



GLEN Instrument Reference Manual

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List of abbreviations

AID:A	Aufwachsen in Deutschland: Alltagswelten (Kuger et al., 2020)
ALLBUS	Allgemeine Bevölkerungsumfrage der Sozialwissenschaften (GESIS – Leibniz Institute for the Social Sciences, 2022)
FReDA	FReDA-Panel (Bujard et al., 2025)
GIP	German Internet Panel (Blom et al., 2015)
GLEs	German Longitudinal Election Study (GLEs, 2022, 2023a, 2023b)
Green-SÖP	Socio-Ecological Panel Survey (Fron del et al., 2023; Klick et al., 2021)
ISSP	International Social Survey Programme (ISSP Research Group, 2017)
KuBiPaD	Cultural Education and Cultural Participation in Germany (Otte et al., 2024)
PACE	Planetary Health Action Survey (Jenny et al., 2022)
pairfam	German Family Panel (Brüderl et al., 2024)
PASS	Panel Arbeitsmarkt und soziale Sicherung (Trappmann et al., 2025)
SOEP	Socio-Economic Panel (Goebel et al., 2025)

1 About this reference manual

This manual serves as a reference of the instruments used in GLEN that originate from other studies. Wherever possible, GLEN uses established instruments and adjusts them to the self-administered web and mail surveys, for instance, by shortening introductory texts and splitting item batteries to avoid scrolling through long grids. A description of GLEN’s survey design principles can be found in the Design and Cumulative Field Report (Schmiedeberg et al., 2026).

This manual includes only questions that utilize instruments from previous studies and literature. Instruments developed specifically for GLEN are not part of this documentation. Question texts are included only to demonstrate changes made to the original instruments. For full details of all questions and the German-language originals, please refer to the respective codebooks.

2 Acknowledgements

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3 Attitudes and values

3.1 Importance of life domains (val1)

This question is inspired by a similar question in the GESIS-Panel (GESIS – Leibniz Institute for the Social Sciences, 2025), but has undergone a number of adaptations.

While the original question was limited to family life, work or training, and leisure time, GLEN included two additional life domains: “friends” and “religion”. The response scale, which was originally an endpoint-labelled seven-point scale ranging from “not at all important” to “very

important”, was adapted to a fully labelled five-point scale. Moreover, the introductory question text was shortened to facilitate reading on small screens.

3.2 Areas of concern (att1, att2, att3)

This question is based on a panel question in the SOEP (Goebel et al., 2025). The original question comprised a larger number of items and a three-point scale.

GLEN kept the three original categories (“not at all concerned”, “somewhat concerned”, and “very concerned”) and added two categories in between: “slightly concerned” and “quite concerned”. Four areas of concern were kept unchanged (“the impacts of climate change”, “environmental protection”, “economic development in Germany”, and “immigration to Germany”), while two are similar to those in the original question but using own wordings (“wars”, and “crime, public safety”).

The first question (att1) was followed by an open question to cover further topics respondents were concerned about (att2).

Moreover, a question was added which focused on a list of six environmental issues, such as loss of biodiversity and soil sealing (att3). The introductory text was similar, and the response categories identical to the general concern question (att1). The items were adapted from the survey “Umweltbewusstsein in Deutschland 2022” (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit et al., 2024).

3.3 Environmental attitudes (env4)

This scale is based on the nine-item environmental attitudes scale by Diekmann and Preisendörfer (2001, pp. 103–105), which was modified and shortened in a later project (Bruderer Enzler et al., 2019). Originally, it included three items for the cognitive, conative, and affective dimensions, respectively, of which two items were kept for each dimension. GLEN modified the wording of the first item to ease the understanding of the question and replaced the third item with one from the original nine-item version capturing the cognitive dimension. The supplementary text “by many environmentalists” was deleted from the fourth item, while “the government in our country” was replaced with “politicians” in the fifth item. Additionally, “be prepared to” was replaced with “be willing to” in the last item.

Table 1: Environmental attitudes in Bruderer Enzler et al. (2019) and GLEN

Bruderer Enzler et al. (2019)	GLEN
The thought of the environmental conditions under which our children and grandchildren will probably have to live worries me.	It worries me to think about the environmental conditions that our children and grandchildren will likely live in.
If we continue as we have so far, we are heading toward an environmental catastrophe.	If we carry on as we are, we are heading for an environmental disaster.

The majority of the population in our country behaves in a way that is not environmentally conscious enough.	The industrialized world has already exceeded or will soon reach the limits of growth.
Environmental problems are greatly exaggerated by many environmentalists.	Many environmental problems are greatly exaggerated.
The government in our country is doing far too little for environmental protection.	Politicians are doing far too little to protect the environment.
For the sake of the environment, we should all be prepared to reduce our standard of living.	For the sake of the environment, we should all be willing to reduce our standard of living.

3.4 Schwartz human values scale (val3)

Schwartz' theory of basic human values is among the most prominent human value theories and widely used in environmental social sciences (e.g. van Valkengoed et al., 2022). It comprises ten fundamental values: conformity, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, and security.

GLEN uses the 10-item version implemented in the ALLBUS developed by Partsch et al. (2023), which was developed to fulfill the needs of large-scale surveys by offering high validity and reliability as well as low respondent burden.

