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The Attractiveness of Jobs in the German Care Sector – Results of a Factorial Survey*

Martin Kroczek[a,**] Jochen Späth[a]

The skilled labour shortage in nursing is an issue not unique to Germany. Unattractive characteristics of nursing jobs are one reason for the low supply in nursing personnel. In our study, we analyse the influence of job characteristics on the attractiveness of nursing jobs. We address this issue via factorial survey analysis, an experimental method particularly suited to assessing personal opinions and less prone to social desirability bias than standard interview methods. Around 1,300 (current and former) nurses in a distinct region in Germany were asked to rate a set of synthetic job postings, each of which contained information on nine systematically varied job characteristics. We find that, first, attractiveness of care jobs is most strongly affected by rather "soft" characteristics such as atmosphere within the team and time for patients. "Hard" factors play a considerably smaller role. Second, one hard factor, contract duration, is estimated to be among the most important job factors, however. This is a remarkable finding given that nursing occupations suffer from severe skill shortages. Third, though wage has a statistically significant influence on attractiveness, enormous wage raises would be needed in order to yield higher attractiveness gains than the top-rated soft factors, or to compensate for less pleasant job characteristics with respect to those factors. Last, even after controlling for other job characteristics, hospital nursing is still rated as more attractive than geriatric nursing.

JEL Codes: I11, J44, J22

Keywords: Nurse; Labour Supply; Job Choice

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1 Introduction

For a couple of years, Germany, among other countries, has been suffering from a skilled labour shortage in nursing occupations (Drennan & Ross, 2019; Bundesagentur für Arbeit, 2020). In 2019, new job offers for skilled employees had on average been vacant for 118 days before they could be staffed. New job offers for skilled hospital nurses (*Fachkräfte in der Gesundheits- und Krankenpflege*) had been vacant for 178 days in December 2019, and job offers for skilled geriatric nurses (*Fachkräfte in der Altenpflege*) for 206 days according to the German Federal Employment Agency (Bundesagentur für Arbeit, 2020). Due to their significance for the health sector, the shortage in nursing personnel has received particular attention in the general public as well as in the scientific community. Several countries took up strategies to tackle the problem, such as a push for increased immigration of nurses, changes in nursing training or the implementation of new occupational profiles (Marć et al., 2019; Buchan et al., 2015). In Germany, the federal government started a central initiative to tackle the nursing shortage, the Concerted Action on Nursing, which aims at implementing political measures to increase the attractiveness of care work.[1] Nurses' labour supply also entered the international research agenda. Research focuses on the wage elasticity of nurses' labour supply, nurses' job and occupation retention, and nurses' job satisfaction. However, even though some studies identify pecuniary and non-pecuniary job characteristics which can increase nurses' labour supply (Andreassen et al., 2017; Doiron et al., 2014; Hanel et al., 2014; Di Tommaso et al., 2009; Shields, 2004; Antonazzo et al., 2003), the time nurses stay with their job or occupation (Brewer et al., 2012; Zeytinoglu et al., 2011; Cunich & Whelan, 2010; Kankaanranta & Rissanen, 2008; Frijters et al., 2007; Holmås, 2002; Shields & Ward, 2001), or nurses' job satisfaction (Lu et al., 2019; Lu et al., 2012; Lu et al., 2005) – all research areas connected to the attractiveness of nursing – there hardly exists any research that explicitly analyses job characteristics' influence on the attractiveness of nursing jobs.[2]

In this paper, we explicitly question which factors affect nursing job attractiveness. Other than the overwhelming majority of the literature on nurses' labour supply, we focus on the attractiveness of job offers and job offer acceptance. We identify important characteristics for both measures and quantify their influence. To that end, we employ factorial survey methods on a self-conducted survey of (current and former) nurses. The empirical literature on nurses' labour supply mostly uses administrative data, which is highly reliable, but contains only a limited number of characteristics or classical survey data, which often contain an extensive number of characteristics, but are limited in

[1] "…den Arbeitsalltag und die Arbeitsbedingungen von beruflich Pflegenden unmittelbar und spürbar verbessern" (Bundesregierung, 2019).

[2] One exception is a paper by Doiron et al. (2014) who focus on nursing students and newly graduated nurses in Australia.

information content to statements about the concrete work and life situations of the interviewees. Moreover, where surveys try to assess personal preferences and sentiments like satisfaction directly, they may be prone to social desirability bias. The factorial survey method we employ allows us to receive statements on jobs with different characteristics than the interviewee's and mitigate the social desirability bias of the answers in the survey. This method further allows for insights into the implicit preferences of interviewees. Interviewees may not even be aware of such preferences, as they always rate job offers as a whole instead of giving opinions regarding specific job characteristics. Most notably, due to the setup of the experiment, we are able to estimate the causal effects of the evaluated job characteristics and quantify their impact – even if the characteristics may be highly correlated in reality, which is a realistic assumption for job characteristics (Auspurg & Hinz, 2015). Because of the named advantages, we are able to analyse the received data with relatively simple methods and get sensible results.

Due to its benefits, the factorial survey method has already been applied in the literature on job offer acceptance and job attractiveness (Abraham et al., 2013; Doiron et al., 2014; Auspurg & Gundert, 2015; Bähr & Abraham, 2016)[3]. Other than Doiron et al. (2014), who focus on nursing students and newly graduated nurses in Australia, we seem to be the first to apply it to the job attractiveness and job offer acceptance of nurses, though.

To our best knowledge, we are therefore the first to investigate the causal relations of several job characteristics on job offer acceptance and job attractiveness regarding nursing jobs in a European country in general and for Germany in particular. We are also the first to do so for a cross-section of nurses of all working age groups in a developed country. Our results shed light on adjusting screws to make nursing jobs more attractive and therefore yield relevant hints to employers and policymakers in their effort to hire nursing personnel and moderate the shortage in nurses' labour supply. In that regard, we not only offer a qualitative assessment of the importance of the analysed factors, but assess the quantity of the size of their effects on attractiveness and job offer acceptance in absolute and relative terms, and provide evidence on factor combinations yielding the highest combined effects.

Our results point to four major findings. First, attractiveness of care jobs is affected most strongly by rather soft characteristics such as atmosphere within the team and time for patients. Hard factors play a considerably smaller role. Second, there exists one very important hard factor: Contract duration is estimated to be among the most important job factors, a remarkable finding given that nursing occupations suffer from severe skill shortages. Third, though wages have a statistically significant

[3] Abraham et al. (2013), Auspurg and Gundert (2015), and Bähr and Abraham (2016) all employ wave V of the Labour Market and Social Security Panel (PASS – Trappmann et al. (2013)).

influence on attractiveness, enormous wage raises would be needed in order to yield higher attractiveness gains than the top rated soft factors, or to compensate for less pleasant job characteristics with respect to those factors. Lastly, even after controlling for other job characteristics, hospital nursing is rated as more attractive than geriatric nursing. This finding reinforces the argument for a recent policy change in the German system of vocational training for nurses, where training for geriatric and hospital nurses was unified.

