorably than female leaders.

Hypothesis 1B: Female civil servants perceive female leaders more favorably than male leaders.

Hypothesis 2A: Male civil servants perceive transactional leaders more favorably than non-transactional leaders, compared to their female counterparts.

Hypothesis 2B: Female civil servants perceive transformational leaders more favorably than non-transformational leaders, compared to their male counterparts.

Hypothesis 3A: Male civil servants perceive agentic leaders more favorably than non-agentic leaders, compared to their female counterparts.

Hypothesis 3B: Female public employees perceive communal leaders more favorably than non-communal leaders, compared to their male counterparts.

Hypothesis 4: Male civil servants perceive technologically proficient leaders more favorably than technologically non-proficient leaders, compared to their female counterparts.

3. Method

3.1. Data collection

We carried out a conjoint experiment with civil servants from government organizations in the Kyrgyz Republic. The studys' sample comprises 793 civil servants, stratified into four categories according to organizational roles: (i)finance, (ii)economics and commerce, (iii) resources and infrastructure, and (iv)public administration and other sectors. Table 1 displays both the target population and the sample size for each category of public organizations. The experiment was conducted through "Conjointly," a survey software platform designed for conducting conjoint analysis in June-August, 2024. At the time of data collection all organizations listed in Appendix were invited to participate in an online survey on leadership. The survey took approximately 10 to 15 minutes to complete.

Table 1. Target population and sample

	Target population			Sample		
	Total	Male	Female	Total	Male	Female
Finance	780 20.4%	462 27%	318 15.4%	149 18.8%	86 22.5%	63 15.3%
Economy and commerce	634 16.6%	246 14.4%	388 18.4%	132 16.6%	57 14.9%	75 18.3%
Resources and infrastructure	479 12.5%	246 14.4%	233 11%	85 10.7%	52 13.6%	33 8.1%
Public administration or others	1926 50.4%	758 44.3%	1168 55.4%	427 53.8%	188 49%	239 58383/
Total	3819 100.0%	1712 44.8%	2107 55.2%	793 100.0%	383 48.2%	410 52%

3.2. Conjoint experimental design

We utilize a conjoint survey experiment to assess employee's preference regarding public managers. Respondents were presented with two possible managers, each characterized by six attributes with two levels, leading to 64 distinct combinations of manager profiles. Table 2 details the attributes and their levels (see Table 3 in the appendix for an example of a choice set). Each respondent went through this process five times, yielding a total of 7,930 observations (793 respondents × 2 profiles × 5 iterations). The attributes were randomized by software program of Conjointly.

Each attribute, representing the independent variables, takes on one of two levels concerning a leader's gender, as well as gender-related attributes such as trait, leadership style, and technological proficiency. Gender was categorized as either male or female. Gender-related traits are divided into two attributes: agentic as being very self-confident and

ambitious or not, and communal as being very caring and understanding or not. Leadership styles are measured with two attributes, in line with the conceptualization of transactional and transformational leadership by Jensen et al.（2019）. The final attribute refers to the leader's technological proficiency, distinguishing between those who strongly support digitalization within the organization and those who are less supportive.

Table 2. The attributes and levels

Attribute	Level
Gender of the leader	● Male ● Female
Transactional style of the leader	● Highly emphasize the use of rewards and sanctions for employees' performance. ● Less emphasize the use of rewards and sanctions for employees' performance.
Transformational style of the leader	● Highly emphasize a shared vision among employees to achieve the organizational goals. ● Less emphasize a shared vision among employees to achieve the organizational goals.
Agentic trait of the leader	● Highly emphasize individual independence, self-confidence, and ambition. ● Less emphasize individual independence, self-confidence and ambition.
Communal trait of the leader	● Highly emphasize interpersonal relationships, cooperation, and concern for others. ● Less emphasize interpersonal relationships, cooperation, and concern for staffs.
Technologically proficient	● Highly encouraging digitalization in the organization. ● Less encouraging digitalization in the organization

Table 3. Example of a choice set

Imagine a new deputy minister is about to be appointed to your organization. There are two potential leaders, each with unique characteristics. Both of them had enough experience in government organization, and they are now 40-50 years old. Please review the following table of leaders and choose your preferred candidate.

