



## Confirmatory factor analysis and smallest space analysis in the assessment of motivational values: a study with professional education instructors from the National Industrial Training Service (SENAI) of Rio Grande do Sul

## Confirmatory factor analysis and smallest space analysis in the evaluation of motivational values: a study with vocational education instructors from the national service for industrial training (Senai) in Rio Grande do Sul

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### Summary

This study compares Confirmatory Factor Analysis (CFA) and Smaller Space Analysis (SSA) in assessing the motivational values of 364 SENAI-RS instructors using the PVQ-20. CFA confirmed Schwartz's ten factors, presenting good fit and coherent correlations. SSA reproduced the expected circular map, with theoretical clusters and slight overlaps typical of the teaching context. Both methods converged on key evidence—the Benevolence-Universalism cohesion and the Self-Direction-Conformity opposition—but revealed distinct nuances: SSA showed proximity between normative and prosocial values, not captured by CFA. The comparison indicates analytical complementarity, allowing a more comprehensive characterization of educators' value profiles. The findings guide teacher training programs, institutional alignment, and values-anchored educational policies.

**Keywords:** Human Values; Professional Education; Comparative Methods.

### Abstract

This study compares Confirmatory Factor Analysis (CFA) and Smallest Space Analysis (SSA) in assessing motivational values among 364 vocational-education instructors at SENAI-RS, using the Portrait Values Questionnaire (PVQ-20). CFA upheld Schwartz's ten-factor model, producing satisfactory fit indices and coherent inter-value correlations. SSA recreated the anticipated circular map, showing theoretical clusters and slight overlaps typical of teaching contexts. Both methods aligned on key patterns—strong Benevolence-Universalism cohesion and Autonomy-Conformity opposition—yet revealed subtle distinctions: SSA positioned normative and pro-social values closer than CFA detected. The underscores the techniques' complementarity, yielding a richer comparison portrayal of educators' value profiles. These findings can guide teacher-training initiatives, institutional alignment, and value-driven educational policies.

**Keywords:** Human Values; Vocational Education; Comparative Methods

## 1. Introduction

The assessment of human values occupies a central role in Social Psychology contemporary, especially for understanding the motivations that guide behaviors and decisions in social and organizational contexts. The theory of values Schwartz's (1992) universals represents one of the most widely accepted models in this field. The author proposes ten basic motivational types: self-direction, stimulation,

hedonism, achievement, power, security, conformity, tradition, benevolence and universalism. These values are organized in a circular (circumplex) model, structured by four higher dimensions: Openness to Change versus Conservation, and Self-transcendence versus Self-promotion (Schwartz, 1992).

To operationalize this theory, Schwartz and his collaborators developed the Portrait Values Questionnaire (PVQ), an instrument that uses short descriptions of people to evaluate individual values based on perceived similarity to respondent. The PVQ was designed to be more accessible than the Schwartz Value Survey (SVS), with versions such as the PVQ-40, PVQ-21 and the more recent PVQ-RR with 57 items (Schwartz et al., 2001; Cieciuch & Schwartz, 2012).

The PVQ has been widely validated in national and international studies. Brasil, Tamayo and Porto (2009) validated the Portuguese version of the PVQ-21 based on data from high school and college students. Sambiase et al., (2014) compared the factorial structure of the PVQ-21 and PVQ-40 versions in Brazilian samples, demonstrating good replication of the circular structure. Simón et al. (2017), in a bibliographic review and bibliometric, identified more than 50 international publications using the PVQ, demonstrating its versatility in studies on education, culture, work and values organizational.

### 1.1. Analysis Methods: CFA and SSA

Two statistical approaches have stood out in the analysis of the PVQ structure: Confirmatory Factor Analysis (CFA) and Smallest Space Analysis (SSA). CFA, based on Item Response Theory and Structural Equation Modeling, allows empirically test previously defined theoretical models (Brown, 2015). Various studies have employed CFA to validate the structure of values in different contexts and populations. Davidov et al. (2008), for example, used multigroup CFA to test the invariance of values among 20 countries participating in the European Social Survey. Capone et al. (2019) applied CFA to assess the personal values of elementary school teachers Italian medium and its relationship with teacher self-efficacy. In both cases, the CFA proved effective in confirming the ten-factor correlated structure proposed by Schwartz.