3.5 Climate change skepticism (att4)

The items on climate change skepticism were mainly drawn from Whitmarsh (2011), except for three: att4i4, att4i9, and att4i13, which were adopted from Graaf et al. (2023). These were translated to German and the response scales were adjusted to the GLEN standard 5-point Likert scale ranging from "strongly disagree" to "strongly agree".

3.6 Climate change vulnerability of population groups (att13)

This question was inspired by Carman et al. (2023). The original items were worded as statements and partly referred to other population groups, with the following item battery:

- Global warming harms lower income people more than it harms wealthier
- Global warming harms everyone about equally
- Global warming harms people of color more than it harms white people
- Global warming harms women more than it harms men

"In your opinion, who in Germany is most affected by the effects of climate change? Climate change is more harmful to..."

- Poorer people – both groups equally – wealthier people | Neither
- Women – both groups equally – men | Neither
- Foreigners – both groups equally – Germans | Neither
- Older people – both groups equally – younger people | Neither”

4 Personality and mental health

4.1 Life satisfaction (sat1)

The question on general life satisfaction is a standard question, included, for instance, in the SOEP, GESIS-Panel, FReDA, and pairfam. The question wording varies across studies regarding the end-point labelling (“very dissatisfied” in the SOEP vs. “not at all satisfied” in FReDA). In GLEN, the 11-point scale ranged from “not at all satisfied” to “very satisfied”.

4.2 Optimism (psy1)

Optimism is measured using two items from the SWOP-K9, an established instrument that assesses general self-efficacy, optimism, and pessimism (Scholler et al., 1999). The item “I always see the good side of things” was identical to the original, whereas the second item was optimized for simple language: “I always expect good things from the future” instead of “I always look to the future with optimism.” The original four-point response scale was adapted to a fully labelled five-point Likert scale.

4.3 Interpersonal trust (psy2)

Trust is an important factor in human interaction and has been shown to affect political and pro-environmental behavior (Devine, 2024; Tam & Chan, 2018). Generalized interpersonal trust is regarded as a personality trait (with a first measurement instrument developed by Rotter (1967)), which is moderately heritable and largely stable after the formative years (Dinesen & Bekkers, 2017; Weinschenk & Dawes, 2019).

GLEN uses the KUSIV3 scale to measure interpersonal trust (Beierlein et al., 2014).

4.4 Self-efficacy (psy3)

Self-efficacy is conceptualized as a one-dimensional construct referring to individuals’ assessment of their abilities to cope with difficulties and barriers in daily life, generalized across situations and life domains (Bandura, 1978).

The three-item scale „Allgemeine Selbstwirksamkeit Kurzskala“ (Beierlein et al., 2014) is implemented in GLEN.

4.5 Stress, anger, loneliness (psy4)

Stress, anger, and loneliness are asked in a composite item battery. Stress is measured with three-items implemented in pairfam which are based on the 20 items of the “Perceived Stress Questionnaire” (Levenstein et al., 1993) and its German version (Fliege et al., 2009). To measure

anger, GLEN utilizes one of the two items from pairfam, which are based on the “Befindlichkeitsskalen” by Abele-Brehm and Brehm (1986).

To adapt the question to GLEN standards, the originally endpoint-labelled scale ranging from “not at all” (1) to “absolutely” (5) was replaced by a fully labelled five-point scale.

4.6 Depressiveness, anxiety (psy5)

Depressiveness and anxiety are measured using the PHQ-4 (Kroenke et al., 2009). The wording of one of the items on anxiety was slightly revised to facilitate readability: “Worries you could not stop or control” instead of “not being able to stop or control worrying.”

4.7 Risk tolerance (psy6)

Risk tolerance is regarded as a personality trait indicating an individual’s general propensity to engage in or refrain from risky behavioral options (Sitkin & Pablo, 1992). To capture risk tolerance, a single item for the assessment of global risk tolerance from pairfam (pairfam, 2023c) is used.

4.8 Locus of control (psy7)

Locus of control is based on Rotter (1966), which has proven relevant, amongst other things, for individual climate change adaptation (Beckmann & Hiete, 2020). GLEN uses the IE-4 (“Internale-Externale-Kontrollüberzeugung-4”) scale by Kovaleva et al. (2014).

5 Living

5.1 Sense of belonging to place of residence (area2)

This question is based on a similar instrument in the SOEP (Goebel et al., 2025) and pairfam (pairfam, 2023b). While the original question asked about attachment to the place and region, the GLEN question is more concise and only asks about attachment to the place. Further, the four-point scale was reversed and extended to a five-point format according to the GLEN standard.

Table 2: Response scales in pairfam and GLEN

pairfam	not really	slightly	-	strongly	very strongly
GLEN	not at all	slightly	neutral	rather strongly	very strongly

5.2 Social cohesion in the neighborhood (area3)

The three items concerning social cohesion in the neighborhood are taken from Blasius et al. (2008).

5.3 Solastalgia (area4)

Solastalgia is defined as distress and negative emotions such as anger and grief, caused by the transformation and degradation of one’s home environment (Galway et al., 2019).

Solastalgia was captured through four items based on the Brief Solastalgia Scale (Christensen et al., 2024). GLEN supplied a German translation and reduced the number of items to two, which are used

without changes (area4i1 and area4i2). As the question is directed to all respondents, including those who have not experienced environmental degradation, two further items were added to allow respondents to express no or positive changes in the environment (area4i3 and area4i4).

