

## THE PERCEPTION OF GEOGRAPHY AMONG THE GERMAN POPULATION FINDINGS OF A REPRESENTATIVE SURVEY

PAUL GANS, INGRID HEMMER, MICHAEL HEMMER and KIM MIENER

With 3 figures and 4 tables

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**Summary:** Presented here is a representative study of the German population which collected information on the perception of geography as a school subject, as a science, and on the job market. The theoretical basis utilised for this purpose is a two-dimensional attitude research approach which comprises cognitive and affective aspects. The measuring instrument was theory-based and developed by a team of geographers. According to the findings of the study, the perception of geography - both that of the school subject as well as the science - can be classified as highly positive. Geography lessons are seen as a subject which promotes spatial orientation, but also as a subject dealing with human-environment relationships. The science geography is understood above all as the science of the relationship between humans and their environment. However, both in schools and in science, geography is more strongly linked to physical geography topics and topics that deals with human-environmental relationships than with human geography topics. Respondents see jobs for geographers as being mainly in two areas: environmental planning/risks/protection and urban/regional planning. The findings of the study support the proposition that the perception of geography is influenced relatively strongly by how geography is taught. Contact to geographers also has a significant influence on perception. The article concludes with a discussion of the most important results and an outlook on further research.

**Zusammenfassung:** Vorgestellt wird eine repräsentative Studie der deutschen Bevölkerung, welche die Images der Geographie als Schulfach, als Wissenschaft und auf dem Arbeitsmarkt erfasst. Als theoretische Grundlage wird ein zweidimensionaler Ansatz der Einstellungsforschung zugrunde gelegt, der kognitive und affektive Aspekte umfasst. Das Messinstrument wurde theoriegeleitet von einem Team von Geographinnen und Geographen entwickelt. Das Image der Geographie, sowohl des Schulfachs als auch der Wissenschaft, ist den Ergebnissen der Studie zufolge als recht positiv einzustufen. Geographieunterricht wird dabei als Fach zur Förderung der räumlichen Orientierung wahrgenommen, aber auch als Mensch-Umwelt-Fach. Die Wissenschaft Geographie wird vor allem als Mensch-Umwelt-Wissenschaft aufgefasst. Dabei wird die Geographie in Schule wie in Wissenschaft stärker mit physiogeographischen Themen als mit humangeographischen Themen verbunden. Einen Arbeitsmarkt für Geographinnen und Geographen sehen die Befragten vor allem in zwei Bereichen: Umweltplanung/Umweltrisiken/Umweltschutz sowie Stadt- und Regionalplanung. Die Ergebnisse der Studie unterstützen die These, dass das Image der Geographie relativ stark vom Geographieunterricht beeinflusst wird. Kontakte zu Geographinnen und Geographen haben ebenfalls einen deutlichen Einfluss auf die Images. Der Beitrag schließt mit einer Diskussion der wichtigsten Ergebnisse und einem Ausblick auf weitere Forschungen.

**Keywords:** attitude, image, perception, general geography, science, geography teaching, occupational fields

### 1 Introduction

In subject policy discussions that take place in the German-speaking countries, geographers repeatedly bemoan the fact that the general public has a vague and often even negative perception of geography as a science and as a school subject (e.g. BLÜMEL 2003). The basis for such impressions are numerous reports and opinions published in the press, from parents, or from politicians. However, such data is neither representative nor does it lie on empirical grounds.

Although there have been repeated attempts in the past to investigate attitudes towards geography as a school subject (e.g. KÖCK 1997), as a science and/or university subject (e.g. HARD and WENZEL 1979), or on the job market (e.g. MONHEIM et al. 1999), and such studies paint a mostly positive picture of geography, these investigations are generally rather old, focused only on a small, non-representative sample of the population (e.g. university students or school pupils), and always concentrated only on partial aspects, and not on geography as a whole.

Geography's image and third-party perception is an important factor not only for the public perception and dissemination of its scientific findings but also for the status of the school subject and the employability of graduates majoring or minoring in Geography.

The study presented in this article attempts to fill this gap. With a current, representative survey of the German population, its goal is to capture the perception of geography as a science, as a school subject, and on the job market. In addition, it aims to gain an overview of possible influencing factors. The division along the three above-mentioned areas is necessary because it would be reasonable to assume that these three domains are perceived differently; i.e. that there is not just *one* way in which geography is perceived.

This paper starts by introducing the general theoretical framework and the research questions (Chapter 2), proceeds to a brief description of the research design, sample, and instruments (Chapter 3), and concludes by describing selected results (Chapter 4), discussing these in light of the theoretical framework, formulating general conclusions (Chapter 5) and ends with reflection and outlook (Chapter 6).

## 2 Theoretical principles

The two key concepts this study rests on are perception and geography. As a result, we will start by defining and operationalising both concepts. Subsequently, a general overview of research on geography's perception along the lines of its roles as science, school subject, and occupational field will follow.

### 2.1 Perception

Serving as the theoretical basis of this study is an approach based on social psychological concepts from attitude research. These concepts define attitudes as a subject-related and more or less conscious system of dispositions that remain relatively stable over time, and which are easy to capture methodologically. This investigation is based on the two-dimensional attitude module by TROMMSDORFF and TEICHERT (2011, 127ff), in which the cognitive and affective dimensions constitute the scaffolding for attitude formation. Attitudes and the term 'perception', which is frequently used synonymously, are hence viewed as a link between affective motifs and

cognitive subject matter judgements of a person, an object, or a topic (cf. KROEBER-RIEL and GRÖPPEL-KLEIN 2013). The perception described here is also called a foreign perception, which is distinguished from a self-perception (e.g. perception geographers have of geography as a school subject; HEMMER et al. 2015a). The term 'perception' is mostly used on the international level. Occasionally the term 'image' is used, too. Both terms are regarded as synonymous here.

### 2.2 Geography

The dichotomy between physical geography and human geography is common in research and teaching, and is deliberated internationally. In the German-speaking world, the 'three-pillar model' (WEICHHART 2003) is widely recognised, which sees 'society-environment research' as an independent third pillar that occupies a central position between physical geography and human geography (GEBHARDT et al. 2011). Because pressing societal problems mainly come from the field of human-environment interactions, which also constitute the central thematic scope of geography as a subject taught in schools, the three-pillar model offers a basis for the operationalisation of the object of the attitude and the accompanying theory-based conception of a measurement instrument to determine the foreign perception. The national education standards for geography as a school subject in Germany (cf. GGS 2014) visualise the three-pillar model as a cube (cf. Fig. 1). With this concept, the German standards are in accordance with the international understanding of the school subject (International Geographical Union/Commission on Geographical Education, IGU/CGE 2016).