SSA, on the other hand, is a non-metric multidimensional scaling technique which graphically represents the correlations between the PVQ items on a plane two-dimensional. Originally developed by Guttman, SSA does not start from a model

latent, but rather a matrix of similarities (usually Pearson correlations), positioning variables close together when highly correlated and distant when independent (Borg & Groenen, 2005). This approach has been adopted by several authors to visualize the circular structure of Schwartz's values. Tamayo and Porto (2009) used SSA in the validation of the PVQ in Brazilian students, while Ciecuch and Schwartz (2012) compared the structure of values in the PVQ-40 and PVQ-21 versions with multidimensional scaling. Grant (2017) applied SSA to map values personal in university teachers involved in digital programs, evidencing motivational patterns linked to innovation. Sliwak and Zarzycka (2013) applied SSA to test the structure of values among high school and university students Poles, demonstrating their sensitivity to age and educational variations. In 2024, Oeschger et al. used SSA in a comparative study of teachers' values in primary education in Switzerland and the United Kingdom, observing cultural alignments and patterns specific educational enhancement.

## 1.2. Comparisons between CFA and SSA in Valuation

Despite the widespread individual use of CFA and SSA, few studies have explored systematically the differences between the two methods in the analysis of the same data. Ciecuch and Schwartz (2012) argue that while CFA allows for the assessment of adjustments of the theoretical model based on statistical indices (such as CFI, RMSEA, SRMR), SSA reveals the relational topology of items and can capture semantic nuances and overlaps between values that are not detected by rigid factorial models. In comparative terms, SSA has been identified as more exploratory and sensitive to circular structure, while CFA favors formal testing of theoretical hypotheses with greater statistical rigor.

In the present study, we propose a comparative analysis between Factor Analysis Confirmatory Analysis (CFA) and Smallest Space Analysis (SSA) applied to the same set of data obtained with the PVQ-20, answered by 364 Professional Education instructors of SENAI of Rio Grande do Sul. The objective is to compare the results of the two methods, examining convergences and divergences in the organization of motivational values. When In doing so, we seek to contribute to the methodological debate on value assessment, offering subsidies for researchers working at the interface between psychometrics, education and social psychology.

## 2 Methodology

### 2.1. Design and Participants

This study employs a quantitative cross-sectional design, with comparative and descriptive approach. 364 instructors from the Professional Education linked to the National Industrial Training Service (SENAI) of the state of Rio Grande do Sul, Brazil. This number represents approximately 65% of the total active instructor population (N = 562) of the institution to time of data collection, giving the sample high representativeness and statistical power suitable for multivariate analysis.

Participants work in 28 different technical areas, ranging from electromechanics, industrial automation, fashion and design, and even information technology. The academic background of respondents is diverse, including undergraduate degrees, bachelor's degrees, technologists and specializations. The inclusion criteria considered being actively working at the institution and voluntarily agree to answer the questionnaire.

### 2.2. Instrument

To assess the motivational values of the participants, the Portrait was used Values Questionnaire – PVQ-20, which is a reduced version of the questionnaire developed by Schwartz (1992) based on his theory of human values universal. This instrument was chosen for its simplicity, clarity and broad validation in different cultural and educational contexts, including Brazil (Tamayo & Porto, 2009).

The PVQ-20 works as follows: each of its 20 items describes briefly a person, mentioning what they value or prioritize in life. The participant must then evaluate how much this description resembles himself, responding on a scale of 1 to 7, where:

1 means “nothing like me” and

7 means “very much like me”.

Each of the ten basic values of Schwartz's theory - such as Self-Direction, Benevolence, Universalism, Achievement, Power, Security, Conformity, Tradition, Stimulation and Hedonism - is represented by two items in the questionnaire. This allows reliably capture how these values are present in the motivations of participants.

In addition to the responses to the PVQ-20, information was also collected sociodemographic and professional characteristics, such as age, academic background and length of service at SENAI. This additional data is important to allow for a more detailed analysis detailed, considering possible differences between professional profiles within the institution.

