
The Savant Syndrome – Company Size as a Possible Determinant for Occupational Integrability

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Abstract: The savant syndrome is linked to specific cognitive disorders as well as being characterised by certain limitations but also by extraordinary abilities. Nature and extent of these are very heterogeneous and many aspects of the syndrome remain unresearched. The objective of the investigation described in the following was to approach especially the research gap "work and employment". In order to do so, we investigated the influence the size of the company has on its ability to employ savants. Correlations between the size of the company and other coefficients, e.g. the implementation of workplace health management or the employment of individuals who are disabled in general, could already be shown in other previously conducted studies. The investigation was performed as a quantitative survey among 465 employees. Our aim was to evaluate the specific workplace as to whether it fulfils the previously determined criteria for employment of a savant. This enabled us to measure the integrability of the workplace for savants and then to assess the dependence on the size of the company. Integrability was assessed with a general score consisting of the dimensions "strengths", "weaknesses" and "working conditions". With regard to the dimensions "strengths" and "working conditions", those working in micro companies with less than 10 employees showed significantly higher values and thus better integrability than those from small, medium-sized and large companies.

Keywords: Savant Syndrome, Operational Ability, Autism Spectrum Disorder, Prodigious Savants, Talented Savants, Autistic Disorder

1. Introduction

Research into the savant syndrome which has now been conducted for 130 years, was initiated by the British neurologist J. Langdon Down. During his clinical occupation he observed patients suffering from severe disorders on the one hand while exhibiting extraordinary abilities on the other [1]. Until today, information from research on the savant syndrome remains limited. The multitude of theories corresponds with the heterogeneity of manifestations, thus making research considerably more difficult [2]. For a long time, savants were thus the subject of all possible speculations, misconceptions and unfortunately exploitation as well [3]. It is known, however, that the impairment of savants can be diverse and varying in nature and extent depending on the particular clinical picture [4]. The savant

syndrome is not a classified disease but rather a syndrome which is defined by the fact that the different pathogenic factors and manifested symptoms cannot be distinguished from another due to their complexity [5]. Aside from the limitations, the savant syndrome is also always characterised by an above-average pronounced ability in at least one dimension. It is hardly possible to investigate the savant syndrome separately from the particular clinical picture. Every second savant belongs to the autism spectrum disorder, while the other half suffers from other cognitive disorders [6]. Their limitations have an influence on the social integration of savants. As a rule, persons with disabilities have less access to the labour market [7], a tendency that can also be observed for persons with mental illnesses in general [8]. Though there are no reliable data on unemployment rates in savants, unemployment rates of more than average can be

found in autistic people [9]. It would be reasonable to assume that the same is true for savants.

In Germany, as in many other countries, we are concurrently observing a demographic change that will lead to a lack of skilled labour within the next 20 to 30 years [10]. This is correlated with a progressive ageing of the potential working population [11]. The inevitable existence in the shortage of skilled professionals due to the demographic change is viewed quite critically [12]. Still, it appears a paradox that an increased rate of unemployment in savants can be assumed despite the fact that they have abilities that are above average while there is a lack of skilled labour at the same time. This shortage of skilled professionals and the further development to be expected makes it even more necessary than before for companies to foster and support their employees as the most important resource for their corporate success in order to maintain their health and thus their working capacity for as long as possible as well as to bind them to the company [13].

Corporate health management (BGM) provides companies with the conceptional framework for focusing on the health of their employees. Especially when introducing a BGM, pronounced differences and dependencies on the size of the company can be observed. The BGM in small and medium-sized companies (KMU) has been described as being unsystematic and incomplete [14]. The larger a company is, the more we can expect to see a well-structured BGM.

In cases where the BGM has proven to be supportive of savants, it can also be assumed that the size of the company correlates with the integrability of savants. This is the hypothesis to be tested. Thus, it was the objective of our investigation to determine the connection between the size of the company and the integrability of savants on the basis of the existing positions.

