

# A Preliminary Validation of the Polish Version of the Comprehensive Intellectual Humility Scale (CIHS)

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**Background:** In the last few years, empirical research on intellectual humility has grown notably, involving the elaboration of promising measures that provide a different outlook on the construct. Although all of them offer valid, theoretically sound, and meaningful contributions, we selected the 22-item Comprehensive Intellectual Humility Scale (CIHS) by Krumrei-Mancuso and Rouse for validation. The rationale for choosing this questionnaire for Polish validation stands in its multidimensional nature, which enables the study of various nuances of this psychological concept.

**Methods:** The research was carried out with the participation of 260 adults (Study 1) and 210 adults (Study 2). The respondents completed a Polish translation of the original version of the CIHS, the Gratitude Questionnaire—Six Item Form (GQ-6), the General Self-Efficacy Scale (GSES), and the Positive Orientation Scale (P-Scale).

**Results:** The findings obtained in both studies support the four-factor model of the CIHS with the higher order factor. The good fit indices of the CFA and MGCFA show the psychometric solidity of the 22-item structure of the Polish version of the CIHS. With respect to convergent validity, the validation study (Study 2) confirmed that gratitude, self-efficacy, and positive orientation are significant correlates of the CIHS.

**Conclusion:** Since intellectual humility is still a little-known psychological construct, both as a concept and as a possible antecedent or consequence, it would be worth examining it in the future with other variables of an intraindividual and interindividual nature.

**Keywords:** intellectual humility, gratitude, self-efficacy, positive orientation, adults

## Introduction

Intellectual humility belongs to a group of epistemic virtues<sup>1–5</sup> that have been overlooked and understudied in the scholarly literature.<sup>6–10</sup> Recently, however, intellectual humility has attracted a lot of interest in the psychological sciences,<sup>7,9,11,12</sup> resulting in the development of various conceptualizations<sup>13</sup> and several measurement tools.<sup>12,14</sup>

Given that the research on intellectual humility is still in its beginnings,<sup>15–17</sup> there is no agreement on its precise description<sup>9,18,19</sup> and a variety of definitions emphasize different features of this complex and multidimensional construct.<sup>5,20</sup> Broadly speaking, intellectual humility has been considered as a subdomain<sup>18,21–23</sup> or a more specific version of humility.<sup>4,11,24</sup> In fact, general and intellectual humility are often contrasted.<sup>25</sup> While general humility involves “an accurate view of one’s strengths and weaknesses”,<sup>4</sup> p. 215, intellectual humility refers mainly to being open to alternative points of view<sup>4</sup> and recognizing the fallibility of one’s beliefs or knowledge.<sup>12</sup> Thus, general humility implies a realistic view of the self across events and relationships, and intellectual humility alludes to ideas in an intellectual domain or context.<sup>2,26,27</sup>

Another division concerns implicit and explicit theories of intellectual humility. According to the former definitions that reflect “folk” comprehension,<sup>28</sup> intellectually humble people display a combination of cognitive (intelligence, curiosity, love of learning), self-oriented (modesty, not-a-showoff), and other-oriented (politeness, reliability,

unselfishness) dimensions. Some individuals tend to confound humility with self-deception,<sup>29,30</sup> self-abasement,<sup>31,32</sup> weakness,<sup>31,33</sup> low self-esteem,<sup>6,29</sup> humiliation,<sup>33</sup> and ignorance.<sup>29,32</sup> In turn, as attested by latter definitions represented by different philosophers and social scientists, intellectual humility tends to be understood somewhat distinctly.<sup>15</sup>

A further review of the literature shows that most theories give intellectual humility the character of a trait<sup>7,11,16,34</sup> and of a virtue.<sup>11,35</sup> Some other researchers conceptualize intellectual humility as a state at a given time<sup>27</sup> and in a particular situation<sup>34</sup> which consists in phenomenological experience. Nearly all definitions include two components of intellectual humility: intrapersonal and interpersonal.<sup>22</sup> Porter et al<sup>36</sup> even speak about a new framework of intellectual humility which advances in these two distinguished aspects.