### 2.3. Collection Procedures

Data collection was carried out using an electronic form constructed on the Microsoft Forms platform, sent via institutional email and organized groups by regional pedagogical coordinators. The application took place between April and May 2025. Completion was voluntary and anonymous, preceded by free and informed consent. clarified in accordance with the ethical principles of research in Psychology.

### 2.4. Analysis Techniques

Analyses were conducted using two complementary methods: Analysis Confirmatory Factor Analysis (CFA) and Smallest Space Analysis (SSA), applied to the same database with the scores of the 20 PVQ items. The analyses were focus on the structure of motivational values in the total sample, and, at a later stage, were segmentations were carried out by time of institution.

### 2.5. Confirmatory Factor Analysis (CFA)

To analyze the structure of values, Confirmatory Factor Analysis was used. (CFA), which allows testing whether the collected data fits the theoretical model previously proposed. The CFA was performed in R software, using the lavaan statistical package, which is widely recognized for this type of analysis (R Core Team, 2023; Rosseel, 2023).

The adopted model considered the ten theoretical factors proposed by Schwartz, or that is, each factor represents one of the ten universal motivational values (Self-Direction, Stimulation, Hedonism, Achievement, Power, Security, Conformity, Tradition, Benevolence and Universalism). Each item in the questionnaire was associated with the factor corresponding, according to the theoretical definition of the scale.

The quality of the model was assessed using statistical adjustment indices, which indicate whether the proposed theoretical framework fits well with the observed data. The main indicators analyzed were:

- Comparative Fit Index (CFI),



- Tucker-Lewis Index (TLI),
- Root Mean Square Error of Approximation (RMSEA) and
- Standardized Root Mean Square Residual (SRMR).

According to the reference criteria established by Hu and Bentler (1999), a model is considered to have a good fit when:

- CFI and TLI are greater than 0.90;
- RMSEA is less than 0.08;
- SRMR is also less than 0.08.

In addition, factor loadings were evaluated (which indicate how much each item is associated with its factor), the covariances between factors and the modification indices, which help to understand if there are possible improvements in the model or unforeseen relationships initially. This set of analyses allows us to evaluate both the internal consistency of the factors regarding the validity of the theoretical model applied to the context of instructors of professional education.

## 2.6. Smallest Space Analysis (SSA)

Smaller Space Analysis (SSA) was used to explore how values relate to each other. organize psychologically in the group of participating instructors. This method is based on construction of a Pearson correlation matrix between the 20 items of the PVQ-20, that is, calculates the degree of relationship between each pair of items in the questionnaire.

From this matrix, SSA positions each item as a point within a two-dimensional geometric space, in which the distance between points represents the level of similarity between items:

- Highly correlated items appear close to each other.
- Items with low correlation or independence appear further apart.

The technique was conducted using SPSS and R software (through the package smacof, specific for multidimensional scaling). The two-dimensional configuration was chosen because it was the most suitable for visually representing the data structure in an understandable way and aligned with the theoretical model (IBM Corporation, 2022; De Leeuw & Mair, 2023; R Core Team, 2023).

The map generated by SSA was analyzed based on the circular (circumplex) model Schwartz, which organizes values around four major domains:

- Openness to Change,

- Conservation,
- Self-transcendence and
- Self-promotion.

The natural groupings of items were observed, in addition to possible distortions, overlaps and displacements in relation to the theoretical model. Each one of these characteristics was interpreted considering both statistical aspects and the institutional and cultural contexts that may influence instructors' responses.

The goodness of fit of the SSA was assessed by three main criteria:

- The variance explained in the two main dimensions (indicating how much of the pattern of correlations was well represented);
- Topological fidelity (i.e., whether the patterns of proximity and distance between items make sense from a theoretical point of view);
- And the theoretical interpretation of groupings and spatial relationships.

Finally, the SSA results were compared with those of Factor Analysis Confirmatory (CFA), seeking to identify:

- Convergences, such as consistent groupings between methods;
- Divergences, such as overlaps perceived only in the SSA;
- And complementarities, which help to understand in a richer and more detailed way how values are organized in the psychological profile of education instructors professional.

### 3. Results

#### 3.1. Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) was performed based on the model Schwartz's theorist, who organizes human values into ten motivational types basic. In the adopted model, these ten factors were considered as variables latent and correlated, that is, it was assumed that the different values may have relationships between them, which is consistent with the proposal of the circular model.