5.4 Experience of extreme weather events at place of residence (ewe1)

The question was inspired by a similar question implemented in the Green-SÖP in 2012 (Klick et al., 2021). In contrast to the original question which asked about experiences at home, at the workplace, and while traveling, the GLEN question was restricted to experiences at home over the past three years. Moreover, the question asked about different types of weather events.

Table 3: Extreme weather events in the Green-SÖP and GLEN

Green-SÖP	GLEN
Heatwaves	Extreme heat (e.g., recommendations to avoid spending time outdoors)
-	Extreme dryness or drought (e.g., water consumption restrictions)
Storm	Storm (e.g., recommendations to stay indoors)
Heavy precipitation or hail	-
Flooding	Flooding (due to high water or heavy rain)
Landslides	-
-	Forest fire, wildfire

5.5 Perception of extreme weather warnings (ewe8)

This question is based on the item “When it comes to extreme weather, I feel well warned“ („Bezogen auf Extremwetterereignisse fühle ich mich gut gewarnt“), which was fielded in a number of studies (Schulze & Voss, 2023). In contrast to the original (i.e., a statement to which respondents express their agreement on a Likert scale), the GLEN question directly asks about how well respondents feel warned about extreme weather with answers on a 5-point scale ranging from “very poorly” to “very well”.

5.6 Green window view (home23)

Views of greenery from home are regarded as a meaningful indicator for a green neighborhood (Kley & Dovbischuk, 2024). The question included in GLEN is inspired by Preisendörfer and Diekmann (2000); the wording was slightly revised and the response scale expanded from three response categories (“no”, “some”, “a lot”) to a five-point scale (“not at all”, “little”, “some”, “a lot”, “a great deal”).

5.7 Noise at home (home21, home22)

These two questions are based on questions in Bruderer Enzler et al. (2019). The first question concerns noise disturbance at open windows and was used with minor adjustments. It was restricted to three of the original six types of noise: road traffic noise, railway noise, and aircraft noise. While the original study differentiated between daytime and nighttime noise, GLEN did not specify a time period. Finally, a 7-point scale was used instead of the original 11-point scale.

The second question underwent greater changes. Respondents are asked to indicate whether the noise is “somewhat better”, “unchanged”, or “gone” if the windows are closed, whereas the original included an 11-point scale identical to the first question that was considered too burdensome for respondents.

5.8 Air pollution and noise (hlt2)

In the recruitment survey, perceived burdens due to air pollution and noise are assessed using a five-point Likert-type scale: “not at all”, “slightly”, “neutral”, “quite”, and “very”. This question is inspired by the approach used in the GESIS Panel wave bc, with adaptations to align with GLEN’s standardized measurement framework (GESIS – Leibniz Institute for the Social Sciences, 2025).

The GLEN instrument focuses exclusively on perceived burdens from “noise” and “air pollution” by asking “To what extent have you felt burdened by the following in your neighborhood in the past 4 weeks?”. The GESIS Panel assesses instead whether respondents feel impaired by “noise pollution”, “air pollution”, and “lack of accessible green spaces” by asking “How strongly do you feel affected by the following environmental influences in your residential area?”. The dimension “lack of green space” was not incorporated into GLEN.

6 Health

6.1 General health index (hlt1, hlt3, hlt4, hlt5, hlt6)

Four items originating from the (PROMIS v1.2; Rose et al., 2014) available from the Global Health Item Bank form the short scale for the global health measurement “PROMIS Scale v1.2 - Global Physical Health 4a” (Hays et al., 2009):

- physical health (globalo3 – GLEN: hlt3),
- physical function (globalo6 – GLEN: hlt4),
- pain (globalo7 – GLEN: hlt5),
- fatigue (globalo8 – GLEN: hlt6).

All item modifications have been agreed upon with PROMIS National Center Germany.

The first item (hlt3) refers to physical health and was introduced in Wave 1a to replace a more general health item adopted from the German Family Panel (pairfam, 2023b), which was asked in the Recruitment Survey.

The response options for the physical health item (global03) were adjusted to better comply with the guidelines applied in GLEN. It was changed and reversed from the original options:

Table 4: Response scales in PROMIS and GLEN

PROMIS	excellent	very good	good	fair	poor
GLEN	very good	good	satisfactory	not so good	bad

The question on physical limitations in everyday activities (hlt4) was used with two minor changes: The response scale was reversed to match the GLEN standard, and the fourth example (i.e., moving chairs) was removed from the question text.

The question on pain (hlt5) was kept in its original wording and 11-point response scale, but with an introductory sentence (“Some people experience pain over a long period of time. What has your experience been like?”), and a specified reporting period of two weeks.

The question on fatigue (hlt6) was kept in its original wording and 5-point response scale, with an introductory sentence (“Some people also experience daytime fatigue”), and a specified reporting period of two weeks.

Note: If displaying these items in any kind of publication the following notice must be added in a footnote or a disclaimer: “The items of the ‘PROMIS Scale v1.2 - Global Physical Health 4a’ may only be used in own surveys with the consent of the PROMIS Health Organization including a usage agreement.” For using the German version of the items contact the German PROMIS National Center.

6.2 Sleep (hlt7, sat3)

Sleep is captured by two questions: Number of sleeping hours (hlt7) and satisfaction with sleep (sat3). Both questions are based on items from the SOEP (Goebel et al., 2025). For both items a reporting period of two weeks was specified. Moreover, the GLEN version only asks about the average number of sleeping hours per weeknight, adding “Please do not include afternoon naps.”