2. Methods

The following analysis is aimed at determining the subjective perception of the employability of savants in German organisations of different sizes from the point of view of the particular employee. For this purpose, we interviewed randomly chosen employees under the condition that they were salaried persons in a dependent employment position. In order to classify the size of the company we used the European Commission's definition (micro company=< 10 employees, small company=10 – 49 employees, medium-sized company=50 – 249 employees) [16]. As a data collection instrument, we chose a questionnaire with 29 closed items and final answer options. The employability of savants is a latent variable, that can only be measured indirectly and for which suitable attributes have to be constructed in order to make the corresponding issues quantifiable. This operationalisation was based on Seiler's theory [15] that the integration of savants requires consideration of their special abilities and limitations in

addition to appropriate working conditions within the company. For these three dimensions (strengths, weaknesses, working conditions) we generated indicators (numerical reasoning, flexibility, communication needs etc.) based on relevant literature. Items were derived from these indicators, some few of which were taken from established questionnaires regarding BGM while we developed further items ourselves.

The items are scaled ordinally and nominally and the possible responses are in accordance with the Likert method. In order to avoid forced-choice, five possible answers were presented. Several items were posed inversely and then subsequently reversed so that the respondents could not recognise response structures. The quality of the survey sample devised was determined in the pretest by way of an explorative factor analysis and a test of the internal consistency with the help of the statistics software SPSS, version 25. The survey was performed via an online platform in March of 2020 and aimed at employees. After three weeks, the minimum number of participants had been reached and the survey (n=465) was closed. All subsequent tests were performed twofold with a significance level of 5%.

In later evaluations of the results, non-parametric tests were used after the Kruskal-Wallis test could not confirm normal distribution. The coefficients were grouped as mean (M) and standard deviation (SD); by adding the individual dimensions, we determined a general value or score.

3. Results

In total, 465 volunteers participated in the survey; six participants did not complete the questionnaire and broke the interview off prematurely, so that 459 data sets could be evaluated. As to the size of the company, 58 (12.6%) of those questioned work in a company with less than 10 employees, 63 (13.7%) work in a company with 10 – 49 employees, 80 (17.4%) work in a company with 50 – 249 employees and 248 (54.0%) work in a company with more than 250 employees. Further 10 (2.2%) of the respondents could not provide information regarding the size of the company. The general scale of all 30 items with values ranging from -60 to 60 yielded a mean value of -1.60 (SD=12.05). With regard to kurtosis, the scale "weaknesses" exceeded the limits elaborated by Miles and Shevlin [17] for the presence of a normal distribution. The Kolmogorov-Smirnov test yielded a significant deviation from the normal distribution by $p < 0.05$ in all scales.

In order to investigate the hypothesis of a correlation between the size of the company and employment and/or integration of savants, the four categories of company sizes were compared with regard to the target variable "employability". Table 1 and Table 2 show a list of the parameters as well as the test results. Overall, negative values show unfavourable conditions while positive mean values reflect favourable conditions.

Table 1. Parameters of the scales depending on the size of the company.

	less than 10 employees n=58		10 - 49 employees n=63		50 - 249 employees n=80		more than 250 employees n=248		don't know n=10	
	M	SD	M	SD	M	SD	M	SD	M	SD
Strengths	4.09	3.29	2.83	3.32	2.68	2.36	2.86	3.00	2.50	3.34
Weaknesses	-5.39	4.69	-5.67	5.44	-7.20	4.15	-6.40	4.53	-5.00	7.21
Working conditions	2.15	10.55	-1.06	9.93	0.46	8.84	2.78	9.49	0.10	9.55
Total	0.84	12.52	3.91	11.86	-4.06	11.33	-0.76	12.04	-2.40	13.23

Table 2. Effect size and test for group differences. H=Test statistics of the Kruskal-Wallis test.

	Cohen's d	H	p-value
Strengths	0.230	9.911	0.042
Weaknesses	0.126	5.801	0.214
Working conditions	0.217	9.285	0.054
Total	0.222	9.541	0.049

Significant differences between the categories of the company sizes could be found in the dimension "strengths" ($H(4)=9.911$; $p=0.042$). Post hoc tests showed significant differences between "less than 10 employees" and "50 – 249 employees" ($Z=-2.902$; $p=0.004$) and "less than 10 employees" and "more than 250 employees" ($Z=-2.623$; $p=0.008$). The mean values decreased as the number of employees increased indicating a better employability with

respect to "strengths" in micro companies with less than 10 employees.

