methods, data, analyses | 2025, pp. 1-23 DOI: 10.25521/mda.588

All or Nothing: Notable Response Behavior in Rating Scales in Participant Surveys of Academic Continuing Education for Older People

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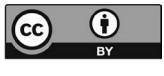
Abstract

Academic continuing education for older people is a scientifically focused offering, targeting individuals in the post-professional phase of life. This age group, and particularly this area of continuing education, has been marginally addressed in educational research. For the first time, comprehensive, cross-institutional datasets on participants are available ($N_{\text{MFB 2019}}$ = 3,918; $N_{\text{MFB 2023}}$ = 4,976), enabling analyses of this group's response behavior in quantitative surveys. Among respondents, a response behavior is observed, characterized by a distinct missing pattern. Some answer only those items on rating scales that are 'fully applicable' to them, while all other items remain unanswered (missing). This response behavior has not been described previously. Consequently, this exploratory study systematically examines the response behavior and identifies data-specific characteristics potentially linked to the response pattern. Based on theoretical considerations derived from the Total Survey Error Model and the cognitive response process model, various influencing factors are taken into account. Using logistic regression, four models were constructed, incorporating both survey-related and person-related factors (sociodemographic, participation-related, and motivation-related) step by step into the analysis. The missing pattern occurs independently of the content of the questions. Results indicate that both survey-related and person-related factors contribute this response behavior. The findings suggest multiple connections to the Total Survey Error Model but do not allow for a clear and mutually exclusive classification of the response error. The discussion focuses on further research desiderata and emphasizes the importance of a deeper investigation to ensure data quality and minimize systematic bias in this the target group.

Keywords: total survey error, older respondents, rating scales, scientific continuing education, response behavior



Academic continuing education for older people in Germany includes programs offered by higher education institutions (Wilkesmann, 2010), targeting individuals in later stages of life (Böhme, 2011). These programs are characterized by their constitutive elements of scientific orientation and research relevance, intergenerationality, and open access without age or entry restrictions (Dabo-Cruz & Pauls, 2018). Despite the openness of the offering, the participant composition tends to be selective: they predominantly attract individuals in post-professional life phases with high educational status (Schmidt-Hertha, 2020; Schneider, 2020).[1] Surveys among participants in Germany have primarily been conducted locally, which limited sample sizes and, consequently, the analytical potential. For the first time, more extensive cross-site datasets are now available ($N_{\text{MFB 2019}} = 3{,}918$; $N_{\text{MFB 2023}} = 4{,}976$)[2], enabling more in-depth analysis, including the analysis of response behavior within this participant group in quantitative surveys.

In all surveys that form the basis of the datasets mentioned—conducted among participants in academic continuing education for older people—a notable response behavior can be observed: A subset of respondents answers only some items on rating scales, selecting the highest agreement option ('fully applies') while leaving the remaining items unanswered (missing). Gradations or intermediate responses are not selected. This response behavior occurs in up to 7.1% of cases (MFB 2019 dataset, see Table 3). Although this represents a small proportion of respondents, analyzing this response pattern is relevant, as such cases are typically excluded from further analysis, leading to compromised data quality. The target response behavior has received little attention in the existing literature. It has not been systematically described, aside from brief mentions in two studies (Felix & Schneider, 2022; Malwitz-Schütte, 2000). Therefore, the present study adopts an exploratory approach to describe this response behavior and identify its influencing factors comprehensively. The guiding research question is: Which survey-related and person-related variables influence the described pattern of missing responses? The aim is twofold: first, to identify which aspects of the survey design contribute to this response behavior and therefore require

[1] The terms 'academic continuing education for older people' and 'post-professional academic continuing education' are therefore often used synonymously.

[2] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.

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particular attention; and second, to assess—by identifying respondent-related factors—whether the exclusion of such cases could result in the systematic exclusion of specific population subgroups.

In the following, the observed response behavior is theoretically contextualized based on perspectives on questionnaire design and survey errors. Then, after outlining the dataset and the methodological approach, the findings of the analysis will be presented. The study concludes with an interpretation of findings and implications for survey research, particularly in the context of academic continuing education for older people.

Theoretical Framework and Research Questions

The design of questionnaires in empirical social research resembles a dramaturgy with two key considerations: the succession of questions and the arrangement of response categories are crucial for achieving high data quality. Targeted communication and a clear structure are essential for maintaining respondent motivation and minimizing dropout (Porst, 2014). Nevertheless, errors can occur at any stage of the data collection and analysis process. The Total Survey Error model identifies various sources of error that cause biases in estimating population parameters, and thus impair the quality of results (Groves & Lyberg, 2010). This study focuses on specific errors within the Total Survey Error model: the response pattern under investigation is a specific form of item nonresponse implying measurement error.

Measurement Error

Questionnaire design is one of the key sources of measurement errors. The order of questions or response categories introduces several position effects. Halo effects occur when preceding questions or response categories serve as contextual information influencing subsequent questions (Manson et al. 1994; Tourangeau et al., 2000). Typically, halo effects refer to content-based priming, meaning the activation of specific themes in respondents' minds (Fietz & Friedrichs, 2022).

Further sources of measurement error are embedded in the cognitive response process. According to Groves et al. (2009), answering a survey question involves multiple cognitively demanding phases, each of which can be disrupted by strategic respondent behavior. When interpreting the meaning of a question, respondents implicitly rely on conversational rules known as maxims of communicative cooperation (Grice, 1975). As a result, respondents may seek additional contextual information when facing comprehension difficulties or withhold responses they perceive as irrelevant or inappropriate (Barth, 2022).