6.3 Chronic diseases in past 12 months (hlt10)

The chronic diseases listed in this question are based on the DACH project (Bruderer Enzler et al., 2019). GLEN does not include rheumatic disease, hearing impairment, states of exhaustion, nervousness, difficulty falling or staying asleep, and depressive moods; most of these health issues are covered in separate questions.

Table 5: Chronic diseases in the DACH project and GLEN

DACH project	GLEN
Hay fever, allergic rhinitis	Allergies (without allergic asthma)
Asthma	Asthma (including allergic asthma)
High blood pressure, hypertension	High blood pressure, hypertension
Circulatory disorder of the heart, angina pectoris	Cardiovascular disease, heart attack, stroke
Chronic bronchitis	Chronic bronchitis
Diabetes	Diabetes
Headaches, migraines	Migraine
Cancer	Cancer

6.4 Ability to participate (hlt11)

These four items are adopted from the PROMIS short scale “PROMIS Short Form v2.0 - Ability to Participate in Social Roles and Activities 4a” (Hahn et al., 2014). GLEN added an introductory question text to ease the understanding of the question: “Does your health condition affect your daily activities? How often do you find it difficult to ...” Moreover, the extreme responses of the five-point response scale were adapted from “always” to “(almost) always” and from “never” to “(almost) never”.

Note: If displaying these items in any kind of publication the following notice must be added in a footnote or a disclaimer: “The items of the ‘PROMIS Short Form v2.0 – Ability to Participate in Social Roles and Activities 4a’ may only be used in own surveys with the consent of the PROMIS Health Organization including a usage agreement.” For using the German version of the items contact the German PROMIS National Center.

6.5 Smoking (hlt12)

This question is based on a module in the SOEP (Goebel et al., 2025). The original version consists of a set of single questions, which were merged into one larger question in GLEN. The GLEN version specifies a reporting period of two weeks and asks for average daily consumption of “cigarettes”, “pipes, cigars, or cigarillos”, and “e-cigarettes / vapes”.

7 Environmental behaviors & lifestyles

7.1 Environmental behavior and norms (env1, env2, env3)

This set of items was developed to capture three concepts.

The items env3i1 and env3i3 measure descriptive and injunctive norms of general pro-environmental behavior, respectively.

The two items in question env2 assess conditional and unconditional cooperation, respectively. These items refer to cooperative and non-cooperative behavior in a social dilemma (see also the social dilemma items in Diekmann and Preisendörfer (1992, 1998)).

Taken together, all six items can be interpreted as operationalizing the construct of social norms in the sense of Bicchieri (2017). According to Bicchieri's framework, the existence of a social norm requires the presence of empirical expectations, normative expectations, and conditional preferences.

7.2 Diet (nut1)

The item assessing food intake was adapted from the "CO₂-relevant environmental behavior" survey developed by Hadler et al. (2021). Specifically, a modified version of a food frequency questionnaire (FFQ) was employed. FFQs typically aggregate multiple food categories and assess the frequency of their consumption. Evidence from a recent meta-analysis indicates that FFQs are generally appropriate instruments for capturing overall dietary intake (Cui et al., 2023).

As noted by Hadler et al. (2022), the consumption of "beef and lamb" represents a particularly critical category for estimating individual greenhouse gas emissions. In the original instrument, Hadler et al. (2021) utilized a seven-point response scale: "several times a day," "daily," "4–6 times per week," "1–3 times per week," "1–3 times per month," "less often," and "never." The items were adapted to conform to the GLEN standard by removing the highest frequency category ("several times a day") and revising the remaining response options to the following six-point scale: "(almost) daily," "several times a week," "once a week," "less often," and "(almost) never." In addition, the list of food categories was slightly revised in scope. In contrast to the original focus on emission-related aspects (Hadler et al., 2022), the adapted version also incorporates health-related considerations alongside environmental factors.

Table 6: Food categories in Hadler et al. (2021) and GLEN

Hadler et al. (2021)	GLEN
Beef, veal	Beef, lamb
Lamb	
Pork	Other meat, sausage
Poultry	
Sausage	
Fish and seafood	Fish, seafood
Cheese, eggs	Dairy products, eggs, cheese
Convenience foods	-
Frozen foods	-
-	Fresh fruit, vegetables, salad
-	Sweets, sweet pastries, salty snacks

7.3 Buying food (nut2)

This instrument was inspired by two questions in the GESIS Panel (GESIS – Leibniz Institute for the Social Sciences, 2025) that asked whether respondents bought organic and locally produced food, respectively, in the past week. GLEN designed a grid question covering several types of food to include fairtrade products, low-caloric products, and special offers, and used a frequency scale to indicate how often respondents bought these types of products: “(almost) always”, “often”, “sometimes”, “rarely”, “(almost) never”.

7.4 Handling food (nut3)

These three items are adopted from a nine-item battery in the third wave of the Swiss Environmental Panel (Rudolph et al., 2025). Minor adaptations were made to improve understandability and adapt the wording to GLEN standards: In the first item in GLEN (item eight in the Swiss Environmental Panel), the GLEN version deleted the word “usually”. In the second GLEN item, the word “eat” was replaced with “buy”, and the word “always” was deleted in the third GLEN item. Moreover, a fully labelled 5-point-likert scale was used ranging from “not true at all” to “completely true”.

Table 7: Item wordings in the Swiss Environmental Panel and GLEN

Swiss Environmental Panel	GLEN
If there are leftovers from a meal at home, I usually keep them and eat them later.	If there are leftovers from a home-cooked meal, I save them to eat later.