### 2.3 Latest Research Development

#### 2.3.1 About the perception of geography as a science

A number of studies reflected on the importance and image of geography in different national settings. Along these lines, SENGENDO (1997) explored the role of the discipline in the public domain in Uganda, while SINGH (2009) analysed people's perspectives on identity and image of the Indian geography. Back in the seventies,

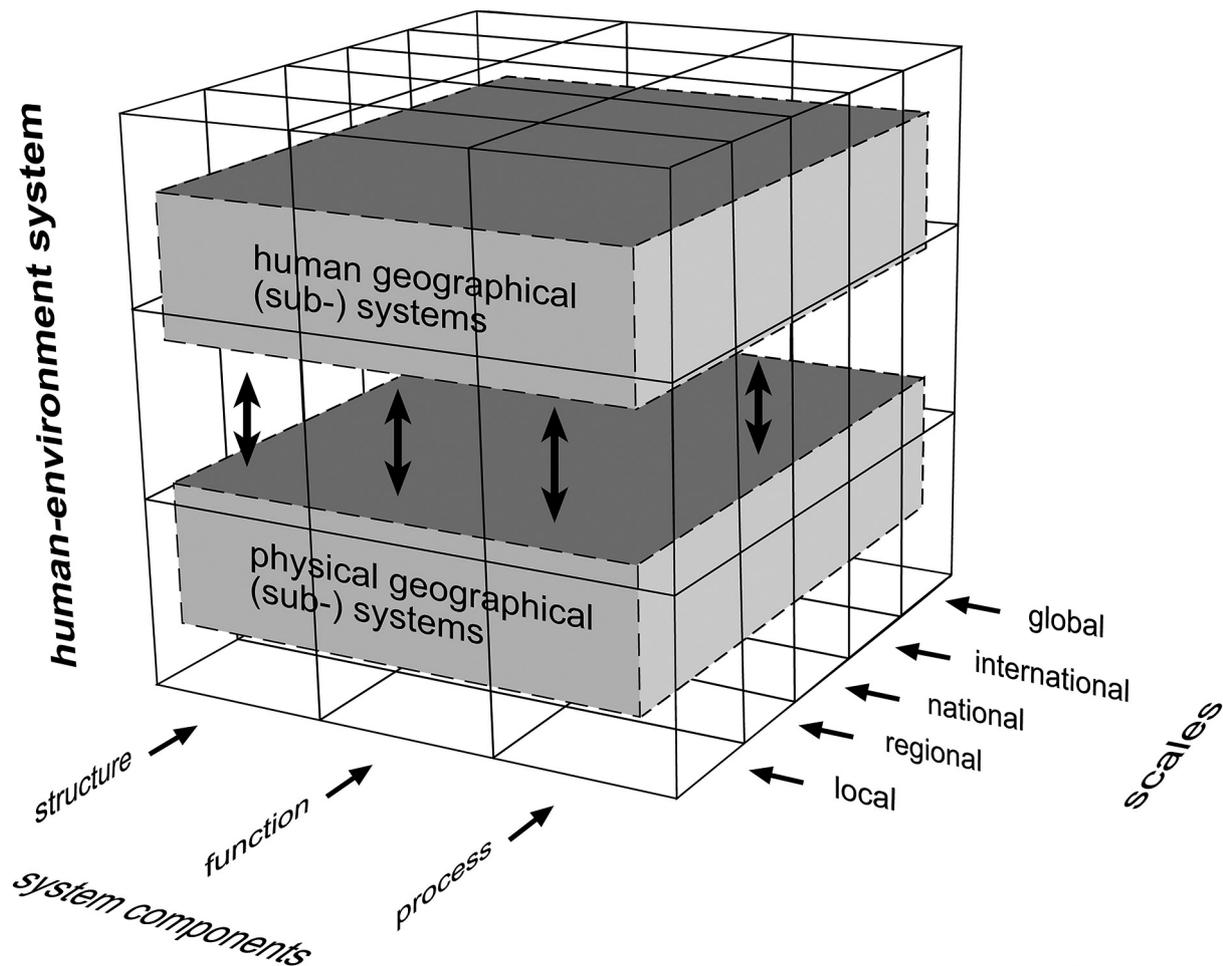


Diagram: Claudia Pietsch

Fig. 1: Basic concepts of the analysis of spatial relationships for geography as a subject. Source: GGS 2014, 11.

PETERSEN and HOFFMANN (1972) conducted a small study among the members of the Association of American Geographers (AAG) which underlined the necessity of an evaluation of their own discipline. In the German-speaking world, HARD and WENZEL (1979) utilised the methodological development of social psychology and applied measuring instruments from attitude research to the investigation of self- and foreign perceptions of geography. A comparison of the two different foreign perceptions collected demonstrated that the assumed perception of those studying geography was estimated as being significantly more negative than students of other subjects actually had of geography. Later studies confirmed this basic trend (GASSLER and RAMMLER 1991; KLEE and PIOTROWSKY-FICHTNER 2003). One important influencing factor of how geography is perceived as a science was found to

be the subjectively experienced teaching of the subject during the students' school years (GASSLER and RAMMLER 1991).

As part of a quantitative empirical study based on the three-dimensional attitude approach by ROSENBERG and HOVLAND (1960), CALÉ and HEMMER (1991, 1992) determined that pupils in the sixth form equated science with the natural sciences, and that geography was indeed viewed as a science.

While most of these studies offer first insights into aspects concerning geography's image, they work with rather heterogeneous concepts of image (c.f. ADICK 2016), rely on different samples and use differing instruments. As a result, none of these studies offers a representative overview of geography's image among a larger population group or even the entire population of a country.

### 2.3.2 About the perception of geography as a school subject

Two trends currently define the research of the perception of geography as a school subject. The first trend involves the development of attitude theory models in the 1960s and 1970s, and makes available the theoretical and conceptional approaches for researching the opinions of pupils on geography as a school subject. Several studies exist on this topic, of which the one by BACHMAIR (1969) is particularly deserving of mention. For the first time, it made it possible to use the approach from three-dimensional attitude research according to ROSENBERG and HOVLAND (1960) with cognitive, affective, and conative dimensions for making the composition of perceptions more tangible scientifically. The central results of the analysis are, on the one hand, the recognisable influence of gender on the subject-related evaluation, and, on the other hand, the dependency of the subject-related evaluation on how the teachers of the subject are perceived (BACHMAIR 1969). In comparison to mathematics, English, German, physical education and music, the results for geography as a subject, which placed fifth, were rather sobering.

Using selected characteristic dimensions, KÖCK (1997) surveyed 266 top representatives from the fields of politics, economics, workers' unions, education, and the sciences on the perception of geography education among the general public. Respondents felt that the subject had a very high importance for daily life and for solving global challenges, and around 70 percent were convinced that geography is a key subject for environmental education. Furthermore, it was shown that geography scored well among content subjects, and respondents were agreeable with 2.20 hours of lessons per week. Only one-third preferred integrative lessons in a subject combination over independent geography lessons. The content of the lessons should be focused on general geography, and include content from the natural and social sciences in equal parts, it was found. The importance of topography was slightly below average.

MIENER (2016) surveyed just under 2,000 pupils in lower secondary education (Sekundarstufe I, pupils aged 10-16) at schools with independent geography lessons on their perception of the subject. They had a positive view of geography. Specifically, the importance of the subject and its contribution to spatial orientation competency were most highly valued, while the motivational component, the level of difficulty, and the scientific nature of the subject tended to receive a low rating. Among pupils, the

perception of the subject is influenced above all by their general interest in geography as well as the pedagogical and methodological structuring of the lessons by teaching staff and their personality characteristics. For one, the perception of a subject depends directly on lesson-related interventions, and for another, on factors intrinsic to the subject as well as external factors.