The first one, called the self-focused feature, refers to one's own knowledge and understanding. In this sense, intellectual humility is about an accurate or moderate perception of oneself as a knower.<sup>2,21,23</sup> According to Roberts and Wood,<sup>37</sup> intellectually humble individuals have a low consideration for self-importance and intellectual domination. Krumrei-Mancuso and Rouse,<sup>2</sup> p. 210, define intellectual humility as "a nonthreatening awareness of one's intellectual fallibility". Likewise, Hill and Laney,<sup>38</sup> p. 243, consider intellectual humility as "a hypo-egoic phenomenon that involves a non-defensive willingness to see oneself accurately by acknowledging one's personal limitations". Viewed in this way, intellectual humility includes the consciousness and/or acceptance that one's beliefs, knowledge or experience may be incomplete, erroneous, or mistaken.<sup>30,39,40</sup> Hook et al<sup>26</sup> consider this awareness as the intrapersonal dimension of intellectual humility that indicates a correct perception of one's knowledge and beliefs. Some researchers underline that intellectual humility does not reflect only acknowledgment of one's intellectual limitations. It also consists in being attentive to one's intellectual strengths and abilities.<sup>2,21,23</sup> For example, Gregg and Mahadevan<sup>41</sup> classify intellectual humility as a realistic evaluation of one's epistemic competencies. Humble people can have positive thoughts and emotions about themselves,<sup>42</sup> and present good psychological adjustment.<sup>31</sup> Altogether, the intrapersonal aspect of intellectual humility is about personal awareness and impartial, non-defensive self-knowledge.<sup>43</sup>

Other definitions stress the interpersonal character of intellectual humility, labeled as the other-focused feature, which implies others' knowledge and understanding. McElroy et al<sup>7</sup> theorize that intellectual humility is relational in nature since it encompasses managing interplays with others. Porter et al<sup>13,44</sup> speak about humility as a disposition to consider and appreciate others' knowledge and intellectual potential. Thus, humble individuals seem to have an interpersonal stance that is other-oriented, rather than self-focused, characterized by respect for others.<sup>2,12,20,22</sup>

In the last few years, empirical research on intellectual humility has grown notably (Table 1), involving the elaboration of promising measures that provide a different outlook on the construct.<sup>20,45</sup> Although all of them offer valid, theoretically sound, and meaningful contributions, we selected the 22-item Comprehensive Intellectual Humility Scale (CIHS) by Krumrei-Mancuso and Rouse<sup>2</sup> for validation.

The rationale for choosing this questionnaire for Polish validation stands above all in its multidimensional nature, which enables the study of various nuances of this psychological concept. Moreover, the CIHS is one of the first self-report and comprehensive scales which measures intellectual humility in both the intrapersonal and interpersonal domains<sup>2</sup> and refers to social and epistemic dispositions.<sup>46</sup> From a psychometric perspective, both the four subdimensions and the overall score can be calculated for the CIHS.<sup>2</sup>

The CIHS is a self-report questionnaire that consists of 22 items that reflect four facets: independence of intellect and ego, openness to revising one's viewpoints, respect for others' viewpoints, and lack of intellectual overconfidence.<sup>2</sup> Independence of intellect and ego enables an individual to be confident in their opinions.<sup>2</sup> In situations of disagreement or different views, such a person does not feel personally attacked, insignificant, or threatened. Openness to revising one's viewpoint allows for the change of one's important perspective when confronted with cogent and different evidence. Thus, intellectually humble people are disposed to change their opinion based on good, new, and convincing reasons or information. Respect for others' viewpoints enables kind conversation even when discussing opposed issues. Such individuals, even if they disagree with others, still welcome different ways of thinking and esteem their interlocutors. A lack of intellectual overconfidence is based on an awareness of intellectual biases and having accurate intellectual self-regard. Humble individuals, listening to the perspectives of others, are eager to turn to them for expertise or to learn from them. In this sense, intellectual humility has both an intrapersonal and interpersonal character.<sup>47</sup>

