

Job Experience and Truck Drivers' Tendency to Change Employment

Rudolf O. Large ^{*† 1}, Michael Schäfer ^{* ‡ 1}

¹ Department of Logistics Supply Management University of Stuttgart – Germany

From a company perspective increased truck driver turnover is a momentous consequence of general driver shortage. However, the tendency to change employers is not the same for all drivers in general. In order to identify those groups of employees showing a substantial tendency for job turnover, latent psychological constructs as well as drivers' demographic data are crucial. To make this data available, a sample has been drawn consisting of more than 900 professional truck drivers. Based on occupational satisfaction, occupational commitment and organizational commitment of these drivers, a six-cluster taxonomy of truck drivers has been derived. Three of these six clusters include drivers for whom a strong intention to leave the company can be assumed. Demographic characteristics considered are time-related factors such as driver age and total years of driving experience. There are significant differences in levels of years of experience within the clusters. Finally, this study suggests effective retention tactics for each of these groups in order to reduce the probability of driver turnover.

Keywords: Truck driver retention, job experience, job satisfaction, occupational commitment and organizational commitment

*Speaker

†Corresponding author: rudolf.large@bwi.uni-stuttgart.de

‡Corresponding author: michael.schaefer@bwi.uni-stuttgart.de

Job Experience and Truck Drivers' Tendency to Change Employment

1. INTRODUCTION

Driver shortage and increased driver turnover are often described as current phenomena of developed economies (Ozawa, Karasawa and Moriya, 1992; Suzuki, 2007; Sersland and Nataraajan, 2015; Prockl et al, 2017; Jaillet, 2019). Even if it is true that truck drivers seem to have a higher level of occupational attachment than other professions of similar human capital (Burks and Monaco, 2019), driver shortage is an actual challenge. From a company perspective, the continuous acquisition of drivers and the reduction of job turnover rates are the two basic main strategies to counteract a shortage of drivers. In a situation of general scarcity of drivers, the acquisition of additional drivers at home or abroad is difficult and involves great effort for the employer. Therefore, employers should focus on employee retention strategies.

The unambiguous definition of job turnover is challenging since the concept covers various behaviors such as moving within an organization voluntarily or involuntarily leaving the organization or even leaving the profession entirely (Hayes et al., 2006). From a driver's individual perspective, a change of job can be carried out by either simply moving to a different employer (change of employer) or by changing tasks and responsibilities either within the same company or at a different company (change of profession). In the first case, the individual leaves the company but remains a truck driver. In the second case, the individual is no longer a driver but practices a new profession or is at least looking for employment in a new profession.

Since driver shortage is pervasive, all companies have a strong interest in retaining their drivers. However, it is up to individual drivers to decide whether they want to give up their job. Since the activity of changing jobs is preceded by an intention of the individual truck driver to change employment (Fishbein and Ajzen, 2010), companies should identify those groups of employees who show a substantial tendency to change jobs. Consequently, research pays attention to latent psychological constructs such as job satisfaction as well as both occupational and organizational commitment. These factors are usually considered to be important influences on the intention of employees to change their job (Hayes et al., 2006; De Gieter, Hofmans and Pepermans, 2011; Yousaf, Sanders and Abbas, 2015). This also applies in the special case of turnover intentions of truck drivers (Beilock and Capelle, 1990; Johnson et al., 2011, Large, Breitling and Kramer, 2014; Schulz, Luthans and Messersmith, 2014). The segmentation of truck drivers based on their turnover intentions would give HR

management the opportunity to focus on these critical groups and to develop group-specific retention tactics. These considerations raise the first research question:

RQ 1: Does a taxonomy of truck drivers based on job satisfaction, occupational commitment and organizational commitment facilitate the identification of driver groups with an above-average tendency to change their job?

The creation of a taxonomy requires a sample of truck drivers. Conducting cluster analysis, a certain number of driver groups is defined and each truck driver within this sample belongs to a dedicated cluster. If the data collection is not anonymous, HR managers would be able to determine whether a certain driver belongs to a driver group with a high job turnover tendency and subsequently apply appropriate retention tactics to this driver. However, non-anonymous data collection is usually not permitted under privacy regulations and also not promising since employees tend to be reluctant to disclose personal data truthfully in relation to their job satisfaction, organizational commitment and professional commitment. In order to assign an additional driver to a cluster afterward, HR managers have to ask for the individual's levels of job satisfaction, occupational commitment and organizational commitment in a reliable manner. Such an attempt would quite obviously be doomed to fail.

This challenge limits the practical use of the driver taxonomy derived. The question therefore arises whether a driver's membership within a particular cluster can be predicted in some other way. General demographic data is already available for each employee or can be collected without any problem. Therefore, the problem of a driver's assignment to a group could be solved if there was a strong relationship between group membership and the demographic characteristics of this driver. Demographic characteristics generally considered in human resource research are gender as well as time-related factors such as age, job tenure, organizational tenure or total years of experience in a given profession (Brush, Moch and Pooyan, 1987; Hayes et al., 2006). These relationships have hardly been considered in research up to now in relation to truck drivers. Consequently, the relationships between these demographic characteristics and the latent psychological constructs, which have been used to derive the driver taxonomy, must be verified. Furthermore, there are hardly any studies on the direct influence of demographic characteristics on the intention to change employer. An important exception is the study of Min and Emam (2003). This research provides evidence that organizational tenure, union membership and the years of driving experience are possible influences on drivers' job changing behavior. Min and Emam concluded that employees with less than six years driving experience show a higher turnover rate than other drivers. This leads to the second research question:

RQ 2: Do demographic characteristics of an individual driver exert any influence on the group membership of this driver based on job satisfaction, occupational commitment and organizational commitment?