The rest of the paper is organised as follows: In the next section, we present related literature. In Section Three, we describe our data and estimation methods. We present our results in Section Four. In Section Five, we provide concluding remarks and political implications of our results.

2 Related Literature and Hypotheses

How to keep nurses at work, motivate individuals to become nurses, or motivate nurses to take up a specific nursing job – in short, how to make nursing jobs more attractive and thereby enlarge the nursing labour supply – has aroused research interest in these times of a widespread shortage of nurses. Factors associated with the attractiveness of nursing jobs are analysed through the lens of research on labour supply elasticity, job retention, nurses' job satisfaction, and job offer acceptance.

Wage raises are one publically advocated measure to cope with the nursing labour shortage (Bundesregierung, 2019). The effects of wage raises on the attractiveness of care jobs are not uncontroversial, however: Shields (2004) and Antonazzo et al. (2003) provide overviews over research on the wage elasticity of the nurse labour supply. Shields (2004) concludes that labour supply is rather unresponsive to wage changes, a conclusion Di Tommaso et al. (2009) and Andreassen et al. (2017) reach in more recent studies for Norway, too. Antonazzo et al. (2003), on the contrary, conclude that the significance of the effect of nurses' wages on labour supply is rather unclear, as some papers in their review point to significant effects whereas others do not. Differentiating between shift types and occupations in their estimation model and accounting for labour supply decisions on the intensive as well as on the extensive margin, Hanel et al. (2014), employing Australian survey data, find a significantly higher wage elasticity of labour supply for nursing degree-holders than former studies without that distinction. There is also evidence that wage level is associated with nurses' job and occupational retention. Kankaanranta and Rissanen (2008) find an association between intent to leave one's employer and one's wage as well as the share of income from shift work for a sample of Finnish registered nurses. Frijters et al. (2007) and Holmås (2002) detect statistically significant effects of the wage level on nurses' decision to leave the British NHS and the Norwegian public healthcare system, respectively. Their estimated effects differ with respect to their economic significance, though. Doiron et al. (2014) evaluate which factors influence job offer acceptance of nurses by employing a discrete

choice experiment, where respondents had to choose between hypothetical jobs. With their factorial survey approach, they find salary to be the most important factor for job selection. This result is driven by the fact that they evaluate a rather large wage rise of over 50 percent, however. The wage level is also a source of job satisfaction. Lu et al. (2012) and Lu et al. (2005) provide overviews of the literature on job satisfaction among nurses, identifying remuneration as a source of nurses' job satisfaction commonly identified in the literature.

Other than the impact of wage changes on the attractiveness of care jobs, it is quite undisputed that non-pecuniary work aspects have a profound influence on the attractiveness of care jobs. Indeed, a vast number of characteristics have been found to be associated with nurses' intention or decision to start or keep working with an employer, or to stay in the healthcare system or in the nursing occupation. Among those are rather objective, hard factors such as working hours (Shields & Ward, 2001; Holmås, 2002; Frijters et al., 2007; Simon et al., 2010; Zeytinoglu et al., 2011), shift arrangements (Holmås, 2002; Doiron et al., 2014) and contract duration (Frijters et al., 2007; Cunich & Whelan, 2010). Furthermore, subjective, soft factors have been found to be associated with the attractiveness of care jobs. Among those are time pressure and quality of care (Estryn-Behar et al., 2010), competences and autonomy, and work relationships (Beecroft et al., 2008; Estryn-Behar et al., 2010). Apart from this, a broad range of non-pecuniary factors are also evaluated with regard to their effects on nurses' job satisfaction. The literature summaries by Lu et al. (2005), Lu et al. (2012), and Lu et al. (2019) also discuss the association between non-pecuniary factors and nurses' job satisfaction. According to their analyses, the abovementioned factors play a prominent role in job satisfaction literature, too.

The intention or decision to start or keep working in nursing is also associated with individual factors. These include an individual's family situation, age, experience, tenure (Shields & Ward, 2001; Holmås, 2002; Frijters et al., 2007; Estryn-Behar et al., 2010), and ethnic background (Shields & Ward, 2001).

Our research interest lies in the determination and quantification of the effects of job characteristics on job attractiveness and job offer acceptance. A huge set of factors has been evaluated in the literature, which can be divided into three main categories: pecuniary job factors, particularly wage; objective (or hard) non-pecuniary job factors such as working hours; and subjective (or soft) non-pecuniary job factors such as autonomy. In accordance with the literature, we hypothesise that all three categories of factors significantly influence job attractiveness and job offer acceptance – though it is a priori unclear how large the absolute or relative effects of factors from the three domains are on job offer attractiveness. A quantification of the effects of these factors is the main contribution of this paper.

How individual factors influence the interest to work in specific nursing jobs is not a concern of this paper, as we study the attractiveness of care jobs rather than the full set of determinants of labour supply in care.

3 Institutional Background

Some peculiarities regarding the provision of care services in Germany have to be considered when analysing the attractiveness of care jobs in the German context. Care personnel in Germany, different to those in other countries, have long been divided into different groups according to their main areas of action as well as their levels of occupational training. Whereas geriatric nurses mainly work with elderly people, hospital nurses mainly work in care for the sick. Further, geriatric and hospital nurses may have the occupational education to work only as a registered geriatric or hospital nurse or as a geriatric or hospital nursing assistant according to their vocational education. This separation along areas of care and level of occupational education is grounded in the history and education system of care in Germany (Bogai, 2017, pp. 23–44). The different areas of activity and partially different tasks could be associated with different levels of attractiveness, and geriatric nursing has been found to be viewed as less attractive than hospital nursing. Compared to geriatric nursing, hospital nursing not only has a better image among pupils and their parents, but pupils' motivation to take up geriatric nursing is also lower than their motivation to take up hospital nursing (Bomball et al., 2010; Matthes, 2016). This differentiation should be considered, as we surveyed German nurses in this study.

It is not only occupations that are differentiated between care for the elderly and care for the sick in Germany. This differentiation is also made with respect to the reimbursement of services provided in geriatric care or healthcare. Nursing services in healthcare are mainly paid for by health insurances, which cover the full amount of the respective costs. Geriatric nursing services are paid for by long-term care insurance, which only covers a share of long-term care expenditures; the rest of the long-term care expense has to be borne by the care recipient (Bogai, 2017). Also, the services provided and the amounts institutions can charge for services in health as well as geriatric care are strongly regulated.

In outpatient geriatric care, only specific packages of services are payed for by long-term care insurance, and the rates for those service packages are fixed (Simon, 2017, pp. 301–304). In outpatient health services, a specified set of services is also provided. However, here the set of services is defined by the individual's medical indication (Simon, 2017, pp. 298–301). For hospital care services, the payments hospitals receive per patient are determined by the specific diagnosis from a fixed catalogue (the diagnosis-related groups) (Simon, 2017, pp. 242–244). In inpatient geriatric care, a comparable system of reimbursement is used which focuses on the amount of care a patient needs rather than specific medical diagnoses (Simon, 2017, pp. 323–325).

