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The Value of National Defense: Assessing Public Preferences for Defense Policy Options

Abstract

Defense spending accounts for a large share of the budget in many countries, but the value of the resulting public good - national defense – has so far escaped assessment. Much of the literature has instead considered indirect benefits of defense spending in terms of greater economic growth or technological spillovers. In this paper, we assess the direct welfare effects of defense policy, namely an increase in the security of citizens, by means of a survey-based discrete choice experiment. Drawing on a representative sample of the German population, results suggest substantial willingness to pay for an increase in troop numbers, the establishment of a European army and an improved air defense system. The reintroduction of compulsory military service does not enjoy public support. Results further indicate substantial preference heterogeneity across respondents and policy options which we explore. As such, these findings demonstrate how methods of survey-based, non-market valuation can help to refine research in this area of public policy.

JEL-Codes: C900, H410, H560, H600.

Keywords: public good, national defense, non-market valuation, discrete choice experiment, willingness to pay.

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1 Introduction

The Russian war of aggression against Ukraine has ended the period of peace in Europe and has thrown the continent into one of its biggest military conflicts in decades. Since then, security and defense have returned to the top of the political agenda. Although President Biden pledged that the U.S. would enhance their military presence in Europe (Biden, 2022), many European countries, under the impression of a sudden military threat, are now prioritizing defense over other government expenditures. In fact, NATO's secretary general Stoltenberg reported that European Allies and Canada would increase their real defense spending by 8.3% in 2023, the biggest increase in decades (Stoltenberg, 2023). These developments raise an essential question: How do citizens value the benefit from increased national security and defense readiness? In other words, what are the effects of such a policy on welfare?

There are several strands in the (economic) literature, which have approached the question of the economic effects of military spending (see Section 2 for a review). This literature recognizes that defense policy affects the economy via a multitude of channels, such as via the effect of military expenditure on economic productivity and growth (Alptekin and Levine, 2012) or by innovation spillovers of defense-oriented research and development. The objective of this research is to determine the effects of defense spending on overall economic performance and, ultimately, welfare. What this ignores, however, is the fact that increased national security and defense readiness are likely to affect the welfare of the population directly – by providing a security and protection from foreign military threats and aggression. As such, the level of national security and defense readiness can be assumed to enter an individual's utility function directly. This effect on individual utility may result from the enjoyment of security for oneself, as well as for others and the country as a whole. In this situation, it should be possible to assess the individual's valuation of this public good (in terms of a Hicksian welfare measure). Given the nonmarket nature of national defense as a public good, direct valuation of these effects by means of stated preferences approaches can be used. To the best of the authors' knowledge, such a direct assessment of the welfare effects of defense policy options has not yet been conducted.

Several factors may be decisive when it comes to the determination of welfare effects of security and national defense. First, given the multitude of defense spending options, the particular measure for which funds are to be used is relevant. Second, a certain heterogeneity of preferences across different population groups with regard to military spending can generally be assumed, depending, for example, on age, political orientation or education. Furthermore, the evaluation of national defense is also difficult because it is

a public good that is naturally not marketable. Developing a methodology for assessing public preferences for defense policy options is important because policymakers know little (at best) about the public's preferences for security and defense measures and their societal value. Moreover, without knowledge of the population's willingness to pay (WTP) for a particular defense policy option, it is impossible, however, necessary, to prioritize them based on grounds of efficiency given limited budgetary resources.

In this paper, we adapt an established method for valuing non-marketable goods: a discrete choice experiment (DCE). DCE is a survey-based method to elicit individual preferences, which we apply to security and defense for the first time. We showcase the application, provide evidence for the validity of the resulting welfare estimates and thereby demonstrate that it is possible to measure the value of national defense and determine individual as well as aggregate WTP for various defense measures.[1]

Results show a strong preference for more spending on security and defense, with an associated aggregate WTP of €14 bn.[2] However, respondents assess the various options very differently. We find large support for the installation of air defense systems. On average, households in Germany are willing to accept an annual increase of taxes by €176 (€ 6.8 bn. in total) for the installation of a European air defense system (€167 for a system providing only national protection) and €74 for the creation of a European army. There is also a positive willingness to pay for an increase in the size of the national armed forces (e.g., €93 for an 25 percent increase), while the (re)introduction of comprehensive conscription would be associated with utility losses of about €50 per household. A thorough analysis of individual responses refines the picture and reveals a high degree of heterogeneity in preferences, which can be categorized into four groups. A first group supports all proposed policy measures with large associated WTP, e.g. more than €300 for air defense systems. A second group comprises individuals with positive, but much more moderate WTP estimates for all policy measures. The third group consists of individuals who reject the measures entirely, while individuals in the fourth group have mixed preferences: they strongly object universal conscription, but at the same time strongly support the establishment of air defense systems.

[1] Wars often mean a social but also an economic break. Based on an analysis of the economic literature from 1899 to 1969, Doti (1978) notes that wars have always been accompanied by a boost in economic research. The Russian war of aggression on Ukraine and the resulting desire of many European countries to strengthen their military security is in this (sad) tradition.

[2] According to the SIPRI Military expenditure database, military spending in Germany amounted to about €50.3 bn in 2022 (Sipri, 2023; see also NATO, 2022). Compared to this, the aggregate WTP of €14 bn is a substantial increase of military spending. However, the NATO guideline of spending 2 percent of the GDP translates into an additional amount of €25.7 bn (total amount of €76 bn) for Germany in 2022. This provides a first indication that our estimates are reasonable and not excessively large.

The next section surveys the related literature, and section 3 details our experimental method and econometric approach as well as the four defense measures. Section 4 contains the results, which we discuss in section 5. Section 6 concludes.

2 Related literature

Our paper contributes to several fields of the literature. First, we contribute to the literature on public goods and their optimal provision. Defense is the classic textbook example of a public good, and because one cannot be excluded from its benefits, there is an incentive to free-ride. This applies in national terms with regard to individual citizens who rely on the protection provided by their national army, which they receive even if they would not voluntarily pay for it. Government solves the free-rider problem through mandatory tax funding of defense. National defense can also lead to externalities at the international level, for example, when the armed forces of different nations join in NATO to defend against a possible attack. NATO's protection applies even if individual alliance members have invested far fewer resources in joint defense than others have.[3]

In the case of such an international public good, however, solving the free-rider problem is much more difficult (Buchholz and Sandler, 2021 for a survey). Given their limited enforcement options vis-à-vis sovereign states, a supranational institution should at least have sanctioning mechanisms against free-riders (Kosfeld et al., 2009). NATO does not have anything like that. The restrained military spending of some European member states over the past three decades can therefore be seen as typical free-rider behavior (Haesebrouck, 2021; Huseraş et al., 2021) – hoping for a sustainable peace on the old continent, and relying on the ultimate protection of the United States.[4] Such different contribution behavior is in line with theoretical and experimental insights from rent seeking. Drawing on the theory of private provision of public goods (Bergstrom et al., 1986; Esteban and Ray, 2001; Lohse et al., 2012), Herbst et al. (2015) argue that a comparably strong agent is likely to be exploited by its weaker alliance members. They free-ride on the strong agent's efforts by accommodating their own efforts and thus benefit from the so-called peace dividend. The drop in military expenditures usually goes along with a shift of resources to civilian use, intending a stimulus to economic and social

[3] See the surveys by Sandler and Hartley (2001) and Konrad (2014) for the economics of (defense) alliances and their formation, respectively.

[4] In fact, the problem of unequal military spending among NATO alliance members dates back to the 1960s and was the starting point for Olson and Zeckhauser's seminal paper on the economics of alliance (Olson and Zeckhauser, 1966, p. 267). Although the threat situation has changed over the past 30 years, and UN peacekeeping and foreign assistance are playing an increasingly important role also for NATO countries, even recent research shows that the free-rider problem remains (Kim and Sandler, 2023).

development (Brzoska, 2007).[5] In fact, the peace dividend is only possible by exploiting the positive externality of the international public good.