If the answer to this research question is yes, it would be promising to link demographic variables to the driver groups derived.

The structure of this paper is as follows: Section 2 analyzes relevant literature with regard to driver shortage and job turnover. The emphasis hereby is on the influence of demographic characteristics on job satisfaction and commitment. Section 3 discusses the definition of scales, data collection and scale purification. In order to answer the first research question, Section 4 firstly presents a taxonomy of drivers based on a hierarchical cluster analysis and secondly, in sub-section 4.2, analyzes the influence of age and job experience on the belonging of an individual driver to a specific driver type. Section 5 then discusses the results of this research and suggest theoretical contributions while the sixth section provides managerial implications. Section 7 summarizes the results and makes recommendations for further research.

2. LITERATURE

2.1. Driver shortage und driver turnover

Truck driver shortage is not a new phenomenon. Already in 1990, Beilock and Capelle stated in their study that a shortage of truck drivers existed and would increase in the future. They estimated that the increase in demand for truck drivers would exceed the growth of the total work force by 0.3% (Beilock and Capelle, 1990). Johnson et al. (2011) and Min and Emam (2002) expected a significant shortage of truck drivers in the future. European Parliament's Committee on Transport and Tourism reported a crucial shortage of drivers in France (European Parliament). Recent estimates stated a lack of 20,000 truck drivers in France (BIFA, 2018). In Germany, the demand for truck drivers was estimated to be around 45,000 (DSLTV, 2017). However, truck driver shortage is not a phenomenon limited only to Europe. The American Trucking Associations (ATA) has indicated a shortage of 60,800 truck drivers in 2018 and predicted a rise to around 160,000 vacancies for 2028, if companies failed to address the problem adequately (Costello and Karickhoff, 2019).

Driver shortage makes the recruitment of additional drivers more difficult. At the same time, there is a second consequence of shortage in labor as excess demand creates opportunities for changing jobs. The result is increased driver turnover. In principle, employee fluctuation is nothing unusual or even problematic. Changing employers is a common procedure for

workers to improve working conditions and pay. However, accelerated fluctuation exacerbates the problem of driver shortage. Dobie, Rakowski and Southern (1998) concluded that 50 percent of respondents to their study expected a turnover rate higher than 50 percent. Keller and Ozment reported turnover rates of 200 to 300 percent for some companies (Keller and Ozment, 1999). Min and Lambert confirmed turnover rates in the range of 100 to 200 percent (Min and Lambert, 2002). According to the ATA the turnover rate was up to 89 percent for large truckload carriers and up to 73 percent for small truckload carriers in the US in 2018 (Costello and Karickhoff, 2019). The most obvious effect of truck driver turnover, however, is the reduction of performance in the industry (Fournier, Lamontagne and Gagnon, 2012). For example, Suzuki, Crum and Pautsch (2009) presented average costs associated with driver replacement amounting to US\$8,000 per person. It is likely that these costs have increased in the decade since then. These extensive consequences justify dealing with the truck driver profession in more detail (Williams, Garver and Taylor, 2011).

2.2. Job satisfaction, organizational and occupational commitment

As shown in the introduction, latent psychological constructs such as job satisfaction, occupational commitment and organizational commitment are usually considered to be important factors of influence on turnover intention. In this section, we discuss these latent constructs in more detail.

Job satisfaction, work satisfaction or occupational satisfaction are common constructs to characterize employee well-being at work. According to Locke (1969, p. 316) „Job satisfaction is the pleasurable emotional state resulting from the appraisal of one's job as achieving or facilitating the achievement of one's job values. Job dissatisfaction is the unpleasurable emotional state resulting from the appraisal of one's job as frustrating or blocking the attainment of one's job values or as entailing disvalues.” Typically, not only are the two states of satisfaction and dissatisfaction distinguished, but rather the level of satisfaction or dissatisfaction is of interest. In addition to the general level of job satisfaction, satisfaction with various aspects of the work situation is considered. For example, the degree of satisfaction with colleagues, the supervisor, the current salary, opportunities for promotion and the work in general is examined (Malik, Danish and Ghafoor, 2009). Following this multidimensional approach, job satisfaction represents the extent to which an employee's expectations regarding these conditions are met.

Meyer and Herscovitch (2001) present an overview of various definitions of commitment in general as well as in more specific settings. Commitment in general terms refers to a

“stabilizing or obliging force, that gives direction to behavior (e.g., restricts freedom, binds the person to a course of action)” Meyer and Herscovitch (2001, p. 301).

Organizational commitment of employees stands for a psychological state indicated by the strength of commitment to their employers (Meyer, Allen and Smith, 1993; Meyer and Herscovitch, 2001). Meyer and Allen (1991) developed a comprehensive three-component model of organizational commitment “reflecting (a) a desire (affective commitment), (b) a need (continuance commitment), and (c) an obligation (normative commitment) to maintain employment in an organization.” Nevertheless, most studies focus on affective organizational commitment (e.g. Brimeyer, Perrucci and Wadsworth, 2010; De Gieter, Hofmans and Pepermans, 2011) which refers to the emotional attachment to the organization (Yousaf, Sanders and Abbas, 2015). Affectively committed employees do not change employers as they possess a desire to stay with the company.