**Table I** Research Tools to Measure Intellectual Humility

| Measure and Structure   | Authors                                   | Reliability  |
|---|---|--|
| <b>Limitations-Owning Intellectual Humility Scale</b><br>(12 items; 3 subscales)      | Haggard et al <sup>14</sup>               | Overall reliability: $\alpha = 0.86$<br>love of learning $\alpha = 0.81$<br>appropriate discomfort with limitations: $\alpha = 0.84$<br>owning intellectual limitations: $\alpha = 0.77$               |
| <b>Multi-dimensional Measure of Intellectual Humility</b><br>(22 items; 4 subscales)  | Alfano et al <sup>18</sup>                | Open-mindedness<br>intellectual modesty<br>corrigibility<br>engagement   |
| <b>Specific Intellectual Humility Scale</b><br>(9 items; one-factor model)            | Hoyle et al <sup>20</sup>                 | Ranging from $\alpha = 0.88$ to $\alpha = 0.96$  |
| <b>General Intellectual Humility Scale</b><br>(6 items; one-factor model)             | Deffler et al <sup>39</sup>               | Ranging from $\alpha = 0.73$ to $\alpha = 0.87$  |
| <b>Comprehensive Intellectual Humility Scale</b><br>(22 items; four-factor structure) | Krumrei-Mancuso & Rouse <sup>2</sup>      | Intellect and ego: $\alpha = 0.88$<br>openness to revising one's viewpoint: $\alpha = 0.87$<br>respect for others' viewpoints: $\alpha = 0.92$<br>lack of intellectual overconfidence: $\alpha = 0.82$ |
| <b>Intellectual Humility Scale</b><br>(16 items; bi-factorial structure)              | McElroy et al <sup>7</sup>                | Intellectual openness: $\alpha = 0.94$<br>intellectual arrogance: $\alpha = 0.93$  |
| <b>Biola Intellectual Humility Scale</b><br>(17 items; three-factor structure)        | Hill et al in Haggard et al <sup>14</sup> | Perspective-taking<br>low concern for intellectual status<br>low intellectual defensiveness  |
| <b>Relational Humility Scale</b><br>(16 items; three-factor structure)                | Davis et al <sup>22</sup>                 | Overall reliability: $\alpha = 0.90$<br>global humility: $\alpha = 0.92$<br>superiority: $\alpha = 0.82$<br>accurate view: $\alpha = 0.79$   |

The CIHS, measuring intellectual humility and understood as a multi-faceted disposition, is one of the few scales that captures its various characteristics and thus provides a more graspable theoretical understanding.<sup>18</sup> The original study of the CIHS<sup>2</sup> shows that this measure is a reliable tool for investigating intellectual humility. Therefore, the main goal of Study 1 and Study 2 was to verify whether new datasets with Polish-speakers provide a similar goodness-of-fit index as the original model of the CIHS. Moreover, the aim of Study 2 was to demonstrate the convergent validity of the CIHS.

## Methods and Materials

### Study I

#### Participants and Data Collection

The research was carried out with the participation of 260 adults (75.4% women). Their mean age was  $M = 20.52$  with  $SD = 2.15$  (range = 18–34 years). The data were gathered via the paper-and-pencil method through convenience sampling. This type of data collection was selected because of its simple, affordable, and prompt implementation. University students of psychology, pedagogy, national security, and economics were asked to take part in the research. They were informed of the goal of the study and were assured of the privacy protection policy. Those who agreed to participate in the study received extra credit in their classes. All of them provided fully informed, written consent. The study was approved by the Bioethics Committee of the Institute of Psychology at the University of Szczecin and carried out in accordance with the Declaration of Helsinki.

## Study Procedure

We applied a Polish translation of the original version of the Comprehensive Intellectual Humility Scale developed by Krumrei-Mancuso and Rouse,<sup>2</sup> which contains 22 statements and estimates four dimensions of humility: intellect and ego, openness to revising one's viewpoint, respect for others' viewpoints, and lack of intellectual overconfidence. In the instructions, the participants were asked to read each statement and indicate their agreement or disagreement. All the items were rated on a 5-point Likert scale where 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *strongly agree*.

In terms of the forward-translation process, three independent, bilingual linguistics translated the CIHS from English to Polish. Next, three psychologists assessed all aspects of the Polish versions of the CIHS and came to an agreement with respect to the items' meanings or inadequate expressions. Afterward, twenty adults were invited to complete the Polish CIHS and state whether the statements were understandable. Finally, three different bilingual translators who previously did not know the questionnaire performed three back-translations that were found to be compliant with the English version of the CIHS. The final Polish edition, alongside the items of the CIHS original version, is available in the [Appendix](#).

## Statistical Analyses

Before carrying out the analyses to confirm the structure of the CIHS, we estimated a priori the appropriate sample size through G\*Power 3.1.9.4,<sup>48</sup> using empirical evidence from the original research by Krumrei-Mancuso and Rouse.<sup>2</sup> The studies prevalently demonstrated small and moderate correlations between the dimensions of the CIHS and other variables. Consequently, we computed the sample size given the power level of 0.90, critical significance of  $\alpha = 0.05$ , and a small effect of 0.20. G\*Power calculated that we would require at least 207 respondents in the study.