Satisficing refers to a response behavior in which steps of the cognitive response process are shortened or skipped to reduce cognitive burden (Krosnick, 1991). Inconsistent, overly long, or complex questions, fatigue effects, or a lack of motivation can increase the likelihood of such behavior (Barth, 2022; Billiet & Davidov, 2008; Bogner & Landrock, 2015). Response effects associated with satisficing include, for example, acquiescence—the tendency to agree regardless of content.

Biased response tendencies may not only stem from satisficing strategies but also from specific personality traits of respondents. This includes, for example, social desirability—the tendency to conform to social norms and respond in a way that aligns with perceived expectations (Kreuther et al., 2008). Various studies suggest that older age, lower social status, lower cognitive abilities, and lower formal education are associated with a higher likelihood of extreme responses and acquiescence (Bogner & Landrock, 2015; Greenleaf, 1992). Social desirability is more commonly observed among highly educated respondents, women, and older individuals (Preisendörfer & Wolter, 2014). Person-related characteristics, such as age or education level, can also impact concentration levels, increasing susceptibility to fatigue effects (Barth, 2022; Krosnick, 1991).

Nonresponse Errors

The main focus of this study is on item nonresponse, which refers to missing values for specific survey items (Engel & Schmitt, 2022; Faulbaum, 2022). Common causes include insufficient understanding of the question's intent, inability to retrieve appropriate information, or unwillingness to disclose information (Beatty & Herrmann, 2002; Groves et al., 2009; Krosnick, 2002). While these causes often reflect satisficing behavior, they may also result from the perceived sensitivity of questions (Tourangeau & Smith, 1996).

When evaluating nonresponse errors, the primary concern is the occurrence and extent of these errors among specific respondent groups, as this can lead to systematic bias in the data. Missing data patterns are commonly classified as MCAR (missing completely at random), MAR (missing at random), or NMAR (not missing at random; Allison, 2002; Rubin, 1976). For the analysis of variables, cases with missing values can either be excluded or imputed with plausible estimates, assuming complete independence (MCAR) or at least independence from the variable in question (MAR; Engel & Schmidt, 2022). Both approaches carry risks for data quality. Therefore, minimizing item nonresponse during the response process must be the primary goal in survey design (Dillman et al., 2009).

Preliminary studies of the response pattern under investigation in the available datasets indicate that the nonresponse process is not random, but rather dependent on the item itself and other influencing variables (Felix & Schneider, 2022). Given the selective participant group—individuals enrolled in academic

continuing education for older people—it is reasonable to examine person-related variables. However, survey-related variables also seem to contribute, as this response behavior is observed more frequently when a multiple-response set precedes the item battery (Felix & Schneider, 2022).

Based on the theoretical frameworks of measurement and nonresponse errors, the following research questions emerge:

Perspective 1: How do survey-related variables influence the target response behavior?

Perspective 2: How do person-related variables influence the target response behavior?

Methodology

Data Foundation

In official statistics and large-scale surveys, academic continuing education for the older people is only marginally addressed. However, comprehensive key figures are important for legitimizing and further developing such programs (Bertram et al., 2017). To address this gap, the Working Group on Research Questions and Statistics of the 'Federal Association for Academic Continuing Education for the Elderly' (AK BAG WiWA) developed the Standardized Questionnaire for Participant Surveys in Post-Professional Academic Continuing Education (MFB). The initiative aimed to create a uniform survey instrument capable of generating comparable data across different university sites.

The first version of the questionnaire has been available since 2019 (AK BAG WiWA, 2019; MFB 2019). It covers the thematic fields: Study behavior, preferences and motives, social interactions with other stakeholders, satisfaction, impacts and desires, social environment and civic engagement, educational biography, and sociodemographic data. The questionnaire is designed to be adaptable for quantitative surveys to suit the specific conditions of individual university sites (Bertram et al., 2017). The semi-standardized questionnaire includes up to 40 questions. The number varies considerably due to the location-specific selection of questions and response formats. Respondent burden is substantially mitigated through the application of targeted filter routing. Pretests with the MFB 2019 were carried out at three university sites, followed by three additional surveys. The surveys were conducted online, supplemented by paper questionnaires to avoid excluding individuals with low digital affinity. The resulting data were consolidated into a unified dataset (MFB 2019 dataset), which includes N = 3,587 valid cases with a response rate of approximately 40%. This dataset only includes individuals actively participating in the program during the survey semester, as biases among those no longer engaged could not be excluded. The average age of respondents is 69.8 years, with 56.4% women and 43.6% men. The

response rate for those indicating a third or non-binary gender was too low for meaningful inclusion in the dataset. A total of 62.7% of respondents hold a university degree. The average duration of participation is 10.34 semesters, and the median satisfaction level is 4.41 on an ascending five-point scale (Table 1).

