





# Development and Validation of a German Interpersonal Sensitivities Circumplex (ISC-G)

## A Self-Report Measure of Perceived Aversive Behaviors of Others

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**Abstract:** The Interpersonal Sensitivities Circumplex (ISC) assesses individual differences in sensitivities to aversive interpersonal behaviors. In this research (total  $N = 1,519$ ), we developed and validated a German adaptation of the ISC (ISC-G) and extended the nomological net of interpersonal sensitivity as a construct. Using the structural summary method, we investigated associations with self- and informant reports of adaptive (interpersonal) personality traits as well as self-reported personality functioning, maladaptive personality traits, childhood trauma, and hypersensitivity. Replicating and extending previous findings with the ISC, the present research sheds light on the interplay between different personality traits and the perception of others' interpersonal behavior. Results suggested that individuals report experiencing interpersonal behavior opposite to their own self-description in terms of agency and communion as aversive. This oppositional pattern was most pronounced for antagonistic vs. agreeable traits/behaviors. We discuss these results in the context of research on personality pathology.

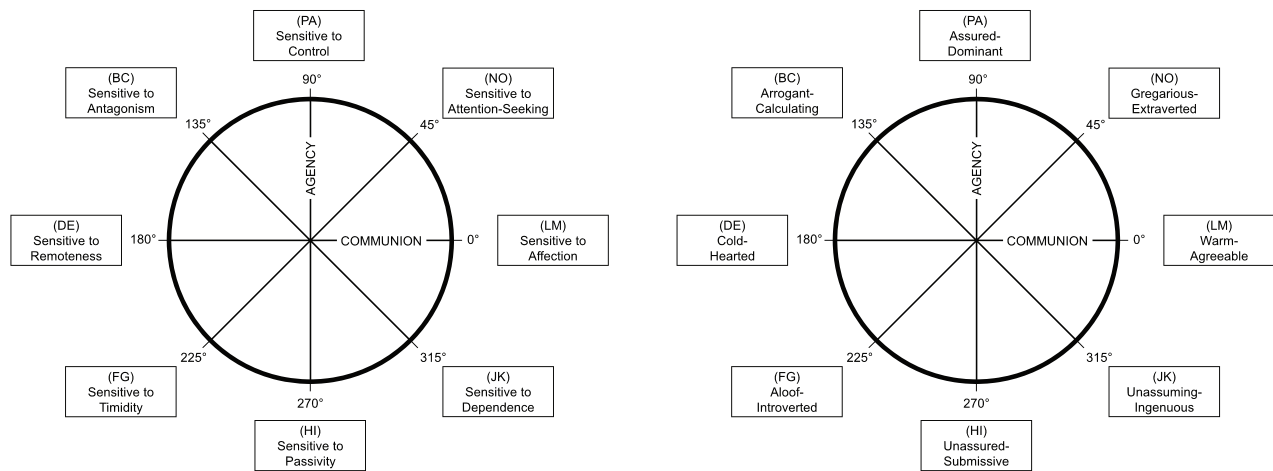
**Keywords:** validation, interpersonal sensitivity, circumplex model, psychopathology, personality pathology



As a social species, human beings interact with others regularly. But interpersonal contact is not always pleasant. Sometimes, others' behavior is irritating. Importantly, not every person is disturbed by the same behavior and in the same intensity as others. While some may be irritated by others' friendliness, others may welcome it. The *Interpersonal Sensitivities Circumplex* (ISC; Hopwood et al., 2011) was developed to capture individual differences in sensitivity to different interpersonal behaviors.

In the ISC model, various forms of interpersonal sensitivities are organized within the *Interpersonal Circumplex* framework (IPC; see Figure 1; Leary, 1957; Wiggins, 1991). The IPC organizes interpersonal phenomena (behaviors, traits, motives) in a circular manner around the two orthogonal dimensions of agency (dominance, power,

status) and communion (friendliness, warmth, love). Agency ranges from assertive/dominant to unassertive/submissive behavior and thus reflects the individual's relative status ("getting ahead"). Communion ranges from warm/agreeable to cold/quarrelsome behavior and thus reflects the extent to which the person "gets along" with others (Wiggins, 1991). Within the IPC, behaviors that are alike are placed side by side, whereas behaviors that are thought to be unrelated are placed at an angle of 90°, and opposite behaviors are placed on opposite sides of the circle. As illustrated in Figure 1, the IPC can be divided into eight segments (*octants*) labeled with two capital letters (Wiggins, 1979). Each octant represents a specific blend of agency and communion (e.g., the octant NO reflects high agency and high communion). The original English-language ISC is comprised of 64 items representing various kinds of aversive interpersonal behaviors. Respondents are asked to rate how much it bothers them when another person engages in the described behavior (e.g., "doesn't want to be friends", "is bossy"). Items are aggregated into



