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# Is Personal Distress a Part of Empathy?
# A Re-Analysis of the Multidimensional Empathy Concept

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**Summary**

The Interpersonal Reactivity Index (IRI) (Davis, 1983) combined the four factors empathic concern, perspective taking, personal distress and the fantasy scale into a multidimensional concept of empathy that is still generally valid today. On the basis of the German translation of the IRI, the Saarbrücken Personality Questionnaire on Empathy (SPF), two different model adjustments were examined with the help of structural equations: a general factor model of empathy and the previous multidimensional model. The calculations were based on questionnaire data from 7 668 subjects at the age from 10 and 80 years, some of which were collected online. It turned out that the multidimensional concept was superior to the general factor model, but without including the personal distress scale (NPAR = 31, RMSEA = .06, PCLOSE = .00, SRMR = .04, CFI = .96). Distress can theoretically be regarded as a consequence of empathy and should therefore not to be considered as a part of the theoretical empathy concept.

**Keywords**: Interpersonal Reactivity Index, empathy, structural analysis, personal distress

## 1. Introduction

The construct empathy describes affective and cognitive reactions to the behavior or the situation of observed subjects. These can be other people, animals, or even fictional characters in books or movies. This multidimensional concept, based primarily on Davis (1983b; Davis et al., 1994), combines earlier, unidimensional approaches such as those of Hogan (1969) and Mehrabian and colleagues (Mehrabian & Epstein, 1972; Mehrabian et al., 1988). Hogan described empathy as the ability to take and understand another's perspective without being emotionally involved. In

contrast, Mehrabian and Epstein (1972) focused on the immediate affective response to the emotional state of a counterpart. Davis (1983b) summarized these two concepts and added two further aspects, namely the empathic reactions to fictional situations (in films or stories) and the consequences for the observer himself accompanying the cognitive and/or affective reactions, namely the so-called distress. These four factors emotional concern (EC), perspective taking (PT), fantasy scale (FS) and personal distress (PD) form the content of the Interpersonal Reactivity Index (IRI). This questionnaire was translated into German and test theoretically optimized by Paulus (1997) with the Saarbruecken Personality Questionnaire SPF(IRI) and is currently already available in the seventh version (including online test). The test quality criteria are all good; thus, clear factor loadings without significant side loadings (below .30) are found on the four factors (cf. table 1).

**Table 1. Factor loadings on the four factors fantasy scale (FS), perspective taking (PT), personal distress (PD) and empathic concern (EC)**

| Item | subscales | | | |
|---|---|---|---|---|
| | FS | PT | PD | EC |
| 12-f | .84 | | | |
| 15-f | .80 | | | |
| 07-f | .78 | | | |
| 02-f | .61 | | | |
| 04-p | | .86 | | |
| 10-p | | .84 | | |
| 16-p | | .70 | | |
| 14-p | | .61 | | |
| 08-d | | | .86 | |
| 06-d | | | .85 | |
| 03-d | | | .69 | |
| 13-d | | | .60 | |
| 01-e | | | | .81 |
| 11-e | | | | .80 |
| 05-e | | | | .68 |
| 09-e | | | | .64 |

The correlations among the factors are medium strong (cf. table 2), with only FS showing significantly lower values compared to the other scales.

**Table 2. Correlations of the 4 empathy factors in the German version**

| | FS | EC | PT |
|---|---|---|---|
| EC | .47** | | |
| PT | .37** | .48** | |
| PD | .22** | .24** | -.03* |

The internal consistency of the scales is with Cronbach Alpha of .78, in a very satisfactory range, the split-half coefficient with subsequent Spearman-Brown correction shows a very good value with $r_{tt}$ = .80.