These regulations limit organisations' freedom regarding the provision of the respective services and set limits to how care work is organised – limits we had to consider when we set up the hypothetical job offers. The reimbursement rules in the provision of health and geriatric services further limit the range for nurses' wages, bounding nurses' wages from above. On the other hand, nurses' wages are also bounded from below due to a specific minimum wage for nurses (Harsch & Verbeek, 2012). Within these boundaries, wages for nurses in hospitals are further regulated, as they are mostly employed under the rules of collective agreements. In geriatric nursing, collective agreements are less common (Bogai, 2017, pp. 212–213). The institutional situation of bounded and partly collectively regulated wages leads to a situation where nurses' wages are not as flexible as in other sectors. However, nurses' wages still exhibit significant variation, as Bogai et al. (2015) show. In our context, this allows for (synthetic) job offers that contain a significant range of wages without offering too unrealistic wage rates. Still, as low as employers' leeway regarding the establishment of favourable working conditions may appear in general, there are still some adjustment screws. Given the overall narrow scope of wage offerings for German nurses, these are of even greater importance, and can serve employers as a unique selling point.

4 Data

4.1 Survey Method

To assess the question of which factors drive job attractiveness and job offer acceptance, we ran a standardised survey among current and former care workers. As we exclusively sampled persons who work or have in the past worked in care, we focus on what attracts the core nursing labour potential (back) to nursing jobs. To study how new segments of the population could be attracted into care professions, individuals who never worked in nursing would have to be interviewed, too. In setting up the survey, the following considerations were taken into account: (1) care workers need not be explicitly aware of each and every preference of their own which ultimately influences their perception of the attractiveness of a given job. (2) Even if they were, several aspects could be highly correlated and thus difficult to disentangle if respondents were asked directly about their influences on job offer acceptance. (3) Among other factors, our survey involves issues that are likely to suffer from social desirability bias, such as the hourly wage or whether care professionals prefer to have much excess time for patients.

To account for these aspects, the survey consisted of two parts. One part of the survey was traditionally item-based and predominantly served the purpose to query control variables such as socio-

demographic data. The main part of the survey was designed as a factorial survey where care workers were presented with vignettes describing fictional advertisements of care jobs.[4]

A factorial survey differs from a traditional item-based survey insofar as several parameters relevant to the research question are enquired in a coherent unit of meaning – usually represented as short texts – at the same time, instead of asking several separate questions. Thus, respondents to a factorial survey always evaluate an overall set of variables that are interrelated and can influence each other. Of course, when combining multiple variables with multiple characteristics, many constellations and thus many different vignette texts are possible, with each leading to different evaluations on the part of the respondents. By presenting several systematically varied constellations, the influence of the individual dimensions can be separated in the analyses by keeping all other dimensions constant by means of multiple regression (experimental design).

Factorial surveys are usually used to record opinions and moral values. Various studies in the economic and social sciences have already successfully applied this method in different contexts, including conceptions of fair labour income (e.g. Jasso & Webster Jr., 1997; Jasso & Webster Jr., 1999), the assessment of poverty dimensions (Will, 1993) or the quality of childcare measures (Shlay et al., 2005). A more recent example can be found in Abraham et al. (2013). Part of wave V of the Labour Market and Social Security Panel (PASS – Trappmann et al., 2013) was conducted as a factorial survey, with the aim of estimating influencing factors for the attractiveness of job offers for the unemployed.

4.2 Survey design

As part of the factorial survey, the fictional job advertisement (see Table 1) was presented to care workers in form of a series of vignettes in text form. The vignettes follow a $2^7 3^1 8^1$ experimental design, which generates a systematic variation of the individual text modules. To measure the influence of pecuniary job characteristics, the vignettes contain wage as one dimension. To access the influence of soft non-pecuniary characteristics, work autonomy, time for patients, atmosphere within the team and roster reliability enter the vignettes. We address the influence of hard non-pecuniary job characteristics via the type of nursing care (hospital or geriatric nursing), the kind of care institution (in- or outpatient care), working hours and contract duration. We selected the specific dimensions for the respective domains in a multistage process which included an exploration of the relevant literature, expert interviews and pre-tests to identify the most prominent or most relevant dimensions. The dimensions of care type and care institution are not prominent in the international literature; differentiation along those characteristics is important in the German context, however. Further job

[4] A detailed description of the methodology of the vignette survey would take up too much space here. A great introduction can be found in Auspurg and Hinz (2015).

characteristics which possibly affect job attractiveness, but are not under control of the employer or not in the focus of this study (e.g. commuting distance from home), are “controlled for” in an intro text to the vignettes. Reading from top to bottom, the right column of Table 1 lists all conceivable vignette constellations.

Table 1: Vignette Dimensions and Levels

Dimension	Level	Vignette text
Activity (Act)		In the locality where you have been working so far, a job in
	1	hospital nursing
	2	geriatric nursing
		is advertised
Institution (Inst)		at an
	1	inpatient care institution
	2	outpatient nursing service
Working hours (Hours)		
	1	full time (39 h/week)
	2	50% part time (20 h/week).
Wage (Wage)		The gross hourly wage without supplements for Sundays, public holidays and night work is
	1	11 euro. The monthly gross earnings are thus around [11*20 / 11*39].
	2	14 euro. The monthly gross earnings are thus around [14*20 / 14*39].
		17 euro. The monthly gross earnings are thus around [17*20 / 17*39].
		20 euro. The monthly gross earnings are thus around [20*20 / 20*39].
		23 euro. The monthly gross earnings are thus around [23*20 / 23*39].
		26 euro. The monthly gross earnings are thus around [26*20 / 26*39].
		29 euro. The monthly gross earnings are thus around [29*20 / 29*39].
		32 euro. The monthly gross earnings are thus around [32*20 / 32*39].
Contract duration (FTC)		The position is on a
	1	one-year fixed-term contract without prospect of extension.
	2	one-year fixed-term contract with prospect of extension.
	3	permanent contract.
Autonomy (Auto)		Through acquaintances, you have learned that nurses at this employer have
	1	little
	2	much
		autonomy with regard to the order in which they perform their tasks.

Time for care recipient / patient (Time)	1 2	As part of the job, you would have little plenty of time to talk to the care recipient/patient about personal subjects.
Cordial team (Team)	1 2	The team members are not very friendly. very friendly.
Roster reliability (Roster)	1 2	Unforeseen services and roster changes are rarely frequently to be expected.

How attractive is this job offer to you?

Very unattractive										Very attractive
1	2	3	4	5	6	7	8	9	10	11
❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑

How likely would you be to accept this job offer? If you were employed at the time, you would have to give up your current job.