To test the underlying measurement model of the measure, we applied a Confirmatory Factor Analysis (CFA) in Study 1 and Multigroup Confirmatory Factor Analysis (MGCFA) in Study 2. The measurement model comprised of four orthogonal latent factors, which were the indicators of a higher order latent variable. Although the scale is comprised of five categories, we treated the data as categorical given the unequal distribution of answers. As a result, we used polychoric correlation matrices and applied the Weighted Least Squares with Means and Variances adjusted (WLSMV) estimation method. No correlations between the residuals were added. To evaluate the CFA model fit, we relied on standard recommendations. That is, we deemed the analyzed model to be well fitted to the data if the values of the Comparative Fit Index (CFI) were  $\geq 0.90$  and the values of the Root Mean Square Error of Approximation (RMSEA) were  $\leq 0.08$ .<sup>49,50</sup>

In the MGCFA, we compared whether the measurement model found in Study 1 is invariant with the data from Study 2. For this purpose, we evaluated two subsequent models with an increasing level of constraints: configural and scalar.<sup>50</sup> The configural model is an unconditional model, where no constraints are imposed. In the scalar model, not only the values of factor loadings but also the item intercepts are constrained to be equal across the compared groups. Although it is possible to find an in-between model in the literature (ie, metric model), it is recommended to directly compare the configural model with the scalar in the assessment of categorical data. To evaluate if the results across studies are invariant, we relied on standard recommendations.<sup>51,52</sup> Thus, we deemed a model as invariant if the values of the  $\Delta CFI$  and  $\Delta RMSEA$  did not exceed 0.010. The analyses were carried out in the lavaan package.<sup>53</sup>

Finally, we tested the convergent validity of the CIHS to verify whether intellectual humility correlates positively with gratitude, self-efficacy, and positive orientation. The theoretical foundations for a potential positive association between intellectual humility and gratitude rely on the fact that both of these constructs involve an other-oriented stance,<sup>54</sup> expressing the capacity to consider others' points of view.<sup>55</sup> In fact, Krumrei-Mancuso<sup>56</sup> suggests that intellectual humility may act as a precursor to experiencing gratitude. In turn, Kruse et al<sup>57</sup> support that expressing gratitude is an antecedent or elicitor of humility. The authors demonstrate that there may be a strengthening relationship between humility and gratitude. Another facet that connects both constructs concerns appreciation. Intellectual humility, in its interpersonal component, means appreciating others' intellectual capacities.<sup>13</sup> Gratitude is considered to be one of the aspects of appreciation which per se denotes acknowledging the value of something or someone.<sup>58</sup> Given the common characteristics, a positive correlation can be expected between intellectual humility and gratitude.

Next, potential correlations between intellectual humility and self-efficacy can be based on self-expansion theory. According to this model, people are inherently motivated to extend their potential efficacy through seeking new things, acquiring new knowledge, or gaining a new competence.<sup>59</sup> Given that intellectual humility implicates openness to new paradigms<sup>60</sup> and openness to revising one's viewpoint,<sup>2,39</sup> involves gaining<sup>11</sup> and sharing new knowledge,<sup>61</sup> and facilitates the development of new skills,<sup>60</sup> we assumed that both constructs would be positively associated. Moreover, the rationale behind choosing self-efficacy stems from the fact that we know little empirically about the possible relationships between these variables. For example, Porter et al<sup>44</sup> note that it is necessary to know to what extent the two variables are similar or, on the contrary, differ from each other.

Finally, a positive correlation between intellectual humility and positive orientation may be based on research that confirms that humble people tend to have positive thoughts about themselves<sup>42</sup> and present self-knowledge non-defensively.<sup>43</sup> Hook et al<sup>26</sup> also observe that they are likely to perceive the needs of others and regulate social bonds. Thus, a positive attitude toward oneself and others may distinguish intellectually humble people. Moreover, previous studies have shown that intellectual humility is positively associated with variables that form the essence of a positive outlook, such as life satisfaction,<sup>62,63</sup> self-esteem<sup>18</sup> and optimism,<sup>28</sup> but there is no research investigating the relationship between intellectual humility and positive orientation.