The CFA results indicated that the model presented a good fit to the data, according to the criteria most commonly used in scientific literature. Specifically, the following model quality indices were observed:

- CFI = 0.921 and TLI = 0.903, both above the limit of 0.90, considered adequate – namely;  
CFI = Comparative Fit Index and Tucker-

Lewis Index (Tucker-Lewis Index), also known as NNFI (Non-Standardized Fit Index);

- RMSEA = 0.056, below 0.08, which indicates an acceptable approximation error – namely; in Portuguese: Root Mean Square Error of Approximation;
- SRMR = 0.061, also within the recommended parameters (less than 0.08) – namely; in Portuguese: Standardized Root Mean Square Error of Residuals.

These values, taken together, indicate that the participants' data fit well.

to the theoretical structure of ten values proposed by Schwartz, validating the model for this group of instructors.

The factor loadings, which represent how much each item contributes to the factor to which it is associated, ranged from 0.45 to 0.78. Loadings above 0.50 are generally considered moderate and indicate a good representation of the factor. Loadings above 0.70 are considered strong. In the present study, the factors of Benevolence, Universalism and Achievement were the ones that presented the highest loadings, which suggests that the items that measure these values were well understood and strongly represented by the instructors.

On the other hand, the Hedonism and Tradition factors presented slightly higher loadings. low. This is expected in research that uses reduced versions of the PVQ, such as previous studies indicate (Cieciuch & Schwartz, 2012). The lower load may mean that these values are less salient, less discriminated by participants or that the items do not capture these constructs with the same strength in specific contexts as professional education.

Regarding the correlations between the factors, the results followed the theoretical pattern:

- Benevolence and Universalism showed a very high correlation ( $r = 0.78$ ), which makes sense, as both belong to the dimension of Self-transcendence, focused in the well-being of others and in promoting the common good.
- Between Self-Direction and Conformity, the correlation was practically zero ( $r \approx 0$ ), which is also expected, as they are values that occupy opposite positions in the circular model: Self-direction emphasizes freedom, independence and creativity, while Compliance prioritizes obedience, harmony and respect for norms social and institutional.

In summary, the CFA confirmed that the framework of the ten values proposed by Schwartz is robustly present in the sample of professional education instructors of

SENAI-RS. Furthermore, the correlation patterns and factor loadings reinforce the validity of the PVQ-20 instrument, even in its reduced version adapted to the context teacher.

### 3.2. Smallest Space Analysis (SSA)

Smallest Space Analysis (SSA) was applied using the correlation matrix among the 20 items of the PVQ-20, producing a two-dimensional representation of the structure of the values. This configuration was able to explain 89.2% of the total variance, which indicates an excellent explanatory power of the model - that is, almost all the information present in the relationships between items could be represented in this plane with two dimensions. The results revealed an organization of items very close to what is proposed in the Schwartz's theory of values, which predicts a circular (circumplex) arrangement, where the values are grouped around four major motivational dimensions:

- Self-transcendence (focus on the well-being of others and the common good);
- Self-promotion (focus on personal success, status and power);
- Openness to Change (valuing independence, novelty and exploration);
- Conservation (emphasis on security, stability and maintaining order).

Within this arrangement:

- Benevolence and Universalism formed an extremely close group, with virtually no clear boundaries between them. This suggests that, in the perception of instructors, these two values are experienced almost as the same motivation - both linked to caring for others, inclusion and the collective good. This continuity reinforces both the theory and what was observed in the CFA, where these values also showed high correlation.
- At the opposite pole, the values of Compliance, Security and Tradition were grouped together clearly, composing the region corresponding to Conservation, that is, a set of motivations focused on stability, harmony and respect for institutional and social norms.
- At the bottom of the map, the Self-Direction values are grouped together, Stimulation and Hedonism, all associated with Openness to Change, that is, search for freedom, creativity, pleasure and new experiences.

- Power appeared isolated, further away from the others, occupying the position characteristic of Self-Promotion values, reinforcing the idea that this value directly opposes pro-social values such as Benevolence and Universalism. Realization has already taken an intermediate position between Self-promotion and Openness, which makes sense, as this value can express both the desire for personal excellence and recognition in contexts collaborative.

