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## Polish adaptation and validation of the Anti-Fat Attitudes Scale – AFAS

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### Abstract

Background: Bias, stigma, and discrimination in relation to weight are frequently experienced by many obese people. The goal of the present study was to develop a Polish adaptation of the Anti-Fat Attitudes Scale (AFAS) proposed by Morrison and O'Connor. Materials/methods: The study was conducted on undergraduate students of the University of Warmia and Mazury in Olsztyn. The original Canadian Scale Anti-Fat Attitudes Scale was translated into Polish, and its factor structure, reliability and construct validity were determined. Results: The exploratory factor analysis (Study 1) supported the development of the Polish version of the Anti-Fat Attitudes Scale with a one-dimensional structure modeled on the original version of the scale (factor loading ranged from .71 to .85). The confirmatory factor analysis (Study 2) validated the one-factor structure of the tool with high values of GFI and AGFI (above .95) and an acceptable value of RMSEA (RMSEA =.07). The results of the analysis revealed that satisfactory stability was maintained over a 4-week period. The validity criterion was confirmed based on correlations with the constructs that were theoretically linked to this phenomenon. Conclusions: The Polish version of the AFAS can be used to measure negative attitudes toward overweight individuals.

### Keywords

Anti-Fat Attitudes Scal, obesity, discrimination

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# Polish adaptation and validation of the Anti-Fat Attitudes Scale – AFAS

## Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Data Interpretation
- E Manuscript Preparation
- F Literature Search
- G Funds Collection

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## abstract

**Background:** Bias, stigma, and discrimination in relation to weight are frequently experienced by many obese people. The goal of the present study was to develop a Polish adaptation of the Anti-Fat Attitudes Scale (AFAS) proposed by Morrison and O'Connor.

**Material/Methods:** The study was conducted on undergraduate students of the University of Warmia and Mazury in Olsztyn. The original Canadian Scale Anti-Fat Attitudes Scale was translated into Polish, and its factor structure, reliability and construct validity were determined.

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## INTRODUCTION

Obesity affects individuals physically, psychologically and socially [1, 2]. Bias, stigma, and discrimination in relation to weight are frequently experienced by many obese people [3, 4]. Obesity has serious implications for personal and social quality of life and overall health. Research has documented weight stigmatization in many areas of daily life [2, 3, 4]. The majority of the above studies have been conducted in countries with the highest prevalence of obesity, including the United States and Great Britain. For this reason, the obesity stigma receives significant attention in those countries.

However, obesity is a global-scale epidemic of the 21st century [1, 5, 6]. The number of overweight people and the prevalence of weight-based discrimination continues to grow steadily around the world. In the United States, where obesity poses a significant problem, weight-based discrimination has risen by 66% in the past decade [2]. A study into the prevalence of the weight bias in Poland demonstrated that 20% of 55 women admitted to an obesity management clinic had been victimized on account of their weight, whereas 25% of the subjects had witnessed such events [3]. The obesity stigma is widespread, and it impacts many areas of life, from education and occupation to dating and health care [4]. For example, negative perceptions of overweight people exist in employment settings. Research findings have demonstrated that obese employees are perceived as lazy and incompetent by both employers and co-workers [36]. These attitudes can have a negative impact on wages and promotional opportunities for obese employees [7, 8, 9].

Multiple forms of weight stigmatization are also encountered in educational settings. Bias in education is observed through peer victimization at school and the negative attitudes of teachers, administrators and academic institutions. According to Griffiths et al. [10], approximately 36% of obese boys and 34% of obese girls become victims of physical and, in particular, psychological abuse. A Polish study investigating peer violence, conducted on 98 children aged 9-10 years attending psychoeducation classes, revealed a high prevalence of observed or experienced violence towards obese children [11].

