The relationship between self-esteem, aggression and poverty

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Abstract:
Background: The current research literature confirms the link between poverty and psychological characteristics of an individual (Miech, Caspi, Moffitt, Wright, & Silva, 1999). Loix and Pepermans (2009) report criminal behaviour, addiction, low self-esteem, aggression, depression, and suicidal tendencies as subjectively perceived consequences of poverty. Research by Tremblay (2000) and Ezekokana, Obi-Nwos, and Okoye (2014) focused on low-income families has confirmed that long-term poverty is a predictor of physical violence and aggression in children. The relationship between poverty and selected characteristics has been investigated, however, research regarding the moderating effect of poverty on aggression and self-esteem is absent.

Research goal: The presented study had two objectives - to verify whether there is a difference between the poor and non-poor people in self-esteem and aggression; and to verify if poverty moderates the relationship between self-esteem and aggression.

Method: The research sample consisted of 86 employed persons (48 women). The inclusion criteria were as follows: (1) aged between 25 and 59 (M = 33.58 SD = 8.10); and (2) a permanent monthly income. The income was dichotomised, and people with up to 400€ per month were assigned to the group of poor (N = 24). The data was obtained using convenience sampling and the actual collection was conducted in person. Two research tools were used - self-esteem was investigated through the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) and aggression was assessed using the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992). The reliability of the research tools was verified using McDonald's total omega coefficient – RSES: ωTotal = .82; BPAQ: ωTotal = .91.

Results: The Independent Sample t-test found that the poor and non-poor groups did significantly differ in the degree of self-esteem (t(84) = -3.24, p = .002, Cohen's d = -0.78, . post-hoc statistic power with α = .05 was 89%), with higher self-esteem achieved by non-poor. No significant differences were found between the groups in relation to aggression (t(84) = 1.20, p = .234, Cohen's d = 0.29, post-hoc statistical power with α = .05 was 22%). The application of moderated regression analysis in a model describing self-esteem as a criterion, aggression as an independent variable and poverty as a moderator was statistically significant (F(3, 28) = 10.43; p < .001; R² = .24).
Despite a strong correlation between aggression and self-esteem (r = .35), aggression became a non-significant predictor of self-esteem when poverty was included as a moderator (t(82) = 0.42; b = 0.03; p = .672); the poverty itself was a significant predictor (t(82) = 3.28; b = 3.71; p = .002). The interaction between aggression and poverty was not a significant predictor, nevertheless the value was borderline (t(82) = -1.95; b = - 0.14; p = .055). If the person was not poor, self-esteem got lower with increasing aggressiveness (t(82) = - 4.27; b = - 0.11; p < .001).

Conclusion: The study confirmed that poverty is a determinant of impaired self-esteem, but based on the available evidence, it is not possible to conclude whether or not poverty affects aggression. Moreover, the effect of poverty on moderating the relationship between self-esteem and aggression was confirmed. The link between aggression and self-esteem was found to be weak in the group of poor people, whereas aggression was shown to be a relatively strong predictor of self-esteem in the group of non-poor people. The limitations of this study are the inclusion criteria for the poor (up to 400€), the sample size and the sampling method.