The ongoing digitalization and the impacts of the COVID-19 pandemic have led to changes in the organization and offerings of post-professional academic continuing education after 2019, which were not captured by the MFB 2019. Consequently, the instrument was expanded to include questions and items related to digitalization, along with a thematic block addressing the relationship between science and society (AK BAG WiWA, in press; MFB 2023). The new questionnaire contains up to 57 questions. In addition to content updates, methodological revisions were also made. A complex filtering system was implemented to reduce the individual workload of respondents and address increased dropout rates (Engel & Schmidt, 2022). These filters account for survey groups such as 'current and former participants' and 'digitally inclined and digitally averse individuals'. Further validation was conducted using the previously collected MFB 19 survey data. Questions with high missing rates were revised for clarity, precision, and comprehensibility. The internal consistency of scales was tested using Cronbach's Alpha (Rost, 2013). Additionally, all rating scales included the following completion instruction: "Please indicate for each of the following statements the extent to which you apply. Provide a response for each row!" (MFB 2023). Based on the revised MFB 2023, a synchronized survey was conducted in the summer semester of 2023 at 15 institutions in Germany. Given the digital developments during the COVID-19 pandemic, it was assumed that an online survey would be appropriate for the target group. Only at one institution were additional paper questionnaires requested for individuals without email access. After data cleaning and plausibility checks, a dataset of N = 4,976 valid cases was compiled, yielding a cleaned response rate of 31.1% (MFB 2023 dataset). As with the earlier dataset, only respondents actively participating in the program at the time of the survey were included in the analysis (N = 3,665). The average age of respondents is 70.3 years. Of the respondents, 52.6% are women and 47.4% are men. The response category 'diverse' was excluded from the analysis for the reasons mentioned earlier. A total of 77.9% of respondents hold a university degree. The average duration of participation is 12.7 semesters, and the median satisfaction score is 4.40 on an ascending five-point scale (Table 1).

A pooled dataset was created from the two datasets (N = 7,252) to enable both cross-site comparative analyses and temporal comparisons. In the pooled dataset, the average age of respondents is 70.0 years. Of the respondents, 54.5% are women and 45.5% are men. A total of 70.7% of respondents hold a university degree. The average duration of participation is 11.5 semesters, and the median satisfaction score is 4.41 on an ascending five-point scale (Table 1).

Table 1 Overview of the data basis

	MFB[a] 2019-dataset	MFB 2023-dataset	Pooled dataset
Cleaned response count	3,587	4,976	/
Cleaned response rate (%)	approx. 40	31.1	/
Current participants	3,587	3,665	7,252
Average age (years)	69.8	70.3	70.0
Gender distribution (%)			
Male	43.6	47.4	45.5
Female	56.4	52.6	54.5
With university degree (%)	62.7	77.9	70.7
Participation duration (semesters)	10.34	12.7	11.5
Satisfaction (median)	4.41	4.40	4.41

[a] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.

Methodological Approach

The exploratory approach systematically investigates the response pattern observed (Tukey, 1977) to identify specific characteristics of the data that may be associated with the missing data pattern being studied. The dependent variables examined refer to item batteries *participation motives*, and *impacts*. These item batteries were chosen because they were consistently collected at all locations during both survey time points. The item battery *participation motives*[3] consists of 15 items (MFB 2019) or 18 items (MFB 2023). The item battery impacts[4] comprises 8 items (MFB 2019) or 9 Items (MFB 2023; see Table A1 and Table A2 in the appendix). Dichotomous variables are constructed to indicate whether the notable response pattern is present or absent within each item battery. Specifically, if respondents answer all items in a given battery either exclusively with "fully applies" or leave them entirely unanswered, the dependent variable for that battery is coded as 1 (*presence of the response pattern*). In contrast, if respondents use varying levels of the 5-point response scale or leave all items unanswered, this is coded as 0 (*absence of the response pattern*). In describing the examined response pattern, the dependent variables are assessed separately within the two subsamples, MFB 2019 and MFB 2023, and an intra-individual comparison is conducted.

[3] Question wording: "What expectations and goals do you associate with participation in [NAME OF PROGRAM]", response format: 1 (*does not apply at all*) to 5 (*fully applies*).

[4] Question wording: "What personal experiences have you had with/through the [NAME OF PROGRAM]?", response format: 1 (*does not apply at all*) to 5 (*fully applies*); −997 (*I cannot judge*).

This allows for initial insights into the relevance of person-related or survey-related factors affecting the response behavior.

A binary logistic regression is used to explore explanatory influences. Based on the theoretical framework, four groups of predictors are introduced: survey-related, person-related sociodemographic, person-related participation-related, and person-related motivational predictors.

Due to the technical implementation of the individual surveys, variables related to the motivation for survey participation are available only for the MFB 2023 dataset.

Operationalization

The aim of the collecting data using both MFB 2019 and MFB 2023 was to provide a comprehensive overview of the state of post-professional academic continuing education in Germany. Consequently, the resulting dataset was not specifically designed for the research question being examined here. Rather, the insights regarding the observed response behavior emerged as a byproduct of the analyses on respondents' participation and study behavior, which constituted the primary focus of the research. Thus, operationalizing of the variables under investigation, focuses on selecting or generating suitable indicator variables that can approximate the phenomena of interest. Figure 1 illustrates the analytical model.

Survey-Related Characteristics

The analysis of these characteristics focuses on terms of questionnaire design and question wording. Preliminary studies on the observed pattern of missing data suggest a potential association between the response pattern and the question type of the preceding item, particularly when it involves a multiple-response set. This may indicate halo effects (Manson et al., 1994; Tourangeau et al., 2000). Even if the response behavior cannot be attributed to content-related priming from preceding questions, it may instead be explained by a questionnaire-related spillover effect. Therefore, an indicator variable is constructed to reflect the presence of a preceding multiple-response set. Regarding question wording, the observed nonresponse process may also relate to the scaling of the items (Fietz & Friedrichs, 2022; Manson et al., 1994; Tourangeau et al., 2000).

Item nonresponse caused by reluctance to disclose information (see above; Beatty & Herrmann, 2002; Groves et al., 2009; Krosnick, 2002) may be reduced by including an active abstention category. Thus, the presence of an active abstention category is considered a survey-related characteristic. Given the different survey time points, survey timing is introduced as a control variable to ensure that the effects of survey-related characteristics are not due to variations in data collection contexts. Institution-specific influences on survey implementation are controlled for by the location of the surveying institution. Survey-related

characteristics include survey timing, the type of preceding question, and the presence of an active abstention category, all incorporated into the modeling as independent variables (Model 1).