Very unlikely										Very likely
1	2	3	4	5	6	7	8	9	10	11
❑	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑

Source: Factorial survey of (former) care workers, IAW, own representation.

To reduce the survey load, a fractionalised[5] sample of 200 vignettes was drawn from all possible combinations of vignette dimensions (vignette universe) and distributed to the various questionnaires by fractionalised blocking, so that each respondent received ten different vignettes. The questionnaires were randomly assigned to the respondents to ensure the vignette variables were independent from respondent characteristics. The survey uses a Resolution V design with a D-

[5] This means a sample with maximum information in the sense of the orthogonality of the vignette dimensions is drawn ("efficient design"). The higher information density of fractionalised samples as opposed to random samples is evidenced by research (Johnson et al., 2006; Kuhfeld et al., 1994). The criterion for the efficiency of sampling is the D-efficiency (see next footnote).

efficiency[6] of 95. The results thus have a high internal validity. In concrete terms, all the main effects, along with all two-way interactions of the vignette dimensions, can be estimated in isolation from each other.

As an outcome, we chose to have the care workers evaluate a) how attractive the presented job offer is to them and b) how likely they would be to accept that job offer, under the condition that they would have to give up their current job if they had one. Clearly, whereas the first question (a) is largely abstract by nature, the second question (b) follows a stricter concept of "attractiveness".

To estimate the causal effects of the vignette dimensions on the attractiveness of the fictitious jobs, we first relied on the experimental design, which allowed us to separate the effects of the single dimensions. Second, to abstract from the fact that the vignette text might contain other unknown confounding variables that could impact the evaluation of the vignettes, the vignette text was preceded by a short *vignette intro.* In the intro, essential confounders were "controlled" by being (fictitiously) held at a level that remained constant over the individual vignettes. In this way, further basic characteristics of the vignette job (e.g. all jobs take place in direct care and involve an average amount of [night and weekend] shifts and on-call duties) were controlled for, together with the prerequisites needed to take over the vignette job, as well as further characteristics of the employer and the region in which the job is offered.

The survey underwent several rounds of cognitive pre-testing with experts and nurses to ensure that all relevant information was given in the vignettes or the vignette intro text and that the language and presentation of the survey enabled the respondents to understand it in the same way we understood it.

4.3 Sampling procedure and sample characteristics

The survey was addressed to current and former nurses who work or who have worked in the regional planning area (RPA) of Heilbronn-Franken, Germany. RPAs are constructed by the Federal Institute for Research on Building, Urban Affairs and Spatial Development for the purpose of carrying out nationwide comparisons and assessing large-scale regional tendencies and explicitly rely on the concept of an economic centre surrounded by a more rural periphery. See BBSR (2019) for more detailed information on the construction of RPAs. The precise RPA of Heilbronn-Franken was chosen as a region which is comparable to the regions surrounding it with respect to socio-demographic factors, and as it is not adjacent to other national states (Austria, France, Switzerland) because

[6] The D-efficiency is a measure of the orthogonality of the constellations of the vignette universe depicted in the sample, i.e. the full factorial. It takes on values between 0 and 100, where 100 represents complete orthogonality.

proximity to a national border would bring about specific peculiarities that could affect the intended analyses.

Our gross sample was drawn from the Integrated Employment Biographies (IEB) from the Federal Employment Agency (BA)[7] and consisted of 8,116 individuals who worked as professional caregivers in the named RPA at the time of the sampling or who had worked as professional caregivers in the RPA during the five years prior to sampling. The sample was stratified by employment status (currently vs. formerly working as a care professional), (former) profession (nurses vs. geriatric nurses), and the kind of institution the respondents (formerly) worked in (inpatient vs. outpatient care).[8] Within these strata, interviewees were drawn at random.

The IEB contain process data at the person level from the procedures of the BA and cover persons with the following employment status: "employment subject to social security (recorded from 1975 onwards); marginal part-time employment (recorded from 1999 onwards); receipt of benefits in accordance with Social Code Book III (recorded from 1975 onwards) or Social Code Book II (recorded from 2005 onwards); registered with the Federal Employment Agency (Bundesagentur für Arbeit - BA) or at an institution responsible for implementing SGB II as a jobseeker (recorded from 1997 onwards); participation in an employment or training measure (recorded from 2000 onwards)" (Antoni et al., 2019, p. 7).

Records are taken from employment reports that companies have to submit to the pension insurance funds at the beginning and end of employment, at the end of the year, and when changes in employment status occur. Each of these reports is shown in the record employment episode on a daily basis, which includes both socio-demographic information of the employee (date of birth, gender, education, nationality, etc.) and information about the employment relationship (daily gross pay, part time/full time, position in the profession, etc.). Within the reporting periods, there is at least one employment episode per year for each employed person, but often more, depending on the number of reports submitted.

Data collection was carried out in the form of paper and pencil interviews (PAPIs) in November and December 2018. To generate high response rates, the participants also received a letter of recommendation from the German Nurses Association Southwest (DBfK). Participation was further incentivised via vouchers for a big internet retailer given to the first 800 respondents to mail back their questionnaire. We received a total of 1,607 filled-out questionnaires (around a 20 percent response

[7] Data access was provided within the context of a § 75 SGB X application.
[8] The data are also the basis for a separate analysis on drivers of nurses' job satisfaction, see Höld et al. (2020).

rate). After data cleansing, we were left with 1,313 completed interviews.[9] More than 1,000 of those correspond to active nurses. Our net sample is comparable to the gross sample in terms of the sex and age of respondents. However, German, currently active registered nurses (with completed vocational training) working in a stationary care setting were overrepresented.[10] This needs to be considered when interpreting the results.

Table 2 gives an overview of the basic sample distribution across care professions and care status. Nearly half of all respondents in our sample belong to the nursing care sector, about one third belong to elder care and about one fifth claim to work in both nursing care and elder care at the same time. Nearly four fifths of the sample consists of current nurses, while the remaining fifth is constituted by former nurses. The former nurses in our sample belong to nursing care more frequently than the current nurses do, and in elder care there are fewer former nurses than across all care sectors.

[9] A large part of the data cleansing consisted of checking whether respondents' answers were consistent with the questionnaire filters.

[10] Possible reasons for this are – besides differences in the willingness to participate in the interview – inter alia (1) an erroneous record of the respondents' characteristics within the data on which the sampling procedure is based (at least insofar as these are not relevant for the calculation of the social security contributions) and (2) changes in the variables between the time of the sampling procedure and the interview (in particular with regard to the status as former/active nurse or the care setting). To deal with these possible problems, we refer to the self-classification of the respondents in the survey to determine central individual information (former/active status, care setting). This is also sensible, as vignette ratings may be related to a person's present status and setting rather than to possibly different information gathered at the time of sampling. Overall, it therefore does not seem sensible to reweight the sample because of the stated differences. It should be pointed out that the named differences may, if anything, affect the external validity of our results; the internal validity is not affected.