Overall, the literature on defense as a public good has extensively addressed the free-rider issue. At the same time, another question remains open. How to value the security effect of defense as a public good, especially at the national level? The dearth of evidence of the benefits of defense also means that the question of the optimal level of defense as a public good is difficult to answer, because all theoretical approaches since the Samuelson condition (Samuelson, 1954) have been based on cost-benefit analyses (see Kreiner and Verdelin, 2012 for a synthesis of different approaches). As a proxy for the cost of defense, most papers use budgetary spending on the military.[6] In contrast to the costs, assessing the benefits of defense expenditures as a public good is tricky. Armaments and soldiers have no direct productive use even though military research has sometimes led to great technological progress in the civilian sector as well (Sutherland, 2014). Alternatively, much of the literature has therefore examined the effect of military spending on an economy's growth. Benoit's groundbreaking studies unveiled a positive correlation (Benoit, 1978, 1973). Subsequently, numerous paper made extensive efforts to delve into this matter. Some meta-studies confirmed positive effects of military expenditure on growth for developed countries (Alptekin and Levine, 2012; Awaworyi Churchill and Yew, 2018) while others found the opposite (Compton and Paterson, 2016; Dunne and Tian, 2016). The absence of a widely accepted agreement concerning the influence of military spending on economic productivity could be attributed to the diverse range of methodologies employed in various studies, each with distinct statistical properties and underlying assumptions (Emmanouilidis and Karpetis, 2020). Our paper redirects attention back to the evaluation of security benefits from increased military spending and the elicitation of willingness to pay for the provision of the public good.

Hereby we contribute to another literature. We extend the applicability of the methodology of the DCE. This approach has been pioneered in marketing research (Louviere and Woodworth, 1983) and has since been used extensively in a variety of fields such as transport (Hensher, 1994), environmental (Hoyos, 2010), climate (Lechthaler and Vinogradova, 2017), health (Elias et al., 2019) and cultural economics (Grisolia and Willis,

[5] For example, West Germany, as a frontline Cold War state, spent 2.6 % of its GDP on the armed forces in 1988, whereas the share has been only about half since the late 1990s (Sipri, 2023). Germany was able to rake in a peace dividend estimated at about $420 billion (Bardt, 2018, p. 7) but at the expense of an increasingly weakening sovereign defense capability.

[6] This approach, however, neglects the welfare costs of taxation. Due to the distorting effect of taxes, welfare costs associated with military expenditure may exceed tax revenues (Kanniainen and Poutvaara, 2018). Brzoska (1995) surveys concepts and potential issues when measuring military expenditure such as problems of politically motivated underestimates or ambiguities about the right way to treat paramilitary forces or conscripts.

2011), and increasingly in labor (Maestas et al., 2023; Mas and Pallais, 2017; Wiswall and Zafar, 2018), finance (Gutsche and Ziegler, 2019), regional and urban economics (Caplan et al., 2021). Our application to the field of defense economics is new to the literature on DCE. Unlike standard opinion surveys, our preference elicitation method allows to estimate willingness to pay, i.e., we uncover how much each household is willing to spend for a particular security measure. In addition, we can use the estimates of individual or aggregate WTP for policy analyses that provide important insights into popular (non)support for policy programs.[7]

Furthermore, we also add to the specific literature on the demand for military expenditure. Some of the theoretical contributions apply a standard neo-classical model with both a private and a public good and determine military spending and real consumption depending on income, prices, preference parameters, strategic parameters and other countries' military spending. The role of the government is to weigh the benefits of increased security achieved through military spending against the trade-off it presents in terms of reduced civilian productivity (see Smith, 1995 for a general discussion).[8] We extend the theorized policymaker's decision-problem directly to individual citizens' optimization. By incorporating multidimensional tradeoffs, individuals have to balance private expenditures against costs and benefits of public defense programs considering their budget constraint and preferences.

In general, the application of theoretical macro models for estimating military expenditure is challenging though due to potential data problems, primarily the lack of good information on prices (Smith, 1995). Nevertheless, some models seem to fit the real data well (see Smith, 1989 for an early study on the UK and France) and have resulted in studies for both Western states and those of the Warsaw Pact right at the end of the Cold War (see the international survey edited by Hartley and Sandler, 1990).[9] Surprisingly, there is little research on the identification of preferences and, hence, demand for defense expenditures from micro data such as population surveys. Such an approach would allow

[7] So far, the literature in this context has focused mainly on the rather opposite question, namely how military spending can influence election outcomes (Becker, 2021; Klomp, 2023a; Kuokštytė et al., 2021).

[8] Papers that focus on the impact of military spending on economic growth (see above) make widely use of the macroeconomic Feder–Ram model, although the augmented Solow or the Barro model may involve fewer problems and limitations (Dunne et al., 2005). Especially during the Cold War period, other models were also considered to explain how military spending was determined. These models stem from various theories, such as those concerning the dynamics of arms races, bureaucratic behavior, the functioning of the military-industrial complex, or the demands of the capitalist mode of production (Smith, 1977).

[9] While the literature has extensively examined the factors that determine demand for defense spending, the supply side has been somewhat sidelined and has only been considered at the country level or in theoretical models. Some recent research on the supply side analyzes the determinants of sales of the arms-producing and military service companies (Blum, 2019; Klomp, 2023b)

evaluating existing policies with respect to the electorate's preferences. One of the few studies was carried out by Throsby and Withers (2001). They use Australian survey-based micro-data from 1992 to analyze how consumer preferences may influence military spending. In particular, they draw on evidence from a pre-existing contingent valuation survey on community preferences for 16 public outlays including national defense as one of them. They found that the level of military spending by the Australian government was roughly 20 percent higher than desired by the civilian community. Compared to their work, our methodology to measure individual preferences for defense expenditures differs in two important ways. First, we design a DCE specifically to address the question of evaluating different defense alternatives, which allows for a more targeted investigation than using pre-existing data. Second, and more importantly, the strength of the DCE approach we use is that it forces participants to make multidimensional tradeoffs by weighing cost-based alternatives and choosing one at a time. This leads to much more robust results than those from a CVS and marks a promising way for future research on the preferences for security policy and demand for military expenditure. This is where our paper adds to the literature.

3 Methods

3.1 Survey development

The survey instrument was developed in an iterative process following the current state-of-the-art in DCE (Johnston et al., 2017). A draft online questionnaire was constructed based on information from the literature and items from the annual survey of the Center for Military History and Social Sciences of the Bundeswehr in Potsdam, Germany (Graf, 2022; Steinbrecher et al., 2021). Feedback on this draft questionnaire was sought in a workshop with experts of the Center for Military History and Social Sciences of the Bundeswehr in Potsdam, Germany and in a focus group meeting with $N = 36$ participants. In response to this feedback, language describing the choice attributes and choice instructions was shortened and clarified and the graphical presentation of the choice cards was improved. Subsequently, the questionnaire was piloted with an online sample ($N = 102$) drawn from the underlying population to examine responsiveness of stated choices to attribute ranges and to test survey functionality.

The final questionnaire consisted of three sections. After a landing page, the first section contained a quiz of factual questions on matters of German security and defense policy. The second section consisted of the DCE. After the introduction of the attributes, respondents were instructed on how to complete the set of eight choice tasks. This

contained both a budget reminder[10] and a consequentiality statement to improve incentive compatibility and facilitate valid preference elicitation (Carson and Groves, 2007).[11] Opt-out reminders were repeated on each choice task.[12] The final section contained several sets of attitudinal as well as socio-demographic questions. The English translation of the original German questionnaire is available from the corresponding author on request.

