

# Work Ability and Analysis of Stress-Relevant Coping With Demands of Teachers—A Cross-Sectional Comparative Study in Germany and Ukraine

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**Objective:** The aim of this study was to identify strain factors and compare work ability and stress-relevant coping with demands for German and Ukrainian teachers. **Methods:** Data from 147 German and 291 Ukraine teachers were examined. A professional history questionnaire, the Work Ability Index, and a questionnaire for the analysis of stress-relevant coping with demands (inability to recover subscale) were used. The differences among the age groups in the two countries were evaluated. **Results:** German teachers reported more demands than Ukrainian teachers did. The Work Ability Index score indicates a moderate level of work ability for both groups of teachers. German teachers are more unable to recover than Ukrainian teachers are ( $P < 0.001$ ), and older German teachers are significantly less able to recover than their Ukrainian counterparts are. **Conclusions:** Health intervention and promotion are necessary, especially for older teachers.

**Keywords:** international, teachers, work ability, stress factors, mental health

## OBJECTIVE

For several decades, there has been increasing evidence of elevated stress levels in the workplace.<sup>1</sup> Multiple occupational groups and numerous employees report such as time pressure, work overload, an increase in presenteeism, long working hours, and a lack of breaks, which could negatively impact their mental health.<sup>2,3</sup> The profession of teaching is particularly associated with psychological stress in the workplace.<sup>4,5</sup> Teachers' work conditions have been studied in numerous scientific publications over the past decades.<sup>6–11</sup> High levels of psychological and emotional stress in the teaching profession in the

sense of health impairments were mentioned.<sup>5,12–14</sup> Teachers feel stressed and exhausted, and these feelings are increasingly associated with burnout.<sup>9,15</sup> Forty-three percent of teachers report multiple types of work-related mental stress.<sup>16</sup> In contrast to their relatively high qualifications, teachers are affected to a large degree by occupational gratification crises.<sup>17</sup> The result of an imbalance between occupational expenditure and rewards received in return (model of occupational gratification crises)<sup>18</sup> can lead to long-term sickness absence<sup>19</sup> or mental disorders,<sup>20</sup> for example. In 2019, the education profession had 4.9% sick leave in comparison to 5.4% for all professions.<sup>21</sup> Although this is below the national average, mental diseases represented the largest proportion of work incapacity per 100 AOK\* members.<sup>21</sup>

Work-related demands of teachers include various factors that result from the workplace or from the teacher's work. Teachers consistently feel disturbed by the following three main stressors: a high number of pupils in the classroom, the behavior of difficult pupils, and a high number of teaching hours.<sup>9,22</sup> Other stressors in the teaching profession include time pressure, lack of recovery breaks, large differences in performance among pupils, high vocal strain, and students' lack of willingness to learn.<sup>23</sup> School noise is another important stress factor in the work days of teachers. Teachers are often exposed to high levels of noise during lessons, and it is not uncommon for the sound level to exceed 75 dB.<sup>24</sup> Another problem is the total number of working hours of teachers, which is high and contrary to the widespread social assumption that teachers are "half-day workers."<sup>9</sup> Unlike in other professions, the employment contract of teachers only specifies the number of teaching hours to be performed, a so-called teaching obligation.<sup>25</sup> This does not take into account the time spent on all nonteaching activities, such as preparing and following up on lessons. This time depends individually on the teacher and their demands on the quality of their own work. In particular, engaged teachers report a very high workload.<sup>25</sup> In addition to the demands listed, there are numerous others not mentioned at this point.

In addition to stressors, resources such as personal factors can have a protective impact on teachers' mental health and influence how strain in the workplace is perceived and managed. These include individual competencies, personality traits, attitudes, and coping strategies.<sup>26–28</sup> Despite a large number of mental demands, teachers are once again characterized by high levels of job satisfaction and are highly likely to state that they would like to continue working in the profession.<sup>29,30</sup> Especially with regard to physical health characteristics, teachers achieve above-average results.<sup>31</sup> A possible reason is that teaching is associated with a variety of existing and newly created resources. Examples include good teamwork among the staff, educational consensus, learning and development opportunities in everyday life, mutual recognition at school, and respect.<sup>32,33</sup>