**Figure 1.** Circumplex models of Interpersonal Sensitivities Circumplex (ISC; Hopwood et al., 2011; left panel) and Interpersonal Adjective Scales (IAS-R; Wiggins et al., 1988; right panel).

eight scales that reflect the octants of the IPC (Figure 1). Each octant represents the tendency to be bothered when others show behaviors representative of that specific blend of agency and communion. In addition, general interpersonal sensitivity (i.e., regardless of style) can be distinguished from these dimensions by considering a total score or general factor.

In interpersonal theory, the principle of complementarity describes the tendency of two interacting individuals to behave oppositely in terms of agency and similarly in terms of communion (Kiesler, 1983; Carson, 1969). When the dynamics of interactions are measured as they unfold, research has reliably found that dominant behavior pulls for submissive behavior and submissive behavior pulls for dominant behavior, whereas warmth pulls for warmth and coldness pulls for coldness (Fox et al., 2021; Sadler et al., 2009). It has been theorized that this kind of complementarity occurs because complementary behaviors satisfy the underlying motives of interaction partners (Horowitz et al., 2006). It follows that anticomplementary behaviors (i.e., similar on agency and opposite on communion) should be experienced as bothersome because interpersonal motives are frustrated.

Using the ISC, however, Hopwood et al. (2011) found that – whereas cold-dominant and dominant behaviors were reported as most bothersome on average – individuals tended to find interpersonally opposite behaviors aversive (i.e., opposite on both agency and communion). Thus, participants report being generally less bothered by behaviors they exhibit themselves and bothered more by behaviors contrary to their own. For example, individuals with cold-dominant (BC) interpersonal traits reported relatively greater sensitivities to warm-submissive behaviors (JK, sensitivity to dependence) in the ISC. The Big Five domains of extraversion and agreeableness can be seen as rotated

variants of the interpersonal dimensions of agency and communion (McCrae & Costa, 1989), with (high) extraversion being located in the warm-dominant octant (NO) and (high) agreeableness being indicative of warm-submissive behavior (JK). Consistent with the notion of interpersonal opposites, Hopwood et al. (2011) found extraversion to be specifically related to sensitivity to timidity (FG) and agreeableness to be specifically related to sensitivity to antagonism (BC). Thus, the principle of complementarity may not be reflected in the relationship between individuals' self-reported traits and their descriptions of how they perceive others' behavior in general. The finding of interpersonal opposites tending to be reported as bothersome in the ISC rather appears to align with social psychological findings regarding the effect of similarity on liking. Specifically, meta-analytic findings suggest that perceived and actual similarities between persons are associated with higher attraction, and thus liking, toward others (Montoya et al., 2008). As the robust effect that 'similarity attracts' (Byrne, 1997) also pertains to personality traits (e.g., Grosz et al., 2015; Tenney et al., 2009), its counterpart assumption that dissimilarity generates repulsion (Rosenbaum, 1986) may help explain interpersonal opposites being perceived as disturbing. In this vein, the similarity-attraction literature may provide an alternative hypothesis to the complementarity principle with regard to the perception of interpersonal behaviors: Individuals could indeed find behaviors most aversive that are opposite to their own on both agency and communion.

Personality disorders (PDs) are often described in terms of interpersonal dysfunction (e.g., Hopwood, 2018; Hopwood et al., 2013; Pincus et al., 2020; Wright et al., 2012). For example, according to the Diagnostic and Statistical Manual of Mental Disorders (5th edition; DSM-5; American Psychiatric Association [APA], 2013), borderline

PD is characterized by unstable interpersonal relationships, schizoid PD is associated with detachment from social relationships, and individuals with dependent PD fear the loss of support or approval and show submissive behavior in order to elicit warm, caregiving reactions in others (APA, 2013). The Alternative Model for Personality Disorders in DSM-5 (AMPD; APA, 2013) posits two components of personality pathology that capture interpersonal content. Criterion A pertains to general personality functioning and involves interpersonal dysfunction in the form of impairments in an individual's capacity to relate to others (i.e., empathy, intimacy). Criterion B contains the maladaptive traits and facets model of which several are inherently interpersonal per definition (e.g., hostility, withdrawal) and are also characterized by specific interpersonal content in terms of problematic interpersonal behaviors associated with them (Williams & Simms, 2016; Wright et al., 2012). Research using the ISC has thus far accumulated evidence suggesting that interpersonal sensitivities show general and specific associations with features of personality pathology. For instance, results indicate that more severe personality dysfunction is associated with more general interpersonal sensitivity (Dowgwillow et al., 2018; Hopwood et al., 2018). Other correlates of interpersonal sensitivities include pathological narcissism (Hopwood et al., 2011), obsessive-compulsive PD (Cain et al., 2015), and subclinical maladaptive traits (Dowgwillow & Pincus, 2017; Grove et al., 2019). Interpersonal dysfunction is often studied in terms of interpersonal problems (e.g., Alden et al., 1990), which reflect an individual's perception of problems with their own interpersonal behavior (e.g., being aggressive toward others; trying to please others too much). Importantly, interpersonal problems and sensitivities appear to be related but distinct sources of information about an individual's interpersonal dysfunction (Hopwood & Good, 2019).