3.2 Choice attributes

The choice alternatives are composed of five attributes. The selection of attributes (Table 1) was inspired by the political debate at the time and an in-depth discussions with researchers at the Center for Military History and Social Sciences of the Bundeswehr, Potsdam, Germany. The first attribute relates to the troop size of the German federal armed forces, including equipment ready for deployment. This is certainly a key indicator of the country's readiness to defend its own and allied territory. While troop size in the 1970s and 1980s was just under half a million active soldiers, it is currently around 185,000 (Bundestag, 2023, p. 146; Bundeswehr, 2023). Possible levels of this attribute are "no change" (keep the status quo), increasing the size of the Bundeswehr by a quarter to 231,250 soldiers or an increase of a half to 278,000 soldiers, respectively.

The establishment of a common European army represents the second attribute. At present, Germany's common defense takes place primarily within the framework of NATO. Of the 3.3 million soldiers from 31 member countries, the United States alone accounts for 1.35 million and is by far the most important NATO force in terms of equipment size and readiness (NATO, 2022, p. 12). For some time now, there have been proposals, particularly from the French side, "... to make Europe capable of acting independently..." in addition to NATO, according to President Macron in his speech at the Sorbonne University in 2017 (Macron, 2017). This could be achieved by integrating parts of the existing national armed forces to a new European army. The remaining national armies would then be correspondingly smaller.

[10] The (translated) budget reminder reads: "The amount of money that you spend for the purpose of security and peace, will not be available for other expenses."

[11] The consequentiality statement reads: "Also remember that the results of this survey will be made available, for example, to members of the Bundestag from the fields of security and defense policy. This means that your answers potentially influence the shaping of this policy in the future."

[12] The repeated opt-out reminder reads: "If the additional taxes and charges for your household under alternatives B or C are higher than the amount you would actually be willing to pay, please choose alternative A." The inclusion of this device has been shown to reduce hypothetical bias (Ladenburg and Olsen, 2014). More recently, Börger et al. (2023) also showed that repeated opt-out reminders alleviate the dependence of WTP estimates on the selection of cost amounts, so-called cost vector effects, which had been of concern previously (Glenk et al., 2019).

Table 1: Choice Attributes

Attribute	Description	Levels
Troop size	Changes in the number of soldiers of the armed forces	0%; +25%; +50%
European army	Establishment of a joint army within the European Union	No; Yes
Military service	Reestablishment of general military service for men and women	No; Yes
Air defense system	Installation of an air defense system to protect against rocket and missile attacks	No; for Germany; for Europe
Cost	Described as an annual (and monthly; p.m.) increase in the general level of taxation	€0; €24 p.a. (€2 p.m.); €48 p.a. (€4 p.m.); €96 p.a. (€4 p.m.); €144 p.a. (€12 p.m.); €240 p.a. (€20 p.m.); €396 p.a. (€33 p.m.)

The third attribute describes the reintroduction of compulsory military service, e.g. as part of a compulsory social service applicable to all genders. Since mid-2011, compulsory military service has been suspended in Germany and thus de facto abolished. Since then, the armed forces have consisted mainly of temporary and professional soldiers. General conscription for men had been introduced in West Germany in 1956 (and in the then GDR in 1962). This decision was driven not only by the impracticality and financial burden of recruiting the targeted level of troops of 500,000 soldiers through any other means but also by the belief that the nation's identity and determination to defend itself should be embodied in the defense concepts and national service. In addition, compulsory military service created the possibility of a well-trained reserve force that could have been drawn upon in the event of war (Harries-Jenkins et al., 1982). The same arguments can be made today, which is why states like Israel (as a "nation-in-arms," Ben-Eliezer, 1995) and Finland rely on a conscript army for decades and Lithuania and Ukraine reintroduced one in 2015.[13]

The fourth attribute relates to the defense against airborne and space-based attacks where "we have a lot of catching up to do in Europe," as stated by German Chancellor

[13] A repeated fear of the introduction of compulsory military service is a potential influence of conscription on political inclinations. However, Fize and Louis-Sidois (2020) do not find evidence supporting a shift in the political preferences of former conscripts when analyzing data from France.

Scholz in his speech at the Charles University in Prague in 2022 (Scholz, 2022). Traditionally, airspace surveillance has focused on intruding aircraft. Current defense systems can not protect against incoming rockets and missiles. This could be improved, although it is also clear that there can be no 100 percent protection (Popkin, 2019). Respondents were able to indicate their preference as to whether current protection against aerial threats should be expanded, and if so, whether this should be sought primarily for Germany or for Europe as a whole.[14]

The final attribute is the cost to the individual household. It is described as an increase in the general level of taxation, in a range of absolute amounts to ensure that this mode payment perceived as plausible and binding (Johnston et al., 2017).

Each choice task consisted of three unlabeled alternatives, two hypothetical alternatives and the current situation as third alternative. While the level values describing the current situation remained constant across all choice tasks, we allocated the attribute level values across the two hypothetical alternatives by employing an orthogonal fractional factorial design. This design resulted in 72 choice tasks (see figure 1 for an example choice task). Out of this basket of tasks, eight choice tasks were randomly drawn without replacement and presented one by one to the respondents.

3.3 Econometric approach

For the purpose of the present study, the choice of the appropriate econometric model is not straightforward. We start with a brief review of the multinomial logit model. We then discuss the most common extensions of this standard model and explain why the latent class (LC) model is the preferred model for our research question.

The multinomial logit model (McFadden, 1974) assumes that respondent i derives the following utility from choosing alternative j in choice situation t:[15]

$$U\left(\mathbf{x}_{ijt}\right) = \mathbf{x}_{ijt}\boldsymbol{\beta} + \epsilon_{ijt} \tag{1}$$

where $\mathbf{x}_{ijt}$ denotes the row vector describing the attribute levels of this alternative and β is a column vector of parameters to be estimated. Assuming that the choices of respondent i reflect utility maximization and further that the error term ϵ follows a Type I Extreme Value distribution, the probability that a given respondent i in choice situation t chooses

[14] In mid-August 2023, about six months after our survey was conducted, the United States gave its approval for Germany to purchase Israel's Arrow 3 missile defense system. The $3.5 billion system is designed to protect Germany from ballistic missile attacks starting in 2025 (Times, 2023).

[15] This model is also called 'conditional logit model', see for example, Yoo (2019). See Croissant (2020) for a discussion of these different terms.

Please carefully consider the following choice alternatives. Then choose the alternative you prefer for yourself and your household.

If the additional taxes and charges for your household under alternatives B or C are higher than the amount you would actually be willing to pay, please choose alternative A.

		Alternative A (current situation)	Alternative B	Alternative C
Troop size (Number of soldiers)		185,000 (0%)	231,250 (+25%)	185,000 (0%)
Establishment of a European army		No	No	Yes
Reintroduction of military service		No	No	Yes
Air defense system		No extended protection	Extended protection for Germany	Extended protection for Europe
Additional taxes and fees payable by <u>your</u> household		€ 0	€ 144 p.a. (€ 12 per month)	€ 240 p.a. (€ 20 per month)
I choose:		○	○	○

Continue >>

Figure 1: Example of the experimental task

alternative j is

$$\frac{\exp\left(\mathbf{x}_{itj}\boldsymbol{\beta}\right)}{\sum_{h=1}^{J}\exp\left(\mathbf{x}_{ith}\boldsymbol{\beta}\right)}. \tag{2}$$

Let y_{itj} denote a binary indicator that is equal to one if respondent i in choice situation t chooses alternative j and 0 otherwise, the joint likelihood of the T choices is given by

$$P_i(\boldsymbol{\beta}) = \prod_{t=1}^{T}\prod_{j=1}^{J}\left(\frac{\exp\left(\mathbf{x}_{itj}\boldsymbol{\beta}\right)}{\sum_{h=1}^{J}\exp\left(\mathbf{x}_{ith}\boldsymbol{\beta}\right)}\right)^{y_{itj}} \tag{3}$$

In this multinomial logit formulation, the same vector of coefficients (β) applies to all sampled respondents, thus ignoring any preference heterogeneity.