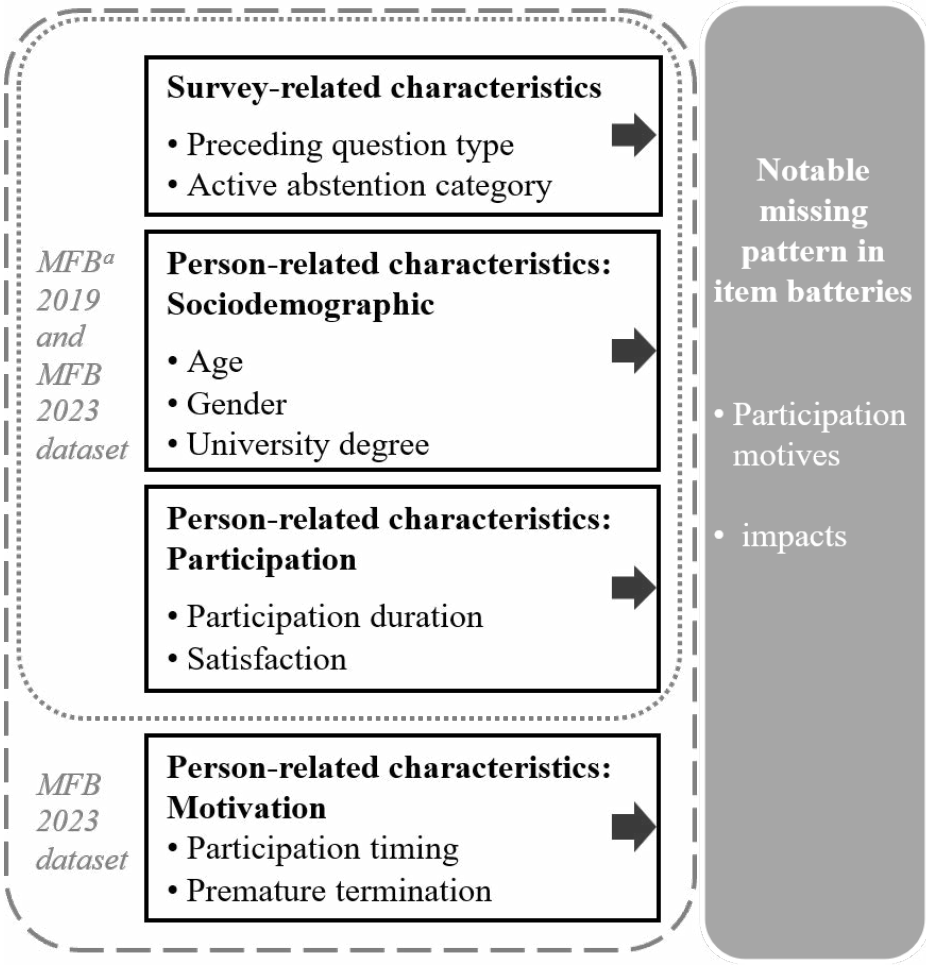

Figure 1 Analytical model (own representation).
[a] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.

Person-Related Characteristics: Sociodemographic

For person-related characteristics, deficiencies in the response process and respondent personality traits play an important role. Age, social status, and formal education have been identified as key predictors of participation in continu-

ing education in general (Hoffmeyer-Zlotnik & Warner, 2014). At the same time, these factors are acknowledged as influencing biased response tendencies (see above; Barth, 2022; Bogner & Landrock, 2015; Greenleaf, 1992; Krosnick, 1991). Consequently, the sociodemographic variables of age, gender, and formal education—in this case, having a university degree—are included as independent variables in the first group of person-related characteristics (Model 2).

Person-Related Characteristics: Participation

Person-related characteristics associated with participation in post-professional academic continuing education mainly concern the respondents' affiliation with the implementing institution. The willingness to disclose information is a conscious decision within the response process. However, this decision may be overshadowed by effects of social desirability. Voluntary participation in such programs—typically motivated by intrinsic interest—requires a high degree of personal commitment. If respondents are highly satisfied with the program, this may—paradoxically or precisely for that reason—result in effects of social desirability in the response behavior. From the available datasets, the duration of participation in the academic continuing education program for older people and satisfaction with the program can serve as indicators of this commitment and are thus included as independent variables (Model 3).

Person-Related Characteristics: Motivation

Finally, motivation-related aspects are relevant for survey participation. Specifically, satisficing strategies are rooted in the respondents' motivation (Engel & Schmidt, 2022; Krosnick et al., 1996). Respondents, adhering to Grice's maxims of communicative cooperation, may omit responses they perceive as inappropriate or irrelevant to reduce cognitive burden. To assess motivation for participating in the survey, indicator variables can be developed from the survey metadata. The required metadata is available only for the synchronized survey using the MFB 2023, as the MFB 2019 data was gathered using entirely different survey software, rendering suitable metadata unavailable.

Initially, the timing of survey participation is considered. According to Porter and Whitcomb (2005), late survey participation may indicate low motivation, similar to non-participation. However, the definition of 'late responders' remains ambiguous. For the current analysis, a dichotomous variable is generated from the survey metadata by splitting the field period in half. Early participation during the first half of the survey period is interpreted as indicative of higher motivation compared to participation in the middle or latter half of the survey period. Furthermore, premature termination of the survey is utilized as an indicator of low motivation to complete the survey (Model 4). Table 2 presents an overview of the operationalization of characteristics, their corresponding indicator variables, and measurement levels.