Attribute	Manager 1	Manager 2
Gender of the leader	Male	Female
Transactional style of the leader	Highly emphasize the use of rewards and sanctions for employees' performance.	Less emphasize the use of rewards and sanctions for employees' performance.
Transformational style of the leader	Highly emphasize a shared vision among employees to achieve the organizational goals.	Less emphasize a shared vision among employees to achieve the organizational goals.
Agentic trait of the leader	Highly emphasize individual independence, self-confidence, and ambition.	Less emphasize individual independence, self-confidence and ambition.
Communal trait of the leader	Highly emphasize interpersonal relationships, cooperation, and concern for others.	Less emphasize interpersonal relationships, cooperation, and concern for staffs.
Technologically proficient	Highly encouraging digitalization in the organization.	Less encouraging digitalization in the organization.

3.3. Analytical strategy

The primary objective is to understand how various attributes influence respondents' preference for leaders. This study employs the Average Marginal Component Effect (AMCE) to evaluate the causal impact of changing a single attribute within a set, while accounting for the distribution of other attributes (Hainmueller et al., 2014). The AMCE captures the average effect of modifying a specific attribute while holding the other attributes constant for all respondents. To calculate the AMCE for each attribute, we apply the Ordinary Least Squares (OLS) method. In this estimation, the dependent variable, Y_i, is a binary indicator of the respondent's preference for leader, and the independent variables, D_i^k, are also binary, reflecting the levels of each of the six attributes ($k = 1, 2, \cdots, 6$).

$$Y_i = \beta_0 + \sum_{k=1}^{6} \beta_k D_i^k + X_i' \delta + \varepsilon_i,$$

where Y_i represents respondent i's PSM, which is coded as one if the selected choice set is chosen and zero otherwise. D_i^k is a dummy variable that equals one if respondent i is assigned the non-baseline level (out of two levels) of the k-th attribute (such as the leader's leadership trait, style, gender, rumors of corrupt behavior, personal relationship, or birthplace), and zero otherwise. X_i is the vector of the control variables (covariates), including respondent's gender, age, and gender equality perception. The error term is denoted as ε_i.

Each attribute has two levels, with one serving as the baseline. The baseline levels for these six attributes are defined as follows: female leader, non-transactional style, non-transformational style, non-agentic trait, non-communal trait, and technologically non-proficient. By applying the AMCE, we can assess how shifts from baseline levels to alternative levels of specific attributes impact the average preferences of respondents. To account for variance under repeated sampling (five rounds in this experiment), standard errors are clustered (Knudsen & Johannesson, 2019). Table 4 presents the summary statistics for the variables analyzed.

Table 4. Summary statistics

Variable	Mean	Std. dev.
Answer	0.500	0.500
Leaders' gender		
Male	0.500	0.500
Leadership style		
Transactional	0.499	0.500
Transformational	0.500	0.500
Leadership trait		
Agentic	0.499	0.500
Communal	0.498	0.500
Techonolical		
Technologically proficient	0.499	0.500
Respondents' characteristics		
Gender	0.519	0.500
Age	0.614	0.486
Gender equality perception	0.402	0.490

4．Results

4.1．Main results

This study investigates how male and female civil servants' preference for leaders is affected by different information framings related to (ⅰ)leaders' gender, (ⅱ)leaders' traits (agentic and communal), (ⅲ)leaders' styles (transactional and transformational), and (ⅳ)leaders' technological proficiency, utilizing the frameworks of social identity theory. For this purpose, the study divides the full sample into two subsamples: male and female civil servants. In our experiment, female civil servants make up 52% of all respondents. Table 5 presents the OLS results for the full sample, and Table 6 presents the OLS results for these two subsamples: male and female civil servants. Figure 1 illustrates the AMCEs of the attributes along with their 95% confidence intervals, derived from the models that account for covariates. A positive coefficient signifies that respondents show a preference for the leader at a particular attribute level compared to the baseline, whereas a negative coefficient implies a lack of preference for the leader at that attribute level. The estimated coefficients for the model that includes covariates are almost the same as those for the model without covariates, indicating that the randomization in our experiment was effective.