## METHODS

The divergence in the high stress levels combined with emotional strain on the one hand and high job satisfaction on the other hand makes teachers an interesting object of research. The aim of this

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**Ethics Approval and Consent to Participate:** All investigations on humans were carried out in accordance with the appropriate ethics committee, in accordance with national legislation as well as according to the Declaration of Helsinki. All informed participants submitted a declaration of consent. The study was authorized by the responsible Saxon educational agency (August 7, 2012). The Ukrainian Ministry of Education (register no. 1358/2012) and the Otto von Guericke University in Magdeburg, Germany (register no. 19/2016) for the comparison of the German and Ukrainian groups gave positive ethical opinions.

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\*AOK = German for "Allgemeine Ortskrankenkasse," General Local Health Insurance Fund, statutory health insurance.

study is to identify the strain factors and compare work ability and stress-relevant coping with demands in the teaching profession of different ages using a German and Ukrainian sample. The use of age groups allows a differentiated analysis of the results. The general question of this article is as follows: Are German and Ukrainian teachers in the studied samples different or similar in terms of the expression of targets variables? The following working hypotheses result from the research question and are tested in this article: Compared with Ukrainian teachers, German teachers are more stressed by the main stress factors and demands related to the categories of pupils and classes, teacher staff and colleagues, and satisfaction in the workplace. In both full samples, the perceived stress caused by the demands related to the category pupils and classes increases with age. Both full samples are characterized by a high level of job satisfaction. In both full samples, work ability is comparable with declining with age.

## Subjects

The data from a total of 438 teachers are presented, divided into two samples (German [G],  $n = 147$  and Ukraine [UA],  $n = 291$ ). To improve comparability between the two samples, subjects are divided into three age groups based on the World Health Organization definition<sup>34</sup>: age <45 years ( $n = 198$ ), age 45–54 years ( $n = 152$ ), and age >54 years ( $n = 88$ ).

In the first step, 77 general education schools of different types in Central Germany (Saxony-Anhalt) were informed in writing about the planned project. The questionnaires were then sent out in prestamped letters with the request that they must be returned after they had completed the questionnaire in full. Despite intensive efforts and the use of various media (eg, local newspapers with information about study, information letters to various school institutions), the response rate was low. The whole project ran from 2011 to 2014. The data were collected as part of a research project of the German Social Accident Insurance (DGUV) titled “Healthy and motivated in the teaching profession until retirement—ways of prevention.” Study information is available at: <https://forschung-sachsen-anhalt.de/project/im-lehrerberuf-gesund-motiviert-bis-15163>.

In the second step, in the context of a German-Ukrainian pilot project, the questionnaire on sociodemographic and occupational data was translated into Russian, and the other questionnaire was used in the Russian version. The questionnaires were translated by two translators. The data collection of the Ukrainian teachers proceeded in the Kharkiv region in 2013. Participants were informed about the study in the context of teacher meetings and asked to participate.

The questionnaire used in the study was collected and analyzed anonymously using a six-digit code. The handed out questionnaires were all completely filled out, as the completeness of the questionnaires was checked. An approved vote of the ethics committee for the whole project is available.

## Procedure—The Questionnaires

The questionnaire used in this study is composed of different survey instruments for work-related factors:

- Professional history questionnaire<sup>35</sup>;
- Checklist of mainly psychological strain in the teaching profession,<sup>36</sup> and for person-related factors;
- Work Ability Index (WAI)<sup>37,38</sup>; and
- Questionnaire for the analysis of stress-relevant coping with demands (FABA)—inability to recover subscale.<sup>39</sup>

## Professional History Questionnaire

Characteristics of working conditions and tasks were identified using the occupational history questionnaire according to Seibt and Spitzer.<sup>35</sup> The questionnaire was used to collect general information

about the amount of employment experience and relationships. Additional family strains (eg, children) were also requested.