Table 2 Operationalization of variables in the analysis: Overview

	Indicator variables	Scaling
	Survey-related characteristics	
	Preceding question type	0 *(question does not follow a multiple-response set)* 1 *(question follows a multiple response-set)*
	Presence of an active abstention category	0 *(abstention category not available)* 1 *(abstention category available)*
	Person-related characteristics	
Sociodemographic	Age	Metric *(years at the time of the survey)*
	Gender	0 *(female)* 1 *(male)*
	University degree	0 *(degree present)* 1 *(degree not present)*
Participation	Participation duration	Metric *(number of semesters)*
	Satisfaction	1 *(not at all satisfied)* 5 *(fully satisfied)*
Motivation	Participation timing	0 *(early participation (until midpoint of survey period))* 1 *(late participation (from midpoint onward))*
	Premature termination	0 *(complete response)* 1 *(incomplete response)*
	Dependent variables	
Response behavior	Missing pattern in item batteries (participation motives, impacts)	0 *(no missing pattern)* 1 *(missing pattern)*

Results

The notable missing pattern was observed in both item batteries examined at both survey time points (MFB 2019 and MFB 2023). The response pattern occurred more frequently within the item battery on *participation motives*. In the MFB 2019 dataset, 7.1% of respondents exhibited this response behavior. In contrast, it was slightly less prevalent at both survey time points in the item battery *impacts* (Table 3). To better assess the extent of the missing pattern, the average item non-response was calculated for both item batteries. The results indicate a considerable overlap between the missing pattern and overall item nonresponse and is therefore highly relevant for data quality considerations. When

comparing the two survey time points, the incidence of the response behavior decreased in the *participation motives* and *impacts* item batteries. This decline may be attributed to changes in survey-related characteristics. For instance, in the MFB 2023 survey, the completion instructions for the item batteries were made more precise[5].

Table 3 Occurrence of the notable missing pattern in the examined item batteries.

Item battery	MFB[a] 2019 (*N* = 3587)		MFB 2023 (*N* = 3665)		Pooled dataset (*N* = 7252)	
	Average item non response	Missing pattern	Average item non response	Missing pattern	Average item non response	Missing pattern
	%	%	%	%	%	%
Participation motives	12.5	7.1	8.0	3.7	10.2	5.4
Impacts	6.9	2.8	3.4	1.4	4.8	2.1

Notes: Source: Combined dataset of BAG WIWA standardized questionnaire (MFB 2019 dataset and MFB 2023 dataset).
[a] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.

To examine whether the missing pattern occurs independently of question content or is associated with certain topics, the item battery *study activities* was also analyzed (see Table A3 in the appendix). The results show that the missing pattern under investigation also occurs within this item battery. In the pooled dataset, 2.6% of respondents exhibited the missing pattern (MFB 2019: 2.4%; MFB 2023: 2.7%). These findings suggest that the occurrence of the specific missing pattern is independent of the content of the item batteries.

Furthermore, significant correlations are observed between the occurrence of this response behavior across both item batteries (contingency coefficients—phi: overall: .38***; MFB 2019: .37***; MFB 2023: .39***; ***$p < .001$). This may serve as an initial indication of the influence of person-related characteristics. The moderate strength of these associations (contingency coefficients < .4) suggests that additional factors, such as survey-related characteristics, also play a role.

[5] The original completion instruction, "Please indicate the extent to which the following statements apply to you!", was expanded to: "Please indicate for each of the following statements the extent to which you apply. Provide a response for each row!"

Regression Analysis

To identify potential factors influencing the occurrence of the missing pattern, three models were calculated based on the pooled dataset (MFB 2019 and MFB 2023). Model 1 includes only survey-related characteristics as predictors (Table 4, Model 1). The preceding question type is significantly associated with the response behavior. Specifically, a preceding multiple-response set increases the likelihood of the missing pattern occurring by 45%. This effect is observed exclusively within the *participation motives* item battery. For the *impacts* item battery, neither the preceding question type nor the presence of an abstention category significantly influences on the occurrence of the missing pattern.

Table 4 Effects of survey-related and person-related characteristics on the presence of a notable missing patterna (logistic regressions), *Exp(B)*

Predictors	Model 1		Model 2		Model 3	
	PM	I	PM	I	PM	I
Survey-related characteristics						
Preceding question type (Ref.: no multiple-response set)	1.45**	1.29	1.43	1.14	1.47*	1.07
Active abstention category (Ref.: not available)	1.20	.73	1.31	.88	1.10	.74
Person-related characteristics: Sociodemographic						
Gender (Ref.: female)			.64***	.46***	.72*	.46***
Age (years)			1.07***	1.05***	1.07***	1.04*
University degree (Ref.: present)			1.57***	1.61*	1.68***	1.63*
Person-related characteristics: Participation						
Participation duration (ascending in semesters)					1.00	1.01
Satisfaction (ascending scale)					1.41**	2.37***
Constant (regression coefficient *B*)	−2.31	−2.86	−7.21	−6.27	−8.98	−9.75
Pseudo R^2 (Nagelkerke)	.02	.01	.06	.05	.06	.08
Base (*N*)	7,252	7,252	6,283	6,283	5,803	5,803

Notes: All models controlled for survey time point (MFB 2019/2023; the abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.).
Source: Combined dataset BAG WIWA standardized questionnaire (MFB 2019 dataset and MFB 2023 dataset).
[a] Coding of the dependent variables: Participation motives (PM) and impacts (I): 0 (*no missing pattern*), 1 (*missing pattern*).
***$p < .001$; **$p < .01$; *$p < .05$ (*t*-test).