One other research methodology trend, enriched by the approaches of qualitative research, analyses the scholastic perception of geography and its causes using a two-step process consisting of quantitative methods and follow-up interviews that are both partially and fully standardised (ADEY and BIDDULPH 2001, 2003; NORMAN and HARRISON 2004; McCRONE et al. 2005). Interviewed here were pupils aged approximately 14 to 16 years. Content-wise, these studies concerned themselves with the prevailing perception based on lessons experienced so far, as well as the desired perception based on lessons expected in the future. Dimensions considered for this purpose included the value of the subject for dealing with day-to-day tasks, the difficulty of the content, as well as the motivation for the subject and the related topics and working methods. These studies were insightful because they showed that the actual perception differed significantly from the expected perception. In particular, the expected utility of the subject was seen as rather high, and associated with a level of difficulty comparable to that of mathematics (ADEY and BIDDULPH 2003).

There is considerably more research on the image of the school subject geography. However, most studies relied on questionnaire surveys carried out with pupils. Comparing these studies represents a rather challenging ambition. In contrast, there are no representative studies that explore the image of the school subject geography among the adult population.

### 2.3.3 About the perception of geography as an occupational field

The analysis and research of the occupational field of geographers is a rather young research topic. There exist only isolated studies which refer specifically to the discipline of geography (e.g. HILLMANN 2006; LANGHAGEN-ROHRBACH and BRAUNER 2006). In a study encompassing several universities and federal states in Germany, BERAN et al. (2012) investigated the job prospects of geography graduates at ten locations. Data was collected on information regard-

ing the thematic focus of the degree, the duration of the degree course, practical and abroad experiences as part of the course of the study, the length of time between graduation and starting a new job, as well as their current activities, the skills expected according to their profiles, their personal financial situation, and their satisfaction with the degree they obtained in retrospect - in the context of their current point of view. However, according to the graduates, it is not the subject-specific know-how and skills which are decisive for professional success, but instead general competencies, in particular the ability to think and work in an interdisciplinary fashion, followed by the ability to work in a team and being well-read (BERAN et al. 2012, 69). Overall, job prospects for geographers are seen in a positive light according to this study, with the caveat that no specific occupational field can be named here in which graduates could be employed. Instead, there is a very wide range of possible occupations ranging from consulting to teaching and research at universities and schools, through to market research.

The analyses named so far primarily represent how geographers view 'their own' occupational field. However, in a quantitative study carried out in 1999 by geographers at the University of Trier, it was mainly decision-makers from the world of business both with and without any contact to geography in Germany who were surveyed (KLEMMER et al. 2000). In addition to the quantitative study, sixty qualitative expert interviews were carried out in order to ascertain the 'relationship between the science and real-world practice in spatial planning' as well as to analyse the self- and foreign perception of geographers in spatial planning (MONHEIM et al. 1999). For the first time, the foreign perception of the occupational field 'geography' was analysed in-depth. Hence, the perception of geography is estimated to be worse by the specialist public, i.e. geographers, than by representatives of other disciplines. According to the findings of the study, the perception of geography is vague due to the breadth of its scope; it is frequently confused with geology, cartography and topography, and geography as a science is equated to school geography (MONHEIM et al. 1999, 47).

A very detailed analysis of the US job market for geographers and the competencies expected of them is given by SOLEM et al. (2008). In this investigation, 29 general and 20 geography-specific competencies were examined. Respondents were categorised as 'university', 'public sector', 'private sector', and 'non-profit companies'. According to this study, the three most important specialist competencies

which geographers require on the job market are 'spatial thinking' (73 %), 'interdisciplinary perspective' (64 %), and 'geographical information systems' (58 %) (SOLEM et al. 2008, 367).

Regarding both their methodology and content, previous studies on the perception of geography as an occupational field are heterogeneous.

Summing up, the two-dimensional attitude model by TROMMSDORFF and TEICHERT (2011) qualifies best to grasp the concept of image underlying this study. Regarding the specific understanding of geography, the authors followed the three-pillar operationalisation of geography. As previous studies only offered insights into the image of selected population groups without claiming representativeness, based on a representative sample of the German population, this study explores the following five questions:

- Which are the spontaneous associations with geography?
- What are the images of the German population regarding the scientific discipline of geography?
- What are the images connected to geography as a school subject?
- What are the images of geography as an occupational field?
- Which factors influence geography's image?

### 3 Methodology

#### 3.1 Design and sample

The study on the perception of geography among the population is a quantitative and empirical cross-sectional investigation with explorative character, and part of a larger investigation on the perception of geography, which utilised separate questionnaires to determine the perception of geography as a science both among media representatives as well as on the job market and in the professional world among human resources managers (cf. GANS and HEMMER 2015). It was commissioned by the Deutsche Gesellschaft für Geographie, an umbrella organisation for all German-speaking geographical specialist associations, and carried out in summer 2013 with support from the market research institute Forschungswerk Nürnberg in the form of telephone interviews (capi to web).

In order to obtain representative statements on the foreign perception of geography among the public, a random sample ( $n = 801$ ) of the legal adults in Germany was chosen (at least 18 years of age). The

distribution of the respondents in the sample corresponded to the distribution of the overall population in the various federal states. 46 percent of those surveyed were men, 54 percent women. For the property 'age of respondents', persons aged 18 to below 30 were under-represented in comparison to the overall population in Germany. The percentage of parents of school-age children was 25.6 percent ( $n = 205$ ), of which 45.9 percent received independent geography lessons and 25.9 percent geography lessons combined with another subject. Furthermore, over a quarter of respondents (28.2 percent) personally knew a geographer. The questionnaire for the population focused above all on schools, but also included a number of items on geography as a science and as an occupational field.

### 3.2 The measuring instrument

The measuring instrument for the population survey consists of a questionnaire (cf. GANS and HEMMER 2015, 107–117), which was developed in a model-based manner by a team consisting of representatives of specialist geographical associations and the Forschungswerk. Due to technical requirements (survey time, costs), it was necessary for the content of the questionnaire to have a particular focus. Hence, the questionnaire for the population has an emphasis on geography as a school subject, but also includes two scales on geography as a science and as an occupational field.

The scales were designed based on the principles of the three-pillar model of geography and the national geographical educational standards (cf. Chapter 1, Fig. 1). According to the two-dimensional attitude construct (cf. Chapter 1) the study is based on, an attempt was made to collect data on both the cognitive dimension (e.g. existing knowledge about geography) as well as the affective dimension (e.g. emotional attitudes towards geography). There was an intentional alternation between open and closed questions. For one, this was to obtain replies that were as uninfluenced as possible, and for another, statements that were as specific as possible. For necessary Likert-like reply scales which are common in attitude measurements and which allow the use of parametric methods due to their postulated distance metrics, the degree of agreement with a statement was generally stated as 1 = 'Fully agree' to 5 = 'Completely disagree'. In the case of predetermined reply options, their sequence was modified in a rotating manner from respondent to respondent.