An especially interesting finding was the unexpected proximity between the items of Conformity and Benevolence. Although they theoretically belong to domains different (Conservation and Self-transcendence), in practice, the instructors seem to understand that obeying the rules, valuing harmony in the work environment and collaborating with colleagues are not distinct behaviors from acting generously, empathy and care. This reveals that, in the educational context of SENAI-RS, fulfilling rules and being collaborative are part of the same ethos, the same logic professional oriented towards the collective good.

Another point worthy of attention is the atypical behavior of the Universalism item 3 (UN3), which appeared closer to the Achievement items than to the other Achievement items. Universalism. This pattern may reflect a very specific interpretation of the instructors, where we promote a fair, inclusive and ethical environment — which is the essence of this item — is seen not only as a moral value, but also as a goal professional excellence. In other words, achieving goals and being successful is, for many, of these professionals, inseparable from building a fair, welcoming and inclusive environment.

These findings reinforce that SSA not only confirms the theoretical framework of values, but also allows us to observe more clearly how, in our daily professional lives, certain values overlap, merge or take on specific meanings, shaped by the institutional culture and practices of the educational environment.

### 3.3. Comparison between CFA and SSA Results

The two methods - Confirmatory Factor Analysis (CFA) and Smallest Space Analysis (SSA) - were applied to the same 20 items of the PVQ-20, but each “sees” the data differently. The table below summarizes, in straightforward language, the that each technique showed, where they converge and why one complements the other.

**Table 1:** Comparison between Confirmatory Factor Analysis (CFA) and Smaller Space Analysis (SSA)

in the evaluation of the values of SENAI-RS instructors.

Comparison dimension	What the CFA showed	What the SSA added	Why is it useful to combine
<b>Structure Discreet x Continuous</b>	Confirmed <b>10 separate factors</b> (the ten Schwartz values).	It exhibited a <b>circular continuum</b> : neighboring values (e.g., Benevolence–Universalism) “blend” into each other in space; opposites (Self-Direction x Conformity) lie at opposite corners.	It shows that, although statistically distinct, some values are <b>experienced as gradations</b> in teaching practice.
<b>Compatibilities and Oppositions</b>	High factor correlations ( $r \approx .78$ ) between Benevolence–Universalism and almost zero correlation between Self-Direction–Accordance.	The same pattern appears visually: close clusters and distant points. The <b>unexpected proximity</b> Conformity–Benevolence is obvious in the map.	It makes it easier to discuss <b>the effects of context</b> (at SENAI, “following rules” and “taking care of others” seem to go hand in hand).
2nd order <b>latent axes</b>	They can be inferred, but they are hidden in the numbers.	Axes become <b>clear</b> : vertical (Conservation $\approx$ Openness to Change); horizontal (Self-transcendence $\approx$ Self-promotion).	It gives a quick overview of <b>motivational tensions</b> that the CFA confirms but does not illustrate.
<b>Detailing x Synthesis</b>	Delivers <b>accurate statistics</b> : charges (0.45–0.78), fit indices (CFI = .92 etc.), reliability.	It offers <b>visual synthesis</b> and intuitive language for managers and teachers.	Together, they support both <b>psychometric validation</b> regarding the <b>practical communication</b> of findings.
<b>General convergence</b>	Schwartz’s model is <b>validated</b> in sample.	Circular map also <b>replicates</b> the model.	Double validation reinforces the <b>robustness</b> of the results.

**Note:** Table prepared by the author based on his own research data. CFA = Factor Analysis Confirmatory; SSA = Smaller Space Analysis.

### What this means for SENAI-RS

- Predominance of Self-Transcendence, Realization and Preservation: instructors value caring for others, achieving excellence, and maintaining stability. This reflects a collective ethos focused on the common good, but also on performance.
- Conformity + Benevolence as a cooperative lever: the proximity of these values suggests that rules and solidarity reinforce each other. They can be basis for peer tutoring projects, communities of practice, codes of co-constructed coexistence.
- Less evidence of Self-Direction: space to encourage didactic autonomy, authorial projects and pedagogical experimentation, balancing the emphasis on standards.