Model 2 includes sociodemographic characteristics along with survey-related characteristics. The three factors considered (gender, age, and university degree) significantly affect the occurrence of the missing pattern in both examined item batteries (*participation motives* and *impacts*; Table 4, Model 2). Men, compared to women, have a 36% lower chance (*participation motives*) and a 54% lower chance (*impacts*) of exhibiting the specific response behavior. Additionally, with each additional year of age, the likelihood of the missing pattern increases by 7% (*participation motives*) and 5% (*impacts*). Furthermore, individuals without a university degree are significantly more likely to exhibit the specific response behavior. Their chances increase by 57% (*participation motives*) and 61% (*impacts*) compared to those with a university degree.

Model 3 includes two participation-related characteristics in addition to the previously considered predictors (Table 4, Model 3). The duration of participation does not significantly affect on the occurrence of the missing pattern. However, the satisfaction of respondents has a clear and significant impact on their response behavior. As satisfaction increases, the likelihood of a specific missing pattern increases by 41% for *participation motives* and by 137% for *impacts*. The overall analysis of the model indicates that the previously described influences of the preceding question type, gender, age, and university degree persist even when controlling for participation-related characteristics. The explanatory power of Models 1–3 remains relatively low, with Nagelkerke Pseudo-R^2 values ranging between .01 and .08. Nonetheless, all models are statistically significant.

Based on the MFB 2023 dataset, a fourth model was calculated, incorporating motivation-related characteristics (Table 5). The timing of participation in the survey shows no association with the missing pattern. However, premature survey termination has a strong and significant impact on the occurrence of the missing pattern within the *participation motives* item battery. Respondents who terminate the survey prematurely are 270% more likely to exhibit this response behavior compared to those who fully complete the survey. Additionally, the significant effects of age and satisfaction are confirmed. Concerning the occurrence of the missing pattern within the *impacts* item battery, no conclusions can be drawn about the influence of motivation-related characteristics, as the overall model is not statistically significant.

Conclusion and Discussion

This study aimed to systematically investigate a specific response behavior. It is characterized by respondents answering only those items on rating scales they perceive as fully applicable with the highest level of agreement, leaving all other items unanswered. Such behavior results in item nonresponse, requiring an analysis of potential biasing influences. The study considered both survey-

Table 5 Effects of survey-related and person-related characteristics on the presence of a notable missing pattern[a] (logistic regressions), *Exp(B)*

Predictors	Model 4	
	PM	I[b]
Survey-related characteristics		
Preceding question type (Ref.: no multiple-response set)	/	1.09
Active abstention category (Ref.: not available)	/	/
Person-related characteristics: Sociodemographic		
Gender (Ref.: female)	.83	.43
Age (years)	1.04*	1.01
University degree (Ref.: present)	1.50	1.16
Person-related characteristics: Participation		
Participation duration (ascending in semesters)	1.00	1.00
Satisfaction (ascending scale)	1.40*	1.62
Person-related characteristics: Motivation		
Participation timing (Ref.: early participation)	1.22	1.00
Premature termination (Ref.: complete response)	3.70*	2.64
Constant (regression coefficient *B*)	−7.83	−6.41
Pseudo R^2 (Nagelkerke)	.028	.032
Base (*N*)	3,076	3,076

Notes: Source: Dataset BAG WIWA standardized questionnaire 2023 (MFB 2023 dataset; the abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.).
[a] Coding of the dependent variables: Participation motives (PM) and impacts (I): 0 (*no missing pattern*), 1 (*missing pattern*).
[b] Model is misspecified (chi² = 12.306, *df* = 8, *p* = .138).
***$p < .001$, **$p < .01$, *$p < .05$ (*t*-test).

related and person-related characteristics across sociodemographic, participation-related, and motivation-related dimensions. The notable missing pattern was observed in up to 7.1% of cases across the examined item batteries. It occurred independently of the content of the questions. While the proportion of affected cases appears small, the presence of this response behavior in all included surveys—regardless of the survey time point or university location—indicates a systemic issue that warrants further examination. The hypothesis from preliminary studies suggesting a specific halo effect caused by preceding multiple-response sets was partially confirmed. The influence of an absent abstention category could not be substantiated. Between the two survey time points (MFB 2019 and MFB 2023), the frequency of the missing pattern decreased

in the item batteries on participation motives and *impacts*. The most prominent change between the two surveys was the adjustment of the completion instructions.

Therefore, one of the key recommendations emerging from the results is to systematically examine missing responses in surveys for the presence of this specific pattern and to implement corresponding adjustments in questionnaire design. In this context, providing clear and comprehensive instructions for completing the questionnaire is particularly important for future surveys in this field of research. The length of the item batteries is not the focus of the analysis, as the response pattern occurs to a lesser extent in the MFB 2023 surveys despite a slightly higher number of items.

A highly significant correlation was found between the occurrence of the missing pattern across the analyzed item batteries. This intra-individual comparison suggests that, in addition to survey-related factors, person-related factors play a role in the occurrence of the missing pattern. The regression models indicate a significant influence of the examined aspects of person-related characteristics.