In the literature, the PD scale is controversial. Cliffordson (2002, p. 50) criticizes in her study the content-related proximity of the PD scale to the EC scale („*That means that the participants responded to at least some of the PD items with other-oriented feelings, rather like Davis' EC aspect.*"), where she had already encountered a similar problem in 2001: „*The content of PD, conceptualized by the respondents appears, however, to be different when compared with PD as concretized by Davis. Thus, the validity of PD and therefore also the personal distress dimension, can be*

*questioned.*" (Cliffordson, 2001, p. 37). Israelashvili et al. (2020, p. 2) described the contrasting perspectives between EC and PD as follows: „*There is thus a clear distinction between feelings of concern for others (empathic concern), versus feelings of personal concern for oneself (personal distress)*." Fernández et al. (2011) also found weak internal consistency values for the PD scale, whereas the other three factors yielded expectation-compliant results. Hosser & Greve (1989), in the analyses of their translation of the original 7 PD items, also reduced them to only 4 because of poor psychometric properties. In Siu and Shek's (2005) Chinese version, the PD factor does not appear at all. Similarly, emotion recognition studies have often simply omitted the PD scale (Brosnan et al., 2014; Olderbak & Wilhelm, 2017; Riggio et al., 1989).

The purpose of this study is now to examine whether the empirical model of Davis (1983b) on which the questionnaire is based can be replicated using data from a large and representative sample and whether it may need to be modified.

# 2. Materials and Methods

As already described, the theoretical model of empathy according to Davis (1983b) consists of the four factors EC, PT, FS, and PD. The criticism of the PD scale has also already been presented, which is why it will be considered in particular whether the PD scale can be empirically represented in the model and how high its contribution to the overall model is.

First, however, it should be examined whether Eysenck's assumption of a general factor "empathy" (Eysenck et al., 1990) seems to be sufficient as an explanation.

## 2.1. Participants

The following analyses are based on the responses of 7,668 subjects, of which 66.1% were female (5,070). The age range was from 10 to 80 years with a mean of 27.9 years ($s$ = 11.23). Data resulted from paper-pencil tests and from the online version of the SPF. A 5-point Likert scale was used, labeled from "never applies (1)" to "always applies (5)." Participation was voluntary, and the participants received feedback in the form of norm and PR values and a simple explanation after completing the test.

## 2.2. Structure analysis

In order to determine the best structure of the items four different models were calculated using confirmatory factor analysis (AMOS 21).

*Models 1a,b: General factor model:*
All items are determined by a factor "empathy". According to Eysenck et al. (1990), empathy is represented by a general factor whose items have high loadings on fictive, emotional, and cognitive topics. Since the construct personal distress is quite controversial in theory (Paulus, 2014), we compute a second model (Model 1b) without the items on PD.

*Models 2a,b: Group Factor Model (Higher-Order Model):*
Following Davis (1983a) or Paulus (2009, 2012), 4 factors are expected, each capturing cognitive (PT) and affective (EC, FS, and PD) aspects. Here, too, the classification of the factor PD remains unclear, so that analogous to models 1, two model variants were also calculated.