Table 5. OLS estimations with and without covariates

|	Without covariates	With covariates
Leaders' gender（base: female）		
Male	0.138***	0.138***
	(0.015)	(0.015)
Leaders' transactional style（base: non-transactional）		
Transactional	0.074***	0.074***
	(0.014)	(0.014)
Leaders' transformational style (base: non-transformational)		
Transformational	0.138***	0.138***
	(0.015)	(0.015)
Leaders' agentic trait（base: non-agentic）		
Agentic	0.111***	0.111***
	(0.014)	(0.014)
Leaders' communal trait（base: non-communal）		
Communal	0.083***	0.083***
	(0.014)	(0.014)
Leaders' technological proficiency (base: non-technological)		
Technological proficient	0.098***	0.098***
	(0.014)	(0.014)
Respondents' characteristics		
Gender		0.001
		(0.001)
Age		−0.001
		(0.001)
Gender equality perception		0.001
		(0.001)
Constant	0.179***	0.178***
	(0.018)	(0.018)
No of observations	7930	7930
R-squared	0.072	0.072

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.

Table 6. Heterogeneity across respondent's gender

	Subsamples		With interaction terms with Female
	Male	Female	
Leaders' gender（base: female）			
Male	0.185*** (0.023)	0.095*** (0.027)	0.185*** (0.023)
Leaders' transactional style （base: non-transactional）			
Transactional style	0.071*** (0.020)	0.078*** (0.020)	0.071*** (0.020)
Leaders' transformational style（base: non-transformational）			
Transformational style	0.107*** (0.023)	0.169*** (0.019)	0.107*** (0.023)
Leaders' agentic trait （base: non-agentic）			
Agentic trait	0.088*** (0.021)	0.134*** (0.020)	0.088*** (0.021)
Leaders' communal trait （base: non-communal trait）			
Communal trait	0.063*** (0.022)	0.102*** (0.020)	0.063*** (0.022)
Leaders' technological proficiency （base: technologically non-proficient）			
Technologically proficient	0.073*** (0.020)	0.122*** (0.019)	0.073** (0.020)
Interaction terms with respondent's gender（male）			
Leaders' gender × respondent's 　gender			−0.090*** (0.031)
Transactional style × respondent's 　gender			0.006 (0.028)
Transformational 　style × respondent's gender			0.006** (0.028)
Agentic trait × respondent's 　gender			0.045 (0.029)
Communal trait × respondent's 　gender			0.038 (0.028)
Technologically 　proficient × respondent's gender			0.049* (0.029)
Constant	0.206*** (0.024)	0.151*** (0.024)	0.206*** (0.024)
Respondent's characteristics included	Yes	Yes	Yes
Observations	3 810	4 120	7 930
R-squared	0.069	0.084	0.077

Notes: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.

Figure 1. Subsample analysis by respondents' gender
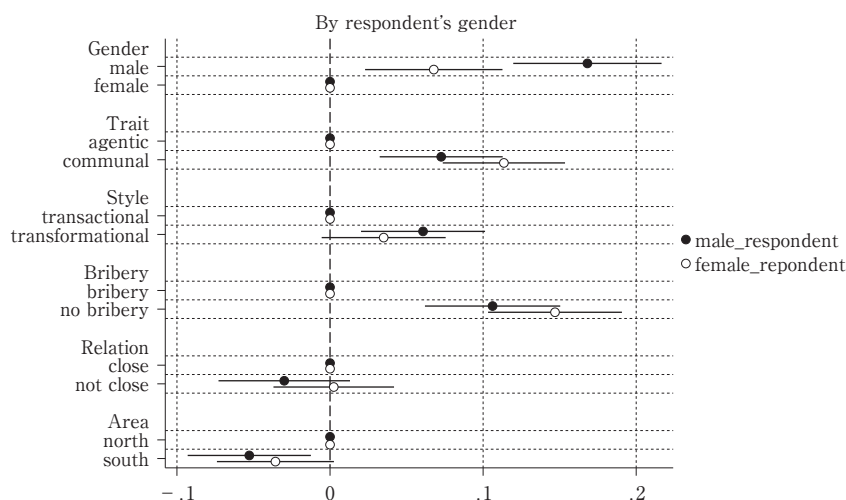
First, concerning civil servants' gender and leaders' gender, we investigate if civil servants have a preference for leaders of the same gender. Specifically, we assess male civil servants perceive male leaders more favorably than female leaders (Hypothesis 1A), and female civil servants perceive female leaders more favorably than male leaders (Hypothesis 1B). The estimated coefficients for male leaders are significantly positive for both male and female civil servant subsamples. This suggests that civil servants, regardless of gender, perceive their preference for male leaders higher compared to female leaders. Additionally, the model with interaction terms shows that the coefficient for the interaction between the respondent's gender (female) dummy and the leader's gender is significantly negative at the 1 percent level (Table 6). This implies that male civil servants are more influenced by their leaders' gender than female civil servants. These findings support Hypothesis 1A but fail to support Hypothesis 1B. Also this result suggest that social identity theory is relevant only for male civil servants, while gender incongruity, the opposite of gender congruity, is apparent among female civil servants.