## Results

### Assessment of the Measurement Model

The fit indices of the analyzed four-factor model with the higher order factor suggested an optimal fit to the data ( $\chi^2_{(205)} = 510.55$ ;  $p < 0.001$ ; CFI = 0.923; RMSEA = 0.076 [90% CI = 0.068, 0.084]). The descriptive statistics, item-total correlations and the standardized factor loadings are presented in Table 2. The strength of the factor loadings on all hypothesized factors was adequate<sup>64</sup> (ie,  $\geq 0.30$ ), with only one item (ie, item 2) loading weaker than 0.40 and only two other items (ie, items 4 and 11) loading weaker than 0.50. The estimates of internal consistency were good for all the analyzed factors except overconfidence, which was acceptable. The respect factor appeared to be the best indicator of the higher order latent variable, while overconfidence was the weakest. The provided results support the hypothesized measurement model.

## Study 2

### Participants and Data Collection

The research was conducted on a group of 210 adults (89.5% women). The mean age of the respondents was  $M = 21.45$  with  $SD = 1.95$  (range = 18–27 years). The data were gathered via the paper-and-pencil method through convenience sampling, similarly to Study 1. University students of psychology and pedagogy were asked to participate in the research. They were informed of the aim of the study and were assured of the privacy protection policy. All of them provided fully informed, written consent. The procedure applied in Study 2 was consistent with the approach used in Study 1.

### Measurement

The Polish CIHS from Study 1 was administrated in Study 2.

The Gratitude Questionnaire—Six Item Form (GQ-6), created by McCullough et al,<sup>65</sup> and adapted into Polish by Kossakowska and Kwiatek,<sup>66</sup> estimates individual differences in the disposition to experience gratitude in daily life. It is a concise, six-item tool where the participants indicate their answers on a 7-point scale where 1 = *strongly disagree* and 7 = *strongly agree*. A higher score implies a higher degree of gratitude. Consistent with the original research on gratitude, the reliability of the questionnaire in our study was  $\alpha = 0.84$ .

The General Self-Efficacy Scale (GSES), developed by Schwarzer and Jerusalem and adapted into Polish by Juczyński,<sup>67</sup> is a brief, 10-item scale that measures the respondent's beliefs concerning their expectations of their confidence to confront the various daily activities that could produce stress. The respondents assess each of the ten statements using a 4-point Likert scale (from 1 = *no* to 4 = *yes*). The possible range of scores is between 4 and 40. The higher the final result, the stronger the general self-efficacy. Various studies provide good coefficient alphas from 0.76 to 0.90. In the present study, Cronbach's alpha was 0.91.

**Table 2** Descriptive Statistics, Item-Total Correlations and Standardized Factor Loadings

| Item/Scale     | Scale          | M    | SD   | $r_{it}/\alpha$  | $\lambda$ |
|----------------|----------------|------|------|------------------|-----------|
| 16             | Independence   | 3.57 | 1.15 | 0.67             | 0.82      |
| 17             |                | 3.51 | 1.24 | 0.69             | 0.85      |
| 18             |                | 3.35 | 1.20 | 0.69             | 0.79      |
| 21             |                | 3.57 | 1.15 | 0.65             | 0.80      |
| 22             |                | 3.75 | 1.19 | 0.63             | 0.77      |
| 6              | Openness       | 4.17 | 0.90 | 0.52             | 0.67      |
| 7              |                | 4.32 | 0.71 | 0.66             | 0.80      |
| 8              |                | 4.22 | 0.73 | 0.70             | 0.88      |
| 9              |                | 4.25 | 0.69 | 0.71             | 0.88      |
| 10             |                | 3.59 | 1.00 | 0.56             | 0.77      |
| 11             | Respect        | 4.20 | 0.75 | 0.32             | 0.46      |
| 13             |                | 4.15 | 0.81 | 0.51             | 0.71      |
| 14             |                | 4.45 | 0.85 | 0.62             | 0.76      |
| 15             |                | 4.21 | 0.83 | 0.54             | 0.72      |
| 19             |                | 4.34 | 0.78 | 0.57             | 0.76      |
| 20             | Overconfidence | 4.40 | 0.69 | 0.54             | 0.72      |
| 1              |                | 2.82 | 0.85 | 0.34             | 0.50      |
| 2              |                | 3.03 | 1.01 | 0.26             | 0.31      |
| 3              |                | 2.54 | 1.04 | 0.41             | 0.58      |
| 4              |                | 2.93 | 1.16 | 0.37             | 0.48      |
| 5              | Higher order   | 2.70 | 1.19 | 0.43             | 0.62      |
| 12             |                | 2.86 | 1.14 | 0.33             | 0.56      |
| Independence   |                | 3.55 | 0.94 | 0.85[0.82, 0.88] | 0.45      |
| Openness       |                | 4.11 | 0.62 | 0.82[0.79, 0.86] | 0.60      |
| Respect        |                | 4.29 | 0.54 | 0.77[0.73, 0.81] | 0.99      |
| Overconfidence |                | 2.81 | 0.63 | 0.63[0.56, 0.70] | 0.21      |