Table 2: Care Worker Sample by Care Sector and Nurses' Care Status (Current vs. Former Nurses)

		Current nurses	Former nurses	Total
Nursing care	n	461	153	614
	Row %	75%	25%	100%
	Column %	44%	56%	47%
Elder care	n	355	43	398
	Row %	89%	11%	100%
	Column %	34%	16%	30%
Both at the same time	n	224	77	301
	Row %	74%	26%	100%
	Column %	22%	28%	23%
Total	n	1,040	273	1,313
	Row %	79%	21%	100%
	Column %	100%	100%	100%

Source: Care worker survey, own calculations.

Beyond the information presented in Table 2, about two thirds of the current nurses[11] work in inpatient care, yet with considerable differences between care sectors. Although nurses working in inpatient care account for the majority of respondents from nursing care and elder care (83 percent and 72 percent, respectively), only every tenth respondent working in both nursing care and elder care at the same time (and in the same job) belongs to inpatient care. Regarding further respondent characteristics, about nine out of 10 respondents are female, German, and aged 45 years on average. Of the respondents in our sample, 85 percent have at least five years of professional experience in direct care. All respondents work or have worked in direct care and have at least completed vocational training as a nurse. More than half of the respondents have a secondary school diploma (German *Realschulabschluss*).

5 Methods

We estimate the relationship

$$y_{ij} = \mu + \boldsymbol{x}_j'\boldsymbol{\beta} + \alpha_i + \epsilon_{ij},$$

where y_{ij} denotes the attractiveness or job offer acceptance evaluation of job offer j for person i, μ is a constant, $\boldsymbol{x}$ is a vector of observable characteristics of the job offer, $\boldsymbol{\beta}$ is a vector of parameters

[11] Only current nurses were asked about the care setting at their main job.

measuring the influence of the observable characteristics on the attractiveness evaluation, α is an unobserved individual effect at the person level, and ϵ is an individual and job offer-specific error term.

When set up effectively, the factorial survey design virtually rules out endogeneity issues related to the vignette dimensions, as correlation between them is eliminated as much as possible and surveys are assigned to each respondent at random. The job characteristics are therefore uncorrelated with the individual and job-specific error term ϵ (strict exogeneity assumption) and the unobserved individual effect α by design (random effects assumption) (Auspurg & Hinz, 2015, pp. 91–92; Wooldridge, 2010, pp. 291–292). In estimating the model, we can therefore apply standard ordinary least squares (OLS) estimation. However, we must account for the data structure by clustering standard errors on the respondent level, as each respondent had to assess several job offers. For the estimation results we present here, we explicitly take the person-specific unobserved effect into account and apply random effects (RE) estimation to the data, which yields more efficient estimates of the effects of the job characteristics (Auspurg & Hinz, 2015, pp. 91–92; Wooldridge, 2010, pp. 291–297).[12]

An instructive way to grasp the size of the effects of the different characteristics on job offer acceptance and job attractiveness is how much extra wage an individual would have to be compensated with for a less pleasant job characteristic, meaning by how much pay would have to rise for a job offer to be ranked as attractive as another, otherwise equal job offer, where one characteristic k is more positive (x_k changes from 0 to 1). In this case, the overall change in job attractiveness would be zero, and hence

$$\beta_w \log(wage + \Delta wage) = \beta_w \log(wage) + \beta_k,$$

where $\Delta wage$ is the change in wage retained as compensation for the less pleasant working conditions. Rearranging this equation, we get

$$\Delta\text{wage in } \% = \left[\exp\left(\frac{\beta_k}{\beta_w}\right) - 1\right] * 100,$$

which yields the compensation needed to keep job attractiveness constant when x_k changes from 1 to 0 (Auspurg & Hinz, 2015, pp. 99–101 propose a comparable approach). As an example, this compensation measure answers the following question: How much more does an employer have to

[12] To check the sensitivity of our results, we also estimated RE ordered logit models, which account for the ordinal nature of our outcome variable. The results were nearly the same and are available from the authors upon request. As the proportional odds assumption on which the RE ordered logit model relies does not seem very realistic given that our outcome variable has so many levels, we chose to stick with the linear RE model.

pay for a job on a fixed-term contract compared with a job on a permanent contract in order for two otherwise comparable job offers to be similarly attractive?

6 Results

Table 3 shows the RE estimates of the effects of the vignette dimensions on job attractiveness (column 1) and the willingness to accept a job offer (column 2).[13] The dependent variables in our models are measured on an 11-point scale. Therefore, the absolute size of the coefficient of a job characteristic shows, by how much the rating of a job offer changes, if the characteristic changes by one unit (i.e. from a less favourable to a more favourable manifestation or from hospital nursing to geriatric nursing and from inpatient care to outpatient care, respectively). Wages are an exception and discussed separately.

First, we note that all coefficients have the expected positive sign and almost all characteristics have a statistically significant effect on job attractiveness and job acceptance throughout the models. Furthermore, the results differ only slightly between the models. The order of the effect sizes is similar with regard to job attractiveness and willingness to accept a job offer (see below). In absolute sizes, the estimated effects on job acceptance (including the constant) are considerably smaller, though, which could be due to the more serious consequences implied by the question regarding job acceptance relative to the attractiveness rating.

The sizes of the estimated coefficients differ considerably. When we arrange the different factors by effect size from largest to smallest, we get the following order: 1. Team, 2. Time for patients, 3. Contract duration, 4. Roster reliability, 5. Autonomy, 6. Volume of work, 7. Care sector, and 8. Care institution. The effect of the wage variable is not part of this enumeration due to its continuous nature and will be discussed separately. Notably, with the exception of contract duration, we estimate the largest effects for rather soft factors of work atmosphere and organization of work. Working with a very cordial team as opposed to a less cordial team increases attractiveness and acceptance ratings by more than one point on the 11-point scales. An offer for a job in which staff has more time for patients is also rated higher by around one scale point. Working on a reliable roster gains job offers around 0.7 scale points on the attractiveness scale, and just below 0.6 points on the acceptance scale. More autonomy leads to a 0.5 scale-point gain on the attractiveness scale and just below a 0.4-point gain on the acceptance scale. Hard job factors such as the volume of work and employment in the care sector have a lower influence on job attractiveness. One hard job factor that has a large impact on job attractiveness is contract duration. The rating difference between a job offer with a one-year fixed-

[13] OLS estimates are presented in Table A 1 in the Appendix, for comparison.