## Checklist of Mainly Psychological Strain in the Teaching Profession

This questionnaire<sup>36</sup> is used to identify strain factors in the school workplace. The questionnaire used in this work includes questions about pupils and classes as well as the teaching staff and was additionally supplemented by questions about support and satisfaction in the workplace. Teachers’ subjective perceptions were asked. The answer to the statements follows a two-step process. First, it is determined whether the statement is relevant (1 point) or not relevant (0 points). A four-point scale is then used to assess the degree of stress caused by the work condition. The associated points are assigned as follows: does not strain me (0 points), hardly strains me (1 point), strains me moderately (2 points), and strains me greatly (3 points).

## Work Ability Index

The WAI is an instrument for evaluating the work ability of employed persons.<sup>37,38</sup> Work ability means the successful accomplishment of work-related tasks. This can be determined by taking into account work-related, health-related, and personal factors. A high WAI value means that the employee’s individual qualifications match his or her various work requirements, whereas a low WAI value indicates a mismatch between the company’s requirements and the employee’s personal qualifications. According to Böckelmann and Seibt,<sup>40</sup> work ability is classified as a person-related factor. The response options differ depending on the subscale. After summing all the points, the WAI total value is obtained (range from 7 to 49 points), which reflects the employee’s ability to work and can be classified as follows: poor work ability, 7–27 points; moderate work ability, 28–36 points; good work ability, 37–43 points; and excellent work ability, 44–49 points.

## Questionnaire for the Analysis of Stress-Relevant Coping With Demands—The Inability to Recover Subscale

The inability to recover subscale of FABA<sup>39</sup> allows the identification of conspicuous behaviors that are associated with ineffective coping styles and thus could be relevant to illness.<sup>41</sup> The scale is based on personal factors such as sense of coherence and health behavior. The inability to recover scale includes six questions and responses based on the degree of agreement or disagreement using the following options: strongly disagree (1 point), somewhat disagree (2 points), somewhat agree (3 points), and strongly agree (four points). By summing the points and subsequent age- and sex-specific normalization (point values 0–24), it is possible to classify the ability to relax as normal (up to 75%), conspicuous (up to 90%), and very conspicuous (90% and above). The higher the score is, the greater the inability to recover. The cutoff is 19 for “noticeable” values and 21 for “very noticeable” values.

## Statistical Analysis

The data were analyzed by using the statistical program Statistical Package of the Social Sciences (SPSS), version 22.0. First, the data were analyzed descriptively to determine frequencies, average values (AVs), and standard deviations (SDs). The presence of a normal distribution was confirmed by using the Kolmogorov-Smirnov test.

Thereafter, different significance tests were applied. For the mean values of both total samples, the  $t$  test for independent samples was used for verification. For the nonnormally distributed interval-scaled variables or for the normally distributed and nonnormally distributed ordinal-scaled variables, the Mann-Whitney  $U$  test was used. The differences among the age groups in both countries were verified by a one-factor analysis of variance or the Kruskal-Wallis test for the normally distributed and nonnormally distributed ordinal-scaled variables. Bonferroni test was chosen as post hoc test. The chi-squared test and Fisher’s exact test were used to calculate the significance of the



frequency differences. A significance level of  $P < 0.05$  was used for all calculations.

**RESULTS**

**Sample Description**

The German total sample comprised 147 teachers (mean age, 48.1 [7.5] years; range of 30–64 years), including 131 (89.1%) females and 16 (10.9%) males. The Ukrainian total sample included 291 teachers (mean age, 43.5 [12.6] years; range of 19–81 years), including 280 (96.2%) females and 11 (3.8%) males. The proportions of older workers were approximately 70% in the German sample and 55% in the Ukrainian sample. The allocation of subjects into age groups is shown in Table 1. The majority of teachers had children (G 93.9%, UA 78.3%). Full-time school teachers in Ukraine work 18 hours per week (contractually defined). Depending on the type of school and the federal state, the hours of teaching (mandatory hours) in Germany range from 24 to 28 hours.

**Work-Related Factors—Work History of Teachers**

The majority of the German subjects taught at an elementary school ( $n = 59$ ). Twenty-seven teachers each worked at gymnasiums or special schools, and 20 teachers worked at comprehensive schools. Another 41 teachers taught at secondary schools and professional schools. Data on school type were not collected from the full sample in Ukraine. Information regarding the employment relationship and duration is summarized in Table 1.