When buying groceries, I usually decide spontaneously in the shop what I want to eat.	When shopping for groceries, I decide what to buy spontaneously in the store.
I always throw away food after the best before date.	I throw food away once it has passed its best-before date.

7.5 Second-hand markets (csm12, csm15)

These questions capture respondents' engagement in second-hand practices over the past 12 months, distinguishing between acquisition and disposal behaviors. Both questions are implemented as multiple-response formats covering key product categories. The first (csm12) measures the purchase of used goods, while the second (csm15) captures the selling or gifting of used goods. Together, they provide a behavioral indicator of participation in second-hand markets and informal reuse practices.

These measures are conceptually related to established items on sustainable consumption and second-hand practices in previous surveys (e.g., PACE Wave 18, Swiss Environmental Panel Wave 8). The GLEN instrument focuses specifically on realized purchasing behavior rather than frequency or attitudinal dispositions.

7.6 Waste sorting, recycling (env6)

This question is similar to questions asked in the ISSP 2009 (ISSP Research Group, 2017) and the "CO₂-relevant environmental behavior" survey developed by Hadler et al. (2021), but compared to the latter, the question wording was shortened and the four-point response scale ("always", "often", "sometimes", "never", "does not apply") was revised to a fully labelled five-point frequency scale ("(almost) never", "rarely", "sometimes", "often", "(almost) always") for GLEN.

7.7 Free time activities (lsr1, lsr4)

The items in lsr1 capture the frequency of selected free time activities within the past four weeks to provide a behavioral indicator of everyday leisure patterns, implemented as a battery with a fully labelled six-point response scale ranging from "(almost) daily" to "(almost) never". The activities cover a range of domains, including social interactions, media consumption, physical activity, online behavior, and informal or low-effort free time activities.

The item battery is conceptually based on established measures of free time activities (e.g., in the SOEP), with some items having been added to focus on environmentally relevant behavior and a reference period specified. The specific items vary across survey waves, with different subsets of activities included while maintaining a consistent response scale.

A further question with focus on cultural activities (lsr4) is based on similar, albeit more detailed, questions in KuBiPaD (Otte et al., 2024).

7.8 Membership in organizations (eng2, eng3)

This question captures respondents' membership in voluntary organizations and associations. It is implemented as a multiple-response question covering a range of organizational types, with an additional open category for other memberships, which can be accessed at the GLEN Safe Data Center at RPTU Kaiserslautern.

It originates from the membership question from the survey "Umweltbewusstsein in Deutschland 2022" (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit et al., 2024), with minor adaptations to the category scheme (e.g., grouping of cultural and traditional associations and inclusion of trade unions and emergency services). The measure provides a behavioral indicator of formal social participation and civic engagement, focusing on actual memberships rather than intensity of involvement or attitudinal orientations.

Table 8: Free time activities in Umweltbewusstsein in Deutschland and GLEN

Umweltbewusstsein in Deutschland 2022	GLEN
Sports club	Sports club
Music association (instrumental, dance, chant, theater)	Theater group, music association, choir
Kulturverein (Literatur, Kunst, Geschichte)	
Traditional association (civic, heritage, shooting or carnival club)	Traditional or cultural association (for example, art, heritage, carnival club)
Environmental or nature conservation organization	Environmental or nature conservation organization
Social organization	Social organization
Hobby association (gardening or stockbreeding, other hobbies)	-
Party	Political party
-	Disaster relief, fire department
-	Trade union
Other, namely:	Other, namely:
No membership	None of the above
Don't want to say	-

8 Mobility

8.1 Use of transport modes (mob1, mob3)

These two questions are based on a question regularly included in the study Mobility in Germany (Galich & Dubernet, 2025). Response categories were revised to eliminate gaps and allow for more detailed answers.

Table 9: Response options in Mobility in Germany and GLEN

Mobility in Germany	GLEN
Daily or almost daily	(Almost) daily
One to three days per week	Several times per week
	Once per week
One to three days per month	Several times per month
Less than monthly	Less often
Never or almost never	(Almost) never

The list of transport modes was also adapted: With exception of the recruitment survey, car use was merged with motorcycle and scooter use due to restricted questionnaire space as the number of motorcyclists is small and additional information about these two groups gathered from additional questions about motorcycles (mob6-mob9). The original question asked about bicycles and e-bikes together but differentiated between trains and buses for long-distance stretches, whereas the GLEN version asked for bike and e-bike use separately, but merged long-distance train and bus travel to one category. In addition, the GLEN measure added e-scooters, which were not part of the original list of items. Local public transport was kept without changes. Finally, the item about walking was placed in a separate question to adapt to GLEN requirements regarding small screens.

Additional questions were asked with similar instruments: Transport mode use for errands (mob12), free time (mob13), and commuting (mob15). However, the response scale was changed to allow answers in relation to the frequency of the required mode: “(almost) always”, “often”, “sometimes”, “rarely”, “(almost) never”. This reduces the risk of spurious change over time, as, for instance, employees who commute exclusively by bike will select a different answer if they reduce their weekly working or office days whereas they would consistently opt for “(almost) always” with the relative scale offered. Moreover, the transport modes were merged into four categories: “Car, motorcycle, moped”, “bicycle, e-bike, e-scooter”, “bus, train”, and “walking (entire route)”.