term contract without prospect of extension and a permanent contract amounts to around 0.9 and just over 0.8 points on the attractiveness and the acceptance scale, respectively. Although this finding is in line with results from other studies (Frijters et al., 2007, Cunich & Whelan, 2010), it seems puzzling in times of skilled labour shortage in nursing. It seems that (former) nurses are either not aware of the fact that skill shortage gives them advantages in the labour market or have another reason to value long contracts especially highly; this could be because they are particularly risk averse, feel less valued if they are offered fixed contracts, or simply do not like to change their employer because they want to work with the same team for as long as possible or fear the need to change location if they search for a new job. On the other hand, with between 20 and 30 percent of contracts, an unexpectedly high share of nurses have been working under fixed-term contracts in Germany in recent years. Although the numbers differ between sources, they are non-negligible throughout them, whether from surveys (Kliner et al., 2017, p. 51) or from personal calculations based on administrative data on German employment histories (SIAB).[14] The high shares are surprising, as employers should have an incentive to tie nurses to them as long as possible and offer attractive working conditions due to skill shortage. Furthermore, we see from other publications and our own calculations based on the SIAB that the share of fixed-term contracts in the care occupations has been significantly higher than the average share over all other occupations (Dundler, 2018; Kliner et al., 2017, p. 51) and other occupations subject to skilled labour shortage in recent years. The latter in particular is unexpected as the demand for care services can almost surely be considered to rise, for instance, due to demographic change (Hackmann, 2010; Hackmann & Moog, 2008). A specific aspect of nursing work in Germany is the division of nursing occupations into hospital nurses, mainly caring for the sick, and geriatric nurses, mainly caring for the elderly (Bogai, 2017, pp. 23–44). We find that, even after controlling for the other job characteristics in our model, geriatric nursing is still considered significantly less attractive than hospital nursing, which is in line with results from previous (survey) studies in Germany (Bomball et al., 2010; Matthes, 2016). As we control for several characteristics which usually separate geriatric from hospital nursing jobs (e.g. lower wage in geriatric nursing (Bogai et al., 2015)), our hypothesis is that we measure the overall worse image of geriatric nursing in this way.

Although it is difficult to compare our results with earlier research quantitatively due to significant differences in the scientific approaches and the methods applied, qualitatively, our results for the importance of non-pecuniary job characteristics are in line with earlier work on nurses' intention or decision to start or keep working with an employer, or to stay in the healthcare system or in the nursing

[14] To that end, we employed information for the year 2014 from the weakly anonymous Sample of Integrated Labour Market Biographies (SIAB) 1975 - 2014. The data were accessed on-site at the Research Data Centre (FDZ) of the Federal Employment Agency (BA) at the Institute for Employment Research (IAB) and/or via remote data access at the FDZ. Data documentation: Antoni et al. (2016).

occupation, which found non-pecuniary factors to have significant effects on the named domains of nurses' labour supply (Doiron et al., 2014; Zeytinoglu et al., 2011; Estryn-Behar et al., 2010; Simon et al., 2010; Cunich & Whelan, 2010; Frijters et al., 2007; Holmås, 2002; Shields & Ward, 2001).

Although the ordering of the effect is the same in the job attractiveness model as in the job acceptance model, the effect sizes differ less strongly in the job acceptance model. When confronted with the more serious decision about actually quitting one's job for a new job offer, objective factors seem to gain relative importance in comparison to a ranking in attractiveness.

An intuitive way to grasp the quantitative relevance of the different job characteristics is the wage change percentage an individual would have to receive in order to be compensated for a less attractive manifestation of a specific job characteristic. Table 4 gives the respective calculations. The ordering of the amounts of compensation is naturally the same as the ordering of the effect sizes. However, in this way, the relevance can be quantified in a monetary way. Looking at job attractiveness, wage would have to rise by 47 percent to compensate for a less cordial team, 40 percent to compensate for less time with patients, 30 percent to compensate for a fixed-term contract without a chance of prolongation instead of a permanent contract and 23 percent to compensate for a less reliable roster. The considerable size of these wage compensations already implies that wage itself – though statistically significant – may not play the largest role for care workers' perception of jobs.

In addition, as shown in Table 3, a wage increase by 1 percent increases job attractiveness by about 0.035 points. To approximate the effect of a realistically possible wage change, we adhered to the latest rise in the minimum wage for qualified nursing assistants in Western Germany: over the course of 2020 and 2021, minimum wages for qualified nursing assistants[15] in Western Germany will increase from 11.35 to 12.50 euros, which corresponds to a 10-percent rise in wages.[16] For those hospital nurses working under a public service collective agreement, a wage increase of 8 percent has been gained with the 2019 collective agreement. Thus, wage raises of this size would by far have a smaller impact on job attractiveness and job offer acceptance than most of the other job characteristics we evaluated.[17] Our results are therefore in line with the large part of the literature that estimates the effects of wage changes on labour supply and retention of nurses that are so small in size that substantial wage increases would be required to yield economically significant effects on the supply of

[15] Nursing assistants who have undergone the respective vocational training.

[16] Doiron et al. (2014) evaluated the effect of a wage rise from the lowest to the highest level in their survey – an increase by over 55 percent. This seems to be an implausible wage increase for an otherwise similar position. A natural, data-driven approach would be the evaluation of changes by one standard deviation in the corresponding variable. The standard deviation of the log-wage variable in our vignette setup is 0.34. A wage change by 34 percent would yield the third highest effect on the attractiveness and the fourth highest effect on the acceptance measure. However, wage changes by over 30 percent still seem unrealistically high.

[17] The change in y due to a $\frac{\Delta wage}{wage}$ change in wages is given by $\Delta y = \beta_w * \log(\frac{\Delta wage}{wage} + 1)$.

nurses (Andreassen et al., 2017; Di Tommaso et al., 2009; Shields, 2004; Frijters et al., 2007). Our results with regard to wages would further be in line with what Doiron et al. (2014) found in a comparable study for young Australian nurses, if Doiron et al. (2014) had evaluated a more realistic change in wages than they did.

We also evaluated the interaction effects between vignette dimensions, as well as between vignette dimensions and respondents' current work situation. Table 5 provides an overview of the results regarding the former interaction, and statistically significant effects are coloured. Evaluating the interactions, we observed three interesting points. First, we found hardly any interaction effect between activity or institution and other vignette dimensions. This means that the same factors are relevant for nursing care and elder care as well as for inpatient care and outpatient care jobs, and therefore the same policies could increase the attractiveness of jobs among the different institutions and activities. Second, wherever we found significant interaction effects between dimensions, they were mostly positive. This means that changes that increase attractiveness amplify each other. Third, we found the largest interaction effects for interactions with the factors that exhibited the largest main effects. Therefore, it could be a rewarding strategy for employers and policymakers to improve simultaneously on more than one of the dimensions with the largest effects. Due to the interaction effects between the evaluated job characteristics, it becomes increasingly costly for an employer to compensate (possible) employees for less pleasant working conditions with respect to more than one job characteristic. Put another way, with an increasing number of unpleasant job characteristics, employers' wage offers must increase over-proportional.