# 3. Results

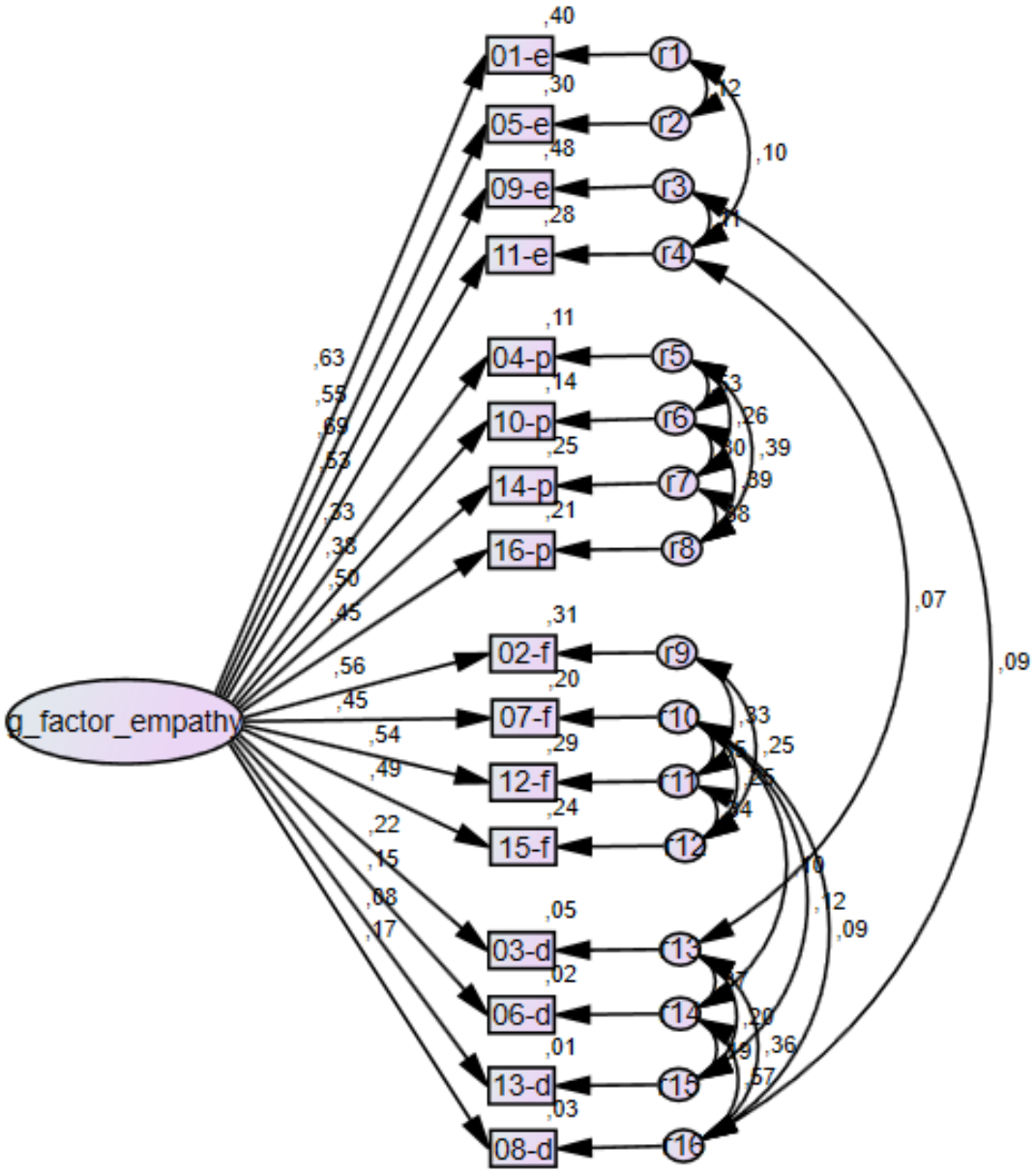
## 3.1. Preliminary remark on the consideration of unsystematic residual covariances.

In all of the following models, we account for the possibility of residual covariances from the outset. This is done in particular because of the semantic similarity of many items within a factor. The modification indices calculated starting from the initially assumed independence of the residuals show several times that the residual covariances have to be treated as free parameters, which significantly improves the model fit quality. The selection of the free parameters was based on the modification indices; all covariances with a ParChange of at least .10 or higher were considered.

## 3.2. Model 1a,b

First, we tested how well a general factor model can be represented across all items. Regardless of the quality of the model fit, the following figure 1 shows that the standardized regression weights of the PD items are significantly lower than those of the other three constructs (see table 3).