With Cohen's d, the effect size showed a medium effect for "strengths" and the general score, as well as a slight effect for "weaknesses" with $d=0.126$.

The following graphical comparison of the company size categories is limited to the scale of the general score.

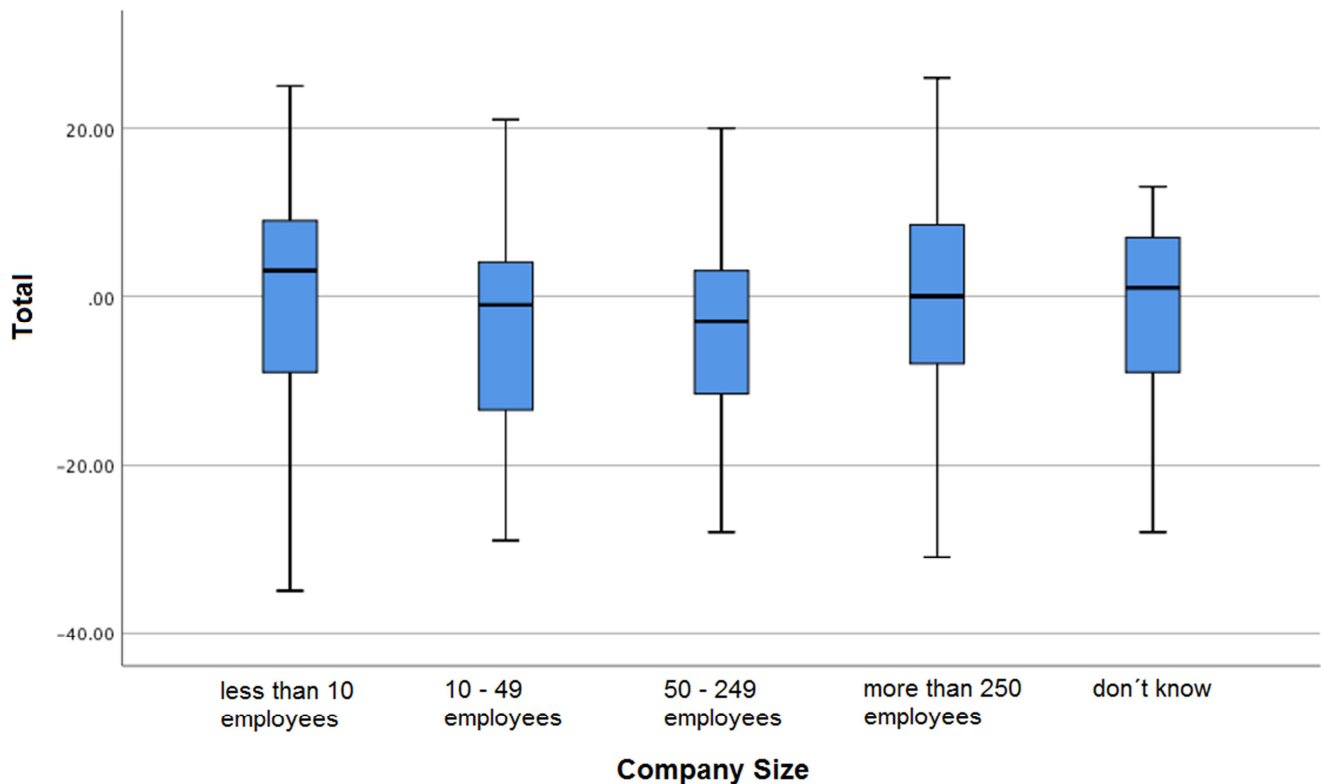
**Figure 1.** General score and size of the company.