9 Political attitudes and protest

9.1 General political interest (pol1)

This question was adopted from the GLES cross-section 2021 (GLES, 2023b). As in the original instrument, a five-point scale is used, but the response options were slightly revised in accordance with the standard GLEN wording (e.g., “überhaupt nicht” vs. “gar nicht”).

9.2 Party preference (pol2)

The party preference item ("Sonntagsfrage") was adopted from the ALLBUS 2021 (Baumann, 2023). The order of response options was adjusted to reflect parliamentary representation at the time of panel recruitment 2024. The party Bündnis Sahra Wagenknecht (BSW) was additionally included as it ranked among the more prominent parties ahead of the upcoming election.

9.3 Satisfaction with democracy in Germany (pol2)

This question is adopted from the GLES cross-section (GLES, 2023b). The question wording was identical to the original question, but instead of a five-point scale, the GLEN question was answered on an endpoint-labeled 11-point scale ranging from “not satisfied at all” to “very satisfied”.

9.4 Institutional trust (pol9)

This six-item battery is based on similar questions in GLES (GLES, 2023b) and ALLBUS (Baumann, 2023). The question wording was revised, based on the GLES version. The items “federal government”, “science”, and “public broadcasting” were taken from GLES, the items “political parties” and “municipal administration” from ALLBUS.

The answer scale was slightly adapted from the original sources. GLES uses an endpoint labeled 11-point answer scale from “do not trust at all” to “trust totally”; ALLBUS uses an endpoint labeled 7-point answer scale from “no trust at all” to “very high trust”. The GLEN version uses an endpoint labeled 7-point response scale ranging from “not at all” to “completely”.

9.5 Trust in politicians in Germany (pol4)

In addition to trust in institutions (pol9), which is regularly asked in the panel, a number of items describing beliefs concerning politicians were included once in the starter survey. The items stem from Kulin et al. (2024) in a slightly shortened version (e.g., “competent” vs. “competent and efficient”).

9.6 Political positions (pol18, pol19)

Political positions were measured using a two-dimensional scale adapted from the GLES Panel (GLES, 2023a), comprised of an economic dimension (GLES: kpX_1090; GLEN: pol18) and a cultural dimension (GLES: kpX_1130; GLEN: pol19).

9.7 Authoritarianism (att7)

The concept of authoritarianism is rooted in Adorno et al. (1950), who described it as a personality trait formed early in life. More recent research regards it as a stable set of attitudes and values based on personality and socialized worldviews (Duckitt, 2015).

In GLEN, authoritarianism is measured using the Ultra-Short Authoritarianism (A-US) scale by Heller et al. (2020), which is a shorter version of the Kurzskala Autoritarismus (KSA-3) by Beierlein et al. (2015) capturing the three principal dimensions of authoritarianism: authoritarian aggression, authoritarian submission, and authoritarian conventionalism.

9.8 Perceived relative deprivation (att10)

Items measuring perceived relative deprivation were developed and pretested by the GLEN research team. Wording was strongly informed by the work of Hameleers (2019) and Elchardus and Spruyt (2016).

9.9 Distributive justice principles (att11)

Items measuring attitudes towards equity were selected and adapted from the ALLBUS 2014 questionnaire (GESIS – Leibniz Institute for the Social Sciences, 2018). Four of the eight original items (F074) were retained, with one item selected per dimension of justice principles. Wording was substantially modified to simplify language and reduce response time.

Table 10: Distributive justice principles in ALLBUS 2014 and GLEN

ALLBUS 2014	GLEN
It is just if people who work hard earn more than others.	Those who perform better than others at work should also earn more.
It is just if all people enjoy equal living conditions.	-
It is just if people from distinguished families consequently enjoy privileges in life.	-
A society is just if it cares for the weak and those in need of support.	Society should take special care of the weak and those in need.
It is just if each person gets only that which he/she has worked hard for him/herself.	-
It is just if people who have children to care for or relatives in need of nursing care receive special support and benefits.	-
It is just if income and wealth in our society are distributed equally among all persons.	There should not be large differences in income and wealth.
It is just if those at the top in a society enjoy better living conditions than those at the bottom.	Those at the top of society should have better living conditions than those at the bottom.

9.10 Goal of climate-friendly transformation in Germany (pol12)

This question was adapted from a similar question concerning the transformation of the economy in Germany in the survey “Umweltbewusstsein in Deutschland 2022” (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit et al., 2024).

The original wording was retained and the term “economy” replaced with “society”. The response scale, which originally included four categories and “don’t know”, was adapted to the GLEN standard, a fully labelled five-point scale ranging from “strongly oppose” to “strongly in favor” without a “don’t know” option.

9.11 Trigger points (att5)

The items in this question were adopted from Mau et al. (2023). Originally, the question was comprised of eight items, of which two were included in GLEN.

9.12 Types of climate protection measures (pol20)

These items were drawn from Bohmann et al. (2024). The wording of the introductory text and the answer scale, originally a 4-point scale, were adapted to the GLEN standard, a fully labelled 5-point scale.

9.13 International climate policy (pol23)

This question consists of two items based on items asked in “Umweltbewusstsein in Deutschland”. The first, “Germany should not have pioneering role”, was taken from the 2020 survey (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit & Umweltbundesamt, 2024), while the second, “Germany should support poorer countries” from the 2022 survey (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit et al., 2024). While the latter asked about the importance of the support for poorer countries in its original form (with a response scale ranging from “not important at all” to “very important”), both items were worded as statements in GLEN to which respondents should express their agreement.