There are several extensions that introduce more flexibility regarding such heterogeneity, among them the random parameter logit model (RPL, Revelt and Train, 1998) introducing a continuous mixing distribution and the LC logit model accommodating discrete variations in preference weights. The need to assume a specific parametric distribution to model the heterogeneity is a drawback of the RPL model. LC models extend the multinomial logit model without the need to specify a parametric distribution for the heterogeneity (von Haefen and Domanski, 2018). An additional advantage of the LC model is the ability to describe the different classes (for example, in relation to observable characteristics) and in turn to describe more directly potential winners or losers of a specific policy (von Haefen and Domanski, 2018). As discussed in the introduction, the assessment of preferences and potential rejection and support of defense policy instruments is the main research question, and therefore a LC model is employed.[16]

The LC model contains a different vector of utility weights β_c for each class $c = 1, ..., C$. However, the respondents are not perfectly sorted in of these classes. Instead, respondents are allocated to each class with an associated respondent-specific class membership probability π_{ic}. This probability is modeled using a separate multinomial logit function:

$$\pi_{ic} = \frac{\exp\left(z_i\gamma_c\right)}{\sum_{l=1}^{C}\exp\left(z_i\gamma_l\right)} \tag{4}$$

where z_i is a vector of respondent-specific variables and γ_c a coefficient vector to be estimated.[17] As a consequence, the joint likelihood of the choices made by respondent i

[16] RPL models assuming normally distributed utility weights for all non-monetary attributes and a cost parameter following a (mirrored) log-normal distribution were also considered. The estimated standard deviations turned out to be very large compared to the respective mean estimates. This suggests that discrete groups for the preference heterogeneity are more suitable than a continuous uni-modal distribution.

[17] Note that γ_c is set to zero for one class to identify the model.

is given by

$$\sum_{c=1}^{C} \pi_{ic} P_i(\beta_c)$$

where each $P_i(\beta_c)$ is obtained by evaluating equation (3). The multinomial logit model for the individual class membership probability allows to analyze, for example, whether male respondents compared to female respondents are more likely to be a member of a specific class. Moreover, aggregating individual probabilities to average class membership probabilities provides a measure for the sizes of the classes in our sample.

The respondent-specific variables collected in z_i are demographic variables, e.g. age, gender, income, education and political orientation.[18] Finally, it is important to note that the number of latent classes has to be chosen before estimating the model. Between 2 and 6 classes were considered. While model fit as indicated by the Bayesian Information Criterion improved with increasing number of classes, the average class membership probability for at least one class dropped under 10 percent for models with more than four classes. This may lead to identification issues in these low probability classes. Therefore, the model with four latent classes appeared most suitable to capture the existing preference heterogeneity and was used for analysis.[19] Denoting the utility weight for a specific attribute with associated level k as β_k, we WTP estimates were calculated as $WTP_k = -\beta_k/\beta_{cost}$, where β_{cost} denotes the estimated cost parameter. Since WTP estimates are a ratio of two estimated parameters, 95% confidence intervals are simulated (Krinsky and Robb, 1990).

4 Results

4.1 Sample characteristics

The survey was conducted online in February 2023. In total, 1808 complete interviews were collected. The sampling scheme ensured that the sample is representative with respect to age, gender and geographical distribution of the German population. Table A-1 in the appendix provides summary statistics for the sample. In line with the sampling scheme, the average age of 45 years and the gender distribution in our experimental

[18] To check the robustness of results, a specification without demographics was considered (in this case, z_i just contains $C-1$ intercepts). As will be shown, the estimates of the utility weights β_c and the derived WTP estimates are very similar in these two approaches. Note that this does not imply that the demographics are unable to explain class membership; it implies that the demographics do not induce confounding concerning the *utility weights* β_c and the derived WTP estimates.

[19] All choice models are fit in R (R Core Team, 2022) employing the package 'Apollo' (Hess and Palma, 2022, 2019). Note that the resulting log-likelihood function of the LC model can be optimized without simulation. When fitting RPL models, 1,000 Sobol draws are used to simulate the log-likelihood.

Table 2: Aggregate WTP (in EUR) and 95 percent confidence intervals (CI)

	Mean	CI (lower bound)	CI (upper bound)
Troop size (+25%)	93	54	130
Troop size (+50%)	73	17	111
European army	74	26	110
Military service	-50	-147	-7
Air defense - Germany	167	133	249
Air defense - Europe	176	145	238

Note:
The table presents estimates for the average WTP for each household. The WTP is computed in two steps. First, we employ the latent class model results (Table A-2) to compute the WTP within each class. Second, the class membership probabilities are used to aggregate the class-specific WTP estimates. 95 percent confidence intervals are simulated using 10,000 random draws.

sample closely match the corresponding population values. We further asked respondents to indicate their voting intention, and the resulting voting intention distribution closely matches a representative opinion poll of that time.[20]

4.2 Willingness to pay for defense policy options

We first discuss the results on the aggregate level. To this end, we use the resulting coefficients from the latent class model[21] (see Table A-2) to calculate the marginal WTP for the different choice attributes. While these WTP estimates are class-specific, they can be weighted using the average class membership probabilities to arrive at sample averages. Table 2 reports these sample averages and the simulated 95 percent confidence intervals.

The WTP for an increase of the troop size by 50 percent is €73 and about €93 for an increase of 25 percent. These numbers suggest that –on average– increasing the troop size by 25 percent is evaluated as preferred. A partial integration of the existing forces into a new European army is associated with a similar WTP: on average, each sampled household is willing to spend €74 for this policy option. There is no support for the reinstatement of military service (as part of a general social service); on average,

[20] The results are available upon request.

[21] As explained in section 3.3, our main model is the LC model with 4 latent classes and demographic variables that are used to explain class membership. The results are compiled in Table A-2 in the appendix. A version of this model without parametrisation of the class membership function, i.e. where z_i only contains class-specific constants provides virtually identical results regarding the resulting WTP estimates; see Table A-3 for the regression table and Figure A-1 for the resulting class-specific WTP estimates.

households evaluate this policy option as a loss of €50. Finally, results indicate substantial WTP estimates for defense systems against airborne or space-based assaults. On average, a household is willing to spend €167 for a system that is able to secure the German airspace and and an additional amount of €9 (yielding €176) for an extended system to secure European airspace. Since there are about 41 million households in Germany, the presented WTP estimates per household imply the following totals for Germany: about €3.8 billion (bn) for increasing the troop size by 25 percent, €3 bn for a 50 percent increase, about €3 bn for the European army, €-2 bn for the reinstatement of military service, €6.8 bn for an air defense system covering Germany and €7.2 bn for a European air defense system. These totals can be used for assessing the aggregate valuation for different policy programs. For example, a program that involves an increase of the troop size by 25 percent, the installment of a European air defense system and the creation of a European army is associated with an aggregate WTP of €14 bn.

4.3 Preferences for defense policy options in Germany

We now examine preference heterogeneity using the results from the LC model. There are four classes, and the average class membership probabilities (see Table A-2) are about 35, 16, 27, and 22 percent for Classes 1 through 4, respectively. For each class, we use the class-specific coefficients (see columns 1-4 in Table A-2) to obtain class-specific WTP estimates. This allows to 'zoom into' the different WTP estimates that are disguised by the sample averages. Figure 2 shows these estimates.