The Positive Orientation Scale (P-Scale), originated by Caprara et al<sup>68</sup> and adapted into Polish by Łaguna et al,<sup>69</sup> is a short, single-factor measure that assesses the positive evaluation of oneself, one's life, and the future. The scale is composed of 8 items (with one reverse-coded item: "At times, the future seems unclear to me"). The participants rate their tendency to express positive judgments using a 5-point Likert scale (from 1 = *strongly disagree* to 5 = *strongly agree*). Different studies show that the P-Scale has very good psychometric properties. In the current study, the overall Cronbach's alpha was  $\alpha = 0.86$ .

## Results

### Assessment of the Measurement Model

In Study 2, the expected measurement model was also well-fitted to the data ( $\chi^2_{(205)} = 440.78$ ;  $p < 0.001$ ; CFI = 0.937; RMSEA = 0.074 [90% CI = 0.065, 0.084]). The estimates of the internal consistency were consistent with those reported in Study 1 and were as follows:  $\alpha_{\text{Independence}} = 0.86$  (0.83, 0.89);  $\alpha_{\text{Openness}} = 0.77$  (0.72, 0.82);  $\alpha_{\text{Respect}} = 0.77$  (0.72, 0.82);  $\alpha_{\text{Overconfidence}} = 0.61$  (0.53, 0.69). To evaluate the extent to which the results from Study 2 are comparable to those reported in Study 1, we conducted the MGCFA. The fit of the configural model was adequate ( $\chi^2_{(410)} = 943.40$ ;  $p < 0.001$ ; CFI = 0.931; RMSEA = 0.075 [90% CI = 0.068, 0.081]) as was the scalar model ( $\chi^2_{(491)} = 1080.97$ ;  $p < 0.001$ ; CFI = 0.923; RMSEA = 0.072 [90% CI = 0.066, 0.077]). The overall difference between the analyzed models was within the assumed range, that is,  $\Delta\text{CFI} = 0.008$  and  $\Delta\text{RMSEA} = 0.003$ . Thus, the measurement model of the scale across both studies can be seen as fully invariant.



**Table 3** Correlations Between Dimensions/Overall Score of CIHS, GQ-6, GSES, and P-Scale

|     | IIE     | ORV     | ROV     | LIO      | IHO     | GRA     | SEF     | POS |
|-----|---------|---------|---------|----------|---------|---------|---------|-----|
| IIE | 1       |         |         |          |         |         |         |     |
| ORV | 0.19**  | 1       |         |          |         |         |         |     |
| ROV | 0.39*** | 0.47*** | 1       |          |         |         |         |     |
| LIO | -0.03   | 0.25*** | 0.11    | 1        |         |         |         |     |
| IHO | 0.67*** | 0.69*** | 0.73*** | 0.503*** | 1       |         |         |     |
| GRA | 0.16*   | 0.23*** | 0.35*** | 0.14*    | 0.33*** | 1       |         |     |
| SEF | 0.29*** | 0.18**  | 0.28*** | -0.28*** | 0.18**  | 0.23*** | 1       |     |
| POS | 0.23*** | 0.09    | 0.24*** | -0.11    | 0.18**  | 0.46*** | 0.51*** | 1   |

**Note:** \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Abbreviations:** IIE, independence of intellect and ego; ORV, openness to revising one's viewpoints; ROV, respect for others' viewpoints; LIO, lack of intellectual overconfidence; IHO, intellectual humility overall; GRA, gratitude; SEF, self-efficacy; POS, positive orientation.