This research aimed to adapt the ISC (Hopwood et al., 2011) into German, validate the new measure, and further investigate how interpersonal sensitivities relate to personality, interpersonal style, and psychopathology. We followed Hopwood et al. in examining associations between ISC octants and self-reported Big Five domains and interpersonal traits. Extending previous research, we also examined associations between self-reported interpersonal sensitivities and interpersonal traits as judged by groups of informants for each target individual. This enabled more robust interpretations of the interplay between interpersonal style and sensitivities. We also extended previous research by examining maladaptive personality traits in greater detail. Although the link between personality functioning and interpersonal sensitivity has already been established in previous studies, findings are limited to Criterion A of the AMPD and specific maladaptive personality traits such as pathological narcissism. In addition to replicating these

correlates, we explored the ISC in relation to Criterion B. Finally, we investigated associations with further variables related to maladaptive social functioning. Childhood maltreatment is characterized by attachment and interpersonal problems in adults (Godbout et al., 2019; Paradis & Boucher, 2010). Hypersensitive individuals report being easily stressed and overwhelmed by internal and external demands and stimuli (Aron & Aron, 1997; Benham, 2006).

We had the following hypotheses. First, we expected that general interpersonal sensitivity would be related to personality dysfunction, pathological narcissism, childhood maltreatment, and hypersensitivity. Second, we expected people to report being most bothered by their interpersonal opposites across interpersonal traits and both normal-range and maladaptive personality traits.

## Method

### Samples

We tested our hypotheses in four independent samples. Table 1 describes sample characteristics and measures used in each sample. All participants provided informed consent and received course credit (student samples), monetary rewards, or comparable rewards (community and general population samples). Participants were recruited at several universities, online, or via the panel provider Respondi (Sample 4). In Sample 2, informants were recruited by their respective targets. We report how we determined our sample size, all data exclusions, all manipulations, and all measures used in this research. In terms of sample size, we included samples that allow for stable estimation of correlations (Schönbrodt & Perugini, 2013). This criterion was not considered for Sample 2, given the complexity of collecting multi-rater data. In Samples 1 and 3, we excluded participants with more than 10% missing values in the ISC. In Samples 2 and 4, there were no missing data. Sample 1 was used to derive a 40-item ISC from a larger item pool. All other samples were used for validation analyses.

### Measures

In the following, all measures will be listed in the order of the respective samples in which they were used. In Sample 1, only the German ISC item pool was administered. In further samples, the final ISC-G was assessed alongside the criterion measures.

#### Interpersonal Sensitivities Circumplex – German Item Pool (Sample 1) and ISC-G (Further Samples)

We aimed to construct a German adaptation of the ISC (Hopwood et al., 2011), a 64-item questionnaire with items

**Table 1.** Sample characteristics and overview of measures used in specific samples

#	Population	N	Age M (SD)	Gender	Measures
1	Community	379	31.4 (10.1)	84% female	ISC-G item pool
2a	Students	129	21.7 (4.46)	87% female	ISC-G, IAL self-report
2b	Informants*	377	30.9 (14.4)	59% female	IAL informant report
3	Students	507	25.2 (7.49)	86% female	ISC-G, PID-5, IPO-16, CTQ
4	General Population <sup>†</sup>	504	46.6 (14.7)	51% female	ISC-G, HSPS-G, HSNS

Notes. ISC-G = German Interpersonal Sensitivities Circumplex; IAL = Interpersonal Adjective List; PID-5 = Personality Inventory for DSM-5; IPO-16 = Inventory of Personality Organization; CTQ = Childhood Trauma Questionnaire; HSPS-G = Hypersensitive Person Scale; HSNS = Hypersensitive Narcissism Scale. Samples 2 and 3 were also used in Leising et al. (2013) and Zimmermann et al. (2014), respectively, which did not include the ISC-G or any of the present analyses. \*There were three informant reports per target for all but 10 participants who were judged by two informants each. <sup>†</sup>Sample 4 was approximately representative of the German population in terms of age and gender.

assessing the extent to which individuals are bothered by others' interpersonal behaviors. In the ISC, respondents are asked to rate how much it bothers them when another individual engages in the behaviors described by the items, using a response format ranging from 1 = *not at all, never* to 8 = *extremely, always*. Items form eight scales (i.e., octants), each representing different types of interpersonal sensitivity (e.g., sensitivity to affection, LM), and are organized within the circular structure of the IPC.