**Figure 1. Standardized path model of a presumed general factor empathy. (Modell 1a)**


g_factor_empathy
01-e
05-e
09-e
11-e
04-p
10-p
14-p
16-p
02-f
07-f
12-f
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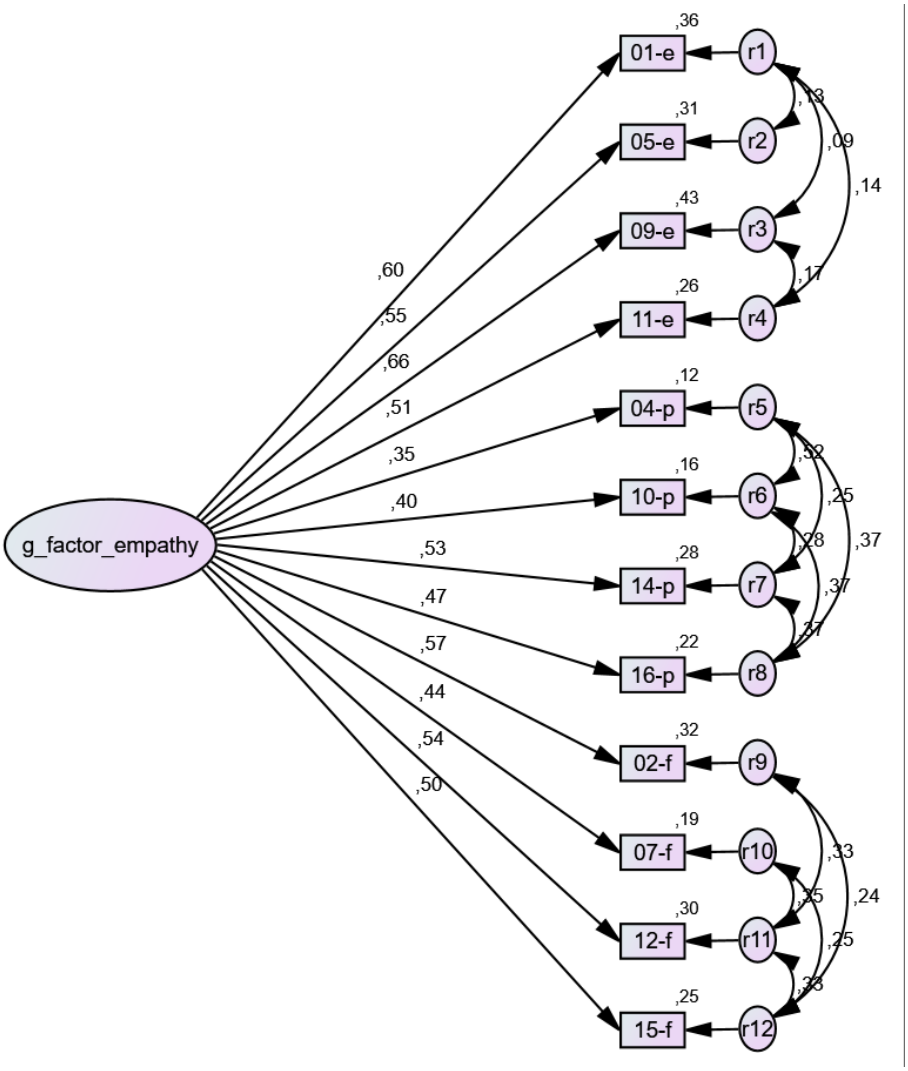
,57

**Table 3. Standardized regression weights with three and four subscales, respectively.**

| | | | 4 Scales | 3 Scales |
|---|---|---|---|---|
| EC1 | <--- | g_factor_empathy | .62 | .55 |
| EC2 | <--- | g_factor_empathy | .56 | .50 |
| EC3 | <--- | g_factor_empathy | .70 | .63 |
| EC4 | <--- | g_factor_empathy | .53 | .51 |
| PT1 | <--- | g_factor_empathy | .34 | .38 |
| PT2 | <--- | g_factor_empathy | .38 | .43 |
| PT3 | <--- | g_factor_empathy | .51 | .61 |
| PT4 | <--- | g_factor_empathy | .46 | .55 |
| FS1 | <--- | g_factor_empathy | .53 | .56 |
| FS2 | <--- | g_factor_empathy | .41 | .43 |
| FS3 | <--- | g_factor_empathy | .51 | .58 |
| FS4 | <--- | g_factor_empathy | .47 | .57 |
| PD1 | <--- | g_factor_empathy | .21 | --- |
| PD2 | <--- | g_factor_empathy | .14 | --- |
| PD3 | <--- | g_factor_empathy | .19 | --- |
| PD4 | <--- | g_factor_empathy | .08 | --- |

As already described at the beginning, the factor personal distress is repeatedly in the focus of criticism. Here, too, the values of the PD scale stand out clearly (negatively) from the other three scales, which we interpret as an indication that this scale does not quite fit into the theoretical concept of empathy as it is supposed to be captured by the SPF. If we now test the model fit of a general factor model with only three scales (1b, figure 2), the goodness of fit changes significantly (cf. table 4), so that this model must now be tested against the assumptions described above.