## Convergent Validity

As shown in Table 3, convergent validity was assessed by measuring the correlation (Pearson correlation coefficient) between the four subscales of the Comprehensive Intellectual Humility Scale, gratitude, self-efficacy, and positive orientation.

There was a positive correlation of gratitude with all the dimensions and the overall score of intellectual humility, indicating that the more grateful an individual is, the more they tend to declare intellectual humility in its four dimensions (independence of intellect and ego, openness to revising one's viewpoints, respect for others' viewpoints, lack of intellectual overconfidence). Self-efficacy correlated positively with IIE, ORV, ROV and IHO, and was negatively associated with LIO. In addition, positive orientation was positively associated with IIE, ROV and IHO.

## Discussion

Given the importance of intellectual humility in different spheres of personal and social life, we conducted two studies to validate the CIHS into Polish. To our knowledge, the present project is the first attempt to examine the latent structure of the original CIHS and verify whether new datasets provide similar goodness-of-fit indexes as the original CIHS. We also confirmed the scale's convergent validity.

The findings obtained in both studies corroborate the results of Krumrei-Mancuso and Rouse,<sup>2</sup> thus supporting the four-factor model of the CIHS with the higher order factor. The good fit indices of the CFA and MGCFAs show the psychometric solidity of the 22-item structure of the Polish version of the CIHS. The reliability values, like the original ones for the four subscales, support the internal consistency of the measure. The outcomes indicate that the Polish version of the scale is a reliable tool and manifests similar psychometric characteristics to Krumrei-Mancuso's version. Therefore, the CIHS, in its four dimensions of independence of intellect and ego, openness to revising one's viewpoint, respect for others' viewpoints, and lack of intellectual overconfidence, can be used to assess intellectual humility.

With respect to convergent validity, all the dimensions/overall score of intellectual humility represented in the CIHS correlated with grateful disposition and self-efficacy. Such results are understandable considering that intellectual humility shares the interpersonal dimension with gratitude and the intrapersonal dimension with self-efficacy. According to Ballantyne,<sup>27</sup> intellectual humility, like gratitude, concerns the prosocial aspects of life and relationships with others. Wong and Wong<sup>70</sup> suggest that both constructs entail other-oriented components. Humility consists in a lack of self-focus and reflects an appreciation for others.<sup>57</sup> Likewise, gratitude has been demonstrated to correlate negatively with self-focused attention<sup>71</sup> and is considered an appreciation of other people.<sup>72</sup> Gratitude belongs to the group of other-focused emotions.<sup>57,73</sup> Moreover, humble people tend to be less self-oriented and more open to the needs of others.<sup>10,57</sup>

A similar pattern of correlations has been observed between the three dimensions of intellectual humility (independence of intellect and ego, openness to revising one's viewpoints, respect for others' viewpoints), its overall score, and self-efficacy, with the exception of a negative relationship between lack of intellectual overconfidence and self-efficacy. The results of our research are in conformity with some previous empirical studies. For example, humility has been found to be not only a positive correlate of self-efficacy<sup>74,75</sup> but its positive predictor,<sup>76</sup> as well. Although humility is

considered as a “de-centering of the self”,<sup>77</sup> p. 5, it does not involve an absence of self-confidence. People who are humble seem to have a realistic, accurate self-concept,<sup>74,78</sup> and secure self-identity.<sup>78</sup> Also noteworthy is the inverse association between lack of intellectual overconfidence and self-efficacy. Although there are no similar studies on this topic, it can be assumed that lack of intellectual overconfidence correlates with lower intellectual confidence and therefore lower self-esteem.