The questionnaire comprises four subject groups (c.f. HEMMER et al. 2015b, 32). In the first subject group, the respondents were prompted to name their spontaneous associations with the keyword 'geography' (question 1). The goal of this was to determine their direct and uninfluenced attitude towards the subject of the survey. Subject group 2, which focuses on the importance of geography as a school subject and constitutes the largest section of the questionnaire, consists of seven question groups and the corresponding sub-scales. Question 2 includes a scale which asks about the importance of covering twelve different types of content in geography lessons. This content consists of core topics of geography lessons, which were obtained from the three-pillar model and the national educational standards (cf. Chapter 1). Question 3 allows respondents to assess the importance of geography as a school subject via eleven statements. The statements used were mostly about the educational contribution of the subject (cf. GGS 2014, 5-7) and combine both cognitive and affective elements (cf. Chapter 1); only two elements were purely affective statements with value judgements ('Geography is an important school subject' and 'Geography is an interesting school subject'; both originating from previous studies, cf. Chapter 1). In question 4, respondents were expected to assess how comprehensively individual competencies were promoted in geography lessons. The eleven skills listed were derived from the competency model of the educational standards for geography as a subject (GGS 2014, 9). Because the perception of a school subject not only results from its content and competencies as well as its perceived educational contribution, but also how its importance is judged in comparison with other subjects, question 5 provides respondents with the opportunity to assess the relevance of geography as a school subject in comparison with six natural and social science subjects (cf. Chapter 1). Question 6 takes a similar tack, in which the desired scope of geography lessons is determined. The attitude towards the organisation of the school subject (question 7) - independently or as part of a subject combination with natural and/or social sciences - was included, on the one hand, due to reasons of subject policy, and, on the other, to allow a comparison with the findings obtained by KÖCK (1997). Question 8 gives respondents the opportunity to make suggestions as to how the perception of geography as a school subject can be improved. It is precisely via this open question that additional aspects of the public's perception of geography can be broached which were not touched upon by the previous, primarily closed questions.

Subject group 3 is concerned with ‘Geography as a science’. For this purpose, eleven geographical fields of research were listed which were derived from the three-pillar model (cf. Chapter 1). They were read out by the interviewer in a rotating sequence, and the respondents had to judge if a particular research field was very important (1) or not important (5) for the discipline of geography. Question 10 prompts respondents to evaluate eight statements on geography as a science. In this case, the first four involved mainly a cognitive description and classification of the nature science, while statements 5 to 8 were concerned with an assessment of the societal significance of geography as a social science.

With the help of an open question, subject group 4 aimed to find out what job prospects geographers had in the respondents’ opinion. The replies were assigned to categories of occupational fields by the interviewers.

Furthermore, four independent variables were also queried which, due to the state of research, could be expected to have an influence on the formation of perception (age, gender, educational qualifications), and/or which could plausibly be expected to lead to different attitudes (school-age children). In accordance with the contact hypothesis (PETTIGREW and TROPP 2006), it is assumed that as the fifth independent variable, contact to geographers could contribute to a more positive image. Having studied geography could also significantly influence perception. Unfortunately, only nine of the 801 respondents had studied geography at the university level, such that this factor was not investigated in greater detail.

## 4 Findings

Results follow the main research questions formulated at the end of Chapter 2. Responses connected to the factors influencing image (question 5) are be presented in separate sub-chapters.

### 4.1 Associations with geography

The basis for determining the associations were the replies of the population to the first question (cf. Chap. 3), which attempted to elicit a link between individual thoughts and feelings related to the term provided (‘geography’) that was as spontaneous and undirected as possible. With up to 17 responses per person, the 801 respondents provided a total of 3,237 replies. 20 persons or 2.5 percent of

all respondents did not provide any responses at all, while eleven other persons did not know what to answer. Despite the open approach, the first response of the respondents demonstrated a significant concentration on just a few associations. The four most frequently specified responses were ‘countries’, ‘geography’, ‘maps, country maps, world map’ and ‘school, lessons’. At 36.6 percent, they constituted over one-third of all the first responses given, and affirm the importance of geography for imparting topography and orientation systems, including the media and educational institutions necessary for this purpose. The associations with geography are similar for both genders. Women are more likely to link geography with ‘school, lessons’, ‘countries’, ‘travel, travelling’, while men were more likely to associate it with ‘maps, country maps, world maps’.

As the number of responses given by a person increases, the terms that are strongly associated with spatial knowledge start to lose their overwhelming dominance. Instead, more specific geographical content was mentioned more frequently (e.g. ‘mountain chains, mountains’ or ‘cities, city’), and new concepts such as climate change, land use, or natural phenomena were also added. The numerous responses, which were often only listed once, made it difficult to conduct more detailed investigations or a comparative analysis with their many possible interpretations. Hence, ten categories were defined according to which the terms named were classified (GANS 2015, 39).

In table 1, the highly significant difference between the distributions of the first response to all responses is striking ( $\chi^2=354$ ;  $p=0.000$ ). For the first response, the two categories ‘Spatial terms, general’ and ‘Teaching, education, qualifications’ alone accounted for half of all responses, while the corresponding percentage fell to 28.5 percent when all responses by survey participants were considered (cf. Tab. 1). At the same time, the change in the sums of the percentages of the phenomena named in the physical and anthropogenic environment is almost a mirror image: They increase from 12.2 to 37.8 percent. The extent of the differences between the first response and all responses are comparable for men and women, but the distribution according to gender differs significantly in each case.

Overall, the distribution of the associations across the ten defined categories paints a picture of geography which appears to be defined among the population by geography as a school subject and its imparting of spatial knowledge and methods for orientation. The significance of these perceptions is

**Tab. 1: Categorised associations of the population (n = 801) with geography**

Associations categorised	Responses (in %)					
	First response	Gender		All responses	Gender	
		Male	Female		Male	Female
Spatial terms, general	27.7	27.9	27.5	19.1	19.2	19.1
Spatial terms, specific	3.8	4.7	3.1	5.9	6.8	5.1
Physical environmental phenomena	8.2	7.5	8.8	26.7	25.9	27.3
Anthropogenic environmental phenomena	4.0	4.2	3.8	11.1	10.2	11.9
Processes, phenomena, crises, hazards	4.0	5.6	2.6	6.2	7.0	5.6
Media and methods of orientation	16.4	18.1	14.9	11.1	12.2	10.3
Teaching, education, qualifications	22.5	18.9	25.6	9.4	8.1	10.4
Travel	6.5	4.5	8.3	4.5	3.9	4.9
Science, sub-disciplines, researchers	4.1	5.0	3.3	4.3	5.0	3.7
Other	2.8	3.6	2.1	1.7	1.7	1.7
Number of responses	781	359	422	3,220	1,448	1,772

Source: GANS 2015, 40

independent of age and also mostly independent of the educational levels of the respondents. In addition, responses which also categorise geography as a science increase in dominance when respondents have contact with geographers.