German teachers were contractually obliged to teach an average of 24.2 (4.1) school hours per week and thus assumed a significantly higher teaching load than Ukrainian teachers, who had an average of 20.4 (7.6) school hours ( $P < 0.001$ ). Also, there are high significant differences in hours of reduction (reduction of the hourly depute, especially for teachers over a defined age), hours of free (free hours on teaching days) and hours of stand-in class (substitute lessons, eg, in case of illness of other teachers), and total working hours among the age groups of both countries (Table 1). The difference between age >54 years in the two countries was especially prominent. Although Ukrainian teachers were obligated by employment contracts to teach an average of only 16.8 (5.9) hours per week, German teachers reported an average of 24.2 (4.1) hours per week ( $P < 0.001$ ). Differences were also found between the two countries in terms of teaching

hours, reduction hours, stand-in hours, and free hours (each  $P < 0.001$ ), with the results shown in Table 1.

**Work-Related Factors—Teachers’ Mental Stress**

The two samples were similar in the survey of the most frequent demands in the category of pupils and classes. The everyday work of German and Ukrainian teachers was determined by the presence of the following work conditions: performance differences (G 95.1% vs UA 69.8%,  $P < 0.001$ ), behavioral disorders (81.9% vs 45.6%,  $P < 0.001$ ), low willingness to learn of pupils (71.3% vs 54.9%,  $P = 0.002$ ), parents’ disinterest (66.7% vs 41.8%,  $P < 0.001$ ), disciplinary problems (66.2% vs 30.5%,  $P < 0.001$ ), and high noise (54.2% vs 41.8%,  $P = 0.02$ ). Tables 2A to C present the occurrence of the main factors and their perceived contribution to high levels of strain: (1) pupils and classes, (2) staff and colleagues, and (3) satisfaction of German and Ukrainian teachers considering the age groups.

The demands related to the category staff and colleagues were evaluated predominantly positively in both samples, although Ukrainian teachers always reported a higher level of satisfaction. A good social climate was present for 73.8% of German teachers and for 90.9% of Ukrainian teachers ( $P < 0.001$ ). Interaction with colleagues was not only associated with positive emotions for all teachers. Thus, almost three quarters of all German teachers reported stress related to interactions with colleagues and thus differed significantly from the Ukrainian sample, in which only 15.8% of the teachers agreed with this statement ( $P < 0.001$ ). The results of the age groups with regard to the demands of the category stress related to interactions with colleagues largely correspond to the results of the overall samples.

Both total samples were characterized by high to very high levels of satisfaction with the professional situation. There were clear differences among the samples with regard to their satisfaction with the school climate (G 64.8%, UA 88.0%;  $P < 0.001$ ), organization of school (G 53.4%, UA 90.4%;  $P < 0.001$ ), and communication structures (G 46.2%, UA 86.5%;  $P < 0.001$ ).

**Teachers’ Work Ability**

The WAI total scores of 34.7 (6.7) (G) and 35.8 (5.4) (UA) indicate moderate levels of work ability for both groups of teachers, but the differences are not significant. In both countries, there is a decline in work ability with increasing age. The data on work ability are shown in Table 3.

**TABLE 2A.** Selection of the Most Important Stress Factors in the Category Pupils and Classes and Their High Intensity of German and Ukrainian teachers