**Key words:**

**Introduction**

The concept of poverty is defined from an economic rather than psychological perspective. According to the United Nations (1995), poverty can be characterised as an inadequate income and lack of resources to ensure dignity, leading to hunger, poor health and health care, limited access to education, inadequate housing, and social discrimination and exclusion. Similarly, the World Bank (Haughton & Khandker, 2009) defines poverty as income or available resources that are below the minimum living conditions, reflected in poor housing, health and access to food. Additionally, it considers the psychological aspects related to subjective well-being deprivation associated with poverty. Operationalisation of poverty in psychological research is often understood from an economic perspective. It is characterised, for example, as a ratio of income-to-needs equal to or less than 1:1 (Evans & Kim, 2007) or as a household income less than 60% of the median (Emerson & L. Turnbull, 2005). It is also necessary to point out that many researchers often work with constructs related to poverty, namely: socioeconomic status (Hackman & Farah, 2009, Reiss, 2013, Turkheimer et al., 2003, Santiago, Wadsworth & Stump, 2011), low income (Evans, 2004, Riley et al., 2013), material difficulties (Slack et al., 2004; Parish et al., 2008), economic deprivation (Eamon, 2001; Wagmiller et al., 2006) or (material) scarcity (Shah, Mullainathan, & Shafir, 2012; Denny et al., 2004). This research is based on a monetary approach, which considers poverty as the income of a person below a conventional threshold, typically 60% of the median of a national income. Nygard, Hårtull, Westnævir, and Jungerstam (2016) refer to this as "objective poverty" based on their analysis of secondary data (The 2010 GERDA Survey). Psychological research confirms that living in poverty affects the psychological characteristics of an individual (Miech, Caspi, Moffitt, Wright, & Silva, 1999). Loix and Pepermans (2009) have described several categories of consequences of poverty in addition to social and family problems based on reports of poor people. In line with other researchers (McBride, Paikoff, & Holmbeck, 2003; Davis, Banks, Fisher, & Grudzinskas, 2004), the described behavioural problems included criminal behaviour, addiction, and psychological problems related to low self-esteem, aggression, depression, and suicidal tendencies. If the interest is primarily to confirm the link between living in poverty and aggression, research literature focuses separately on a group of children and a group of adults. Tremblay (2000) and Ezeokana, Obi-Nwos, and Okoye (2014) confirmed that long-term poverty is a predictor of physical violence and aggression in children from low-income families. These studies confirmed that children living in poverty are inclined to psychopathology, difficulties in maintaining social standards, delinquency, theft, violence and drug use. The link between living in poverty and aggression has also been confirmed in the adult population. Keels (2008) notes that aggression in families
with low socio-economic status (income below the poverty line) was significantly reduced following a promotion. Santiago, Wadsworth and Stump (2011) describe that there is strong evidence in favour of the link not only between poverty and psychopathological phenomena such as aggression, narcotics abuse, anxiety, but also low self-esteem. MacLeod (1995) illustrated how self-esteem can be related to the poverty of an individual in the future. The author has introduced a model according to which self-esteem during adolescence can influence teenager’s choice of occupation. The author states that low self-esteem is associated with higher levels of anxiety and depression, which consequently hinder adequate inclusion into society. Santiago, Wadsworth, and Stump (2011) argue that these factors (low self-esteem, anxiety, and depression) may be related to individual poverty in the future. The fact that poverty does not necessarily reflect low self-esteem was confirmed by McMullin and Cairney (2004) who argue that lower income is associated with lower self-esteem, but only if individuals consider poverty to be a social stigma.

Overall, the following can be concluded based on the research literature concerning poverty. 1). The research on the link between poverty and selected characteristics of an individual, namely aggression and self-esteem, has been predominantly conducted in countries with a different culture (South America, Africa) and beyond the European research context. 2). The limitation of the research studies is a research sample which consists of children and adolescents, whereas research into aggression among poor adults is rare. 3). Even if the relationship between poverty and selected characteristics (aggression and self-esteem) was examined, the moderated effect of poverty on these variables was not investigated. Aggressive behaviour can potentially lead to aggravated self-esteem. However, it remains unclear whether living in poverty leads to risky behaviour to such an extent that aggression has no longer a significant effect on self-esteem.

Research goal
The presented study has two objectives; namely to verify whether there is a difference between the poor and non-poor people in self-esteem and aggression; and to verify if poverty moderates the relationship between self-esteem and aggression. On the basis of available literature, we assume that people included in the group of poor will report lower self-esteem and higher aggression compared to a group of people not considered poor. Additionally, we assume that poverty will have a moderating effect on the link between self-esteem and aggression.