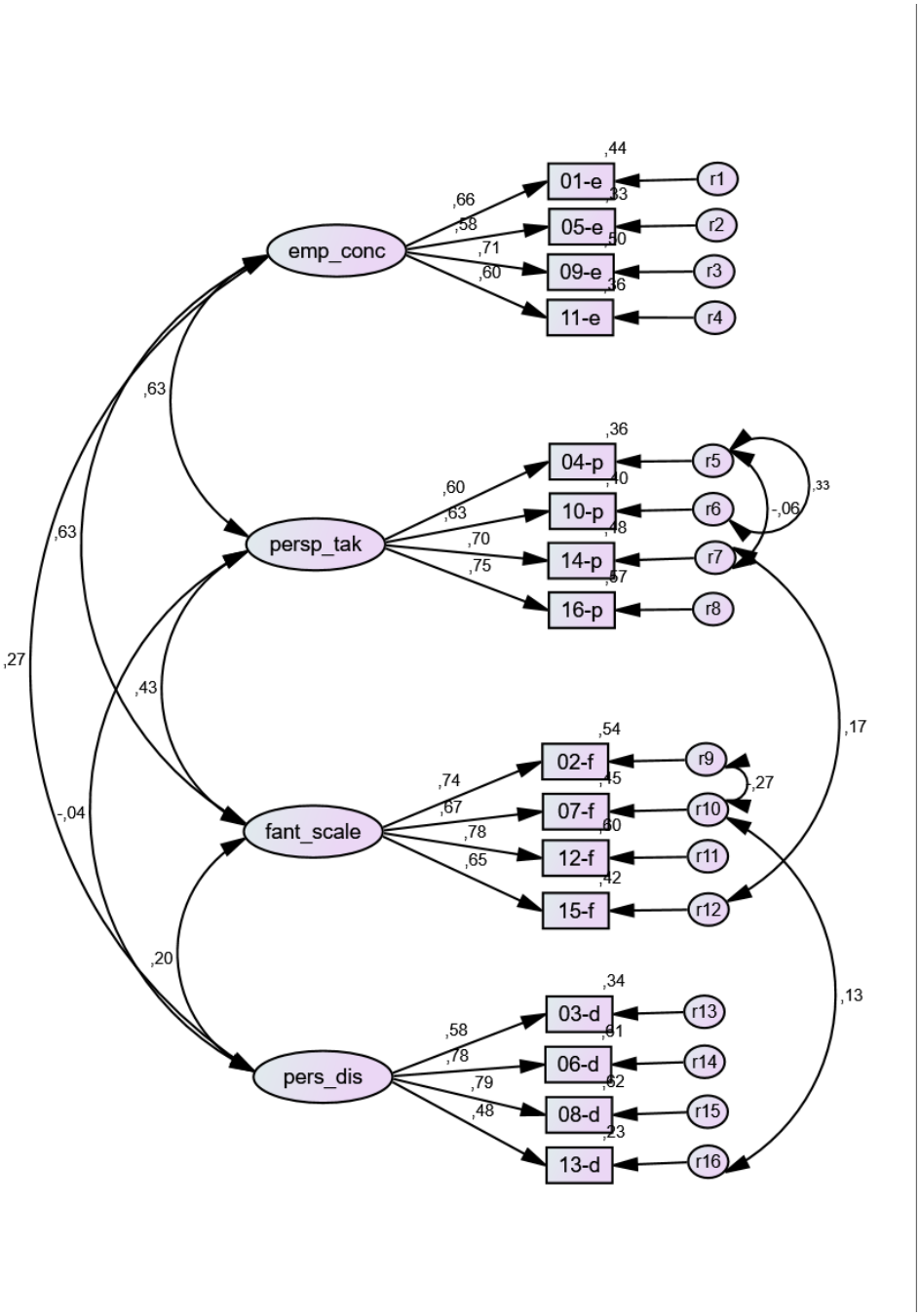
**Figure 2. Standardized path model of a presumed general factor empathy without PD items. (Modell 1b)**