Paradoxically, weight stigma also occurs in healthcare settings. Studies show that negative attitudes toward overweight individuals exist among physicians, nurses, dietitians, psychologists and medical students. According to Carr et al. [12] and Puhl et al. [2], weight bias can have severe psychological consequences. The psychological outcomes of weight discrimination include depression, anxiety, low self-esteem and poor body image. Weight stigma also exerts a direct effect on individuals' health [13]. Research suggests that social stressors, such as weight stigma and discrimination, influence cortisol levels, which, in turn, may contribute to hypertension, abdominal fat storage and cardiovascular disease [13, 14, 15, 16, 17].

Weight stigma plays an important role in everyday life and brings serious consequences that pose a direct threat to the health and life of a large part of the human population. Therefore, the nature and the extent of this problem have to be analyzed to propose effective solutions and improve the daily functioning and well-being of obese individuals. Several measures can be applied in studies of weight-based stigmatization and discrimination. The Rudd Center for Food Policy and Obesity lists the following validated measures for assessing the weight bias: Anti-Fat Attitudes Questionnaire

(AFA) [18], Anti-Fat Attitudes Scale (AFAS) [19], Anti-Fat Attitudes Test (AFAT) [20], Attitudes Toward Obese Persons Scale (ATOP) [21], Beliefs About Obese Persons Scale (BAOP) [22], Fat Phobia Scale-short form, and the Universal Measure of Bias-Fat Scale (UMB-FAT) [23]. The above measures may be used for self-assessment or in group training sessions to initiate discussions about weight bias in clinical practice. Unfortunately, none of them has been adapted for Polish respondents.

We decided to include the Anti-Fat Attitudes Scale (AFAS) in our study. The AFAS by Morrison and O'Connor [19] contains 5 items that measure negative attitudes toward overweight individuals. The answers are evaluated on a 5-point Likert-type scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Higher scores denote stronger endorsement of anti-fat attitudes. The results of the studies revealed that the scale had satisfactory internal consistency: Alpha values ranged from .70 to .80, which satisfies the requirements of the construct validity. The AFAS scores were positively correlated with, among others, authoritarianism, homonegativity and political conservatism. Furthermore, overweight participants obtained lower scores on the AFAS than individuals who were thin or in the normal weight range. The factor structure of the AFAS was unidimensional. We decided to validate the Anti-Fat Attitudes Scale (AFAS) because it is a psychometrically robust measure of anti-fat attitudes. It contains a small number of questions, which is an additional advantage. The AFAS is easy to use, and it can be applied as the only research tool or with other questionnaires. This is particularly useful in research investigating the determinants of prejudice against obese people. Lengthy and laborious questionnaires may cause the respondents to become tired and distracted, which, in turn, could distort the answers. Therefore, the small number of accurate diagnostic questions in the questionnaire could have a positive effect on the conducted study [24]. To the best of our knowledge, this is the first published study attempting to validate the original Canadian Anti-Fat Attitudes Scale. We hope that our findings will provide helpful insights for researchers attempting to validate the AFAS in other languages.

## STUDY 1

The aim of the Study 1 was to evaluate the psychometric properties of the Polish version of the Anti-Fat Attitudes Scale (AFAS). We expected that the AFAS would satisfy the requirements of the construct validity and reliability. Criterion-related validity was tested based on the presence of correlations between AFAS and the measures of directivity and political conservatism.

## MATERIAL AND METHODS

### PARTICIPANTS

The study was conducted on undergraduate students of the Faculty of Social Sciences of the University of Warmia and Mazury in Olsztyn. The studied population consisted of 237 students ( $M_{age} = 20.27$ ,  $SD_{age} = 3.34$ ), 88% of which were female. All participants signed written consent forms, and the study was approved by the Bioethics Committee of the University of Warmia and Mazury in Olsztyn, Poland.

## THE PROCEDURE OF TRANSLATING THE AFAS

The scale was translated from English into Polish by three persons acting independently: a sworn translator of English and two psychologists who were holders of Cambridge Certificates of Proficiency in English. Their translations were compared and analyzed to develop a single Polish version of the scale. The scale was then translated from Polish into English by three persons acting independently: one physician and two psychologists who were fluent in English. No significant differences were found.