Research sample
The research sample consisted of 86 professionals (48 women). The inclusion criteria were as follows: (1) aged between 25 and 59 (M = 33.58 SD = 8.10); and (2) a permanent monthly income. Subsequently, the income was dichotomised, and people with up to 400€ per month were assigned to the group of poor (N = 24). The data were obtained using convenience sampling and the actual collection was conducted in person.

Research methods
The Rosenberg Self-Esteem Scale (RSES: Rosenberg, 1965) was employed to investigate self-esteem. Participants were asked to answer 10 questions on a 4-point Likert scale (0 = strongly disagree, 3 = strongly agree), while higher score indicates higher self-esteem. Aggression was assessed using the Buss-Perry Aggression Questionnaire (BPAQ: Buss & Perry, 1992). Participants were asked to answer 29 items on a 5-point Likert scale (1 = Extremely uncharacteristic, 5 = Extremely characteristic), with higher score indicating higher aggression. The reliability of the research tools was verified using McDonald's total omega
coefficient – RSES: \( \omega_{\text{Total}} = .82 \); BPAQ: \( \omega_{\text{Total}} = .91 \). Poverty was examined using 4 response categories: 0 - 198.09€ (sum of the minimum living wage in Slovakia from 2016); 198.09€ - 400€; 400€ - 900€; more than 900€. The test battery also collected basic socio-demographic data.

### Statistical analysis

The normality of data distribution for individual groups was verified by Shapiro-Wilk's test, skewness and kurtosis coefficients, detection of outliers and histogram analyses. The data for each of the groups indicated a normal distribution with only minor deviations, and extreme values in the dataset were not found.

Missing data (less than 1%) were imputed using multiple imputation method ("mice" package in R; Van Buuren & Groothuis-Oudshoorn, 2011). Regression analysis was conducted since its assumptions in terms of homoscedasticity, multivariate normality (tested against Mahalanobis score), and normal distribution of residuals and their independency were met.

The Independent Samples t-test was used to examine the differences between the groups of the poor and non-poor in self-esteem and aggression. Furthermore, Bayesian analysis with non-informative prior value (0.707) (Table 2) and sequential analysis (Figure 1) were calculated.

### Results

Table 1 represents descriptive statistics of self-esteem and aggression scales, with focus on individual groups.

**Table 1: Descriptive analysis of self-esteem and aggression scales**

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
<th>( \omega_{\text{Total}} ) (n)</th>
<th>Shapiro-Wilk (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem</td>
<td>20.76</td>
<td>5.09</td>
<td>4</td>
<td>30</td>
<td>.82 (10)</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>18.04</td>
<td>4.70</td>
<td>4</td>
<td>26</td>
<td></td>
<td>0.94 (.132)</td>
</tr>
<tr>
<td>Non-poor</td>
<td>21.18</td>
<td>4.89</td>
<td>4</td>
<td>30</td>
<td></td>
<td>0.97 (.085)</td>
</tr>
<tr>
<td>Aggression</td>
<td>73.00</td>
<td>18.28</td>
<td>37</td>
<td>117</td>
<td>.91 (29)</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>76.79</td>
<td>14.51</td>
<td>48</td>
<td>107</td>
<td></td>
<td>0.97 (.747)</td>
</tr>
<tr>
<td>Non-poor</td>
<td>71.53</td>
<td>19.45</td>
<td>37</td>
<td>117</td>
<td></td>
<td>0.97 (.108)</td>
</tr>
</tbody>
</table>

Note.: \( N_{\text{total}} = 86; N_{\text{poor}} = 24; N_{\text{nonpoor}} = 62 \)

A combination of frequentist and Bayesian approaches was conducted in order to verify the differences between the groups of the poor and non-poor in self-esteem and aggression.