Table 6 shows the interaction effects between vignette dimensions and respondents' current work situation. The results indicate that all but geriatric nurses and nurses working in outpatient care prefer healthcare jobs to jobs in geriatric care. Regarding in- and outpatient care, we found that nurses prefer jobs in the same kind of institution they are or have been employed in – that is, nurses in inpatient care prefer jobs in inpatient care, and those in outpatient care prefer jobs in outpatient care. Another difference can be found with respect to full-time versus part-time jobs. All but former nurses show a preference for full-time jobs. Regarding wages and team spirit, we found effects of the same direction for all groups of nurses, although the effects differ in size. Regarding the other job characteristics (contract duration, autonomy, time for patients and reliable rosters), we found no differences with respect to the different groups of nurses. The effects are therefore quite comparable across the different groups of interviewees. However, there may exist variation in the ratings on the personal level over further individual characteristics. A subject of separate, ongoing research is to what extent groups with differing individual characteristics value specific job characteristics differently.

Table 3: Main Effects of Job Characteristics on Job Attractiveness and Job Acceptance, RE Estimation Results

	(1)	(2)
	Attractiveness	Acceptance
	Linear RE	Linear RE
Hospital nursing	0.144***	0.118***
	(0.038)	(0.035)
Outpatient nursing service	0.066	0.038
	(0.043)	(0.041)
Full time (39 h/week)	0.463***	0.389***
	(0.045)	(0.043)
ln (hourly wage)	3.503***	2.679***
	(0.074)	(0.073)
1-year FTC with prospect of extension	0.665***	0.585***
	(0.048)	(0.045)
Permanent contract	0.914***	0.832***
	(0.050)	(0.046)
Much autonomy of how to work	0.517***	0.389***
	(0.041)	(0.039)
Plenty of time for care recipients/patients	1.173***	0.881***
	(0.042)	(0.040)
Very friendly team	1.339***	1.015***
	(0.042)	(0.041)
Reliable roster	0.729***	0.584***
	(0.041)	(0.038)
Constant	-9.498***	-7.336***
	(0.220)	(0.219)
Observations	12758	12700
Adjusted/overall R2	0.297	0.211
rho	0.264	0.294

*/**/*** = significant at the 10/5/1% level. Standard errors clustered at the care worker level.
Vignette dimensions and their manifestations (reference categories are underlined):
Activity: *Hospital nursing* and *geriatric nursing*. Institution: *Inpatient care* and *outpatient nursing service*. Working Hours: *Full time* and *50 % part time*. Wage: *eight wage levels*. Contract duration: *One-year fixed-term contract without prospect of extension*, *one-year fixed-term contract without prospect of extension*, *permanent contract*. Autonomy: *Little autonomy* and *much autonomy*. Time for patient: *Little time for patient* and *plenty of time for patient*. Team: *Not very friendly* and *very friendly*. Roster reliability: *Rare unforeseen services and roster changes* and *frequent unforeseen services and roster changes*.
Source: Care worker survey, own calculations.

Table 4: Compensation for Worse Working Conditions

	(1)	(2)	(3)	(4)
	Attractiveness		Acceptance	
	OLS	Linear RE	OLS	Linear RE
Hospital nursing	0.035	0.042	0.036	0.045
Outpatient nursing service	0.013	0.019	0.008	0.014
Full time (39 h/week)	0.140	0.141	0.154	0.156
1-year FTC with prospect of extension	0.212	0.209	0.251	0.244
Permanent contract	0.300	0.298	0.368	0.364
Much autonomy of how to work	0.159	0.159	0.154	0.156
Plenty of time for care recipients/patients	0.400	0.398	0.388	0.389
Very friendly team	0.468	0.466	0.460	0.461
Reliable roster	0.233	0.232	0.243	0.243

Vignette dimensions and their manifestations (reference categories are underlined):
Activity: *Hospital nursing* and *geriatric nursing*. Institution: *Inpatient care* and *outpatient nursing service*. Working Hours: *Full time* and *50 % part time*. Wage: *eight wage levels*. Contract duration: *One-year fixed-term contract without prospect of extension*, *one-year fixed-term contract without prospect of extension*, *permanent contract*. Autonomy: *Little autonomy* and *much autonomy*. Time for patient: *Little time for patient* and *plenty of time for patient*. Team: *Not very friendly* and *very friendly*. Roster reliability: *Rare unforeseen services and roster changes* and *frequent unforeseen services and roster changes*.
Source: Care worker survey, own calculations.

Table 5: Two-Way Interactions of Vignette Dimensions

	Activity	Institution	Working hours	Wage	Contract duration	Autonomy	Time for patients	Team	Roster reliability
Activity	x	0	0	0	0	0.191	-0.149	0	0
Institution	0	x	0	0	0.154	-0.157	0	0	0
Working hours	0	0	x	0.007	0.000	0.191	0	0.212	0.139
Wage	0	0	0.007	x	0.015	0.005	0.011	0.013	0.008
Contract duration	0	0.154	0	0.015	x	0.402	0.398	0.681	0.290
Autonomy	0.191	-0.157	0.191	0.005	0.402	x	0.251	0.285	0.178
Time for patients	-0.149	0	0	0.011	0.398	0.251	x	0.510	0.313
Team	0	0	0.212	0.013	0.681	0.285	0.510	x	0.258
Roster reliability	0	0	0.139	0.008	0.290	0.178	0.313	0.258	x

Standard errors clustered at the care worker level. Dependent variable: job offer acceptance. Significant positive interaction effects are marked by light grey bars, and significant negative effects are marked by darker grey bars. A value of "0" indicates that there is no significant interaction effect between two variables.
Vignette dimensions and their manifestations (reference categories are underlined):
Activity: *Hospital nursing* and *geriatric nursing*. Institution: *Inpatient care* and *outpatient nursing service*. Working Hours: *Full time* and *50 % part time*. Wage: *eight wage levels*. Contract duration: *one-year fixed-term contract without prospect of extension*, *permanent contract*. Autonomy: *Little autonomy* and *much autonomy*. Time for patient: *little time for patient* and *plenty of time for patient*. Team: *Not very friendly* and *very friendly*. Roster reliability: *Rare unforeseen services and roster changes* and *frequent unforeseen services and roster changes*.
Source: Care worker survey, own calculations.

Table 6: Cross-Level Interactions

Effect	Hospital nurses	Geriatric nurses	Current nurses	Former nurses	Nurses in inpatient care	Nurses in outpatient care
Activtiy	+	0	+	++	+	0
Institution	0	0	0	0	-	+
Contract duration	+	+	+	0	++	+
Wage	+	++	++	+	++	+
Team	+	++	+	+	+	++

Interactions between respondent characteristics (horizontally) and vignette dimensions (vertically) are expressed.
0: no interaction effect, +: positive interaction effect, ++: positive interaction effect, which is significantly larger than the effect for the other respective category, -: negative interaction effect.
Standard errors are clustered at the care worker level. Dependent variable: job offer acceptance.
Vignette dimensions and their manifestations(reference categories are underlined):
Activity: *Hospital nursing* and *geriatric nursing*. Institution: *Inpatient care* and *outpatient nursing service*. Contract duration: *one-year fixed-term contract without prospect of extension*, *permanent contract*. Wage: *eight wage levels*. Team: *Not very friendly* and *very friendly*.
Source: Care worker survey, own calculations.