Clearly, it is possible to distinguish four different preference patterns: Class 1 ('High-WTP') is characterized by comparably high marginal WTP for all attributes. Within this class, the WTP for a reinstatement of compulsory military service (*M.S.*) is €135. Notably, all other WTP estimates are above €200 per year, with WTP for the installation of an air defense system for Europe (*A.E.*) even exceeding €300 (at €322). Respondents within this class do not distinguish between increasing the troop size by 25 percent (*BW25*) or 50 percent (*BW25*): the associated WTP estimates are €229 and €225, respectively.

WTP estimates in Class 2 ('Low-WTP') are also consistently positive, but much more moderate compared to the first class. Respondents within this class are willing to spend €26 for increasing the troop size by 25 percent (*BW25*) and €32 for an increase of 50 percent (*BW50*). A similar WTP of €32 exists for establishing a European army (*E.A.*). Similar to Class 1, the largest WTP exists for the installation of an air defense system: the associated estimates are €37 for a system covering Germany (*A.G.*) and €44 for a system covering Europe (*A.E.*), respectively. The point estimate of €3 and the associated

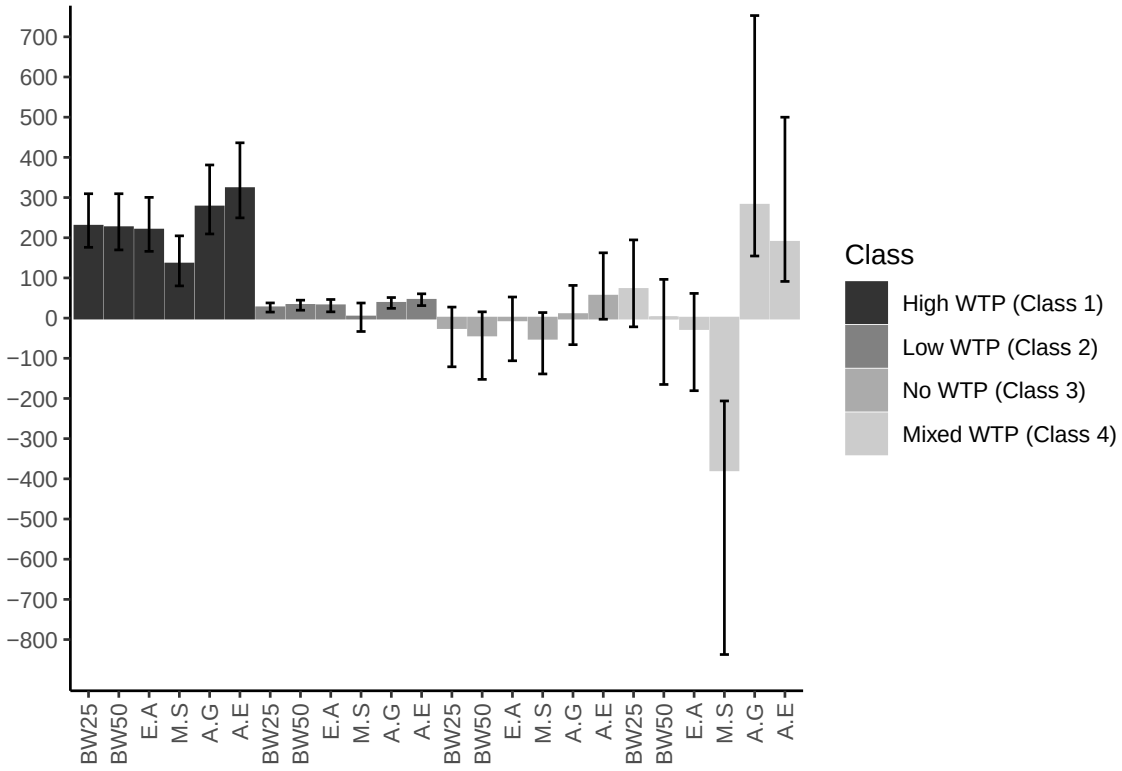

Figure 2: WTP estimates (in EUR)

Note: The figure presents class-specific WTP estimates for the choice attributes (BW25: increase troop size by 25 percent; BW50: increase troop size by 50 percent; E.A.: European army; M.S,: Reintroduction of military service; A.G.: Air defense for Germany; A.E.: Air defense for Europe

confidence interval indicate that the WTP for the reinstatement of military service is virtually zero.

Class 3 is composed of respondents who do not support any proposed policy instrument. The confidence intervals indicate that all WTP estimates are not statistically different from zero. Table A-2 in the appendix indicates large standard errors for the utility weights which explains the large confidence intervals (the coefficient for the European air defense system is marginally significant). Note, however, that the two intercepts for alternatives B and C are negative, large and statistically significant (see Table A-2). Therefore, we may conclude that this group of respondents hardly distinguishes between the proposed policy attributes, but rejects any combination of these instruments.

In Class 4, WTP for a change in troop size and an introduction of a European army are indistinguishable from zero. The associated WTP for the reinstatement of military service is negative and comparably high (€-377) indicating that respondents in this class very strongly object this policy measure. WTP for both air defense systems are positive and substantial, i.e. €281 and €189, respectively.

In summary, the results indicate four distinct classes: the first class ('High-WTP') is composed of respondents having a consistently high WTP for all attributes. Compared to this, members of the second class ('Low-WTP') are willing to pay much smaller amounts for the proposed policy measures and nothing at all for the reinstatement of compulsory military service. Respondents in Class 3 ('No-WTP') are not willing to pay for any measure. Finally, there is a fourth class ('Mixed-WTP') strictly opposing military service but valuing air defense systems, particularly for Germany alone. Therefore, it is evident that –ceteris paribus– a policy package involving the installment of an air defense system would attract more support compared to a package that suggests the reintroduction of military service instead of the air defense system. We will discuss such policy packages in more detail in Section 4.5.

4.4 Characterisation of class membership

We now analyze the composition of the four classes. To this end, we exploit the three vectors of coefficients γ_c that explain the probability that a certain respondent is a member of Classes 2–4 rather than the reference Class 1 (see the lower panel of Table A-2). Table 3 summarizes the resulting average class membership probabilities (by averaging over respondents.)

Starting the discussion with political orientation,[22] we see that respondents with a left

[22] Respondents were asked to locate themselves on the political left-right spectrum. The exact wording of this question translated from the German original is: "Many people use the terms"left" and "right" when referring to different political attitudes. Where would you place yourself on a left-right scale of

Table 3: Average class membership probabilities

	Class 1	Class 2	Class 3	Class 4
middle (reference)				
left = 1	-0.09	-0.03	0.02	0.10
right = 1	-0.06	-0.07	0.08	0.05
uni = 0 (reference)				
uni = 1	0.07	-0.04	-0.04	0.01
age = 40 (reference)				
age = 50	0.06	0.02	0.00	-0.07
age = 70	0.15	0.06	-0.04	-0.17
male = 0 (reference)				
male = 1	0.05	-0.05	-0.03	0.03
ln_inc = 1.1 (reference)				
ln_inc = 1.3	0.01	0.00	-0.01	0.00
ln_inc = 1.5	0.02	0.00	-0.02	-0.01

Note:
The table presents average partial effects concerning class membership probabilities. For example, the average class average partial effects concerning university degree (uni) are obtained in three steps: we first set the respective university dummy to zero and calculate the resulting class membership probabilities for each respondent in the sample. Second, we average over respondents and obtain a single average membership probability for each class. Third, we apply the same procedure after setting the dummy to one and then calculate the differences of the probabilities.