The tendency to change employment is not only influenced by organizational commitment but also by the degree of commitment to the profession or the chosen career, since leaving a profession is commonly associated with a change in employment. According to Blau (1985, p. 278) “career commitment can be defined as one's attitude towards one's profession or vocation”. Meyer, Allen and Smith (1993) extend the three-component model of organizational commitment (Meyer and Allen, 1991) to the field of occupational commitment. Accordingly, they distinguish three dimensions of occupational commitment: affective, continuance and normative commitment to the occupation. People with a strong affective occupational commitment show positive feelings toward their vocation and fully identify with their current profession (Yousaf, Sanders and Abbas, 2015). Continuance commitment refers to the cost and inconvenience of changing occupations. Normative commitment shows the level of obligation and responsibility to remain in the profession. Blau (2003) and Blau and Holladay (2006) split the continuance component further into two separate dimensions, the accumulated costs and limited alternatives occupational commitment, and thus proposed and evaluated a four-dimensional measurement model.

2.3. Demographic characteristics

As shown in the introduction section common demographic characteristics considered in human resource research are gender, age, tenure and years of experience in a given profession (Brush, Moch and Pooyan, 1987; Hayes et al., 2006). In truck driving, gender is not really a relevant criterion since typically the vast majority of truck drivers tend to be male. In the course of this section we discuss potential influences of time-related factors on job satisfaction, occupational commitment and organizational commitment. The research results

cited come from studies concerning mixed groups of employees as well as various professional sub-groups, such as managers, unionized workers or nurses.

In general, results of studies on the relationship between age and job satisfaction turn out to be inconsistent. There are studies indicating that no significant correlation exists between age and various facets of job satisfaction as well as satisfaction with work in general (Malik, Danish and Ghafoor, 2009). Most research results in positive linear influence of age on job satisfaction (Wright and Hamilton, 1978; Brush, Moch and Pooyan, 1987; Kumar and Giri, 2009). A noteworthy exception, however, is the early paper of Saleh and Otis (1964). This research provides evidence for a decrease in job satisfaction at the stage of impending retirement. Other studies assume U-shaped relationships (Clark, Oswald and Warr, 1996; Hochwarter, Ferris and Perrewé, 2001), indicating that satisfaction is high among young employees, then declines and finally increases again with age. In contrast, Chaudhuri, Reilly and Spencer (2015) were unable to support this hypothesis of a U-shaped relationship between age and job satisfaction. Dobrow Riza, Ganzach and Liu (2018) have shown that satisfaction increases with age if employees change employers on a regular basis. In contrast, research assessing the influence of age and organizational commitment provides rather consistent results. In general, a positive relationship can be assumed (Kumar and Giri, 2009; Brimeyer, Perrucci and Wadsworth, 2010).

Another time-related factor which has been considered in research is tenure. Chaudhuri, Reilly and Spencer (2015) conclude that the influence of tenure on job satisfaction is inconsistent and depends on the level of satisfaction and gender. Often, tenure is defined in two different ways (Dobrow Riza, Ganzach and Liu, 2018) with organizational tenure being the length of employment in a given organization (Ng and Feldman, 2010). Since internal transfers or promotions over time can occur, organizational tenure differs from job tenure which relates specifically to years of service in a particular job, not necessarily at only one organization.

The influence of job tenure on job satisfaction cannot be demonstrated statistically (Brush, Moch and Pooyan, 1987; Clark, Oswald and Warr, 1996; Hochwarter, Ferris and Perrewé, 2001). Brush, Moch and Pooyan (1987) use meta-analysis to demonstrate that organizational tenure has a positive impact on job satisfaction. In contrast, Dobrow Riza, Ganzach and Liu (2018) have found a negative relationship. Brimeyer, Perrucci and Wadsworth (2010) identify a weak correlation between organizational tenure and commitment.

Most of the research on satisfaction and commitment conceptualizes work experience in a qualitative manner as the kind of experience gained in a job (Ng and Feldman, 2010;

Brimeyer, Perrucci and Wadsworth, 2010). Sometimes work experience is simply measured just as the number of years a person has worked in total. To take more account of the aspect of specific experiences gained during this period of working life, we define job experience in a quantitative way as the years of professional activity in the present profession. These years may have been spent with different employers. Kumar und Giri (2009) provide evidence for a positive impact of the job experience on job satisfaction and organizational commitment.

As far as we are aware, there are no studies which focus on the influence of demographic factors on occupational commitment. Some studies have used age and tenure as controls and therefore provide correlations with occupational commitment. The results of these analyses are mixed, with correlations usually being rather small (Blau; 1985; Meyer, Allen and Smith, 1993; Yousaf, Sanders and Abbas; 2015).

3. MEASUREMENT AND DATA COLLECTION

3.1. Scales

Literature has proposed various measurement models for measuring the three latent constructs. Elementary scales with only one single item (Wright and Hamilton, 1978; Dobrow Riza, Ganzach and Liu, 2018) or a few items (Hochwarter, Ferris and Perrewé, 2001) are available to measure job satisfaction in general, however, extensive multidimensional scales have been used as well. For example, Kumar and Giri (2009) have applied an instrument with 21 items covering various facets of satisfaction. In this study, we apply the three-item scale used by Large, Breitling and Kramer (2014) to operationalize general occupational satisfaction of truck drivers. This instrument, with some amendments, is based on an earlier scale of job satisfaction proposed by Camman et al. (1983) (Appendix 1). Most studies which deal with organizational commitment apply the three-component model of Meyer and Allen (1991) or at least parts of that model to measure the level of an employee's organizational commitment. Affective organizational commitment items have been used most frequently in recent studies (e.g. De Gieter, Hofmans and Pepermans, 2011; Yousaf, Sanders and Abbas, 2015; Yousaf, Sanders and Yustantio, 2018; Sungu, Weng and Xu, 2019). Accordingly, the four items of the 5-item scale developed by Large, Breitling and Kramer (2014) result from this model. In our study truck drivers were asked to report along these scales.