## 3.3. Model 2a,b

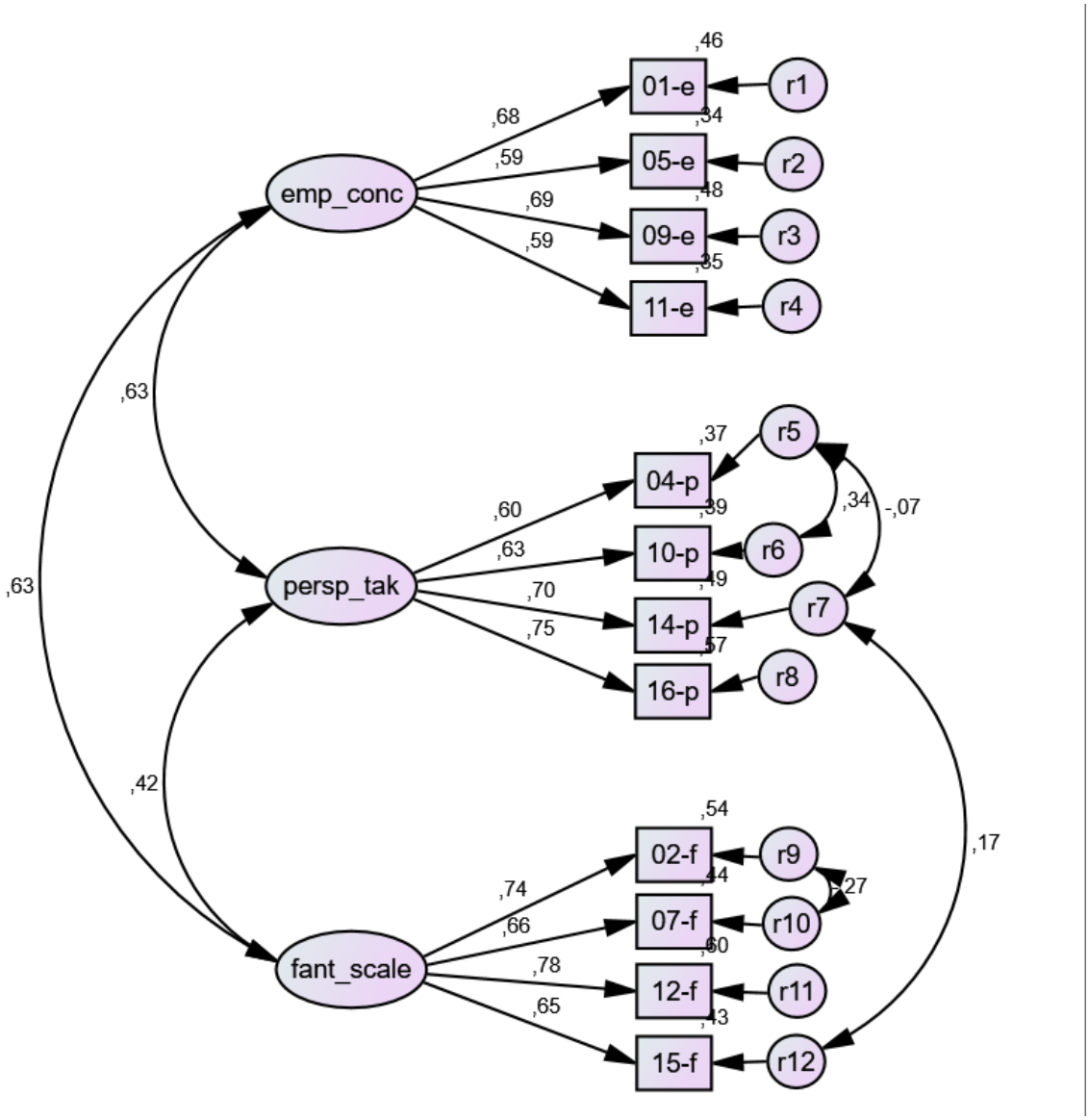
In the construction of the IRI (Davis, 1983b) and the construction of the SPF derived from it (Paulus, 2009), four factors of empathy were initially assumed to be independent. However, the assumption of independence, as still formulated by Davis, could not be confirmed (Paulus, 2009, 2012, 2014), but in principle the 4-factor structure is very clearly demonstrable (cf. table 1). From this, we derive models 2a and 2b to be tested in the following and examine how well our data fit these models.