(*left*) rather than middle orientation are less prevalent in the high and low WTP classes and more prevalent in the No WTP and Mixed WTP classes. This result is in line with a common finding that left-leaning individuals are more likely to oppose the increase of defense policy measures (Klingemann et al., 1994). Subjects with a right (*right*) rather than middle orientation also belong less often to the High WTP class: the probability decreases by six percentage points. A different result is found for the No WTP class: subjects with a right orientation are more likely to belong to this class (a difference of six percentage points), while reporting a left orientation hardly affects the membership probability for this class.

Respondents with a university degree (*uni*) and male (*male*) respondents are more prevalent in the High WTP class; having a university degree increases the associated class membership probability by seven percentage points while the increase for male respondents is five percentage points. Finally, age (*age*) strongly affects class membership. Ceteris paribus, the probability of belonging to the High WTP class is 15 percentage points higher for a 70-year old respondent compared to a 40-year old respondent.

In summary, the probability of belonging to the group with high WTP values (Class 1) is increasing with education, is larger for older respondents, larger for subjects who place themselves in the middle of the political spectrum, and larger for male subjects. Note that these results are obtained controlling for household income (*ln_inc*). Therefore, the differences observed for educational attainment or political orientation are not driven by confounding differences regarding the household income. Finally, respondents with larger levels of household income are more prevalent in the high WTP class; this direct effect is expected since this class comprises respondents with large WTP values. However, this direct income effect is small compared to the other effects: increasing the net household income by 40 percent increases the probability of belonging to the high WTP class by two percentage points.

4.5 Support for policy programs

After the analysis of heterogeneity of preferences, we now turn to the assessment of potential policy programs. Our LC model conveniently summarizes the elicited preferences of the respondents and we will predict the percentage of support of a specific program given a certain cost. Precisely because policy makers know little at best about the preferences of the population regarding defense spending, our approach is of particular importance. It makes it possible, for example, to determine which policy programs have majority support among the population and which do not. To illustrate the point, we

1 to 7, if 1 is “far left” and 7 is “far right”?”

compare three hypothetical programs, two national programs and one European. The structure of the three programs is inspired by possible policy options that were under discussion when we conducted our study. A key point here was the trade-off between national measures versus a European approach, the latter being more time-consuming due to multilateral coordination processes. Each of the three programs includes some of our attributes. We compare two national and one European program. In particular, we examine the following programs:

- **Program 1**, termed "National strategy 1", includes the reintroduction of compulsory military service for both male and female citizens and an air defense system at the national level, i.e. for Germany only.
- **Program 2**, "National strategy 2", also entails the air defense system for Germany but instead of the military service, this program includes a 25 percent increase of the troop size.
- **Program 3** is the "European solution" and consists of an increase of the troop size by 25 percent, the establishment of a European army and the installation of a Europe-wide air defense system.

For each of the three programs, we use the parameters of the LC model to predict the probability to choose the respective program rather than the opt-out alternative. Clearly, for each respondent this probability is decreasing in the associated cost *ceteris paribus*. For a given level of the cost parameter, we then calculate the average probability (across respondents) to choose the policy program.

Figure 3 shows the average choice probabilities of each of the three programs for different costs. These choice probabilities can be interpreted as the predicted vote shares of a program alternative in comparison to the status quo (the do-nothing-pay-nothing alternative). For example, a value of 50 percent indicates that half of the respondents would choose the policy program in question rather than the status quo.

The first important result is that even with an individual tax payment of €0, only a share between 60 and 67 percent of respondents would vote in favor of one of the respective programs. This result is driven by the fact that a substantial share of respondents exhibits a negative WTP for some of the different policy attributes. The previous section has documented (Figure 2) that a substantial group of respondents has a large negative WTP regarding the reintroduction of compulsory military service. Therefore, the support of the National strategy 1 program is smaller compared to other programs: even without additional costs, this program is supported only by 59 percent of the respondents.

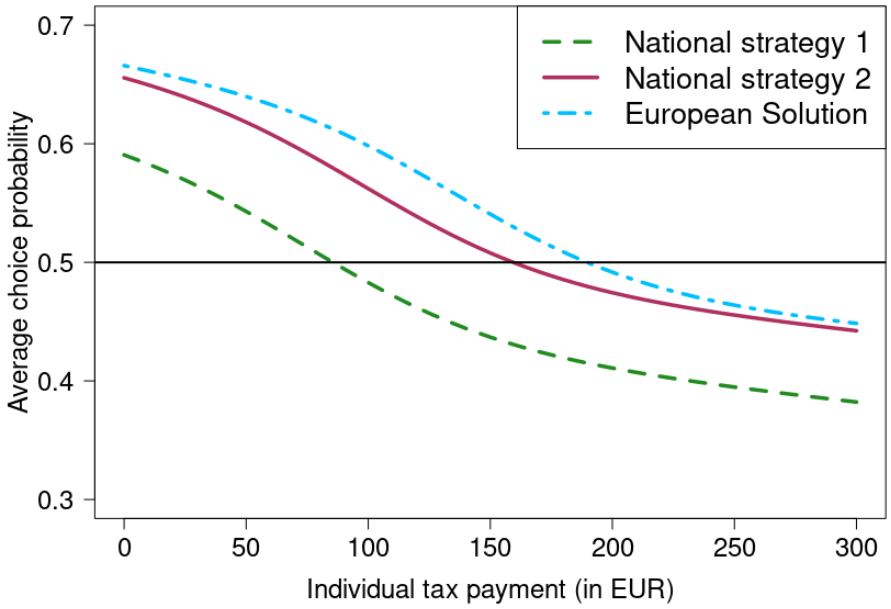

Figure 3: Support for policy programs

The figure further highlights the differences concerning the support of the programs. For example, the average choice probability for the European solution is above 50 percent even at a cost of about €190, while the approval rate for the National strategy 2 program drops below 50 percent for costs above €160, and for program 1 for costs above €90.

The prediction of approval rates for different policy packages highlights how the information for policymakers is substantially improved by running a DCE compared to a 'standard survey' concerning political opinions. For example, for quite some months the introduction of military service and the installment of an air defense system were debated in Germany. A standard opinion survey would probably be able to detect that the approval rate for the National strategy 1 program is not very large. However, the advantage of the DCE is the ability to capture the trade-offs between the policy instruments and the associated (individual) costs.

5 Discussion and concluding remarks

In light of the Russian war against the Ukraine and a lack of research regarding the benefits of military spending on defense and security policy, the present study leverages a DCE to assess the valuation for a number of possible defense policy measures in Germany. Results show that –on average– the German population is willing to pay for the implementation of three out of four proposed defense policy measures. In particular,

WTP for an increase of troop size, for the establishment of a European army and air defense systems at the national and European level are positive and in part substantial. Only the WTP estimate for a reintroduction of conscription is negative at the sample level indicating that this policy option would lead to a loss in welfare if implemented. At the same time, the analysis reveals substantial heterogeneity in preferences and, therefore, WTP. Preference heterogeneity is particularly obvious with respect to the conscription attribute which can be positive or negative, depending on class membership. Respondents in Class 1 (35 percent of the sample) support this policy, whereas those in Class 4 (22 of the sample) clearly oppose it. In the remaining two classes, the WTP for this attribute is practically zero. This ambivalent pattern reflects the contentiousness of this issue in the current public debate where, in recent polling, exactly 50 percent of a representative sample of the German population perceive this policy decision as "necessary" (Graf, 2022)

A further analysis uncovers the demographic variables that explain class membership and by extension preference heterogeneity. This analysis shows that –ceteris paribus– older respondents, male respondents and those having a university degree are more likely to have a large WTP for the proposed policy measures. These results are obtained controlling for household income, which constitutes an obvious potential confounding variable. These empirical results are a necessary ingredient for any theoretical model on the provision of national security as a public good (Kreiner and Verdelin, 2012). The present study demonstrates that approaches to assess preferences for non-market goods frequently used in other fields of economics can be adapted to assess the welfare effects of different sets of security policy measures. Given the current spotlight on the issue of national defense and the competition of a multitude of uses for public funds (e.g. social security, healthcare, education, environmental protection), this paper demonstrates that the empirical elicitation of public preferences over defense policy is an important field of future study.