Meyer, Allen and Smith (1993) propose a comprehensive three-component measurement model of occupational commitment comprising 18 items. Blau (2003) extends this model to 24 indicators and four components. Nevertheless, usually only the items of the affective occupational commitment are taken into account (Yousaf, Sanders and Abbas, 2015; Yousaf,

Sanders and Yustantio, 2018; Sungu, Weng and Xu, 2019). As early as the 1980s, Blau (1985) developed a one-dimensional measurement model which included eight items referring to several components, with some of them, however, revealing low factor loadings. Large, Breitling and Kramer (2014) applied six items taken from this model but with some amendments. We used this 6-item scale to collect data concerning the level of occupational commitment.

3.2. Data Collection

Data was collected by conducting a driver survey in cooperation with a German transport network of small and medium-sized freight carriers. Due to the various nationalities of the drivers employed within this network, an online questionnaire was available for completion in several different languages. A total of 1014 drivers took part in the survey and, of these, 86 records had to be excluded due to missing and/or inconsistent data. This resulted in 928 cases overall being available for statistical analysis. Only 1.1 percent of respondents were female. The average age of participants was 45.4 years. The mean and distribution of age range of the sample matched that of professional drivers in Germany in general. The average work experience as a truck driver was 19.4 years. Based on their years of driving experience, four groups were distinguished: entry-level drivers (up to 5 years), established drivers (between 5 and 15 years), experienced drivers (between 15 and 25 years) and senior drivers (over 25 years).

3.3. Scale Purification

The survey was conducted in cooperation with a German transport network of small and medium-sized freight carriers. Due to the various nationalities of the drivers working within this network, the online questionnaire was available in German, Croatian, Polish, Romanian, Czech and Hungarian. A total of 928 drivers from 51 companies within the network took part in the survey, of which 667 drivers completed the questionnaire in German. The age of the respondents in the sample matched that of professional drivers in Germany in general.

For each construct, exploratory factor analysis (EFA) and Reliability Analysis were conducted. The results demonstrate appropriate levels of reliability and validity. Moreover, EFA was used to calculate standardized scores of each factor (see Table 1).

Construct	Item	Cronbach's Alpha	Corrected item-to-total correlation	Factor loading ^{1,2}	Share of variance explained
		> 0.7	High	> 0.4	> 50%
Occupational	JOB1	0.854	0.680	0.852	77.57%

satisfaction	JOB2		0.764	0.901	
	JOB3		0.737	0.888	
Occupational commitment	OCC1	0.877	0.581	0.694	63,17%
	OCC2		0.728	0.831	
	OCC3		0.754	0.853	
	OCC4		0.780	0.870	
	OCC5		0.696	0.799	
	OCC6		0.600	0.703	
Organizational commitment	ORC1	0.892	0.714	0.819	70,30%
	ORC2		0.589	0.714	
	ORC3		0.793	0.881	
	ORC4		0.818	0.897	
	ORC5		0.778	0.867	

¹ Extraction Method: Principal component analysis.

² Missing values: Cases listwise excluded.

Table 1: Scale reliability and validity.

4. RESULTS

To justify the following analysis, the existence of simple linear or U-shaped relationships is checked. For this purpose, 6 curvy linear regression models are used, with age and professional experience respectively as independent variables and each of the latent constructs as dependent variables. In contrast to earlier research (Clark, Oswald and Warr, 1996; Hochwarter, Ferris and Perrewé, 2001), none of these models leads to significant regression coefficients which indicates that there is no proof of linear or U-shaped relationships between the demographic characteristics (age, experience) and the latent psychological constructs (occupational satisfaction, occupational commitment, organizational commitment) in the case of truck drivers.

4.1. Driver Taxonomy

Cluster analysis was performed based on the factor scores of occupational satisfaction (JOB), occupational commitment (OCC) and organizational commitment (ORC). The Ward algorithm was used with squared Euclidian distances as intervals. The agglomeration schedule shows no pronounced elbow. Therefore, the number of clusters is determined according to the degree of homogeneity. Since factor scores are standardized (mean = 0 and variance = 1), the factor means of each group can be expected to be different from 0 and the variances much smaller than 1. The application of these rules results in the suggestion of a six-cluster solution (see Table 2).

Ward Method	N		Occupational satisfaction (JOB)	Occupational commitment (OCC)	Organizational commitment (ORC)
Cluster 1	104	Mean	1.440	1.386	1.431
		Variance	0.027	0.158	0.107

Cluster 2	211	Mean	0.745	0.706	0.600
		Variance	0.348	0.311	0.267
Cluster 3	163	Mean	0.029	-0.540	-0.380
		Variance	0.095	0.287	0.152
Cluster 4	166	Mean	-0.385	-0.231	0.459
		Variance	0.332	0.153	0.170
Cluster 5	200	Mean	-1.230	-1.166	-1.253
		Variance	0.540	0.368	0.548
Cluster 6	84	Mean	-0.023	0.792	-0.465
		Variance	0.159	0.180	0.227
Total	928	Mean	0.000	0.000	0.000
		Variance	1.000	1.000	1.000

Table 2: Means and Variances of the six-cluster solution.

The central challenge of cluster analysis is the interpretation of the clusters achieved. However, considering the cluster means contributes to an understanding of the nature of each individual cluster. Since the factor scores of the latent psychological constructs are standardized (mean = 0), large positive means within a cluster indicate this characteristic to be dominant. Conversely, a negative mean indicates a weak level of this factor within the cluster. For example, in the first cluster, each of the three factors takes the highest positive mean when compared to the other clusters. This cluster can therefore be called the group of passionate truckers. In contrast, committed employees (cluster 4) possess above-average levels of organizational commitment, but below-par levels of occupational satisfaction and occupational commitment. It can be assumed that such employees would like to stay with the company, but strive for a career change from truck driving. The interpretation based on cluster mean values results in the characterization of each of the six driver clusters (see Table 3). Apart from passionate truckers (cluster 1) and committed employees (cluster 4), there are also the groups of satisfied and committed truck drivers (cluster 2), indifferent truck drivers (cluster 3), frustrated truck drivers (cluster 5) and truck drivers ready to change employer (cluster 6).