#### 4.2 The perception of geography as a school subject

In order to determine the importance, the population ascribes to geography as a school subject, eleven statements based on the educational standards (GGS<sup>3</sup>2014, 5-7) were read out to the respondents in rotating sequence, who were instructed to submit their evaluation of them using a five-level Likert-like scale (cf. Tab. 2). Overall, respondents assigned a high relevance to geography as a school subject, with the highest level of agreement for the statement 'As a school subject, geography contributes significantly to general knowledge', followed by the statements that geography is an important or interesting school subject. On the other hand, respondents agreed least with the statement that the subject contributes to the shaping of values. A breakdown of the scale into two factors using factor analysis shows that the population views the importance of the school subject for each individual as being significantly higher than its social importance.

If we also look at the relative percentages of the responses that are in agreement, ten of the eleven items receive a corresponding reply from more than 50 percent of respondents. Furthermore, if

we examine the statements whose percentages are higher in the first reply category ('Fully agree') than in the second ('Agree'), it becomes clear that geography is seen as a school subject that contributes significantly to general knowledge, is important and interesting, and also helps to better understand spatial phenomena and to orientate oneself spatially - findings that are corroborated by other studies (e.g. HEILIG 1984; KÖCK 1997; HEMMER and HEMMER 2010).

If the respondents are distinguished by their age (younger than or at least 51 years of age), the three items 09 to 11 (cf. Tab. 2) show a highly significant difference ( $p=0.000$ ) favouring the younger respondents, who assign the corresponding content a higher relevance for geography as a school subject than older respondents. This can probably be explained by the restructuring of the content of geography lessons around 1969/70, in which a paradigm shift from regional geography to general geography took place on the German Congress of Geography in Kiel in 1969. However, viewing this change in a critical manner (cf. KORF 2014) seems to be of core importance for the interpretation of results.

In order to find out how well individual competencies are promoted in geography lessons from the viewpoint of the population, eleven skills were read out to respondents in a rotating sequence. The population is of the opinion that competencies in the areas of spatial orientation, the understanding of natural phenomena, and the development of spaces are well-fostered in geography lessons (cf. Tab. 3). Support for the ability to understand interactional relationships between humans and the environment is seen

**Tab. 2: Relevance of geography as a school subject among the population (n = 801) - arrangement of the questionnaire items according to the degree of agreement.**

Rank	Item no.	Item phrasing As a school subject, geography...	$\bar{x}$	s
1	02	contributes significantly to general knowledge.	1.56	0.779
2	07	is an important school subject.	1.71	0.778
3	08	is an interesting school subject.	1.82	0.917
4	06	helps me to better understand spatial phenomena, e.g. earthquakes or land use conflicts.	1.89	0.937
5	05	helps me to better orientate myself spatially.	2.04	1.104
6	03	helps us understand the relationships between humans and the environment.	2.08	0.959
7	01	points out key problems on our planet.	2.14	1.014
8	04	imparts to me knowledge and skills that are useful in daily life.	2.23	1.003
9	10	promotes environmental conservation.	2.41	1.124
10	11	contributes to political education.	2.49	1.123
11	09	helps to create core values for living in a globalised society.	2.61	1.065

Source: HEMMER et al. 2015c, 50

**Tab. 3: Competencies which, in the opinion of the population (n = 801), are fostered by geography as a school subject - items are ordered according to the degree of agreement**

Rank	Item no.	Item phrasing	$\bar{x}$	s
1	06	Ability to become acquainted with the names of important countries, cities, rivers, and mountains, and to describe their location.	2.29	1.07
2	01	Ability to describe the earth as a planet.	2.35	1.01
3	07	Ability to evaluate various maps from an atlas or the newspaper.	2.45	1.07
4	05	Ability to investigate regions such as Germany and Europe in light of certain issues.	2.48	1.05
5	02	Ability to explain natural, i.e. environmental processes such as the formation of mountains and weather phenomena.	2.54	1.07
6	10	Ability to assess spatial phenomena such as floods and urban development or problems according to certain criteria (e.g. advantages and disadvantages for the economy and the environment).	2.67	1.03
7	04	Ability to describe and explain interrelationships between humans and nature and/or the environment (e.g. natural disasters and environmental impact).	2.69	0.96
8	03	Ability to explain societal processes such as urbanisation and globalisation.	2.72	1.03
9	09	Ability to communicate using specialist geographical terms.	2.86	1.05
10	11	Ability to act in an environmentally and socially responsible manner.	2.89	1.05
11	08	Ability to apply important geographical methods in order to e.g. map land use or analyse soil samples, in school or outside in the field.	3.33	1.27

Source: HEMMER et al. 2015c, 54

as sufficient. According to the population, the least-fostered competency is that of applying geographical working methods in class or on site in the field.

Neither the gender nor the highest educational qualifications of the respondents had a bearing on their response behaviour. Respondents with school-age children gave the fostering of topographical knowledge and map evaluation competency a significantly more positive rating than respondents without school-age children. Clearly, parents are aware of the necessity for promoting these competencies in geography lessons.

According to the population, relevant subject areas for geography lessons include, above all, 'environmental problems', followed by physical geography content, regional geography, and spatial orientation. Content from the field of human geography was viewed to be less important in comparison.

No clear picture could be obtained with regard to the preferred manner in which the subject should be taught. While a small majority was in favour of teaching it as an independent subject (52.9%), a total of 46.5 percent of respondents voted for a subject combination approach, of which in turn 27.8 percent voted for it to be taught in combination with social science subjects. The current number of lesson hours is viewed by the majority as being adequate (50.6%) or even insufficient (41.7%). Compared to other natural and/or social science subjects, the clear majority of the population rated geography lessons as being of equal value.

As for recommendations for the potential optimisation of geography lessons, respondents recommended the inclusion of more current topics, as well as topics that would be relevant in the future, which they mainly saw as being in the subject areas 'environment' and 'natural disasters'. Furthermore, in their opinion, clearer, more understandable lessons and excursions could help increase the attractiveness of the subject among the general public.

### 4.3 The perception of geography as a science

Eleven predetermined items were read out by interviewers in a rotating sequence. The question on research topics in geography was: 'To what extent do you believe that geographers deal with these topics when performing research?' (1 = 'Very important', 5 = 'Not at all'). The highest agreement values indicated that the discipline of geography is seen mainly as a natural science and/or as a human-environment science: on average, natural hazards, climate

research, environmental processes, and natural disasters received a high agreement value of less than 2 (cf. Fig. 2). Apart from that, the core content of human geography (developing countries, population, cities, the economy, traffic) is located at the bottom end. However, it should generally be remarked that, without exception, all subject content was recognised as being a very important or important topic (agreement 1 or 2) for the discipline of geography at least 50 percent of the time.

In order to further classify the eleven topics, a main component analysis without rotation was calculated. Three factors with an intrinsic value greater than 1 account for 56 percent of the variance. They refer to the three overarching subject areas 'Georisks and the environment', 'Countries and regions', and 'Society and the economy'. The respective mean values show that the subject area 'Georisks and the environment' (mean: 1.78) is seen as being more significant than the subject areas 'Countries and regions' (mean: 1.94) and 'Society and the economy' (mean: 2.34).