|                          | Germany  |           |           |          |            | Ukraine   |           |           |          |            | G-UA          |
|--------------------------|--|-----------|-----------|----------|------------|-----------|-----------|-----------|----------|------------|---------------|
|                          | AG I   | AG II     | AG III    | Total, % | $P_{AG}^a$ | AG I      | AG II     | AG III    | Total, % | $P_{AG}^a$ | $P_{total}^a$ |
| Stress factor, $n$ (%)   | <b>Main stress factors in the category pupils and classes</b>                          |           |           |          |            |           |           |           |          |            |               |
| Performance differences  | 42 (97.7)  | 61 (92.4) | 34 (97.1) | 95.2     | 0.377      | 76 (67.0) | 53 (79.1) | 27 (62.8) | 69.8     | 0.124      | <0.001        |
| Behavioral disorders     | 31 (70.5)  | 57 (87.7) | 30 (85.7) | 81.2     | 0.057      | 62 (53.5) | 27 (41.5) | 13 (31.7) | 46.0     | 0.039      | <0.001        |
| Low learning willingness | 25 (56.8)  | 49 (75.4) | 28 (82.4) | 71.3     | 0.029      | 60 (50.4) | 42 (65.6) | 21 (51.2) | 54.9     | 0.125      | 0.001         |
| Parents disinterest      | 24 (54.6)  | 49 (77.8) | 21 (61.8) | 66.7     | 0.034      | 49 (41.9) | 28 (44.4) | 15 (37.5) | 41.8     | 0.785      | 0.008         |
| Disciplinary problems    | 25 (56.8)  | 47 (71.2) | 24 (68.6) | 66.2     | 0.278      | 40 (33.1) | 18 (26.5) | 13 (29.6) | 30.5     | 0.633      | <0.001        |
| High noise               | 24 (54.6)  | 37 (57.8) | 16 (47.1) | 54.2     | 0.595      | 44 (37.0) | 33 (50.0) | 17 (42.5) | 41.8     | 0.226      | 0.096         |
| $n$ (%)                  | <b>High stress intensity of main stress factors in the category pupils and classes</b> |           |           |          |            |           |           |           |          |            |               |
| Performance differences  | 6 (14.0)   | 20 (32.3) | 13 (37.1) | 27.9     | 0.024      | 13 (10.2) | 14 (20.3) | 8 (20.0)  | 14.8     | 0.484      | 0.002         |
| Behavioral disorders     | 8 (25.8)   | 27 (46.5) | 20 (64.5) | 45.8     | 0.043      | 23 (18.7) | 18 (28.1) | 10 (25.6) | 22.6     | 0.705      | <0.001        |
| Low learning willingness | 6 (24.0)   | 24 (48.0) | 9 (31.0)  | 37.5     | 0.216      | 38 (31.4) | 26 (36.1) | 13 (33.3) | 33.2     | 0.717      | 0.168         |
| Parents disinterest      | 6 (24.0)   | 21 (43.0) | 12 (54.6) | 40.6     | 0.005      | 49 (40.5) | 27 (38.6) | 13 (34.2) | 38.9     | 0.389      | 0.008         |
| Discipline problems      | 7 (28.0)   | 13 (27.7) | 9 (36.0)  | 29.9     | 0.746      | 20 (16.8) | 11 (16.4) | 7 (16.7)  | 16.7     | 0.078      | <0.001        |
| High noise               | 8 (33.3)   | 7 (18.4)  | 7 (38.9)  | 27.5     | 0.068      | 0 (0)     | 1 (1.7)   | 0 (0)     | 0.5      | 0.667      | <0.001        |

AG, age group; AV, average of the values; SD, standard deviation; G, Germany; UA, Ukraine.

<sup>a</sup>Pearson’s chi-squared test or Fisher’s exact test (cell number < 5).

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**TABLE 3.** Work Ability (WAI) and Relaxation Inability (FABA) of German and Ukrainian age Groups and the Total Sample