## TOOLS FOR ASSESSING THE CONSTRUCT VALIDITY OF THE POLISH ADAPTATION OF THE AFAS

### POLISH ADAPTATION OF JOHN RAY'S SCALE OF DIRECTIVITY DEVELOPED BY BRZOWSKI [25]

The Scale of Directivity (in the paper abbreviated SoD) measures directivity, which is defined as aggressive domination and authoritarianism [25, 26]. Directivity is a personality trait which leads to aggressive domination and the tendency to impose one's will on others. The SoD was developed for the needs of research on the authoritarian personality. The authoritarian personality has a highly similar theoretical lineage to directivity. The SoD consists of 15 questions. In the current study the Cronbach's alpha coefficient for the scale was 0.77.

In the study by Morisson and O'Connor [19], the AFAS scores were positively correlated with authoritarianism. According to John Ray, directivity is directly related to authoritarianism [27]. With regard to the construct validity, we hypothesized that directivity measured by SoD would also be positively correlated with anti-fat attitudes measured by AFAS.

### POLISH CONSERVATISM SCALE

The Polish version of the political conservatism scale was developed solely for the needs of this study. The scale was modeled on the political conservatism scale proposed by Morisson and O'Connor [19]. The respondents evaluated their political conservatism on a 4-point scale: 1 - liberal, 2 - fairly liberal, 3 - fairly conservative, 4 - conservative.

## STATISTICAL ANALYSIS

Statistical analyses were performed in the SPSS 24 PL program. The factorial validity of the AFAS was tested in exploratory factor analysis (EFA) [28]. The convergent validity of each item was tested based on the values of Pearson's correlation coefficients between each item and the total score. Internal consistency was tested based on the values of Cronbach's alpha coefficient ( $\alpha$ ), where  $\alpha$  values greater than .70 were considered adequate. Test-retest reliability was assessed using Pearson's correlation coefficient. Criterion-related validity was tested by correlating AFAS scores with constructs theoretically linked to this phenomenon.

## RESULTS

### CONSTRUCT VALIDITY

The one-factor model proposed by Morrison and O'Connor [19] was tested in exploratory factor analysis (EFA). The one-factor structure was confirmed. One factor explained 60.23% of the variance. The Kaiser-Meyer-Olkin measure reached .836 and exceeded the suggested value of .60. Moreover, the result of Bartlett's test of sphericity was significant, and it confirmed that the matrix of correlation coefficients was arranged in one factor ( $\chi^2 = 421.68, p < .001$ ). All factor loadings were above .70 (Table 1).

**Table 1.** Component factor analysis and factor loadings for the AFAS

AFAS item	Factor loading
Item 1	.81
Item 2	.75
Item 3	.77
Item 4	.71
Item 5	.85

The convergent validity of each item was tested based on the values of the Pearson's correlation coefficient between each item and the total score, which was computed without the corresponding item. Convergent validity was considered satisfactory if the correlation coefficient was higher than .40. In the current study, the correlation coefficients ranged between .56 and .73, and all correlations were statistically significant ( $p < .001$ ).

### RELIABILITY

Cronbach's alpha was determined at 0.83, which indicates a satisfactory level of internal consistency for the 5 questions in the AFAS questionnaire. Moreover, test-retest reliability was assessed based on the values of the correlation coefficient 4 weeks later in a group of 197 participants. The results confirmed the satisfactory stability of the AFAS ( $r = .89, p < .001$ ).

### CRITERION VALIDITY

Criterion-related validity was tested by correlating AFAS scores with constructs theoretically linked to this phenomenon: directivity and political conservatism. Anti-fat attitudes were positively correlated with authoritarianism ( $r = .25, p < .001$ ) and political conservatism ( $r = .32, p < .001$ ).