At least half of the respondents agreed with six out of eight statements that geography should be categorised as a science where its content is concerned (cf. Fig. 3). In the case of 'Geography helps to answer key questions on our planet', agreement reached more than 75 percent, and for 'Geography provides crucial insight for life in a society', it is just under 50 percent. Problem-solving competency met with agreement both at a global and a national level. Geography is clearly seen as a bridge between the natural and social sciences, and helps 'to better understand the complex relationships between humans and their environment'.

An interesting picture was painted by the analysis of whether the evaluation of the statements on geography as a science as well as the assessment of its research topics in the representative survey of the general public was related to other variables for which data was collected. Using  $\chi^2$  tests, HECKMANN and HORN (2015, 67-69) show that geography as a science deals with societal challenges, pursues globally relevant issues, works in an application-oriented manner, and is more appropriately categorised as a natural science. In research, geography is mainly concerned with topics involving the climate, the environment and sustainability, but also with populations, cities, the economy, and traffic.

In summary, it can be said that, as before, 'nobody has a bad opinion of geography as a science' (HARD and WENZEL 1979). People are highly or very highly confident that geography is able to find solu-

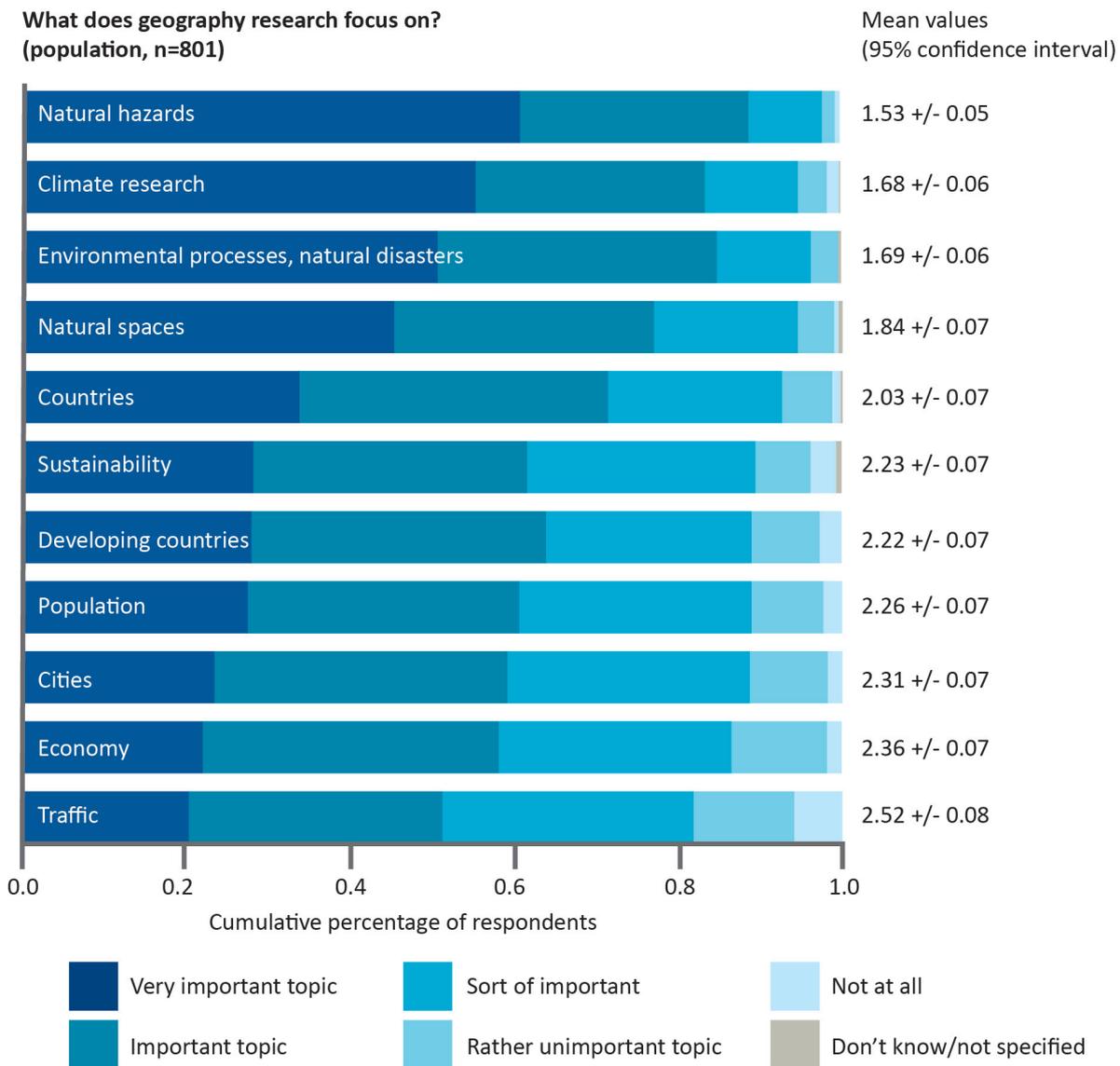


Fig. 2: Assessment of research topics in geography. Source: HECKMANN and HORN 2015, 65

tions for specific problems in Germany (e.g. environmental protection and traffic planning), to answer key questions on our planet (e.g. on the consequences of climate change), and to understand complex relationships between humans and their environment.

#### 4.4 About the perception of geography as an occupational field

In response to the question “What do you think the job prospects are for a geography graduate who does not work as a teacher in a school or remains in

academia at a university or in research?”, respondents were able to answer freely. The open replies were classified by the interviewers according to categories defined in advance in order to facilitate the evaluation. In order to more rapidly arrive at responses that did not include the two occupational fields ‘school’ and ‘university’, they were excluded by the question at the very start. A relatively high number of responses (cf. Tab. 4) referenced occupational fields that can be classified into two categories: ‘Environmental planning/protection/risks’ (11.4 %) and ‘Urban and regional planning’ (13.4 %). Almost a fifth of the respondents were unable to