| WAI                                | Germany     |              |               |                              | Ukraine   |             |              |               |                              | G-UA                |                                 |  |
|------------------------------------|-------------|--------------|---------------|------------------------------|---|-------------|--------------|---------------|------------------------------|---------------------|---------------------------------|--|
|                                    | AG I        | AG II        | AG III        | Total                        | WAI   | AG I        | AG II        | AG III        | Total                        | $P_{AG}^{b,d}$      | $P_{Ges}^e$                     | $P_{AG}$   |
| Score (AV ± SD)                    | 38.0 ± 6.22 | 34.1 ± 5.78  | 31.9 ± 7.43   | 34.7 ± 6.72                  | <b>&lt;0.001</b><br><b>I/II 0.006</b><br><b>I/III &lt;0.001</b> | 36.8 ± 5.13 | 34.2 ± 5.40  | 35.6 ± 5.63   | 35.8 ± 5.4                   | 0.002<br>I/II 0.001 | 0.087                           | NP <sup>b</sup>  |
| <b>Classification, n (%)</b>       | <b>AG I</b> | <b>AG II</b> | <b>AG III</b> | <b><math>P_{AG}^a</math></b> |   | <b>AG I</b> | <b>AG II</b> | <b>AG III</b> | <b><math>P_{AG}^a</math></b> |                     | <b><math>P_{total}^b</math></b> |  |
| Very good                          | 8 (18.2)    | 3 (4.5)      | 2 (5.6)       | <b>0.001</b>                 |   | 14 (9.9)    | 5 (6.4)      | 3 (7.3)       | <b>0.042</b>                 |                     | <b>&lt;0.001</b>                |  |
| Good                               | 20 (45.5)   | 23 (34.3)    | 7 (19.4)      |                              |   | 58 (41.1)   | 17 (21.8)    | 14 (34.2)     |                              |                     |                                 |  |
| Moderate                           | 14 (31.8)   | 31 (46.3)    | 15 (41.7)     |                              |   | 63 (44.7)   | 47 (60.3)    | 22 (53.7)     |                              |                     |                                 |  |
| Poor                               | 2 (4.6)     | 10 (14.9)    | 12 (33.3)     |                              |   | 6 (4.3)     | 9 (10.6)     | 2 (4.9)       |                              |                     |                                 |  |
| <b>Relaxation Inability (FABA)</b> |             |              |               |                              |   |             |              |               |                              |                     |                                 |  |
| FABA                               | AG I        | AG II        | AG III        | Total                        | $P_{AG}$  | AG I        | AG II        | AG III        | Total                        | $P_{AG}$            | $P_{Ges}^e$                     | $P_{AG}$   |
| Score (AV ± SD)                    | 17.1 ± 4.15 | 16.9 ± 4.16  | 19.6 ± 4.52   | 17.6 ± 4.37                  | <b>0.007</b><br><b>I/III 0.028</b><br><b>II/III 0.009</b>       | 13.7 ± 4.28 | 13.8 ± 4.08  | 12.4 ± 3.93   | 13.5 ± 4.18                  | 0.158               | <0.001                          | <0.001 <sup>b</sup><br>I/II, II/III/<br>III <sup>c</sup> < 0.001 |
| <b>Classification, n (%)</b>       | <b>AG I</b> | <b>AG II</b> | <b>AG III</b> | <b><math>P_{AG}^a</math></b> |   | <b>AG I</b> | <b>AG II</b> | <b>AG III</b> | <b><math>P_{AG}^a</math></b> |                     | <b><math>P_{total}^b</math></b> |  |
| Normal                             | 26 (59.1)   | 42 (63.6)    | 17 (47.2)     | 0.0345                       |   | 122 (84.7)  | 68 (91.9)    | 45 (97.8)     | 0.078                        |                     | <b>&lt;0.001</b>                |  |
| Noticeable                         | 11 (25.0)   | 16 (24.2)    | 9 (25.0)      |                              |   | 15 (10.4)   | 3 (4.1)      | 0 (0)         |                              |                     |                                 |  |
| Very noticeable                    | 7 (15.9)    | 8 (12.1)     | 10 (27.8)     |                              |   | 7 (4.9)     | 3 (4.1)      | 1 (2.2)       |                              |                     |                                 |  |

AG, age group; AV, average of the values; SD, standard deviation; G, Germany; UA, Ukraine; NP, not performed; WAI, Work Ability Index; FABA, questionnaire for the analysis of stress-relevant coping with demands–subscale relaxation inability.  
<sup>a</sup>Fisher's exact test.  
<sup>b</sup>Single factor analysis of variance.  
<sup>c</sup>Post hoc Bonferroni test between the same German and Ukrainian age groups.  
<sup>d</sup>Post hoc Bonferroni test between age groups of each country.  
<sup>e</sup>t test.

occurrence of demands. German teachers reported experiencing the main demands significantly more often. The most significant differences existed with regard to the occurrence of behavioral problems and disciplinary problems of pupils, which were reported approximately twice as often by German teachers. Other studies showed occupational strain such as high number of work hours per week, school violence, and the number of pupils in the classroom.<sup>42</sup>