Cluster	N	JOB	OCC	ORC	Group
1	104	+++	+++	+++	Passionate trucker
2	211	++	++	++	Satisfied and committed truck driver
3	163	0/+	--	-	Indifferent truck driver
4	166	-	-	+	Committed employee
5	200	---	---	---	Frustrated truck driver
6	84	0/-	++	-	Truck driver ready to change employer

Table 3: Interpretation of the six-cluster solution.

4.2. Job experience

The second research question refers to the influence of time-related factors on the tendency to change employment. As can reasonably be expected, there is a close relationship between age and driver experience. The Pearson Correlation coefficient is 0.763 and therefore significant. Since an assumption could be made that professional experience is merely the consequence of driver age, both influences have been evaluated separately. Accordingly, as a first step one-way ANOVA was performed considering both age and years of driving experience. Concerning driver age, the F-value is low and not significant. The average age of drivers in the six clusters obviously does not differ significantly. This conclusion is supported by the 95% confidence interval for mean given in Table 4. In contrast, the F-value of years of experience is 2.262 and hence significant (0.046). Table 4 shows that frustrated truck drivers are, on average, more experienced than other groups of drivers. In contrast, the level of professional experience of indifferent drivers is the lowest. The 95% confidence intervals of these two clusters do not overlap. The results of ANOVA thus provide a first indication that the factor ‘years in profession’ influences cluster membership. However, this relationship is not significant for the other clusters.

		N	Mean	Std. Dev.	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Age	Passionate trucker	104	44.88	11.13	42.72	47.05
	Satisfied and committed truck driver	211	45.54	11.09	44.03	47.05
	Indifferent truck driver	162	44.23	10.29	42.64	45.83
	Committed employee	166	45.66	11.10	43.96	47.36
	Frustrated truck driver	200	46.46	10.76	44.96	47.96
	Truck driver ready to change the employer	84	45.19	12.25	42.53	47.85
	Total	927	45.43	10.99	44.72	46.13
Years of experience	Passionate trucker	102	19.29	12.46	16.84	21.74
	Satisfied and committed truck driver	207	19.70	10.63	18.24	21.15
	Indifferent truck driver	162	17.62	10.30	16.03	19.22
	Committed employee	166	19.34	10.79	17.69	20.99
	Frustrated truck driver	196	21.30	11.42	19.69	22.91
	Truck driver ready to change the employer	82	17.90	13.03	15.03	20.76
	Total	915	19.40	11.26	18.67	20.13

Table 4: Means, standard deviation and 95% confidence intervals of the six-cluster solution.

It is possible that a complicated relationship between work experience and the latent constructs is one reason for such an ambiguous result. At the beginning of this section we have already shown that there is no simple proof for a linear or U-shaped relationship

between job experience and occupational satisfaction, occupational commitment or organizational commitment. In the following we will examine whether distinct levels of experience accumulate for certain types of drivers. Based on years of job experience four groups of experience levels can be distinguished: entry-level drivers (up to 5 years), established drivers (between 5 and 15 years), experienced drivers (between 15 and 25 years) and senior drivers (more than 25 years). As expected, the average age of drivers in these four groups differs significantly. While entry-level drivers were on average 33.8 years old, the mean age of established drivers was 39.0 years, while for experienced drivers it was 47.8 years and even 55.2 years for senior drivers. Cross tabulation of experience levels and driver clusters shows substantial accumulations (see Table 5). Parson Chi-Square (37.461) is significant. The contingency coefficient is small but significant and takes a value of 0.198 which indicates some influence of driver tenure.

	Entry-level driver		Established driver		Experienced driver		Senior driver	
	Count	Expected Count	Count	Expected Count	Count	Expected Count	Count	Expected Count
Passionate trucker	18	12,82	25	30,88	21	27,76	38	30,54
Satisfied and committed truck driver	20	26,02	60	62,67	70	56,33	57	61,99
Indifferent truck driver	24	20,36	59	49,04	38	44,09	41	48,51
Committed employee	17	20,86	52	50,25	51	45,17	46	49,71
Frustrated truck driver	15	24,63	59	59,34	54	53,34	68	58,69
Truck driver ready to change the employer	21	10,31	22	24,82	15	22,31	24	24,56
Total	115	115	277	277	249	249	274	274

Table 5: Cross-tabulation driver cluster and experience-level.

Entry level drivers and senior drivers are overrepresented among the category of passionate truckers. Experienced drivers can mostly be found in the cluster of satisfied and committed truck driver as well as in the cluster of committed employees. Established driver are more common than expected in the group of indifferent truck drivers. About 35% of frustrated drivers are senior drivers whereas the share of senior drivers in the total sample is less than 30%. In the group of truck drivers ready to change employer the number of entry level drivers is twice the number expected.

5. DISCUSSION

Cluster analysis results in a taxonomy of six groups of truck drivers. A significant tendency to change employer can be assumed for three of the identified groups which are as follows:

(1) Frustrated truck drivers, (2) indifferent truck drivers, and (3) truck drivers ready to change the employer.

(1) Frustrated truck drivers show very low levels of occupational satisfaction (JOB), occupational commitment (OCC) and organizational commitment (ORC). Thus they are a problematic group in themselves. In times of driver shortages, however, companies need even this disillusioned group of drivers. Both changing employer or leaving the profession could be expected, if drivers in this group had the opportunity to do so (Blau, 2003; Blau and Holladay, 2006). Senior drivers are overrepresented in this group. Since the average age of senior drivers is 55.16 years, there are likely to be significant barriers to change job.