7 Summary and conclusions

Many countries, among them Germany, are suffering from a shortage of nursing personnel. How to tackle this shortage has become a topic of major interest for politics and social sciences. However, research – mainly focused on nurses' labour supply, the time nurses stay with their job or occupation or nurses' job satisfaction – has hardly analysed the explicit influence of job characteristics on the attractiveness of nursing jobs. In this paper, we addressed this question explicitly. Using factorial survey methods on a self-conducted survey of (former) nurses, we identified important characteristics for job attractiveness, as well as job offer acceptance, and quantified their influence.

We identified four major findings from our results. The first is that the attractiveness of care jobs is strongly affected by non-pecuniary job characteristics – a finding earlier studies reached as well (Doiron et al., 2014; Zeytinoglu et al., 2011; Estryn-Behar et al., 2010; Simon et al., 2010; Cunich & Whelan, 2010; Frijters et al., 2007; Holmås, 2002; Shields & Ward, 2001). We further found, however, that attractiveness is affected most strongly by rather soft job characteristics, such as atmosphere within the team and time for patients. Rather hard factors play a considerably smaller role.

The second major finding is that there exists one hard job factor that is very important: contract duration is estimated to be among the most important job factors for job attractiveness and job offer acceptance; although this is in line with previous studies (Frijters et al., 2007; Cunich & Whelan, 2010),

it is a remarkable finding regarding jobs in occupations exhibiting severe skill shortage. For one thing, this is remarkable because nurses should easily find a new job once losing their present one. The disapproval of fixed-term contracts may therefore be a display of nurses' strong preferences for safe employment contracts and against new work environments. This is further remarkable in so far as fixed-term contracts still exist (20 to 30 percent of nurses are working under a fixed-term contract) in times of skill shortage and the share of fixed-term contracts is even higher than the average share over all occupations and other occupations with skilled labour shortage (Dundler, 2018; Kliner et al., 2017, p. 51; own calculations based on SIAB). Rather, employers should have an incentive to offer permanent contracts because it will be difficult for them to hire new nurses if they leave after the end of the fixed term due to nursing skill shortage and because permanent positions would be an effective way to increase attractiveness. Why employers offer fixed-term contracts in times of skill shortage in a part of the economy where demand is almost sure to rise (Hackmann, 2010; Hackmann & Moog, 2008) is open to future research.

The third major finding deals with wages. Although the wage has a statistically significant influence on attractiveness, enormous wage increases would be required to yield higher attractiveness gains than the top-rated soft factors or to compensate for less pleasant job characteristics with respect to those factors. As a consequence, monetary compensation for unpleasant working conditions will be costly. To compensate for unpleasant working conditions with respect to the most relevant job characteristics (e.g. team, time with care recipients/patients, contract duration) wage raises between 20 and 47 percent would be necessary. This is far from what policymakers and employers were willing to offer in minimum wage raises or in collective agreements so far. If employers and policymakers want to significantly increase the attractiveness of nursing jobs and are not willing to provide substantial wage raises, changes in other job characteristics will be necessary. Especially rewarding strategies will be those providing improvement on more than one of the relevant job characteristics.

The last major point deals with a German peculiarity: the separation between geriatric and hospital nursing occupations. Our results show that, even after controlling for other job characteristics, hospital nursing is still rated more attractive than geriatric nursing. This is, for one thing, in line with what we assumed from previous literature (Bomball et al., 2010; Matthes, 2016). This finding, for another thing, reinforces the argument for a recent policy change in the German system of vocational training for nurses, where training for geriatric and hospital nurses was unified (PflBRefG, 2017). In light of our findings, one could argue that the change to a more generalist training for nurses could at least increase the attractiveness of training to become a geriatric nurse.

Appendix

Vignette intro

“Jobs differ in many ways. The following part of the survey contains descriptions of some fictitious job offers in nursing and care for the elderly. All vacancies are fictitious but could happen in reality. We selected all features of the offered positions at random.

At the end of each job description, we would like to hear from you about how attractive the job offered is to you and how likely you would be to accept it if it were offered to you. To do this, we ask you to place your cross on the attached response scales according to your assessment. You can answer the job descriptions in any order. If necessary, you can correct your answers at any time during the survey.

Please note the following:

1. All offered positions are activities in direct nursing care.
2. The prerequisite for the start of all positions offered is a completed training as a specialist in health and nursing, health and child care or geriatric care.
3. All jobs are in the same place as your previous job.
4. There are enough quality childcare facilities near all jobs.
5. At all workplaces, there is a normal shift operation with industry-standard extent of night and weekend services as well as on-call duty.
6. All employers have an average number of employees or beds.
7. All employers are highly regarded in nursing circles.”

Source: Care worker survey.

Table A 1. Main Effects of Job Characteristics on Job Attractiveness and Job Acceptance, OLS Estimation Results

	(1)	(2)
	Attractiveness	Acceptance
	OLS	OLS
Hospital nursing	0.120***	0.093***
	(0.039)	(0.036)
Outpatient nursing service	0.046	0.020
	(0.043)	(0.041)
Full time (39 h/week)	0.456***	0.383***
	(0.045)	(0.043)
ln (hourly wage)	3.487***	2.674***
	(0.074)	(0.073)
1-year FTC with prospect of extension	0.672***	0.599***
	(0.049)	(0.047)
Permanent contract	0.914***	0.838***
	(0.051)	(0.047)
Much autonomy of how to work	0.515***	0.383***
	(0.041)	(0.040)
Plenty of time for care recipients/patients	1.171***	0.877***
	(0.042)	(0.040)
Very friendly team	1.338***	1.010***
	(0.043)	(0.042)
Reliable roster	0.730***	0.582***
	(0.041)	(0.039)
Constant	-9.432***	-7.302***
	(0.220)	(0.220)
Observations	12758	12700
Adjusted/overall R2	0.297	0.211

*/**/*** = significant at the 10/5/1% level. Standard errors clustered at the care worker level.
Vignette dimensions and their manifestations (reference categories are underlined):
Activity: *Hospital nursing* and *geriatric nursing.* Institution: *Inpatient care* and *outpatient nursing service*. Working Hours: *Full time* and *50 % part time*. Wage: *eight wage levels*. Contract duration: *One-year fixed-term contract without prospect of extension*, *one-year fixed-term contract without prospect of extension*, *permanent contract*. Autonomy: *Little autonomy* and *much autonomy*. Time for patient: *Little time for patient* and *plenty of time for patient*. Team: *Not very friendly* and *very friendly*. Roster reliability: *Rare unforeseen services and roster changes* and *frequent unforeseen services and roster changes*.
Source: Care worker survey, own calculations.

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