Both full samples showed a high level of satisfaction with the teaching staff. Almost three quarters of all teachers reported a good social climate and support from colleagues and school management. The Ukrainian teachers showed more favorable results in this context. Despite the positive results, more than 70% of German teachers experienced tensions in the college, which was significantly more often than Ukrainian teachers (20%). Nevertheless, it can be assumed that the results were mostly positive regarding work resources and that both teacher samples can draw on social resources in their work day. One study found that supportive school profiles in terms of usable resources were associated with higher levels of teacher job satisfaction and professional engagement than nonsupportive school profiles.<sup>43</sup>

In the present study, teachers in both countries were characterized by a high level of professional satisfaction. There was a significantly high level of approval with regard to the professional situation, contact with pupils, and relationships with parents and colleagues. German teachers, however, criticized the school climate, the organization of school operations, and the communication structures, and indicated only moderate levels of satisfaction in these areas. The results of this study are consistent with the results of other studies: In a prior large, cross-occupational study, teachers also rated job satisfaction at

high levels similar to those reported by educators, physicians, and engineers.<sup>30</sup> Another study found that the organizational environment significantly affects the stress level and job satisfaction of college teachers.<sup>44</sup> Demands were consistently associated with perceived work-related demands of English teachers, although support of management also played a part.<sup>11</sup>

The WAI of German and Ukrainian teachers indicated moderate levels of work ability for both samples. We also took into account the proportion of teachers who are moderately fit for work. Approximately 57% of teachers in both countries show impaired work ability. The high proportion of German teachers reporting limited work ability is not surprising. It has already been shown that teachers have the lowest levels of work ability in comparison to office workers, educators, and managers.<sup>45</sup>

German teachers were significantly less able to recover than Ukrainian teachers were. The classification into four different degrees of severity supports this statement: approximately 17.1% of the German teachers and 4.2% of the Ukrainian teachers reported being incapable of relaxing. If the proportion of teachers who showed signs of noticeable inability to recover is also taken into account, then approximately 42% (G) and 11% (UA) of teachers had a limited ability to recover. The aforementioned cross-occupational study showed that teachers had the lowest levels of relaxation ability among various occupational groups.<sup>45</sup>

Previous work has already suggested a correlation between older age and increasing stress levels and psychic health complaints.<sup>15,46</sup> Thus, it has already been shown that teachers had the lowest work ability compared with office workers, educators, and managers.<sup>45</sup> Mental illness is more common among teachers than in other professions, as

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are nonspecific complaints such as exhaustion, fatigue, headaches, and shoulder-neck tension.<sup>15</sup> For example, our data demonstrate significantly higher stress levels for older German teachers than for younger colleagues with regard to three of the six demands in the student and class categories (performance differences, behavior problems, and parents' disinterest). It is possible that this result is due to increased overcommitment among teachers, which increased with age,<sup>47</sup> but which does not apply to Ukrainian teachers. Furthermore, the work ability of German teachers decreased with age. Every third teacher with age >54 years had a low level of work ability. The proportion of Ukrainian teachers with a low level of work ability is approximately 5% for each age group and does not change on the basis of age. No significant differences were found with regard to the inability to recover among the individual age groups in each country. It also shows a more extensive age range among Ukrainian teachers. One reason could be that the Ukrainian pension is one of the lowest in Europe. The retirement age in Ukraine is 60 years for men and 55 years for women, or they have a particularly long work experience of 25 to 30 years. In Ukraine, school teachers are initially granted an employment contract for 1 year, after which it is either extended for another year or a permanent contract is concluded by agreement between both sides. Therefore, many Ukraine teachers are afraid of unemployment because they have only temporary contracts. In Germany, teachers are civil servants. They have a permanent contract. Teachers in Germany retire at an average age of 65 years. The general retirement age in Germany is 67 years. Thus, Ukrainian teachers must work longer than the actual retirement age in Ukraine.<sup>48</sup>