**Table 1.** The Polish version of AFAS with English translation

No.	Skala Negatywnych Postaw Wobec Osób Otyłych (SNPWOO)	Anti-fat Attitudes Scale (AFAS)
1	Osoby otyłe są mniej atrakcyjne fizycznie niż osoby szczupłe	Fat people are less sexually attractive
2	Nigdy nie umówiłbym się/nie umówiłabym się na randkę z osobą otyłą	I would never date a fat person
3	Osoby otyłe są na ogół bardziej leniwe niż osoby szczupłe	On average, fat people are lazier than thin people
4	Osoby otyłe mogą winić wyłącznie siebie za swoją wagę	Fat people only have themselves to blame for their weight
5	Osoba otyła w kostiumie kąpielowym na plaży wygląda odrażająco	It is disgusting when a fat person wears a bathing suit at the beach



## STUDY 2

After construct validation, the one-factor structure of the Polish version of the AFAS was confirmed in the second study. Moreover, criterion-related validity was tested by correlating AFAS scores with homonegativity. To investigate the construct validity of the original version of the AFAS, Morisson and O'Connor hypothesized that an endorsement of anti-fat attitudes was positively correlated with homonegativity [17, 19]. Their hypotheses were confirmed. The correlations between anti-fat and homonegativity were  $.37$  ( $p < .001$ ) [19]. Based on the results reported by Morisson and O'Connor [19], we expected that negative attitudes toward overweight individuals would also be positively correlated with greater homonegativity.

## MATERIAL AND METHODS

### PARTICIPANTS

The sample consisted of 250 (88.5% female) undergraduate students of the University of Warmia and Mazury in Olsztyn ( $M_{age} = 21.50$ ,  $SD_{age} = 2.53$ ). The participants were informed about the general purpose of the study and signed written consent forms.

### MEASURES

The sample consisted of 250 (88.5% female) undergraduate students of the University of Warmia and Mazury in Olsztyn ( $M_{age} = 21.50$ ,  $SD_{age} = 2.53$ ). The participants were informed about the general purpose of the study and signed written consent forms.

### AFAS

Negative attitudes towards overweight individuals were assessed with the previously described Polish version of the AFAS by Morrison and O'Connor [19]. The Cronbach's alpha was determined at 0.97.

### HOMONEGATIVITY SCALE IN THE POLISH PREJUDICE SURVEY 2 [29, 30]

The questionnaire consisted of 9 items. Three questions concerned the perceived threat from homosexuality. The following six questions referred to conventional and modern manifestations of homophobia [31]. Conventional manifestations of homophobia involve hostile attitudes towards homosexuals that emanate from moral and religious beliefs about homosexuality. In turn, modern manifestations of homophobia, hostile attitudes towards the gay and lesbian community stem from the belief that their political demands are not justified, that homosexual persons are not discriminated against in society, and that they are reluctant to assimilate to the heterosexual majority [31]. The Cronbach's alpha for each subscale was  $.95$ .

### STATISTICAL ANALYSIS

Confirmatory factor analysis (CFA) with generalized least-squares estimation was performed in the SEPATH module of STATISTICA software version 13.1 PL to evaluate the fit of the data to the one-factor model [32, 33]. Criterion-related validity was assessed based on the values of Pearson's correlation coefficients.



## RESULTS

Confirmatory factor analysis (CFA) was used to test the factorial validity of the Polish version of the AFAS. The following fit indices were examined to determine the extent to which the model fits the data:  $\chi^2$ , goodness of fit index (GFI), adjusted goodness of fit index (AGFI), and root mean square error of approximation (RMSEA) [33]. The model fits the data well when  $GFI > 0.95$ ,  $AGFI > 0.95$ ,  $RMSEA \leq 0.06$  [33, 34]; however, according to some authors [35, 36], RMSEA close to .80 is acceptable. Thus, the one-factor model met the acceptable fit indices ( $\chi^2 = 11.086$ ,  $df = 5$ ,  $p = .05$ ,  $GFI = .98$ ;  $AGFI = .95$ ,  $RMSEA = .07$ ). All factor loadings were above .80 (Fig. 1).