The response tendencies known from the literature, related to cognitive performance in the response process, are also observed here: being female, lacking a university degree, and increasing age all increase the likelihood of the specific response behavior occurring. Interpreting these results is challenging due to the high selection bias within the studied group. Older adults are generally underrepresented in continuing education and participate in surveys less frequently than younger individuals. However, the target group examined here comprises education-oriented older individuals, who participate in surveys at a high rate. In a less selective group of older adults, this response behavior could potentially occur to an even greater extent. Excluding cases with the analyzed missing pattern would exacerbate the exclusion of older adults from continuing education surveys, introducing a risk of systematic bias. Consequently, further investigation of this response behavior is crucial for continuing education research.

Participation-related characteristics are also relevant for explaining the response behavior. When controlling for survey-related and person-related characteristics (gender, age and educational background), the analysis shows that the likelihood of the specific response behavior increases with rising levels of satisfaction (Model 3). This finding initially appears to contradict the assumption that dissatisfied respondents are more likely to show the response behavior as a form of satisficing. One possible explanation for the influence of satisfaction could be social desirability: highly satisfied and committed individuals may tend to select only the most positive response options, avoiding moderate or negative responses. Additionally, the evaluative character of the survey—which implies an assessment of the educational offering—may reinforce socially desirable response behavior. This may lead respondents to perceive certain answers

as unacceptable if they appear to contradict their overall satisfaction with the continuing education program. In surveys without an evaluative character, this effect may be less pronounced. It can initially be assumed that fewer respondents would exhibit the response pattern in such cases. On the other hand, it remains to be examined whether this affects the dropout tendency and whether the tendency to exhibit the response pattern might even increase if fewer respondents terminate the survey prematurely. Further research is required to explore these dynamics. It must be taken into account that social desirability as an explanation for the occurrence of the specific response behavior initially contradicts the results already reported on the role of educational background. According to current research, individuals with higher levels of education are more prone to social desirability and would therefore be expected to exhibit the response behavior more frequently. However, participation in academic continuing education generally implies a strong interest in learning and a high degree of personal commitment—even among individuals without advanced formal qualifications. Thus, a strong affinity for education can also be assumed for participants without a higher level of formal education. Participation duration does not influence the target response behavior.

Using a subset of the dataset, person-related aspects of motivation for survey participation were examined. As a result, survey-related and sociodemographic characteristics lost their statistical significance. Motivation-related characteristics demonstrated explanatory power. The strong influence of the tendency to terminate the survey prematurely suggests that, during participation, respondents may omit information they perceive as irrelevant or inappropriate in order to reduce cognitive load before ultimately deciding to terminate the survey. This behavior does not appear to represent an error in judgment during the response process. Instead, the observed item nonresponse seems to reflect a conscious decision to withhold information. As the survey progresses, such response behavior may contribute to the likelihood of survey termination.

Limitations and Research Desiderata

The aim of this study was to comprehensively describe the missing pattern under investigation and gain a deeper understanding of the influencing factors. This approach is essential to derive methodological recommendations for questionnaire design that minimize potential biases, particularly concerning the target group of participants in post-professional academic continuing education. The relevance of this investigation and the necessity of further studies are evident from the existing research gap regarding participants in continuing education during the post-professional life phase. Given there is no control group of younger respondents in this analysis, it remains uncertain whether this response only occurs in older respondents, warranting further detailed investigation.

Despite the methodological approach that broadly accounts for potential influencing factors, all models exhibit rather low explanatory power for the missing pattern under investigation. This may be interpreted as an indication of MAR, meaning it is dependent on various variables and cannot be ignored without compromising data quality. Additionally, this pattern impacts data analysis, which should be accounted for in survey methodologies. Limitations of the data used in the analyses stem from the research objectives of the surveys and must be accepted as part of this initial investigation. The available indicator variables can only serve as approximations for the relevant characteristics. To further explore the causes of this response behavior and the interrelationships of influencing factors, specific research designs and a broader survey population are needed. Nonetheless, the findings from the studied respondent group highlight a previously overlooked response behavior that may also be relevant in other survey populations. The results suggest multiple connections to the Total Survey Error Model (Groves et al., 2009). However, they do not allow for a clear and non-overlapping attribution of the investigated response error. The significance of this ambiguity can only be addressed through further research.

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Appendix

Table A1 Measurement of participation motives[a]

MFB[b] 2019	MFB 2023
Welche Erwartungen und Ziele verbinden Sie mit der Teilnahme an [NAME DES PROGRAMMS]?	Welche Erwartungen und Ziele verbinden Sie mit der Teilnahme am [NAME DES PROGRAMMS]?
Completion instructions: Bitte geben Sie an, inwieweit die folgenden Aussagen auf Sie zutreffen! **Ich nehme teil, um …**	Completion instructions: Bitte geben Sie für jede der nachfolgenden Aussagen an, inwieweit diese Ihrer Meinung nach zutrifft. Machen Sie in jeder Zeile eine Angabe! **Ich nehme teil, um …**
Response format: 1 (*trifft überhaupt nicht zu*) bis 5 (*trifft voll und ganz zu*)	Response format: 1 (*trifft überhaupt nicht zu*) bis 5 (*trifft voll und ganz zu*)
– mich in meinem (früheren) Beruf weiterzubilden. – mich geistig fit zu halten. – andere Ansichten kennenzulernen. – meine Allgemeinbildung zu erweitern. – eigene Bildungsinteressen zu befriedigen. – früher Versäumtes nachzuholen. – meine Zeit sinnvoll auszufüllen. – an Diskussionen über aktuelle. wissenschaftliche Themen teilzuhaben. – mit jungen Menschen in Kontakt zu kommen. – mich für nachberufliche/ehrenamtliche Tätigkeiten zu qualifizieren. – mein Leben besser zu verstehen und zu bewältigen. – mich auf Hochschulniveau weiterzubilden. – meine Lebens- und Berufserfahrungen an junge Studierende weiterzugeben. – gleichgesinnte Menschen kennenzulernen. – mich einer neuen Herausforderung zu stellen.	– mich in meinem (früheren) Beruf weiterzubilden. – mich geistig fit zu halten. – andere Ansichten kennen zu lernen. – meine Allgemeinbildung zu erweitern. – eigene Bildungsinteressen zu befriedigen. – früher Versäumtes nachzuholen. – meine Zeit sinnvoll auszufüllen. – an Diskussionen über aktuelle wissenschaftliche Themen teilzuhaben. – mit jungen Menschen in Kontakt zu kommen. – mich für nachberufliche/ehrenamtliche Tätigkeiten zu qualifizieren. – mein Leben besser zu verstehen und zu bewältigen. – mich auf Hochschulniveau weiterzubilden. – meine Lebens- und Berufserfahrungen an junge Studierende weiterzugeben. – gleichgesinnte Menschen kennenzulernen. – mich einer neuen Herausforderung zu stellen. – neue Wissensgebiete kennenzulernen. – bestehendes Wissen zu vertiefen. – die heutige Zeit besser zu verstehen