(2) Indifferent truck drivers are not really dissatisfied, however, they do show low levels of occupational commitment. Organizational commitment of these drivers is rather weak, too. Although there is currently no significant indication that they intent to change careers, these individuals may develop a strong turnover intention as soon as the opportunity for a more attractive occupation arises. The group of indifferent truck drivers encompasses an above average percentage of entry level drivers and established drivers. The average age is 33.8 years and 39.0 years respectively. These persons have sufficient flexibility change occupation. Vocational change is therefore likely. On the other hand, there is an opportunity for current employers of these young drivers to motivate and to encourage them to stay in the job.

(3) The average occupational commitment of truck drivers ready to change employer is even higher than in the case of satisfied and committed truck drivers. These drivers like their occupation and consequently, they will remain professional drivers. However, both their job satisfaction and their commitment are rather low. It can therefore be assumed that such drivers intend to leave their current employer soon. Entry level drivers are overrepresented in this group. It would be in the interest of companies to make attractive offers to these young and flexible drivers without delay in order to retain them for at least a short period of time. Examples of such attractive offers could be one-off bonuses or eye-catching individual upgrades for their truck. In the medium term, companies should try to increase both job satisfaction and organizational commitment of these drivers on a permanent basis.

In addition to these three clusters, the category of committed employees is also noteworthy. Individuals in this category show various levels of job experience, but are slightly overrepresented in the groups of established and experienced drivers. Committed employees like working for their current employers, but dislike their job as a professional truck driver. They would rather change jobs within in the company. If no other job opportunity is offered,

these people will probably leave the company to avoid continuing to work as drivers. In any case, from the company's perspective, these drivers will be lost at some point. Human resource managers could try to modify the working conditions of these drivers to increase their job satisfaction. It could be possible that these drivers would be more satisfied working within local delivery rather than long-distance freight transport or vice versa.

From a theoretical perspective, this research contributes to an investigation of the influence of age and years of experience on occupational satisfaction, occupational commitment, and organizational commitment. While there is no proof for linear or U-shaped relationships among these demographic characteristics and latent psychological constructs this research provides evidence for significant differences among distinct groups of drivers. This is an important result, which enriches the discussion about U-shaped relationships and may encourage further research.

In addition, senior drivers in particular show very different group assignments. This result is also essential for research on aging workers. The concept of physical and mental work ability broaches the influence of age on the individual ability to work (Ilmarinen, 2001). Work ability describes the extent to which a worker is able to fulfill the requirements of the occupation. For this purpose, personal characteristics, like health, functional capacities, education, competence as well as values, attitudes and motivation, are compared with the characteristics of the work process, such as work demands, work community and management and work environment (Ilmarinen, 2001). It is noteworthy that senior drivers are overrepresented within the categories of both passionate truckers as well as frustrated drivers. It would therefore be an interesting premise to investigate why some older and experienced drivers are still enthusiastic about their profession, while the opposite is true for others.

6. MANAGERIAL IMPLICATIONS

Overall, the results of this study are relevant to managers in both logistics as well as human resource management. Although there is no conclusive indication for strong linear or U-shaped relationships among tenure and the three latent psychological constructs considered, this research will still enable managers to derive retention procedures tailored specifically to each level of job experience.

In the case of the subgroup of entry-level drivers, retention procedures could, for example, include improved job perspectives, more job variety or incentives which may result in an increase of a driver's level of occupational commitment. Managers could also contact previous leavers and encourage them to re-evaluate their decision to leave by formulating an

exit strategy which would facilitate a return to the company and their old position. Retention procedures could also be put into place from the very beginning targeting school leavers even before they are old enough to acquire their driver's license by training them in a variety of theoretical responsibilities closely related to truck driving within the company.

Within the cluster of established drivers, it could be important for managers to target in particular the group of indifferent drivers. These drivers have already gained some valuable professional experience and still have a long working life ahead of them, so renewing their motivation again regarding their profession and their enthusiasm about the company they are working for, will be beneficial to all sides.

By identifying experienced drivers who show a strong commitment to the company on the one hand, but who wish to change careers at the same time, managers could reward such loyalty by offering this group of drivers a possibility to re-train within the company. This could positively enhance/influence employee motivation while retaining a loyal base of employees.

Within the last cluster of senior drivers, both subgroups of passionate and frustrated truck drivers should be focused on. Despite their advanced average age, this group of drivers possesses valuable accumulated knowledge. Both subgroups could be included and involved in training programs aimed at passing on their knowledge and experience to younger drivers. While it should not be very difficult to involve the passionate senior truck driver in such schemes, the frustrated senior truck driver could experience a surge in motivation and commitment to both their profession as well as the company by feeling valued and appreciated. As a result, such management retention initiatives could also benefit trainees who would be shown the long-term prospects of their chosen career within a company caring for and looking after their employees.

7. CONCLUSIONS AND FURTHER RESEARCH

In order to answer the two research questions of this study we conducted a driver survey in cooperation with a German transport network of small and medium-sized freight carriers. In total 928 cases were available for statistical analysis. Cluster analysis was performed based on occupational satisfaction (JOB), occupational commitment (OCC) and organizational commitment (ORC). This analysis resulted in six driver clusters: Passionate trucker, satisfied and committed truck driver, indifferent truck driver, committed employee, frustrated truck driver and truck driver ready to change employer. One-way ANOVA indicates that years of driving exerts influence on group membership, while the average age remains mostly

constant for all groups. Consequently, tenure was examined in more detail. Based on years of job experience, the following driver types were distinguished: entry-level drivers, established drivers, experienced drivers, and senior drivers. Cross tabulation of experience levels and driver clusters shows substantial gaps between the count of drivers and the expected counts. Therefore, complex non-linear relations could be expected.