Second, regarding civil servants' gender and leaders' styles, we evaluate whether male civil servants perceive transactional leaders more favorably than non-transactional leaders, compared to their female counterparts (Hypothesis 2A), and female civil servants perceive transformational leaders more favorably than non-transformational leaders, compared to their male counterparts (Hypothesis 2B). The estimated coefficient of transactional styles are significantly positive for both male and female respondents. Both female and male subordinates perceive that their preference for transactional leaders is higher than non-transactional leaders. Moreover, the estimated coefficient of transformational styles are significantly positive for both male and female respondents, meaning that civil servants prefer transformational leaders than non-transformational leaders. Additionally, the model with the

interaction terms shows that the coefficient for the interaction between the respondent's gender and the leader's transformational style is significantly positive at the 5 percent level （Table 6）. These findings support Hypothesis 2B and align with Fjendbo（2021）, which states that female employees generally prefer transformational leaders more than male employees. However, Hypothesis 2A is not supported because the coefficient for the interaction between the respondent's gender and the leader's transactional style is not statistically significant.

　Third, concerning the connection of civil servants' gender with leaders' traits, we investigate whether male civil servants perceive agentic leaders more favorably than non-agentic leaders, compared to their female counterparts（Hypothesis 3A）, and whether female public employees perceive communal leaders more favorably than non-communal leaders, compared to their male counterparts.（Hypothesis 3B）. The results show that the estimated coefficients of agentic and communal traits are significantly positive for both male and female respondents. Both female and male subordinates perceive that they would prefer agentic and communal leaders than non-agentic and non-communal leaders, respectively. However, these findings do not support Hypothesis 3 A and 3B, since the coefficients for the interaction between the respondent's gender and the leader's agentic and communal trait are not statistically significant.

　Fourth, for the connection of civil servants' gender with leaders' technological proficiency, we investigate whether male civil servants perceive technologically proficient leaders more favorably than technologically non-proficient leaders, compared to their female counterparts （Hypothesis 4）. The results show that the estimated coefficients of leaders' technological proficiency are significantly positive for both male and female respondents. Both female and male subordinates perceive that they would prefer technologically proficient leaders than technologically non-proficient leaders. Additionally, the model with the interaction terms show that the coefficient for the interaction between the respondent's gender and the leader's technological proficiency is significantly positive at the 5 percent level（Table 6）. It means that female civil servants prefer more technologically proficient leaders than their male counterparts. Interestingly, it is opposite to Hypothesis 4 and do not coincides with other studies（Coffin and MacIntyre, 1999; Whitley, 1997）

4．2．Subsample analysis

　This study also explores the potential varying impacts of information framings on leaders' gender and gender-stereotypical attributes through two additional subsample analyses based on a respondent's characteristics:（i）generation and（ii）perceptions of gender equality, For generational differences, respondents were split into two groups based on age: those who are 40 years old or younger（young generation）and those who are older than 40（old generation）. Regarding perceptions of gender equality, respondents were categorized into

two groups: one that upheld traditional views where women should be homemakers and men should be the primary earners (gender inequality), and another that expressed less support for these traditional views (gender equality), as reflected in their responses on an additional self-assessment questionnaire.[1] Tables 7 and 8, along with Figures 2 and 3, present the coefficient plots with 95% confidence intervals for each subsample analysis across generation and gender equality perception, based on model estimations with covariates.