Finally, the teaching profession in both countries is associated with high mental stress. German teachers and especially older teachers are more stressed than Ukrainian teachers of the same age. The results show the necessity of measures to prevent negative consequences of stress in the teaching profession through health management and health promotion. Relevant causes of occupational strain in the teaching profession must be identified.<sup>49</sup> Low-threshold interventions and outcomes should be pursued.<sup>49</sup> Why do Ukrainian teachers perform better than German teachers do in many of the surveyed variables, especially with regard to the consequences of stress, and what are the reasons for the lower stress levels of older Ukrainian teachers? A final clarification of these questions is not possible due to the complexity and multidimensionality of teacher strain and stress. On the one hand, it can be accepted that the shorter teaching time of Ukrainian teachers is a crucial contribution to their lower stress levels. German teachers teach significantly longer. The amount of work time (both compulsory hours and extracurricular hours) is a recurring source of subjective stress for teachers.<sup>42</sup> This assumption is also supported by the results of a study in which teachers refer to long working hours as a decisive stress factor and call for a reduction in the hours in a workday as the most important health-improving measure.<sup>23</sup> In addition, German teachers more often report negative behavior on the part of pupils. The different social positions of German and Ukrainian teachers could be of decisive importance here. Respect for the teacher and the teacher's reputation in the family and in society are different in the two countries. A reference to this is provided by an international study on the topic of teacher image and recognition in 35 different countries. In this survey, German teachers ranked only 24<sup>th</sup>, whereas Russian teachers were found to have the 4<sup>th</sup> best image.<sup>50</sup> The image of Ukrainian teachers was not explicitly determined in the study. However, due to cultural similarities between Russia and Ukraine, it is also assumed that teachers from the two countries are comparable in terms of recognition. The role of organizational structures in the school workplace should also be questioned. Teachers from both samples differed in terms of their satisfaction with organizational structures. This could result in negative stress experiences and serve as another explanation for the more impaired abilities of German teachers. The general model of strain, resources, and stress in the teaching profession forms the theoretical foundation of this work. The way in which strain is experienced

also depends greatly on the resources available to each individual. In this study, selected work-related resources (support from colleagues or school management, etc) were examined, but other characteristics such as individual personality traits or work-related behavior and experience as well as dealing with stressful situations were not identified. It is therefore conceivable that the two samples differed from each other with regard to these characteristics, which could thus provide an explanation for the different results. Teacher training programs form the basis for the successful practice of teaching and therefore occupy a central position in influencing the development of work-related stress consequences.<sup>51</sup> Therefore, it would be useful to analyze the teacher training programs in both countries with regard to the content and selection of pupils. An intervention study about complementary stress management and well-being for teachers showed experienced benefits in personal and professional settings, behavioral changes, increased awareness of the impact of stress, and a decrease in the stress response.<sup>52</sup>

The results obtained in this study are limited in some other aspects, which will be briefly discussed in the following. The German teachers were significantly older than the Ukrainian teachers. The samples had an unequal number of participants: the Ukrainian teacher group was twice as large as the German sample. Due to the low number of participants, especially in the German sample, a further division into age groups results in very small subsamples. This could lead to outliers having a stronger influence on the mean value and thus to biased results. Moreover, it is well known that the German school system is divided into types of schools and that, in addition, educational policy is regulated at the level of the federal states. This results in very different work situations for teachers, which makes it difficult to compare teachers with one another. The work-related factors can be influenced by how homogenous the school setting is among teachers and students considering race, ethnicity, and economic status. A detailed response rate was not determined, but it was higher than that for the German teachers. We cannot evaluate the number of teachers reached through the different information channels. Also, the professional history questionnaire is unpublished and thus not validated. Teaching experience was not surveyed. This could have an influence on stress. The difference of "professional years" and "years as teachers" was minimal in the German sample and was somewhat higher in the Ukrainian sample. In addition, the Ukrainian school system is structured differently with the central role of the unified school. Participation in this study was voluntary. However, it is accepted that these kinds of study designs tend to identify predominantly health-seeking participants, and thus, data from individuals with more severe health impairments are not included; this can lead to bias in the results.

## CONCLUSIONS

The teaching profession in both countries is associated with high mental stress. Comparative studies are necessary to rank the data collected. Regional conditions must be taken into account in the assessment. General statements should only be made with caution. Older German teachers are more stressed than their Ukrainian counterparts. Health intervention and promotion are necessary in the teaching profession, especially older teachers, to avoid the negative consequences of stress.

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