Further research is needed to explain the nature of the relationships between drivers' experience and the latent psychological constructs used in this study in more detail. Furthermore, it should be examined whether other demographic characteristics exert any influence. As a further step, researchers should consider the influence of contextual factors such as organizational support on truck drivers' turnover intention.

APPENDIX

Occupational satisfaction (JOB): Large, Breitling and Kramer (2014)

- JOB 1 All in all, I am satisfied with my job.
- JOB 2 In general, I like my job.
- JOB 3 In general, I like working in my current profession.

Occupational commitment (OCC): Large, Breitling and Kramer (2014)

- OCC 1 If I could get another job different from being a trucker and paying the same amount, I would probably take it.
- OCC 2 I definitely want a career for myself in this occupation.
- OCC 3 This is the ideal vocation for a life's work.
- OCC 4 I like this vocation too well to give it up.
- OCC 5 If I could do it all over again, I would choose to work in this profession.
- OCC 6 I am disappointed that I ever started to working in this profession.

Organizational commitment (ORG): Large, Breitling and Kramer (2014)

- ORG 1 I would be very happy to spend the balance of my career with my current organization.
- ORG 2 I enjoy discussing my organization with outsiders.
- ORG 3 I do feel like "part of the family" at my organization.
- ORG 4 I do feel a strong sense of belonging to my organization.
- ORG 5 I do feel emotionally attached to my organization.

REFERENCES

- Beilock, R., Capelle, R., (1990). Occupational Loyalties Among Truck Drivers. *Transportation Journal*, 29(3), pp. 20-28.
- BIFA (2018). Truck driver shortage crisis now spreading across the whole of Europe. <https://www.bifa.org/news/articles/2018/dec/truck-driver-shortage-crisis-now-spreading-across-the-whole-of-europe>
- Blau, G., (1985). The measurement and prediction of career commitment. *Journal of Occupational Psychology*, 58(4), pp. 277-288.
- Blau, G., (2003). Testing for a four-dimensional structure of occupational commitment. *Journal of Occupational and Organizational Psychology*, 76(4), pp. 469-488.
- Blau, G., Holladay, B., (2006). Testing the discriminant validity of a four-dimensional occupational commitment measure. *Journal of Occupational and Organizational Psychology*, 79(4), pp. 691-704.
- Brimeyer, T., Perrucci, R., Wadsworth, S., (2010). Age, Tenure, Resources for Control, and Organizational Commitment. *Social Science Quarterly*, 91(2), pp. 511-530.
- Brush, D., Moch, M., Pooyan, A., (1987). Individual Demographic Differences and Job Satisfaction. *Journal of Occupational Behaviour*, 8(2), pp. 139-155.
- Burks, S., Monaco, K., (2019). Is the U.S. labor market for truck drivers broken? *Monthly Labor Review* (3), pp. 1-23.
- Camman, C., Fichman, M., Jenkins, G. D., Klesh, J. R., (1983). Assessing the attitudes and perceptions of organizational members. In Seashore, S. E., Lawler, E. E., Mirvis, P. H., Camman, C. (Eds.): *Assessing organizational change: A guide to methods, measures, and practices* (pp. 71-138). New York: John Wiley & Sons.
- Chaudhuri, K., Reilly, K., Spencer, D., (2015). Job satisfaction, age and tenure: A generalized dynamic random effects model. *Economics Letters*, 130, pp. 13-16.
- Clark, A., Oswald, A., Warr, P., (1996). Is job satisfaction U-shaped in age? *Journal of Occupational and Organizational Psychology*, 69(1), pp. 57-81.
- Costello, B., Karickhoff, A., (2019). Truck driver shortage analysis 2019. <https://www.trucking.org/ATA%20Docs/News%20and%20Information/Reports%20Trends%20and%20Statistics/ATAs%20Driver%20Shortage%20Report%202019%20with%20cover.pdf>
- De Gieter, S., Hofmans, J., Pepermans, R., (2011). Revisiting the impact of job satisfaction and organizational commitment on nurse turnover intention: An individual differences analysis. *International Journal of Nursing Studies*, 48(12), pp. 1457-1588.