**Figure 3. Four-Factor-Model (2a)**



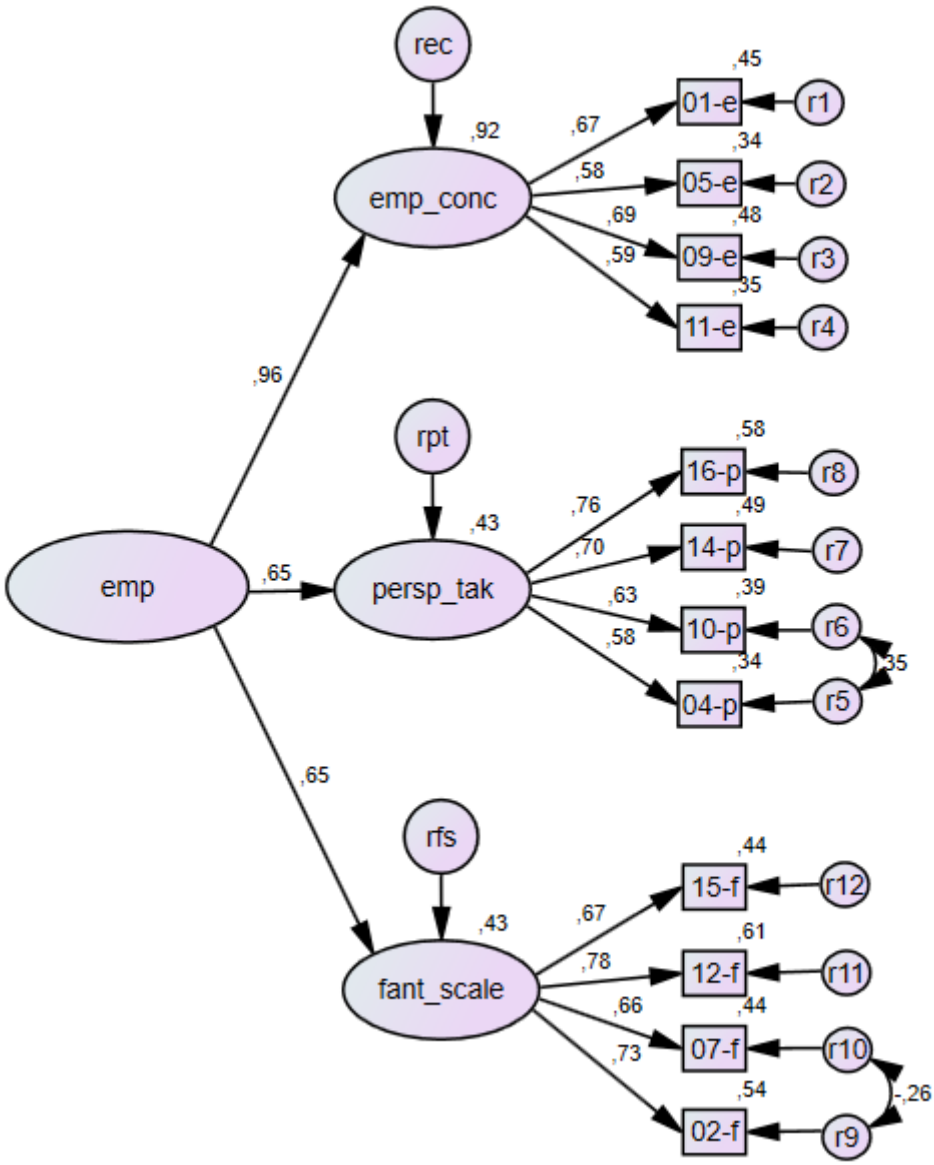

Again, it can be seen that while the distress scale is clearly structured in itself, there are very low covariances to the other three factors (PD-EC: .10; PD-PT: -.01; PD-FS: .08; all p<.01). PD appears to be a factor that is not directly related to empathy theory as measured by the IRI or SPF. Rather, PD represents an independent factor that can be described more as a possible consequence of the other factors, especially PT. In the context of perspective taking, two possible directions are conceivable: If I observe someone who is in distress, I can (a) either imagine how *the other person* perceives this situation and feels about the situation ("imagining other") or I can (b) imagine how *I would feel* in this situation ("imagining self"). However, these approaches to perspective taking lead to different consequences: Both directions of perspective taking lead to empathy, but option (b) can additionally generate personal distress. The resulting motivation to act can be altruistic (to help the victim) in the first case, and selfish (to turn off personal distress) in the second case (Batson et al., 1987; Cliffordson, 2002; Underwood & Moore, 1982). Theoretically it actually seems more likely that a model with only three factors would be more useful, which is what we will explore below.

**Figure 4. Three-Factor-Model (2b)**




Thus, theoretically, only the three factors EC, PT, and FS form the basis of the empathy construct. This can also be represented in a higher-order model (cf. figure 5) without changing the adjustment parameters.