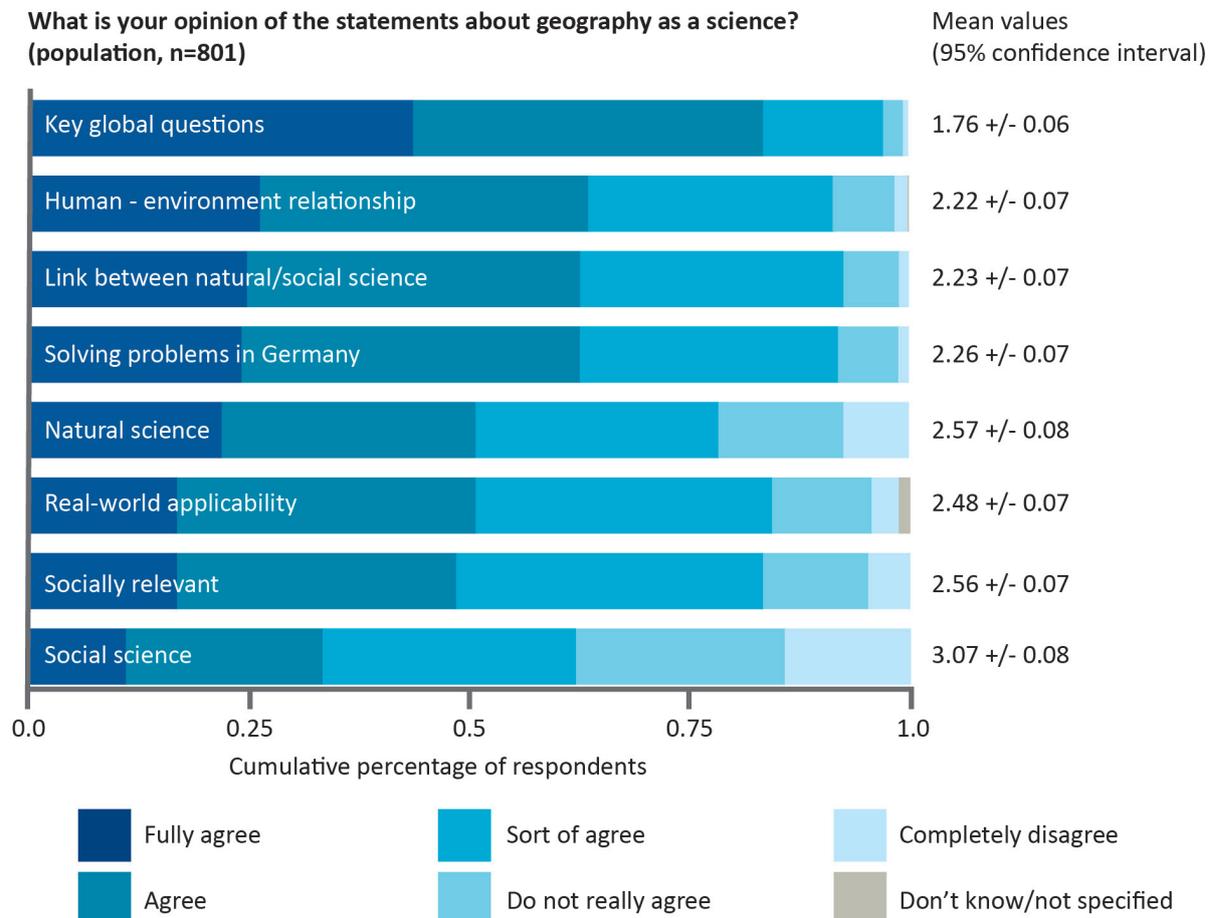


Fig. 3: Evaluation of eight statements about geography as a science. Source: HECKMANN and HORN 2015, 67

name an occupational field. Over 40 percent named job options which could not be classified as one of the predetermined occupational fields.

## 5 Discussion

The results of the population survey on the perception of geography are varied and sophisticated. Therefore, the discussion is based on core statements that rely on the research questions introduced at the end of Chapter 2.

*Core Statement 1: Associations with geography are linked more strongly with natural than with human geography topics and display strong ties to educational aspects.*

The associations support the fact that physical environmental phenomena are mentioned significantly more frequently than anthropogenic environmental phenomena. The results of the overarching study presented by GANS (2015, 46)

show a somewhat modified image concerning the associations of media representatives and human resources managers. Both groups associated geography more strongly with human geography and its nature as a science. To our knowledge, there are no studies containing comparable results. Dealing with the strong association with physical geography is a more complex endeavour. School geography in Germany contains limited elements of physical geography. One possible explanation lies with associations connected to the prefix 'geo'. In general terms, earlier work (cf. GASSLER and RAMMLER 1991; MONHEIM et al. 1999) already emphasised the strong ties between geography's contribution to education and scientific progress.

*Core Statement 2: Geography as a school subject is rated positively, contributes to both spatial orientation and comprehension of human-environmental interaction; topics connected to the environment and physical geography are considered to be very important.*

Tab. 4: Responses for typical geographical occupational fields for geographers (n = 801)

Typical occupational field	Responses in %	
	Total responses (n=801)	First response (n=226)
Environmental planning/protection/risks	11.4	11.5
Urban and regional planning	13.4	17.3
Traffic planning	3.0	3.1
Economic development	1.5	3.1
Communal/policy consultations	1.6	0.9
Corporate consultations	0.7	0.9
Real estate	0.1	0.0
Collaboration with developing countries	0.9	0.0
Agenda 21 processes, sustainable development	0.2	0.4
Public relations	1.1	0.9
Market research	0.6	0.4
Adult education/publishing	1.1	0.0
Other	44.4	48.7
Don't know/not specified	19.9	12.8

Source: NIENABER et al. 2015, 84

The school subject is seen as being of high social and individual significance. Around 80 percent of respondents see it as an important and interesting school subject that makes a significant contribution to general knowledge. A similar positive attitude was also observed by KÖCK (1997), HEMMER and HEMMER (1998, 2010), ADEY and BIDDULPH (2003) as well as MIENER (2016). Respondents were highly confident that geography is able to answer central questions on our planet, understand complex relationships between humans and the environment, as well as link findings and insight from the natural and social sciences.

The significance of general spatial concepts and the media and methods of spatial orientation were already apparent in the associations among the population. The importance of spatial concepts is also high for geography as a school subject. To a great extent, the population is of the opinion that geography lessons foster competencies which help with spatial orientation. However, these competencies involve more than just a situational description, and also include orientation in real space and map competencies. In KÖCK's (1997) paper decision-makers, in addition, only ascribed topography, which was seen as a sub-field of spatial orientation, a subordinating role. Although it should be stated that the content related to spatial orientation and general knowledge

was seen as being significantly more important, the subject was also perceived as contributing significantly to better understanding the complex relationships between humans and the environment. The image of the German population regarding competence acquisition by means of the school subject correlates with geography's self-image (cf. GGS 2014). However, the population sets a stronger emphasis on spatial orientation. Similarly, pupils also identified spatial orientation as school geography's key area of competence (cf. MIENER 2016).

The population's vote was obvious where the content was concerned: by a wide margin, environmental problems were specified as content which should definitely be covered in geography lessons. Geography's significance as an environmental subject is already obvious in KÖCK (1997), whose respondents affirmed with more than a two-thirds majority that geography lessons are a key subject for environmental education. Moreover, the coverage of natural geography topics meets with greater approval than human geography content. The same applies to competencies which are linked to natural geography content. Deserving of discussion in this context is the fact that all existing studies on pupil interest (e.g. HEMMER and HEMMER 2010) show that natural geography topics, above all environmental and human–environment

topics, are met with greater interest than classical human geography content. However, content which is concerned with the day-to-day lives of humans and/or global development problems is also rated as being highly interesting. This leads to the hypothesis that German population considers sustainability topics as essential for school geography. BAGOLY-SIMÓ (2013) showed the validity of such a hypothesis in an international setting.