Preferences for defense spending (including the policy measures like troop size) and policy decisions in fields like industrial policy are potentially jointly determined. Even if we could, for example, use observational data to measure changes in the German population's acceptance following the sequential reduction of defense spending in the 1990s and 2000s, these preferences are potentially jointly determined with economic development in these years, e.g. the regional disparities regarding closing of industries and unemployment following the German reunification. The DCE allows us to randomize characteristics of defense policy in the experimental design including the associated costs, and this randomization removes potential confounding effects in the elicitation of preferences.

Results from stated preferences studies need to demonstrate the validity of the elicited preferences and derived WTP estimates (Bishop and Boyle, 2019). Kling et al. (2012) define a number of validity concepts. Of these, criterion validity – whether hypothetical WTP responses match actual WTP amounts for the same good – and convergent validity – whether the same WTP estimate assessed by means of a stated preference and a revealed preference approach coincide – cannot be assessed at this stage because revealed preference data is not available and the present study is a first of its kind in this field. However, the results presented above contain evidence of construct validity in the sense that WTP correlates positively with household income as predicted by theory. This is expressed by the higher probability of high-income household to be part of the high-WTP class. Similarly, the correlation between respondent age and WTP for compulsory military service is expected. Age increases the probability of belonging to Class 1, whereas the younger a respondent the more likely it is they belong to Class 4 which exhibits large and negative WTP for this attribute

Nevertheless, a number of caveats need to be borne in mind with respect to the empirical results presented above. Unlike in choice applications in e.g. labor economics (Maestas et al., 2023), the preferences (and by extension the WTP estimates) assessed in this study cannot be externally validated by comparison with revealed preferences. As such, the assessment of preferences for national security is akin to the valuation of non-market environmental goods (Johnston et al., 2017). Although we took several steps to develop a choice experiment with high consequentiality and content validity, choice experiments with three alternatives cannot be considered incentive-compatible in the strict sense unless (among other requirements) respondents have uniform priors regarding the preferences of other decision makers (Collins and Vossler, 2009). However, several points regarding the validity of the above results can be made. Firstly, responses to different questions regarding attitudes and political orientation produced results which are comparable to a representative population survey that was conducted before and after the present study (Graf, 2022; Steinbrecher et al., 2021). This refers to responses to questions on perceived threats and the perceived relationship between Germany and Russia (Figure A-2 in the online appendix). This observation demonstrates that attitudes (and by extension preferences) regarding defense policy exhibit a degree of temporal stability.[23] In addition, examining the question which party a respondent would vote for in the event of a general election "this Sunday" (which is the standard formulation in political polling in Germany) shows that the response distribution is identical to

[23] Not surprisingly, the perceived relationship between Germany and Russia changed drastically between 2021 and 2022, and it is conceivable that preferences concerning defense in Germany also changed strongly after 2021.

official polling done around the time of survey implementation. This observation can be interpreted as another piece of evidence regarding the representativeness of the survey sample. Notwithstanding this fact, the results are based on the realized sample of survey respondents from an opt-in internet panel. Although the sample characteristics are reasonably representative of the underlying population, it is difficult to fully rule out issues like selection into the internet panel or systematic non-response in DCEs which are somewhat more involved compared to 'standard surveys' (Johnston and Abdulrahman, 2017).

Although we find several pieces of evidence that support the temporal stability of policy-related attitudes and the representativeness of our sample, there are a number of possible extensions: a first important extension is a (partial) replication of our DCE for the same target population. Such a replication could document possible changes in the WTP estimates over time, and for which subgroups of the population such changes occur. A second possible extension is a replication or implementation of a similar DCE for different target populations. This could document, for example, to what extent preferences and particularly the amount of preference heterogeneity differs across countries. This is left for future research.

Declaration of competing interest

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

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A Supplementary materials / Online appendix

A.1 Summary statistics

Table A-1: Summary statistics

Variable	Mean	SD	Min	Max
Age[a]	45.38	15.12	18.0	86.0
University[b]	0.30	0.46	0.0	1.0
Male	0.50	0.50	0.0	1.0
Log(HH Income)[c]	0.93	0.72	-4.6	3.3
Left[d]	0.11	0.31	0.0	1.0
Right[d]	0.05	0.22	0.0	1.0

Note:
N (Number of respondents): 1808
[a]The average age of the German population is 45 years, see https://www.bib.bund.de/DE/Fakten/Fakt/B19-Durchschnittsalter-Bevoelkerung-ab-1871.html
[b]The fraction of individuals with a university degree is about 18.5 in the population, see, for example, https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Bildungsstand/_inhalt.html
[c]In the German population, the average monthly household income is about 3,800 EUR, see, for example https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Bildungsstand/_inhalt.html. Inserting this average income of 3,800 EUR yields log(3.8)=1.3
d Respondents were asked to locate themselves on the political left-right spectrum. The exact wording of this question translated from the Germany original is: 'Many people use the terms "left" and "right" when referring to different political attitudes. Where would you place yourself on a left-right scale of 1 to 7, if 1 is "far left" and 7 is "far right"?' The dummy-variables are encoded such that responses 1-2 indicate left respondents (left=1), responses 3-5 indicate a middle political orientation (reference group) and responses 6-7 indicate a right orientation.

A.2 Regression tables

Table A-2: Main Model: Latent Class model with 4 classes

	Class 1	Class 2	Class 3	Class 4
Mean prob	0.3488	0.1621	0.2671	0.2220
Alt. B	1.639***	0.875***	−2.589***	0.124
	(0.169)	(0.225)	(0.370)	(0.131)
Alt. C	1.476***	0.758***	−2.919***	−0.436**
	(0.176)	(0.228)	(0.416)	(0.150)
BW.25	0.701***	0.627***	−0.209	0.147
	(0.065)	(0.129)	(0.239)	(0.092)
BW.50	0.690***	0.774***	−0.374	0.002
	(0.073)	(0.155)	(0.260)	(0.100)
Euro.Army	0.671***	0.751***	−0.039	−0.053
	(0.067)	(0.190)	(0.276)	(0.086)
Mil.Service	0.412***	0.066	−0.447	−0.777***
	(0.078)	(0.433)	(0.282)	(0.219)
Air.Ger	0.847***	0.900***	0.078	0.578***
	(0.069)	(0.151)	(0.274)	(0.104)
Air.Eur	0.988***	1.085***	0.486+	0.388***
	(0.073)	(0.159)	(0.259)	(0.099)
Tax	−0.306***	−2.446***	−0.889**	−0.206**
	(0.041)	(0.206)	(0.273)	(0.068)
Const.		−0.148	1.073***	2.071***
		(0.494)	(0.317)	(0.325)
Age		−0.002	−0.018***	−0.054***
		(0.008)	(0.005)	(0.007)
Uni		−0.458*	−0.354*	−0.171
		(0.208)	(0.146)	(0.180)
Male		−0.455*	−0.238+	−0.021
		(0.178)	(0.132)	(0.201)
Log.Income		−0.150	−0.332**	−0.257+
		(0.134)	(0.115)	(0.141)
Left		0.106	0.390+	0.772**
		(0.355)	(0.230)	(0.261)
Right		−0.374	0.489	0.457
		(0.537)	(0.298)	(0.383)
Num.Ind.	1,808			
Num.Obs.	14,464			
Adj. rho2	0.313			
BIC	22,249			
LL	-10,852			

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table A-3: Latent Class model (without variables explaining class membership)