Figure 1 shows that the employability with a mean value of 0.84 ($SD=12.52$) is highest in companies with less than 10 employees. In companies with 10 – 49 or 50 – 249 employees, the total mean value drops to -3.91 ($SD=11.86$) or -4.06 ($SD=11.33$), thus indicating a lesser employability. In large companies with more than 250 employees, the mean

value again increases to -0.76 ($SD=12.04$) but still remains negative, i.e. unfavourable. These differences are significant ($H(4)=9.541$; $p=0.049$). Post hoc tests showed that there were significant group differences between companies with less than 10 employees and 10 – 49 employees ($Z=-2.076$; $p=0.038$), less than 10 employees and 50 – 249 employees

($Z=-2.332$; $p=0.019$) and between 50 – 250 and more than 250 employees ($Z=-2.321$; $p=0.020$).

4. Discussion

This investigation shows that especially micro companies with less than 10 employees offer the best employment opportunities for savants. The respondents from companies with less than 10 employees indicated significantly higher values and thus better conditions concerning the scale "strengths" than those from medium-sized companies. With regard to "weaknesses", no differences related to the size of the company could be observed. The "working conditions" for savants are better in companies with less than 10 employees as well as in companies with more than 250 employees than in medium-sized companies; however, no significant differences could be shown. The general score summarizes the results of the individual scales; differences as to the size of the companies can be proven between micro companies with less than 10 employees and all other size categories investigated.

This result is surprising, especially since large companies with more than 250 employees tend to be quite ostentatious in their diversity efforts, suggesting that they offer better conditions for the integration of people with unique abilities. SAP is one of the pioneers in this area with its "Autism at Work" program which was launched in 2013 [18]. This program focuses on the specific recruitment of employees on the autism spectrum along with their special abilities. It is SAP's declared goal to have hired one percent of employees on the autism spectrum in the company by 2020.

Empirical results also show that so far legislative efforts toward the employment of severely disabled individuals have been mostly without effect for savants. These provisions only obligate companies with 20 or more employees to give at least 5% of their jobs to people with disabilities. If these requirements cannot be fulfilled, the company has to pay monthly penalty taxes. According to the Federal Employment Agency, the current rate is now at 4.6% and thus only slightly lower than that required by law. However, here too we can observe a trend depending on the size of the company, albeit in the other direction. In companies with between 20 and 40 employees, the rate of disabled persons is merely 2.8%. The current rate increases continuously with the size of the company [19]. Companies with less than 20 employees are exempt from this legal provision. The survey shows that it is precisely these micro companies and family-run businesses that offer a good working environment in terms of the requirements for savants. Thus, the property of offering appropriate positions and working conditions for the integration of savants is not related to the absolute numbers regarding the employment of disabled persons.

The opposite trend related to the correlation with the size of the company can also be seen in the implementation of a BGM. In KMU, the backlog with regard to BGM is large [20]. Less than five percent of KMU invest systematically in the health and performance of their employees. 99% of the companies in Germany belong to the category KMU [21];

one third of all employees subject to social security contributions are employees of KMU [22]. The expenses for such a BGM should not be underestimated [23]; both a healthy management style and knowledge conveyed through internal training take time. If executive managers have a well-founded knowledge of mental disorders or even the savant syndrome itself, they can interpret even the smallest indications of such a syndrome and can give the employees affected impulses towards new life-changing developments [2]. Thus, better integration requires investments into knowledge management without the advance guarantee of a benefit, making such investments into BGM risky for companies. Often, small and medium-sized companies lack the resources and/or willingness to take on such risks. A staff advisory committee that could give stimuli for the introduction of a BGM is also often missing [24]. Thus, it could be assumed that larger companies offer better possibilities for the employment of savants.

On the contrary, our investigation showed that despite certain challenges, it is especially micro companies that provide the best opportunities for employing savants even if they have the most catching up to do with regard to BGM and generally employ the fewest individuals with disabilities.

5. Conclusions

Micro companies provide the best framework for reacting to the abilities of savants and meeting their limitations with suitable working conditions. We can assume that there is a correlation with other factors, e.g. an elevated culture of trust which is likewise especially pronounced in micro companies. Factors like strong ties with the company, social support due to familial structures, short and direct lines of communication as well as flat hierarchical structures are certainly also relevant in this connection [24].

Investigating the causes for this could be the subject of further investigations which should focus more closely on the presence of a culture of trust. The situation in other countries would also be of relevance for understanding the cause and effect relationship.

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