*Core Statement 3: The German population perceives geography as a human–environment science.*

Clear is the characterisation of geography as a subject in the field of science that deals with human–environment relationships. Thereby, few participants agreed with geography being a nature science. However, by far fewer respondents saw geography as a social science. Earlier studies (cf. HARD and WENZEL 1979; CALÉ and HEMMER 1991; GASSLER and RAMMLER 1991; MONHEIM et al. 1991; KLEE and PIOTROWSKY-FICHTNER 2003) came to similar results regarding geography being a nature science. However, none of these studies offered geography being a human–environment science as a possible answer. Furthermore, none of these studies claimed representativeness of their respective respondent groups. While no clear explanation can be formulated at this time, one possible hypothesis is that German population perceives research in human geography as more strongly tied to social science (e. g. sociology).

In the view of German respondents, the discipline is seen as a science which links findings from natural and social sciences and contributes to ‘better understanding the complex relationships between humans and their environment’. HECKMANN and HORN (2015) observe the same tendency in their survey of media representatives, who view geographers as specialists for human–environment topics such as natural disasters/georisks, floods, or the use of natural resources. This result might be read as encouragement to further intensify the coverage of specific issues on human–environment interactions in research and teaching.

*Core Statement 4: The population has little knowledge about geography as a profession. Environmental and spatial planning are perceived as the most promising employment perspectives for geographers.*

One fifth of all respondents offered no answer regarding geography as a profession, while almost half of the answers contained professions that hardly employ any geographers. The majority of the valid answers placed geographers within urban and regional planning as well as environmental planning/protection/hazards.

Comparable, but more differentiated statements were made by media representatives and human resources managers (e.g. NIENABER et al. 2015). In cases where there was contact with geographers, the environmental field was specified less frequently, which corresponds to the actual job situation. To achieve more precise answers, the survey carried out among the population did not consider jobs in education and research. This, however, might have led to lower response rates. In contrast, one quarter of all media representatives and one fifth of the surveyed human resources managers named education and science as possible employers (e.g. NIENABER et al. 2015, 83).

*Core Statement 5: Contact with geographers and the individual experience of school geography have the strongest influence on the image.*

Respondents who had contact with geographers specified terms from the categories ‘science, sub-disciplines, researchers’ and ‘teaching, education, qualifications’ significantly more frequently, and mentioned less general spatial terms than the other persons surveyed. Interestingly, the factor contact had no influence on the image of geography as a school subject. Furthermore, respondents who knew geographers agreed with six out of eight statements on geography as a science more strongly than those who did not know any geographers. For the question on possible occupational fields for geographers, differences in reply behaviour were observed between respondents who had contact with geographers and those who did not. There are, to our knowledge, no studies that contain comparable results. Still, the role of this factor seems reasonable and should lead to consequences (see below). The lacking importance of the factor in the case of geography as a school subject might be connected to the fact that all respondents experienced geography lessons during their formal education and further contacts did not lead to any variations in the image.

The associations already show a strong connection between the image of the population and geography as a school subject. For example, 22.5 percent of persons surveyed first associated a term from the category ‘teaching, education, qualifications’ with geography. Furthermore, a sophisticated and positive perception of the science and its topics correlated, as exhibited by the computed results, with a high level of agreement with positive statements regarding geography lessons. An inspection of the variables ‘existence of school-age children’ refutes an influence in this context, such that it can be surmised that geography lessons which the respondents themselves experienced were a much more important factor influencing perception. This finding

was confirmed by GASSLER and RAMMLER (1991) and MONHEIM et al. (1999), who noticed that their respondents equated geography as a science with the school subject; however, this was not confirmed by the current study in this exact shape and form.

## 6 Conclusion, reflection and outlook

German population has an overall positive image of geography that corresponds to the discipline's self-image. Still, some change is urgently required:

1. Reflexion of the results within the discipline
2. More offensive PR
3. More commitment to and support of school geography.

The fact that German population identifies geography rather stronger with spatial orientation as with human–environmental interaction might be a good starting point for an internal reflexion. Moreover, the stronger link between geography and the natural sciences and the perception of the subject with regard to human–environment interactions is certainly highly interesting and worthy of discussion. A more aggressive and broader PR strategy might support both the consolidation of already perceived strengths and support a stronger perception of less obviously perceived strengths of both discipline and school subject. Public opinion might also be in need of further information on the myriad employment opportunities of geography graduates. PR also means to work on stronger ties with decision-makers and a more frequent outing of successful people as a geographer within the public sphere. Finally, given the strong ties between discipline and school subject, geographers might want to dedicate more attention to geography teacher training and school geography as a whole.

There is no fixed perception of geography. Perceptions are formed out of attitudes communicated by society and individual experiences. In order to obtain representative statements regarding which perceptions the general public has of geography, a quantitative empirical study was the methodologically suitable manner for collecting not only cognitive, but also affective percentages of perceptions using collection instruments developed in a theory-based manner. Doing so clarifies the perceptions the respective respondents have regarding geography. Because the existing empirical findings were insufficient to carry out a hypothesis-based investigation, the explorative character of the study needs to be underlined.

By including independent variables and coupling them to dependent variables, it was possible to offer not only a description of the perceptions, but also explanatory approaches. What are the options for further research? This study delivered a great deal of insight, empirically confirmed a number of (pre)conceptions, refuted others, or provided a more sophisticated understanding of them. It would certainly also be interesting to repeat the study, conduct more in-depth studies, or an international comparison. The limits of this study were that the independent variables did not provide sufficient explanations as to how these images and perceptions arose and what their effects are. In order to determine possible factors as well as societal or situational contexts which influence the perception of geography, follow-up studies are conceivable, in which deeper insight into selected findings of this study could be gleaned with the help of qualitative approaches.

## Acknowledgements

The study presented here is part of a larger study which not only included a representative survey of the population, but also surveys of media representatives and human resources managers. The findings of this overall study were presented as a summary of the three partial studies and from a different perspective than in this article in issue 29 of the series *forum ifl* (GANS and HEMMER (2015) and can be accessed at: <http://www.ifl-leipzig.de/de/publikationen/zeitschriften-und-reihen/forum-ifl.html>. Co-authors of the overall study include the authors of this article as well as Christoph Götz, Tobias Heckmann, Günter Heinritz, Michael Horn, Judith Miggelbrink, Birte Nienaber, Antje Schlottmann, and Heiner Schote.

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## Authors

Prof. Dr Paul Gans  
University of Mannheim  
68131 Mannheim  
Germany  
E-mail: paulgans@uni-mannheim.de

Prof. Dr Ingrid Hemmer  
Professorship for Geography Didactics  
Catholic University of Eichstätt-Ingolstadt  
Ostenstraße 18, 85072 Eichstätt  
Germany  
E-mail: ingrid.hemmer@ku.de

Prof. Dr Michael Hemmer  
Institute for Geography Didactics  
University of Münster  
Heisenbergstraße 2, 48149 Münster  
Germany  
E-mail: michael.hemmer@uni-muenster.de

Kim Miener  
Integrierte Gesamtschule Flötenteich  
Hochheider Weg 169  
26125 Oldenburg  
Germany  
E-mail: kim.miener@live.de