	Class 1	Class 2	Class 3	Class 4
Mean prob	0.3520	0.1574	0.2683	0.2224
Alt. B	1.606***	0.867***	−2.544***	0.170
	(0.183)	(0.238)	(0.351)	(0.143)
Alt. C	1.445***	0.748**	−2.886***	−0.396*
	(0.193)	(0.246)	(0.392)	(0.188)
BW.25	0.699***	0.624***	−0.194	0.153+
	(0.063)	(0.155)	(0.228)	(0.088)
BW.50	0.686***	0.771***	−0.406	0.008
	(0.073)	(0.165)	(0.256)	(0.104)
Euro.Army	0.656***	0.788***	−0.012	−0.036
	(0.064)	(0.207)	(0.272)	(0.088)
Mil.Service	0.421***	0.139	−0.519+	−0.822**
	(0.080)	(0.542)	(0.283)	(0.266)
Air.Ger	0.842***	0.917***	0.076	0.594***
	(0.069)	(0.157)	(0.271)	(0.112)
Air.Eur	0.982***	1.086***	0.472+	0.395***
	(0.072)	(0.170)	(0.258)	(0.110)
Tax	−0.303***	−2.541***	−0.881**	−0.230**
	(0.040)	(0.223)	(0.270)	(0.075)
Const.		−0.805***	−0.271**	−0.459**
		(0.136)	(0.099)	(0.141)
Num.Ind.	1,808			
Num.Obs.	14,464			
Adj. rho2	0.31			
BIC	22,231			
LL	-10,929			

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

A.3 preferences for defense policy options (comparison model)

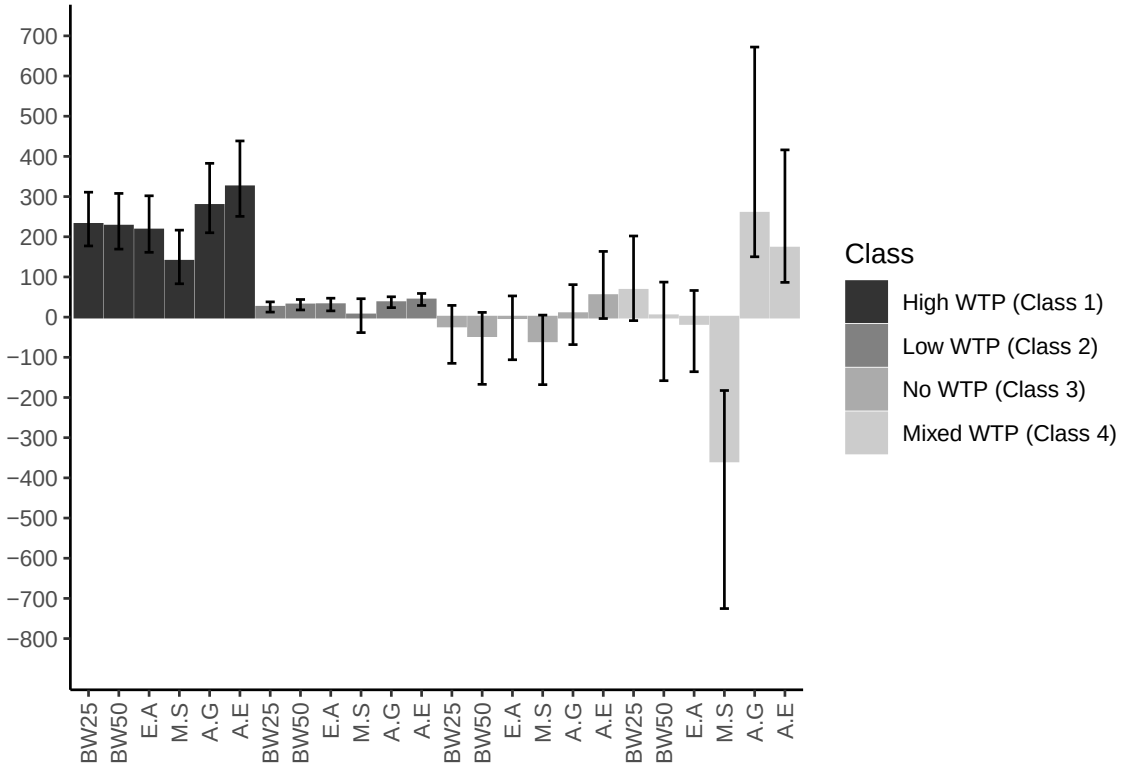

Figure A-1: WTP estimates (comparison model)

Note: The figure presents class-specific WTP estimates for the choice attributes (BW25: increase troop size by 25 percent; BW50: increase troop size by 50 percent; E.A.: European army; M.S,: Reintroducion of military service; A.G.: Air defense for Germany; A.E.: Air defense for Europe

A.4 Relationship Germany and Russia

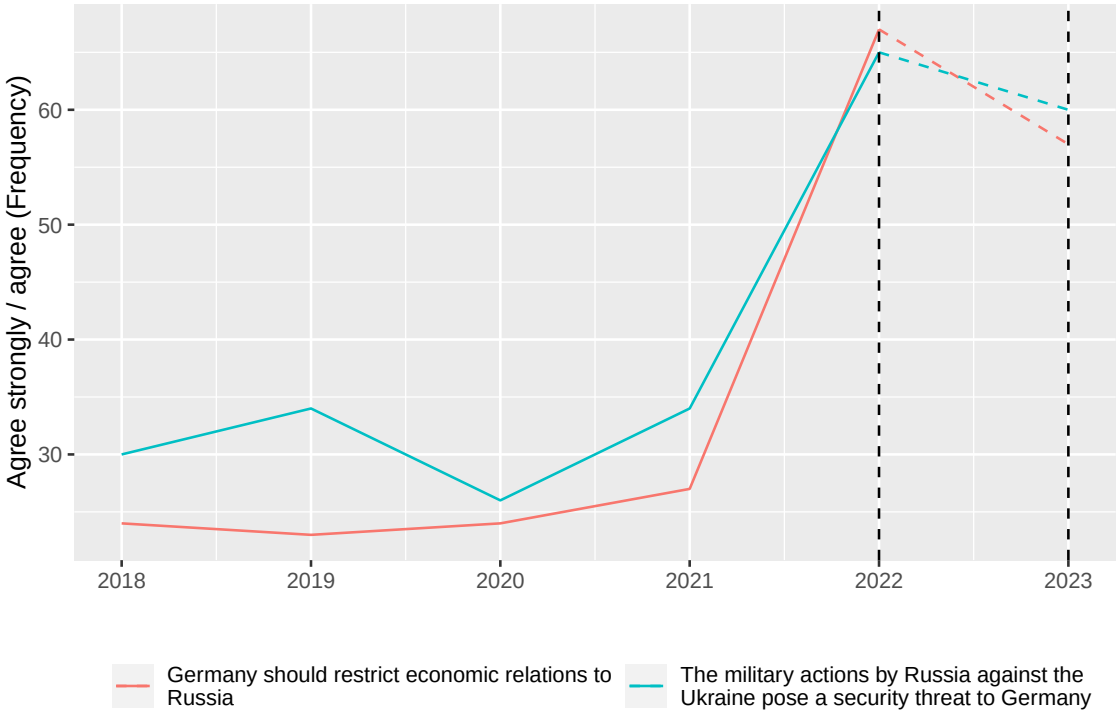

Figure A-2: Relationship Germany and Russia

Note: To investigate into respondents attitudes about the relationship between Germany and Russia we asked two questions which were also used in previous studies by Graf (2022). In this figure we combine the data. The data for the years 2018 - 2022 are by Graf (2022), p. 3 who conducted his 2022 survey in June/July. We conducted our survey in January/February 2023. In sum, the figure suggests temporal stability concerning the relationship between Germany and Russia.