The subsample analysis by generations reveals that irrespective of generations, both male and female civil servants perceive that leaders with male gender, transactional and transformational style, agentic and communal trait, and technological proficiency are preferred than female gender, non-transactional and non-transformational style, non-agentic and non-communal trait, and technologically non-proficiency, respectively.　There is no evidence of variability across generations, as the interaction terms between the civil servants' generational dummy variables and leaders' characteristics are not statistically significant.

Next, the subsample analysis by gender (in) equality perception shows that for both groups of gender equality perception and gender inequality perception perceive that leaders with male gender, transactional and transformational style, agentic and communal trait, and technological proficiency are preferred than female gender, non-transactional and non-transformational style, non-agentic and non-communal trait, and technologically non-proficiency, respectively. Regarding potential differences based on perceptions of gender (in) equality, the coefficient for the interaction term between the gender inequality perception dummy and the leader's gender is significantly positive at the 10 percent level. Civil servants with gender inequlity perception are more sensitive to their leader's gender than those with gender equlity perception. Additionally, the coefficients for the interaction terms of the gender inequality perception dummy with the transactional style dummy and the transformational style dummy are significantly negative at the 10 percent level. Civil servants with gender equlity perception are more sensitive to their leader's leadership styles (transactional and transformational styles) than those with gender inequlity perception.

Table 7. Heterogeneity across respondents' generation

	Subsamples		With interaction terms with Young
	Old	Young	
Leaders' gender（base: female）			
Male	0.167*** (0.024)	0.119*** (0.020)	0.167*** (0.024)
Leaders' transactional style （base: non-transactional）			
Transactional style	0.081*** (0.023)	0.067** (0.018)	0.081*** (0.023)
Leaders' transformational style （base: non-transformational style）			
Transformational style	0.118** (0.023)	0.150*** (0.020)	0.118** (0.022)
Leaders' agentic trait （base: non-agentic）			
Agentic trait	0.118*** (0.022)	0.108*** (0.018)	0.118*** (0.022)
Leaders' communal trait （base: non-communal trait）			
Communal trait	0.094 (0.022)	0.075 (0.018)	0.094 (0.022)
Leaders' technological proficiency （base: non-technological proficient）			
Technological proficient	0.103*** (0.023)	0.094*** (0.018)	0.103*** (0.023)
Interaction terms with respondent's generation（young）			
Gender × respondent's generation			−0.047 (0.032)
Transactional × respondent's 　generation			−0.011 (0.030)
Transformational × respondent's 　generation			0.031 (0.030)
Agentic × respondent's generation			−0.009 (0.030)
Communal × respondent's 　generation			−0.018 (0.028)
Technologically proficient × respon- 　dent's generation			−0.008 (0.030)
Constant	0.161*** (0.028)	0.191*** (0.022)	0.161*** (0.028)
Respondent's characteristics included	Yes	Yes	Yes
Observations	3 810	4 120	7 930
R-squared	0.083	0.067	0.073

Notes: Robust standard errors in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0$.

Table 8. Heterogeneity across respondents' gender equality perception (GEP)

	Subsamples		With interaction terms with gender inequality
	Gender equality	Gender inequality	
Leaders' gender (base: female)			
Male	0.116*** (0.02)	0.170*** (0.02)	0.1116*** (0.02)
Leaders' transactional style (base: non-transactional)			
Transactional style	0.096*** (0.018)	0.041* (0.022)	0.096*** (0.018)
Leaders' transformational style (base: non-transformational)			
Transformational	0.155*** (0.019)	0.108*** (0.02)	0.155*** (0.019)
Leaders' agentic trait (base: non-agentic)			
Agentic	0.135*** (0.019)	0.076*** (0.023)	0.135*** (0.019)
Leaders' communal trait (base: non-communal)			
Communal	0.073 (0.019)	0.097 (0.022)	0.073 (0.019)
Leaders' technological proficiency (base: non-technological proficient)			
Technological proficient	0.108*** (0.019)	0.079*** (0.022)	0.108*** (0.019)
Interaction terms with respondent's GEP (inequality)			
Gender × respondent's GEP			0.053* (0.032)
Transactional × respondent's GEP			−0.055* (0.029)
Transformational × respondent's GEP			−0.046* (0.031)
Agentic × respondent's GEP			−0.058 (0.003)
Communal × respondent's GEP			0.023 (0.029)
Technologically proficient × respondent's GEP			−0.028 (0.029)
Constant	0.158*** (0.021)	0.215*** (0.029)	0.158*** (0.021)
Respondent's characteristics included	Yes	Yes	Yes
Observations	3 810	4 120	7 930
R-squared	0.084	0.063	0.075

Notes: Robust standard errors in parentheses. ***$p<0.01$, **$p<0.05$, *$p<0$.