Finally, independence of intellect and ego, respect for others’ viewpoints, and intellectual humility overall correlated positively with positive orientation. It can be assumed that the broaden-and-build model developed by Fredrickson<sup>79</sup> is a theoretical perspective that may help explain the different correlations between these constructs. According to this approach, positive emotions seem to enlarge people’s range of thought-action choices and strengthen their personal resources. If intellectual humility consists in being confident of one’s own opinion, welcoming different ways of thinking and not feeling personally attacked by them, it can be implicit that people who are intellectually humble tend to distinguish themselves by a positive orientation toward the self and life in general. From an empirical point of view, since there is no research on the relationship between intellectual humility and positive orientation, we considered those studies that combine intellectual humility with life satisfaction, self-esteem, and optimism. It is these variables that form the core of positive orientation. For example, Krause<sup>80</sup> and Rowatt et al<sup>33</sup> speak about the positive association between humility and life satisfaction. This relationship is further explained by levels of wisdom because it is stronger among individuals who show higher levels of wisdom than among people who tend to display its lower levels. There is also some evidence that humility positively correlates with self-esteem.<sup>81</sup> Alfano et al<sup>18</sup> suggest that different dimensions of intellectual humility (open-mindedness, modesty, corrigibility, engagement) correlate positively with self-esteem. Bak and Kutnik<sup>82</sup> point out that self-esteem predicts the four dimensions of intellectual humility described by Krumrei-Mancuso and Rouse<sup>2</sup> and the three dimensions (love of learning, appropriate discomfort with limitations, owning intellectual limitations) proposed by Haggard et al.<sup>14</sup> In another study,<sup>33</sup> humility is positively correlated with self-esteem and with optimism. Self-esteem correlates negatively with humility considered as embarrassment or humiliation, and positively with humility understood as good adjustment.<sup>31</sup>

Moreover, positive orientation did not correlate significantly with openness to revising one’s viewpoints ( $r = 0.09$ ;  $p = 0.11$ ) or lack of intellectual overconfidence ( $r = -0.11$ ;  $p = 0.08$ ). As can be noted, both results exceed the threshold of  $p = 0.05$ <sup>83</sup> but are within the conventional range of tendency ( $0.05 < p < 0.1$ ) so we interpret these findings with caution, assuming that with a larger research group, these results may reduce to significant. Based on the outcomes, it can be tentatively assumed that people with a positive perception of themselves and the world may tend to be open to revising their perspective (eg, when confronted with solid and credible alternative evidence) and may express a lower awareness of intellectual biases and accurate intellectual self-regard. There is some empirical evidence that positive orientation correlates with openness to experience.<sup>84,85</sup> Such a result is not surprising if we think that openness to experience and openness to revising one’s viewpoints likely share a common variance. However, there are also some studies that, like the current study, show an association between positive orientation and openness to experience at the level of tendency.<sup>86–88</sup> Regarding the inverse correlation between positive orientation and the lack of intellectual overconfidence, it can be assumed that a positive view of oneself is not always related to having accurate intellectual self-regard.

## Limitations

Some limitations need to be mentioned. Both samples were predominantly female. While this trend is often seen in research projects, it would be valuable to ensure an equal ratio of women to men in the future. The research was mainly conducted among young adults studying at university. While such a choice is good as a starting point in the context of intellectual humility, it is worth extending the research groups to people representing different stages of development and professional groups. Moreover, although important correlates were included in the convergent validity, in future research conducted in the Polish context, the selection of variables could be extended to those that are more closely connected to the definition of intellectual humility (eg, overclaiming, need for cognition, dogmatism).

From a psychometric point of view, the relatively lower reliability (compared to the values obtained in the original American version) obtained for the lack of overconfidence undoubtedly deserves attention in future analyses. Although too soon to conclude, there may be some cultural differences in understanding and experiencing the concept of



overconfidence between Americans and Poles. At least two things seem to support this line of thought. First, in the present study, the values of lack of overconfidence gained in the Polish samples were lower than these obtained by American respondents (for the remaining CIHS subscales, the results were more similar). Second, there are studies confirming the existence of differences between the regions of the world in terms of overconfidence.<sup>89</sup> Therefore, further research is needed to verify how this subscale operates in the Polish context. Another factor that may have made lack of overconfidence less reliable is the lack of clarity of the construct of overconfidence itself. According to Moore and Healy,<sup>90</sup> this term has been researched in distinct ways (most commonly overestimation vs overprecision vs overplacement) often leading to inconsistent results. In future analyses, it would be good to verify empirically which of these meanings most closely corresponds to lack of overconfidence.

## Conclusion

This validation study showed that the CIHS is not only a suitable tool for measuring intellectual humility but also confirmed that gratitude, self-efficacy, and positive orientation are its significant correlates. Since intellectual humility is still a little-known psychological construct, both as a concept and as a possible antecedent or consequence, it is worth examining it in the future with other variables of an intraindividual and interindividual nature. Moreover, both studies present the cross-cultural validation of the scale and the expansion of intellectual humility research to another country and culture outside of the United States.

## Data Sharing Statement

The datasets used during the current study are available from the corresponding author.

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## Author Contributions

All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

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