- Dobie, K., Rakowski, J.P., Southern, R.N., (1998). Motor Carrier Road Driver Recruitment in a Time of Shortages: What Are We Doing Now? *Transportation Journal*, 37(3), pp. 5-12.
- Dobrow Riza, S., Ganzach, Y., Liu, Y., (2018). Time and Job Satisfaction: A Longitudinal Study of the Differential Roles of Age and Tenure. *Journal of Management*, 44(7), pp. 2558-2579.
- DSLVB, (2017). Fahrermangel gefährdet Versorgungssicherheit – Transportkosten steigen. [https://www.dslv.org/dslv/web.nsf/gfx/37CBC0D9C146D4BDC1258194004DB9B2/\\$file/DSLVB-Pressmitteilung_Fahrermangel%20gef%C3%A4hrdet%20Versorgungssicherheit_.pdf](https://www.dslv.org/dslv/web.nsf/gfx/37CBC0D9C146D4BDC1258194004DB9B2/$file/DSLVB-Pressmitteilung_Fahrermangel%20gef%C3%A4hrdet%20Versorgungssicherheit_.pdf)
- European Parliament, (2008). Shortage of qualified personnel in road freight transport. [http://www.europarl.europa.eu/RegData/etudes/etudes/join/2009/419101/IPOL-TRAN_ET\(2009\)419101_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/etudes/join/2009/419101/IPOL-TRAN_ET(2009)419101_EN.pdf)
- Fishbein, M., Ajzen, I. (2010). *Predicting and changing behavior: The Reasoned Action Approach*. London: Routledge.
- Fournier, P.-S., Lamontagne, S., Gagnon, J., (2012). Interactions between Dispatchers and Truck Drivers in a High Turnover Context. *Relations Industrielles/Industrial Relations*, 67(2), pp. 263-282.
- Hayes, L., O'Brien-Pallas, L., Duffield, C., Shamian, J., Buchan, J., Hughes, F., Spence Laschinger, H. K., North, N., Stone, P. W., (2006). Nurse turnover: A literature review. *International Journal of Nursing Studies*, 43(2), pp. 237-263.
- Hochwarter, W., Ferris, G., Perrewé, P., (2001). A Note on the Nonlinearity of the Age-Job-Satisfaction Relationship. *Journal of Applied Social Psychology*, 31(6), pp. 1223-1237.
- Ilmarinen, J. E. (2001). Aging Workers. *Occupational and Environmental Medicine* 58(8), pp. 546-552.
- Jaillet, J., (2019). Hold on to what you have: Competition among fleets for drivers remains fierce. *Commercial Carrier Journal* 176(4), pp. 46-48.
- Johnson. J., Bristow. D., McClure. D., Schneider. K., (2011). Determinants of Job Satisfaction Among Long-Distance Truck Drivers: An Interview Study in the United States. *International Journal of Management*, 28(1). pp. 203-216.
- Keller, S.B., Ozment, J. (1999). Managing Driver Retention: Effects of the Dispatcher. *Journal of Business Logistics*, 20(2), pp. 97-120.
- Kumar, B., Giri, V., (2009). Effect of Age and Experience on Job Satisfaction and Organizational Commitment. *ICFAI Journal of Organizational Behavior*, 8(1), pp. 28-36.

Large, R., Breitling, T., Kramer, N., (2014). Driver Shortage and Fluctuation - Occupational and Organizational Commitment of Truck Drivers. *Supply Chain Forum: An International Journal*, 15(3). pp. 66-72.

Locke, E., (1969). What is job satisfaction? *Organizational Behavior and Human Performance*, 4(4), pp. 309-336.

Malik, M., Danish, R., Ghafoor, M., (2009). Relationship between Age, Perceptions of Organizational Politics and Job Satisfaction. *Journal of Behavioural Sciences*, 19(1-2), pp. 23-40.

Meyer, J., Allen, N., (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1(1), pp. 61-89.

Meyer, J., Allen, N., Smith, C., (1993). Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *Journal of Applied Psychology*, 78(4), pp. 538-551.

Meyer, J., Herscovitch, L., (2001). Commitment in the Workplace: Toward a General Model. *Human Resource Management Review*, 11, pp. 299-326.

Min, H., Emam, A., (2003). Developing the profiles of truck drivers for their successful recruitment and retention: A data mining approach. *International Journal of Physical Distribution and Logistics Management*, 33(2). pp. 149-162.

Min, H., Lambert, T., (2002). Truck Driver Shortage Revisited. *Transportation Journal*, 42(2), pp. 5-16.

Ng, T., Feldman, D., (2010). Organizational Tenure and Job Performance. *Journal of Management*, 36(5), pp. 1220-1250.

Ozawa, Y., Karasawa, Y., Moriya, E., (1992). The Shortage of Truck Drivers in Japan. *International Journal of Physical Distribution & Logistics Management*, 22(3). pp. 20-23.

Prockl, G., Teller, C., Kotzab, H., Angell, R., (2017). Antecedents of Truck Drivers' Job Satisfaction and Retention Proneness. *Journal of Business Logistics*, 38(3). pp. 184-196.

Saleh, S., Otis, J., (1964). Age and level of job satisfaction. *Personnel Psychology*, 17(4), pp. 425-430.

Schulz, S., Luthans, K., Messersmith, J., (2014). Psychological capital: A new tool for driver retention. *International Journal of Physical Distribution & Logistics Management*, 44(8/9). pp. 621-634.

Sersland, D., Nataraajan, R., (2015). Driver turnover research: exploring the missing angle with a global perspective. *Journal of Service Management*, 26(4). pp. 648-661.

Sungu, L., Weng, Q., Xu, X., (2019). Organizational commitment and job performance: Examining the moderating roles of occupational commitment and transformational leadership. *International Journal of Selection & Assessment*, 27(3), pp. 280-290.

Suzuki, Y., (2007). Truck driver turnover: what rate is good enough? *International Journal of Physical Distribution & Logistics Management*, 37(8). pp. 612-630.

Suzuki, Y., Crum, M.R., Pautsch, G.R., (2009). Predicting truck driver turnover. *Transportation Research Part E*, 45(4), pp. 538-550.

Williams, Z., Garver, M.S., Taylor, G.S., (2011). Understanding Truck Driver Need-Based Segments: Creating a Strategy for Retention. *Journal of Business Logistics*, 32(2), pp. 194-208.

Wright, J., Hamilton, R., (1978). Work Satisfaction and Age: Some Evidence for the 'Job Change' Hypothesis. *Social Forces*, 56(4), pp. 1140-1158.

Yousaf, A., Sanders, K., Abbas, Q., (2015). Organizational/occupational commitment and organizational/occupational turnover intentions: A happy marriage? *Personnel Review*, 44(4), pp. 470-491.

Yousaf, A., Sanders, K., Yustantio, J., (2018). High commitment HRM and organizational and occupational turnover intentions: the role of organizational and occupational commitment. *International Journal of Human Resource Management*, 29(10), pp. 1661-1682.