- Achievement as a bridge to Universalism: “being successful” is understood as achieve goals and create an inclusive environment. Recognition programs can highlight both the results and the ethical and collaborative way of achieving them.

In summary

- CFA ensures that the instrument measures what it is supposed to measure.
- SSA shows how these values interact with each other in the minds of teachers.
- Together, the techniques reveal an organizational culture where excellence, collectivity and stability go hand in hand - a valuable insight for plan continuing education, recognition policies and strategies engagement.

The findings have direct implications for pedagogical management. The correlation between Compliance and Benevolence can be exploited to strengthen cooperative projects, such as peer tutoring or communities of practice based on rules of coexistence co-constructed. The relative timidity of Self-Direction suggests opportunities to promote greater didactic autonomy and pedagogical experimentation. Finally, the positioning intermediary of Realization, touching on Universalism, signals that “success” is seen not only as a personal goal, but as achieving results in an environment inclusive - valuable insight for recognition programs that celebrate both performance and the ethical way to achieve it.

#### 4. Discussion

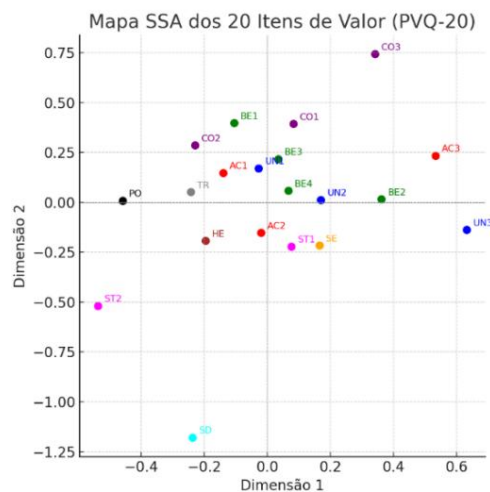
The results obtained in this study reinforce the applicability and robustness of the theory Schwartz's (1992) values for understanding the motivations of instructors in professional education. Both Confirmatory Factor Analysis (CFA) and Factor Analysis Smaller Space (SSA) revealed a structure compatible with the theoretical model of the ten basic values, with patterns of grouping and opposition consistent with studies previous studies (Tamayo & Porto, 2009; Sambiase et al., 2014).

The CFA demonstrated that the PVQ-20 items cluster into ten latent factors distinct, with adequate adjustment indices and factor correlations in line with the theoretical circular organization. These findings confirm the structural validity of the instrument, as already evidenced in previous investigations conducted in different educational contexts (Davidov, Schmidt & Schwartz, 2008; Capone et al., 2019). The

high factor loadings for the values of Universalism, Benevolence and Achievement indicate the salience of these domains among instructors, aligning with studies that point out the central role of self-transcendence and personal fulfillment in practices teachers (Grant, 2017; Oeschger et al., 2024).

Additionally, the SSA allowed us to observe relationships of continuity and overlap between values, revealing nuances not captured by factor analysis traditional. As already discussed by Cieciuch and Schwartz (2012), the circular model of Schwartz tends to express himself more clearly in spatial representations, and the results obtained in this study corroborate this premise. The distribution of items in the two-dimensional plane adequately reflected the four upper axes (Self-transcendence vs. Self-promotion; Openness to Change vs. Conservation), still that with small distortions attributable to compression caused by positive correlations widespread.

**Figure 1.** Two-dimensional map (SSA/MDS) of the 20 value items of the PVQ-20. Each point is an item, with codes indicating the corresponding value (see color legend).



**Note:** Close items imply compatible values; distant items imply opposite or no values. relationship. Dimensions 1 and 2 are components extracted by MDS.

A specific contribution of SSA was the identification of border items such as Compliance (CO1) positioned next to Benevolence (BE1). This pattern suggests that certain behaviors, although theoretically classified into domains distinct, can share functional meanings in everyday educational life. This phenomenon was discussed by Sliwak and Zarzycka (2013), who observed approximations similar semantics between prosocial and normative values in school contexts.

In the present study, this overlap may indicate that instructors attribute cooperative meanings to institutional norms, which reinforces the idea that values are experienced in a contextualized way and not as rigidly separate entities.