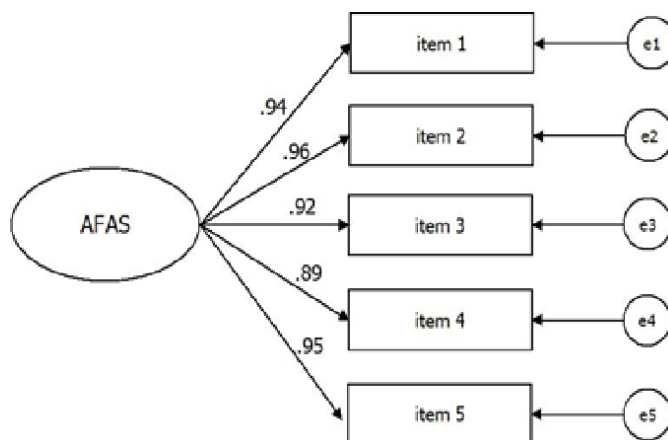


Fig. 1. Factorial structure of the AFAS

As expected, the correlations between anti-fat attitudes and homonegativity were significant. AFAS scores were significantly correlated with the perceived threat from homosexuality ( $r = .95$ ,  $p < .001$ ), conventional manifestations of homophobia ( $r = .92$ ,  $p < .001$ ), and modern manifestations of homophobia ( $r = .93$ ,  $p < .001$ ).

## GENERAL DISCUSSION

The objective of this study was to adapt the AFAS, the Canadian research tool developed by Morrison and O'Connor [19], for the needs of Polish respondents. The results of the validation process demonstrated sufficient internal consistency of the AFAS and significant item-total correlations. Similarly to the original study, the test-retest reliability for the AFAS was high [19].

Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) validated the results reported by the authors of the AFAS. In the Polish version of the scale, one factor with a sufficient loading level was identified. Criterion validity for AFAS was established with the use of the Scale of Directivity, a measure of homonegativity and political conservatism. In all cases, the correlations between the AFAS and the above scales were consistent with our initial expectations and with the study of Morrison and O'Connor [19]. In our study, the endorsement of anti-fat attitudes measured by AFAS was greater among subjects who scored higher on the Scale of Directivity. This implies that individuals with a more aggressively domineering and authoritarian personality are more likely to harbor negative attitudes towards overweight individuals. Similarly to the original version of the scale, anti-fat attitudes were positively correlated with the Authoritarianism Scale [37].

In our study, students characterized by negative attitudes toward homosexual individuals (measurement of homonegativity) also harbored negative attitudes towards overweight individuals. The above observation is also consistent with the results reported by Morisson and O'Connor [19]. In their study, AFAS scores were positively correlated with the Homonegativity Scale. Our study also revealed that political conservatism was related with anti-fat attitudes. Similar observations were made by Morisson and O'Connor [19].

The discussed attempt to validate the Polish version of the Anti-Fat Attitudes Scale is part of a research project investigating the determinants of anti-fat attitudes in Poland. The Polish version of the AFAS paves the way for further research into prejudice against obese people. We believe that our findings will have practical implications for the eradication of anti-fat biases. In the future, the developed tool will be used to verify the effectiveness of specific anti-bias strategies.

## LIMITATIONS

This study has certain limitations which could influence further research. Future studies could be improved by including a higher proportion of male respondents in the surveyed population. Research indicates that males are more prejudiced against obese individuals than females [38, 39, 40]. Greater variation in age and body mass could also contribute interesting information. According to research, overweight people tend to internalize negative stereotypes of obesity and demonstrate considerable anti-fat biases [41, 42].

## CONCLUSIONS

The results of this study demonstrate that the Polish version of the AFAS is a reliable and valid diagnostic tool which can be used to measure negative attitudes towards overweight individuals. Future research is needed to determine personality traits that contribute most anti-fat biases. The effectiveness of practical interventions aiming to reduce anti-fat biases in society should also be examined. The critical components of such interventions should be identified to implement programs that effectively target populations with known biases against obesity.

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