The response scale, which originally included four categories and “don’t know”, was adapted to the GLEN standard, a fully labelled five-point scale ranging from “strongly disagree” to “strongly agree” and “don’t know”.

10 Media consumption

10.1 Internet access and use (web1, web2)

The two questions about internet access and use asked in the recruitment survey are based on questions in the GIP (Blom et al., 2015).

10.2 Activities online (web3, web4)

The question about activities online in the past four weeks (web3) is based on a question in the MOSAiCH 2020 study (Ernst Stähli et al., 2021). The GLEN version has simplified wording and less activities. Moreover, some new activities were included, such as using AI services.

The first two items included in the question about online behaviors (web4) are taken from the MOSAiCH 2024 survey (Ernst Stähli et al., 2025).

10.3 Frequency of media use and use of news sources (med1, med2, med3)

These three questions were asked only in the starter survey in order to capture both media consumption in general and use of news sources.

First, a short general question about media use was asked (med1), which did not differentiate between purposes such as (political) news and entertainment. It was based on a question regularly included in the GESIS-Panel (GESIS – Leibniz Institute for the Social Sciences, 2025). For GLEN, the number of items was limited to four rough categories (social media, TV/movies, podcasts, newspapers) and the past week was specified as a reference period to facilitate recall.

The following two questions (med2, med3) referred to media used for news consumption. In contrast to the questions asked later in the panel (med4, med5, med6), these referred to news in general rather than specifically political news. In addition, med2 offered a more differentiated list of news sources (e.g., distinct categories for newspapers printed vs. online) than the later version (med5). The list of social media services offered in med3 was identical to the later version (med6). Both questions were inspired by the Reuters Institute Digital News Report (Newman et al., 2024).

10.4 Media used for political news (med4, med5, med6)

The two questions on media use for political news (med4, med5) are included alternately so that each is asked once per year. They differ in that med4 asks about frequency of use over the past four weeks whereas med5 asks whether or not specific sources had been used in the past week. The media categories are kept constant across both questions:

- Television, including media libraries
- Daily newspapers (printed or digital)
- News websites or apps for smartphones
- Radio, including web radio
- Social media
- Other sources, namely (open entry)

The questions are inspired by a question included the GLES Rolling Cross-Section (GLES, 2022) that asks about the sources respondents generally use for political news.

The purpose of the simplified question med5 was to capture very recent media use in order to minimize telescoping effects and to provide a more appropriate lead-in for the subsequent item on social media use.

The question med5 is followed by an item on social media use for political news, which asks about a list of specific social media services and platforms used. This question is adapted from the Reuters Institute Digital News Report (Newman et al., 2024). The question text was adapted to better fit the survey context, as the GLEN survey asks specifically about political news, whereas the Reuters Institute Report covers news consumption in general.

10.5 News avoidance (med7)

This question was adopted from the Reuters Institute Digital News Report (Newman et al., 2024). The question text was slightly simplified, and the response scale adapted to fit GLEN standards.

11 Family

11.1 Sex, age, cohabiting status of children (kid2, kid3, kid4)

The way GLEN captures data on respondents' children is inspired by the pairfam design (pairfam, 2023a), but the amount of information is restricted to each child's age in years (kid2), sex (kid3), and whether the child lives in the respondent's household (kid4).

11.2 Partner's education and occupation (rel5, rel6, rel7, rel8)

These questions were asked analogously to the questions asked about the respondent's own education (sde1), occupational status (sde13), occupation (sde14), and industry/sector (sde15). To reduce respondent burden, the number of occupational categories provided in rel6 was smaller than in sde13, and the open questions about occupation and industry were not asked referring to retired partners' last job.

11.3 Division of housework in the couple (rel12)

This question is based on an instrument implemented annually in pairfam (pairfam, 2023a), with the list of tasks adapted to specifically include tasks related to pro-environmental behaviors: Cooking, preparing meals; grocery shopping; taking out the trash, recycling; repairing things. The pairfam response scale was kept with minor adaptations.

11.4 Disagreements with the partner (rel13)

This question was adopted from pairfam (pairfam, 2023a). While the pairfam question focuses on parenting and jealousy, the GLEN version centers on environmental and political issues: environmentally conscious behavior in everyday life; decisions about what we buy in everyday life; politics; nutrition. Two topics are identical in both surveys: financial matters and free time activities. The endpoint-labelled five-point response scale was revised to a fully labelled five-point scale with the same endpoints: "(almost) never" and "very often".

11.5 Parenting goals (kid5)

This question is based on a longer question implemented in pairfam (pairfam, 2023c). For GLEN, the number of items was reduced and an item referring to pro-environmental behavior was added.

Table 11: Parenting goals in pairfam and GLEN

pairfam	GLEN
eat healthily and get enough exercise	eat healthily and get enough exercise
be likeable and liked by others	be likeable and liked by others
integrate into groups	integrate into groups
be respected by others, have a good standing	-
be able to get one's way, to have a strong will	-
accept rules and be able to obey	accept rules and be able to obey
be independent and do things autonomously	-
be able to form one's own opinion	-
achieve higher education	-
be industrious	-
be responsible	be responsible
know how to conduct themselves	-
-	behave environmentally friendly

11.6 Child health (kid6)

Child health was captured by a general item taken from pairfam (pairfam, 2023c).