**Table 2: Independent Samples t-test and Bayesian factor**

<table>
<thead>
<tr>
<th></th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>( \Delta \text{Means} )</th>
<th>( \Delta \text{SE} )</th>
<th>d</th>
<th>( \text{BF}_{10} ) (Error in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-esteem</td>
<td>-3.24</td>
<td>84</td>
<td>.002</td>
<td>-3.77</td>
<td>1.16</td>
<td>-0.78</td>
<td>19.40 (2.3e-4)</td>
</tr>
<tr>
<td>Aggression</td>
<td>1.20</td>
<td>84</td>
<td>.234*</td>
<td>5.26</td>
<td>4.38</td>
<td>0.29</td>
<td>0.46 (0.003)</td>
</tr>
</tbody>
</table>

* Significant result of Levene's test (p < .05) assumes non-equivalence of variations
The relationship between self-esteem, aggression and poverty

**Figure 1: Bayesian sequential analysis**

**Self-esteem**

Independent Samples t-test shows that the poor and non-poor did significantly differ in the degree of self-esteem ($t(84) = -3.24; p = .002; \text{Cohen's } d = -0.78$; post-hoc statistical power with $\alpha = .05$ was 89%), with the poor achieved higher scores in this variable. This finding was also supported by the value of Bayesian Factor ($BF_{10} = 19.40$), which provides strong evidence in favour of the alternative hypothesis.

With regards to aggression, significant differences between the groups were found ($t(84) = 1.20, p = .234, \text{Cohen's } d = 0.29$, post-hoc statistical power with $\alpha = .05$ was 22%). Considering the Bayesian factor ($BF_{10} = 0.46$) and the sequential analysis, it is important to note that the evidence for the null hypothesis is unambiguous, and in overall, the effect might exist but is potentially too weak to be detected in the research sample due to the low statistical power (the size of the sample was not sufficient to detect small effects).

The moderated regression analysis was conducted to determine the effect of poverty on the link between aggression and self-esteem.

**Table 3: Moderated regression analysis with self-esteem as a criterion, aggression as an independent variable and poverty as a moderator**

<table>
<thead>
<tr>
<th></th>
<th>b (SE)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>17.94 (.98)</td>
<td>18.40</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Aggression</td>
<td>0.03 (.06)</td>
<td>0.42</td>
<td>.672</td>
</tr>
<tr>
<td>Poverty</td>
<td>3.71 (1.13)</td>
<td>3.28</td>
<td>.002</td>
</tr>
<tr>
<td>Aggression x Poverty</td>
<td>- 0.14 (.07)</td>
<td>- 1.95</td>
<td>.055</td>
</tr>
</tbody>
</table>

$R^2 = .24$

$F(3, 82) = 10.43, p < .001$

Model self-esteem ~ aggression with respect to poverty (conditional effect)

<table>
<thead>
<tr>
<th></th>
<th>b (SE)</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>.03 (.7)</td>
<td>0.42</td>
<td>.672</td>
</tr>
<tr>
<td>Non-poor</td>
<td>-.11 (.03)</td>
<td>- 4.27</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>
The regression model was found to be statistically significant (F(3, 28) = 10.43; p < .001; R² = .24). Despite the fact that the correlation between aggression and self-esteem in this model was strong (r = .35), aggression became a non-significant predictor of self-esteem when poverty was incorporated (t(82) = 0.42; b = 0.03; p = .672; note: due to the nature of regression analysis that includes a categorical moderator, the presented values represent values of people from the group of the poor), whilst poverty itself was a significant predictor (t(82) = 3.28; b = 3.71; p = .002). The interaction term of aggression and poverty was not a significant predictor, however the p-value was marginal (t(82) = -1.95; b = - 0.14; p = .055). If the person was not poor, self-esteem declined with increasing aggressiveness (t(82) = - 4.27; b = - 0.11; p <.001). Overall, based on the results we can argue that poverty is a determinant of impaired self-esteem, however, based on the available evidence, we cannot conclude whether or not poverty affects aggression. With aggression being a predictor of self-esteem, the relationship was found to be weak in the group of poor people, whereas aggression was shown to be a relatively strong predictor of self-esteem in the group of non-poor people.