**Figure 5. Higher-Order-Model of empathy**




## 3.4. Assessment of the overall goodness of fit

Following Hu and Bentler (1999) and Weiber and Mühlhaus (2014), respectively, we consider fit measures from the following three categories to assess the overall goodness of our models: Inferential statistical goodness of fit (RMSEA), descriptive absolute fit indices ($\chi 2$, SRMR), and incremental fit measures for model comparison default vs. independent model (CFI). Overall, the model fit parameters, as presented for all models in table 4, favor the three-factor model. With fewer parameters, this model has a better overall goodness of fit than the other models.

**Table 4. Fit-Parameter for the different models**

| Modell | NPAR | $\chi 2$ | df | p | RMSEA (PCLOSE) | SRMR | CFI |
|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1a: General factor with four subscales** | 56 | 3245.10 | 80 | <.00 | .06 (.00) | .06 | .92 |
| **1b: General factor with three subscales** | 39 | 1186.88 | 39 | <.00 | .06 (.00) | .04 | .96 |
| **2a: Four-Factor-Model** | 43 | 2298.39 | 93 | <.00 | .06 (.00) | .05 | .94 |
| **2b: Three-Factor-Model** | **31** | **1126.76** | **47** | **<.00** | **.06 (.00)** | **.04** | **.96** |
| **Higher-Order-Model** | 29 | 1292.99 | 49 | <.00 | .06 (.00) | .04 | .96 |

# 4. Discussion

Empathy as a multidimensional construct consisting of affective and cognitive elements is frequently measured in the German-speaking world using the German translations of the IRI (Hosser & Greve, 1999; Lauterbach & Hosser, 2007; Paulus, 2009). Common to all of them is Davis' (1983b) empathy theory, which includes the four factors empathic concern (EC), perspective taking (PT), personal distress (PD), and fantasy (FS). Another common feature is that all German versions have reduced the number of items after test validity analyses, e.g., in the SPF (Paulus, 2009) from originally 28 items to 16 items. In addition, in the SPF the response scale was changed from "does not describe me - describes me very well" to a Likert-scale of "never applies - always applies." The questionnaire, similar to the other translations, has very good test goodness criteria, but its theoretical fit has not yet been analyzed with structural equation models.

We started from two basic assumptions: First, the possibility of a so-called general factor model as postulated e.g. by Eysenck et al. (1990) and, alternatively, a four-factor model as described by Davis (1983b). In both models, it was very clear that the PD scale did not fit the theoretical framework. As described earlier, the criticism of this scale is not new, but we can now show here that the fit values of both models increase significantly when the PD scale is not included. Indeed, personal distress seems to be more a consequential response to empathy, especially PT, than part of the construct empathy, as already formulated by Batson et al. (1997). Likewise, Cliffordson's (2002) and Paulus's (2012) attempts to calculate an overall score for the construct empathy argue in favor of this; for both, the optimal sum score was considered to be the additive combination of the factors EC, PT, and FS.

Comparing both model assumptions (general factor vs. multifactor model), the three-factor model proved to be the one with the best fit measures after deleting the PD scale (see table 4).

Another open question was the interpretation of the fantasy scale as affective or cognitive scale. Arguing for the latter assignment are the formulations of three (out of four) items describing a reaction to empathizing with fictional characters ("I can imagine the feelings of a person in a novel very well" / "When I see a good movie, I can empathize with the main character very easily." / "When I read an interesting story or a good book, I try to imagine how I would feel if the events happened to me.") and thus are very close to the construct of perspective taking. This is also evident from the fact that, at least for the latter item, a residual correlation with a PT- item was included in our structural model 2b. This is contrasted with the remaining item ("After watching a movie, I feel as if I am one of the characters from that movie"), which clearly describes an affective process. However, our Model 2b clearly shows that the latent variable FS correlates higher with EC ($r$ = .63) than with PT ($r$ = .42) (similarly, the correlation values of the classical factor analysis from table 2 also show this) and is therefore more likely to be interpreted as affective by the PBs.

In subsequent analyses, the classical test quality criteria for the revised version of the SPF must now be tested again in order to confirm the quality of the questionnaire in this way as well.

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