11.7 Discussions and disagreements with the child (kid12, kid13, kid14)

Intergenerational interaction is captured through two questions regarding the frequency of discussions about specific topics (kid12) and the level of (dis-)agreement (kid13) between the respondent and the oldest child. The question about frequency of discussions is inspired by Lawson et al. (2019) who use the following question: "How often have you discussed climate change at home with your family?"

Both GLEN questions refer to the following topics: everyday problems; nutrition; health behaviors (for example, smoking, exercise); environmental and climate protection; politics.

Regarding environmental and climate protection, an additional open question invites respondents to specify the exact issues of disagreement (kid14).

11.8 Decision making (kid18)

This question focuses on whether parents or children, or both jointly, make decisions about specific topics. The question is inspired by a question included in AID:A 2019 (Kuger et al., 2020) but has undergone significant revision. While the original question was directed to children and adolescents, the GLEN question asks the parents, which means a revision of the question text and the response options, although the main concept is kept. The topics are adapted to match some issues related to environmental behavior, more specifically transportation and consumption. It asks about decisions surrounding which clothes to buy; which cell phone to use, or whether to have a cell phone at all; and which mode of transportation to use to get to school/training.

12 Socio-demographics

Most questions in this section are based on the recommendations by Hoffmeyer-Zlotnik et al. (2024) with slight adjustments. This includes questions on respondent sex, family status (sde12), highest level of education attained (sde1), vocational qualification (sde2, sde3), and whether the respondent as well as their father and mother were born in Germany (sde5, sde8, sde9).

12.1 Own economic situation (econ1)

This question was adopted from GLES Panel 2021 (GLES, 2023a).

12.2 Monthly net income (econ2, econ3)

Two questions are asked alternating in the a- and b-waves. The monthly net household income (econ2) is part of the mixed-mode a-waves, and the individual monthly net income (econ3) is part of the online-only b-waves. Both questions are based on Hoffmeyer-Zlotnik et al. (2024). The number of categories was determined based on considerations put forward by Longmuir and Grabka (2024).

12.3 Subjective social status (sde22)

Respondents' subjective perceptions regarding their social status can complement objective indicators and have been linked to a number of outcomes such as health, political preferences, and green consumption (Brown-Iannuzzi et al., 2015; Feng et al., 2025; Hoebel & Lampert, 2020).

GLEN implements a question from pairfam (pairfam, 2023b), based on the MacArthur scale (Operario et al., 2004), with a slightly shortened question text.

12.4 Citizenship and country/region of birth (sde4 – sde7)

Citizenship is asked in a single categorical question distinguishing between exclusive German citizenship, dual or multiple citizenship including German citizenship, exclusive foreign citizenship(s), and statelessness. Citizenships are recorded using standardized country lists based on

the ISO classification (196 countries), following the list of states provided by the German Federal Statistical Office (as of 2024).

Country and region of birth are asked with three questions: First, a filter question asked whether the respondent was born in Germany (Hoffmeyer-Zlotnik et al., 2024), then respondents born in Germany were asked whether they were born in the GDR or the eastern German federal states, the western German federal states or in regions that belonged to Germany before 1945. This question is based on the German Microcensus (RDC of the Federal Statistical Office and Statistical Offices of the Federal States of Germany, 2024). Respondents who were not born in Germany were asked about their country of birth.

13 Work

13.1 Occupational status and position (sde13, job4-job9)

Data on both occupational status (sde13) and occupational position (job4 – job9) were collected following the recommendations by Hoffmeyer-Zlotnik et al. (2024).

In Wave 1b, both respondents in paid work and retirees were asked about their occupational position. In future waves, information will be updated only for respondent in paid work.

13.2 Type and sector of current occupation (sde14, sde15)

These items capture respondents' current (or last) occupation and industry/sector. Both questions are implemented as open-ended items, asking for detailed descriptions of the respondent's main occupational activity and the corresponding economic industry/sector. Instructions emphasize precise reporting (e.g., specific job titles and industries) to facilitate accurate coding. Response options include a category for respondents who have never been employed.

The items are designed for coding according to the International Standard Classification of Occupations (ISCO) and *Klassifikation der Berufe 2010/2020 (KldB)* of the German Federal Employment Agency (Bundesagentur für Arbeit). This classification system structures occupations primarily by occupational field ("Berufsfachlichkeit"), reflecting similarities in tasks, knowledge, and skills, and secondarily by requirement level, distinguishing four levels of complexity. Both questions closely follow established survey practice in Germany (e.g., GESIS Panel, PASS).

While the questions were directed to all respondents in Wave 1a, they are directed only to employed respondents who have changed their job in the past 12 months in subsequent waves.

13.3 Working hours (job10)

This question captures respondents' typical weekly working hours, including overtime, and is implemented as an open-ended question asking for the average number of hours worked per week across all current employment activities. It is closely based on the corresponding question in FReDA

Wave 2B (Bujard et al., 2025), with a minor adaptation in wording to emphasize the average weekly workload and to explicitly include multiple jobs.

13.4 Work characteristics (job2)

Job characteristics and conditions at respondents' current workplace were captured by a number of items which were partly taken from pairfam (Brüderl et al., 2024). The endpoint-labelled response scale used in pairfam was replaced by a fully labelled scale.

The first item ("My work is physically strenuous") was used without adaptations, and the third was used only with one minor change ("My *work* provides me with interesting tasks" instead of "My *occupation* provides me with interesting tasks"). The remaining items were developed by the GLEN team.

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