**Discussion**

The first goal of the study was to examine the differences between the group of poor and non-poor in selected personality characteristics – we predicted higher self-esteem in the group of poor people and a higher degree of aggression in the group of non-poor. The hypothesis of lower self-esteem among poor was confirmed. Our research, in line with Sapolsky (2004) and Wadsworth and Achenbach (2005), indicates that poverty is a predictor of lower self-esteem. When interpreting lower self-esteem among the poor, it is important to acknowledge the psychological perspective of poverty related to the inability to provide for family, accompanied by feelings of shame and helplessness (Dzator, 2013). It should be noted that the chosen research design describes the relationship between the selected variables and not their direct linear causality. The available literature has not yet confirmed whether low self-esteem
associated with lower aspirations is the cause of poverty, or the persistence of poverty negatively influences one’s current self-esteem. In our interpretation of the results, we are inclined to a more complex model of circular causality. Thus, less self-confidence and lower aspirations can lead people to choose jobs that do not provide sufficient financial security. The induced state of poverty can in turn negatively affect self-esteem. In order to verify this circular model, it is necessary to conduct longitudinal research including other variables (e.g., anxiety, shame, helplessness, risk behaviour, addiction), which could more precisely identify the causes and consequences of poverty, while identifying the relevant variables between poverty, self-esteem and aggression.

In contrast to other authors (Costello, Compton, Keeler, & Angold, 2003), we did not confirm the assumption of increased aggression in the group of poor people. Our interpretation of this is, that the available research on the consequences of poverty tend to confuse the concepts of aggression, hostility, and crime. We therefore believe that future research should work with the constructs of aggression and criminality separately. The absence of aggression in the group of poor can be understood as an increased tendency of a person to commit situational crime, which is independent of person's aggression. This hypothesis is supported by a study by Keels (2008), which suggests that the opportunity of the poor to move to a better neighbourhood and increase their socio-economic status was associated with a sharp decrease of crime. Overall, our research indicates that aggression measured by the selected tool (BPAQ; Buss & Perry, 1992) is a stable personality trait that may not be influenced by the current financial situation of a person. The available literature related to the psychological consequences of poverty examines the link between aggression and poverty based on the Berkowitz’s (1989) reformulation of the frustration-aggression hypothesis. Our research provides evidence that the state of poverty may not be the reason for a frustration with the consequences of aggression. However, we cannot rule out this hypothesis because it is unclear whether people assigned to the group of poor based on their income subjectively experienced frustration due to the lack of money. Future research that includes this subjective experience of poverty has a potential to provide more accurate answers.

The second research assumption was that poverty has a moderating effect on the link between self-esteem and aggression. In the case of aggression as a predictor of self-esteem, this relationship was shown to be weak among the poor, whereas in the group of non-poor, aggression was a strong predictor of self-esteem. This finding helps to clarify that the presence of poverty affects the relationship between self-esteem and aggression in different ways. It seems that with increased aggression, self-esteem decreases only if the person is not exposed to poverty.

Participants included in the group of poor did not show a decrease in self-esteem when aggression increased. It is plausible that this relationship was not observed due to the fact that the poor have already experienced lower self-esteem, which could have weakened the discriminating ability of self-esteem.

The limitations of this study are the inclusion criteria for the poor (up to 400€). Income of other people in the household could have had an impact on person's financial situation and thus on the results of our research. In terms of methods, the limits are related to the sample size and the sampling method. Due to the sample size and resulting statistical power, a small effect with approximately 20% success rate could be detected. This limitation was largely overcome using Bayesian methods, in particular a sequential analysis that visualises the likelihood of evidence in favour of a hypothesis with respect to the number of observations. Another problematic aspect may be the use of non-informative priors in the Bayesian analysis, however, the study is considered exploratory and further investigation is needed.
These findings need to be replicated in further studies, ideally on larger samples. The need for this is reflected, for example, in examining the differences in aggression between the poor and non-poor, since considering our research findings, conclusions should be drawn with caution.
References


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