[a] Question formulations in original German text. In some cases, university-specific items were added (e.g., "obtain a degree certificate").
[b] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.

Table A2 Measurement of impacts

MFB[b] 2019	MFB 2023
Welche persönlichen Erfahrungen haben Sie mit dem [NAME DES PROGRAMMS] gemacht?	Welche persönlichen Erfahrungen haben Sie mit dem bzw. durch das [NAME DES PROGRAMMS] gemacht?
Completion instructions: Bitte geben Sie an, inwieweit die folgenden Aussagen auf Sie persönlich zutreffen,	Completion instructions: Bitte geben Sie für jede der nachfolgenden Aussagen an, inwieweit diese Ihrer Meinung nach zutrifft. Machen Sie in jeder Zeile eine Angabe!
Response format: 1 (*trifft überhaupt nicht zu*) bis 5 (*trifft voll und ganz zu*); an vier der sechs Hochschulen zusätzlich: −997 (*keine Angabe*)	Response format: 1 (*trifft überhaupt nicht zu*) bis 5 (*trifft voll und ganz zu*); −997 (*kann ich nicht beurteilen*)
– Ich fühle mich in meiner geistigen Leistungsfähigkeit bestätigt. – Ich wurde angeregt, manche meiner eigenen Überzeugungen zu überprüfen. – Ich konnte meine Allgemeinbildung ergänzen und erweitern. – Ich wurde motiviert, meinen eigenen Bildungsinteressen stärker nachzugehen. – Ich habe mehr Anerkennung erfahren – Ich habe neue Kontakte knüpfen können. – Durch das Studium hat sich meine Sicht auf das Älterwerden verändert. – Ich habe mein Selbstvertrauen stärken können.	– Ich fühle mich in meiner geistigen Leistungsfähigkeit bestätigt. – Ich wurde angeregt, manche meiner eigenen Überzeugungen zu überprüfen. – Ich konnte meine Allgemeinbildung erweitern. – Ich wurde motiviert, meinen eigenen Bildungsinteressen stärker nachzugehen. – Ich habe mehr Anerkennung erfahren. – Ich habe neue Kontakte knüpfen können. – Durch die Teilnahme am [NAME DES PROGRAMMS] hat sich meine Sicht auf das Älterwerden verändert. – Ich habe mein Selbstvertrauen stärken können. – Ich kann die heutige Zeit besser verstehen.

[a] Question formulations in original German text. In some cases, university-specific items were added (e.g., " I was able to acquire new skills in dealing with digital media").
[b] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.

Table A3 Measurement of study activitiesa

MFB[b] 2019	MFB 2023
Auf welche Weise arbeiten/lernen Sie für Ihre Lehrveranstaltung(en)?	Auf welche Weise beschäftigen Sie sich mit den Inhalten der von Ihnen besuchten Veranstaltungen?
In der Regel lerne ich, indem ich…	Completion instructions: Bitte geben Sie für jede der nachfolgenden Aussagen an, inwieweit diese Ihrer Meinung nach zutrifft. Machen Sie in jeder Zeile eine Angabe!
Response format: 1 (*nie*) bis 5 (*immer*); −997 (*gab es nicht*)	Response format: 1 (*nie*) bis 5 (*sehr häufig*)
– Aufzeichnungen während der Lehrveranstaltung anfertige. – die angegebene Literatur lese. – nach weiterer Literatur zum Thema suche. – die Inhalte außerhalb der Lehrveranstaltung mit anderen (z.B. Mitstudierende, Lehrende) bearbeite oder diskutiere. – Referate halte. – Hausarbeiten schreibe. – die Übungsaufgaben bearbeite. – an Diskussionen in der Lehrveranstaltung teilnehme. – die vorgegebenen Skripte durcharbeite. – über Lehrveranstaltungsinhalte im privaten Umfeld berichte.	– Ich fertige Aufzeichnungen während der Veranstaltungen an. – Ich lese Literatur zum Thema. – Ich beteilige mich an Diskussionen in der Veranstaltung. – Ich diskutiere die Inhalte außerhalb der Veranstaltung mit anderen (z. B. Mitstudierende, Lehrende). – Ich tausche mich über die Inhalte im privaten Umfeld aus. – Ich beschäftige mich auch nach der Veranstaltung weiter mit den Inhalten.

[a] Question formulations in original German text.
[b] The abbreviation 'MFB' stands for '**M**uster**f**rage**b**ogen' and means 'standardized questionnaire'.