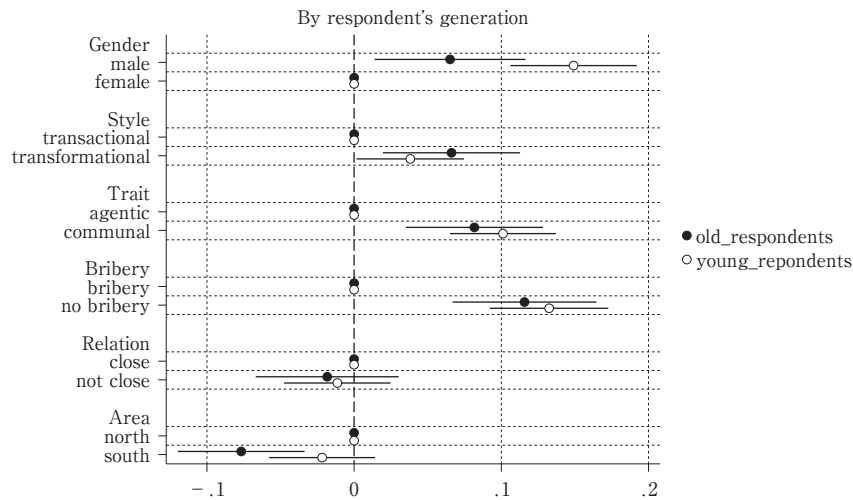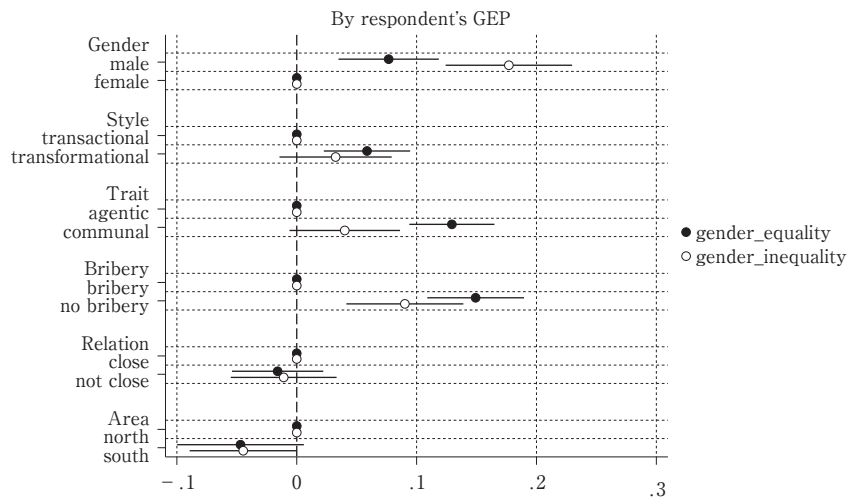Figure 2. Subsample analysis by respondents' generation

By respondent's generation

Figure 3. Subsample analysis by respondents' perception on gender (in) equality

By respondent's GEP

5. Conclusion

This study conducted a conjoint experiment in the Kyrgyz Republic to evaluate how male and female civil servants perceive the impact of a leader's gender and gender-stereotyped attributes (masculine and feminine characteristics) on their leader preference. This study offers a valuable contribution to the existing literature in three key ways. First, unlike previous research, it simultaneously examines both the leader's gender and the civil servant's gender when analyzing the impact of a leader's gender and gender-stereotypical

attributes on civil servants' leader preferences. Second, this study specifically addresses public organizations in developing countries, a context that remains largely underexplored in existing research. By focusing on this area, the study sheds light on leadership dynamics in a region where such investigations are limited. Third, this research utilized a conjoint experiment, a method that effectively addresses response bias, a common issue in traditional surveys. By employing this approach, the study enhances the reliability and accuracy of its findings, offering a more nuanced understanding of civil servants' leader preferences.