Another relevant aspect concerns the intermediate position of the items of Realization, situated between Power, Hedonism and Universalism. This location reflects the hybrid nature of this value, which can manifest itself both as an expression of personal ambition and collective commitment. This pattern was discussed by Grant (2017), when investigating value alignments in teachers involved with technologies educational, and reinforces the notion that professional achievement can mediate tensions between values of self-promotion and self-transcendence.

Regarding the second-tier structure, both the CFA and the SSA provided partial evidence for the bipolar axes proposed by Schwartz. In CFA, the correlations between factors indicated consistent groupings, although some deviations have been observed, such as unexpectedly high correlations between Self-transcendence and Conservation – possibly influenced by culture institutional. The SSA, in turn, more clearly displayed the spatial separation between the theoretical poles, aligning with cross-cultural investigations that demonstrate the spatial expression of the circular model (Simón et al., 2017).

These findings have important implications for understanding ethos teaching professional at SENAI-RS. The predominance of values such as Benevolence, Universalism and Achievement, combined with the relevance of Compliance and Security, suggests a value profile oriented towards care, excellence and stability. This is consistent with the demands of professional education, which simultaneously demands innovation, cooperation and adherence to rigorous standards. Furthermore, the differences observed in segmentation by time of institution indicates a process of value socialization, in which organizational values become progressively internalized.

In summary, the combined analysis of CFA and SSA not only confirms the suitability of the PVQ-20 for assessing values in educational contexts, but also enriches the interpretation by highlighting continuous dimensions, zones of convergence semantics and complex relational patterns between values. This integrated approach contributes to methodological advancement in psychosocial research and offers subsidies relevant to educational management and the professional development of teachers.

## 5. Conclusion

The present study compared the application of Confirmatory Factor Analysis (CFA) and Smaller Space Analysis (SSA) in investigating the motivational values of SENAI-RS Professional Education instructors, based on data collected with the Portrait Values Questionnaire (PVQ-20). The results demonstrated that both approaches are effective in evaluating the value structure according to the theoretical model of Schwartz, highlighting, however, distinct and complementary aspects of the phenomenon investigated.

The CFA provided robust statistical support for the existence of the ten factors proposed, confirming the structural validity of the instrument in the population studied. SSA allowed a relational and continuous visualization of the interactions between values, revealing smooth transitions, semantic convergences and latent structures that enrich the understanding of the instructors' motivational experience.

The analyses highlighted the salience of values such as Benevolence, Universalism, Achievement and Conformity, suggesting a teaching ethos focused on cooperation, care for others, the pursuit of excellence and respect for institutional norms. conjunction between the values of Self-transcendence and Conservation reflects an orientation focused on stability and collectivity, desirable characteristics in the educational environment professional. On the other hand, the lesser emphasis on Self-Direction and Stimulation may indicate challenges in promoting autonomy and innovation among the professionals analyzed.

Among the practical implications of this study, the possibility of using the value profile identified to guide professional development policies. Continuing education programs, team and project management strategies institutional pedagogical approaches can be better aligned with prevailing motivations, promoting greater engagement and effectiveness. SSA, in particular, has proven to be a useful tool for identifying points of tension or convergence between values, and can support institutional diagnoses and personalized interventions.

As limitations, it should be noted that the data refer to a single institution and regional context, which restricts the generalization of the findings. Furthermore, the application of the CFA in reduced versions of the PVQ may compromise the fidelity of factors with few items. SSA, in turn, is sensitive to high correlations between items, which can artificially compact representational space.

For future research, it is recommended to replicate the study in different networks. teaching and cultural contexts, as well as the application of hierarchical or longitudinal studies that investigate changes in value profiles throughout the trajectory

professional. Studies that combine qualitative data with factor mappings and spatial concepts used here can also broaden the understanding of the meanings attributed to values in everyday teaching.

In summary, the articulation between CFA and SSA offers a methodological path promising for understanding the complexity of human values in contexts educational. In the case of SENAI-RS, the results not only validate the PVQ but institutional diagnostic instrument, but also reveal a solid ethical basis, which can be strengthened through strategic actions aimed at valuing autonomy, of innovation and educational justice.

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