Analysis of the study revealed important findings. First, it is observed that civil servants tend to show a stronger preference for male leaders over female leaders, with male civil servants exhibiting a higher preference for male leaders compared to their female counterparts. This finding aligns with the work of Grissom et al. (2012) and Gallup (2013), reaffirming that subordinates generally demonstrate a stronger preference for a male boss compared to a female boss. We propose that one of the key reasons for the observed gender gap in perceptions of leadership is that people continue to hold persistent gender stereotypes. These stereotypes have their origins in the historical separation of roles, where women were primarily confined to the domestic sphere as homemakers, while men were the primary breadwinners, and suited for public leadership positions. Therefore, the government needs to educate civil servants about existence of gender stereoptypes against female leaders. This can help shift societal perceptions that are shaped by persistent gender stereotypes.

Second, regarding leadership style, civil servants perceive transactional and transformational leadership styles more favorably than non-transactional and non-transformational styles, respectively. Additionally, female civil servants demonstrate a greater affinity for transformational leadership compared to male civil servants. These findings support our hypothesis 2B and align with previous studies (Fjendbo, 2021) which states that female employees generally prefer transformational leaders more than male employees. In this context, it would be beneficial to cultivate an organizational culture that prioritizes and embraces inclusive leadership. This includes encouraging open communication, acknowledging various leadership styles (such as transactional and transformational), and ensuring that every employee's voice is recognized and valued.

Third, regarding leadership trait, both male and female civil servants perceive agentic and communal leaders more favorably than non-agentic and non-communal leaders, respectively. There is no significant difference between male and female civil servants perception regarding agentic or communal traits. It would be advantageous to create leadership development programs that focus on fostering both agentic and communal traits. Such training should guide leaders on how to be assertive, decisive, and goal-driven (agentic), while also being collaborative, supportive, and empathetic (communal).

Fourth, regarding leaders' technological proficiency both male and female civil servants perceive technologically proficient leaders than technologically non-proficient leaders. Moreover, female civil servants perceive more favorably technologically proficient leaders compared to their male counterparts. Therefore, it would be advantageous to advocate for the use of technological tools that boost leadership and communication. Encourage leaders to adopt tools that facilitate better team collaboration, data analysis, and project management.

While the study offers valuable insights, it is crucial to acknowledge several limitations. Firstly, the research utilized a conjoint survey experiment to gauge civil servants' perceptions rather than their actual experiences and behaviors. The perceptions reported in the survey may not accurately represent real-world behavior, and our study did not account for potential implicit biases that could influence actual actions（James et al., 2017）. According to Wulff and Villadsen（2020）, survey experiments in management research often have lower validity compared to field experiments, and they recommend that researchers replicate these experiments in real-world settings. Additionally, Neshkova and Kalesnikaite（2019）argue that perceptions and experiences can differ significantly. Therefore, future research should focus on field experiments to better capture the actual behaviors and experiences of civil servants. Despite this limitation, we believe our experimental study added valuable contribution to the existing literature and offers important policy implications concerning gender stereotypes in leadership and the subordinates' leader preference in public institutions.

Declaration of competing interest

The authors declare that they have no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Notes

1) Our model includes covariates: respondents' gender（male＝0, female＝1）and generation（age under 40＝0, age equal or greater than 40＝1）. We also include a dummy capturing the respondent's gender equality perception-GEP（gender inequality perception＝0, gender equality perception＝1）. In our survey, we showed 2 statements related to gender equality perceptions: "I believe that the husband should earn money, and the wife should do household chores" and "In the workplace, privileges are centered on men." Then, for each statement, we asked respondents about how much they agree with the statement. The answers were based on a 5-point Likert scale. For each respondent, we calculate the sum of the two answers, which is recognized as the measure of the GEP. Using the median of the GEP measure, we classified the respondents into two groups of gender inequality perception and gender equality perception. The first group consisted of respondents whose GEP measure is greater than the median（gender inequality perception）, and the second comprises those whose GEP measure is less than the median（gender equality perception）.

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