For a pilot study ( $N = 206$  students, 80% female,  $M_{\text{Age}} = 24.7$ ), the 64 original English items were translated into German, such that wordings remained as similar as possible. The German version was then back-translated by native English speakers to check for correspondence, and the final translation was approved by the first author of the original form. However, the 64 original items did not perform well, which was primarily due to the low reliability of affiliative octant scales (i.e., NO, LM, JK) and poor model fit. We thus reworded the 25 most ill-fitting items and also created 33 new items to be able to draw from a larger item pool. A major strategy was to include more extreme descriptions of behaviors in affiliative octant scales, for example, by changing "tells me they love me" to "tells me they love me all the time" (Item 23, LM). In doing so, we attempted to represent extreme behaviors by high intensity ("very") or frequency ("always") rather than by statements regarding maladaptivity ("too much"). We aimed for a shorter adaptation that still covers the breadth of ISC octants but also facilitates economic assessment. The revised 97-item set was presented to Sample 1, whereas the final 40-item ISC-G was presented to all further samples.

### Interpersonal Adjective List (IAL) Self- and Informant Reports

The IAL (Jacobs & Scholl, 2005) is a German adaptation of the Interpersonal Adjective Scales (IAS; Wiggins, 1995; Wiggins et al., 1988), which measures interpersonal traits using an IPC framework. It has 64 items, eight for each octant scale. Respondents are asked to rate how much a given interpersonal adjective (e.g., assertive, PA)

describes them on an 8-point response scale ranging from 1 = *extremely inaccurate* to 8 = *extremely accurate*. In the present study, the IAL was used as a self-report (Sample 2a) as well as an informant-report measure (Sample 2b). Cronbach's  $\alpha$  for self-reported octant scales ( $Mdn = .81$ ) ranged from .75 (JK) to .85 (FG). Informant ratings were averaged on the item level for each target across informants. For averaged informant ratings,  $\alpha$  coefficients ( $Mdn = .83$ ) ranged from .78 (NO) to .86 (PA). Self-informant correlations ( $Mdn = .51$ ) for octant scales ranged from .31 (JK) to .60 (BC), indicating typical levels of agreement of personality traits between self-reports and informant ratings (e.g., Connelly & Ones, 2010).

### Minimum Redundancy Scales (MRS)

The 30-item version of the MRS (Ostendorf, 1990; Schallberger & Venetz, 1999) assesses the Big Five personality domains via 30 pairs of adjectives optimized to have as little semantic overlap as possible. For each item, respondents are asked to rate which of the two adjectives describes them better on a 6-point bipolar scale ranging from a strong endorsement of the first term (1) to a strong endorsement of the second term (6). One adjective reflects high trait levels of the respective domain, and the other reflects low levels, respectively. In Sample 3, Cronbach's  $\alpha$  coefficients ( $Mdn = .81$ ) ranged from .78 (agreeableness) to .90 (neuroticism).

### Personality Inventory for DSM-5 (PID-5)

The PID-5 is a 220-item self-report measure assessing the dimensional trait model of DSM-5 (APA, 2013; Zimmermann et al., 2014), that is, Criterion B of the AMPD. It assesses 25 maladaptive personality trait facets, with each facet comprising 4 to 14 items. Five groups of three facets each can be combined into the five broader maladaptive trait domains of negative affectivity, detachment, antagonism, disinhibition, and psychoticism. Items are rated on a 4-point response scale ranging from 0 = *very false* to 3 = *very true*. In Sample 3, Cronbach's  $\alpha$  of the trait domains ( $Mdn = .94$ ) ranged from .88 (antagonism) to .95 (psychoticism).

For the trait facets,  $\alpha$  coefficients ( $Mdn = .85$ ) ranged from .71 (irresponsibility; manipulativeness) to .95 (eccentricity).

### Inventory of Personality Organization (IPO-16)

The IPO-16 (Zimmermann et al., 2013) is a 16-item self-report measure assessing the general severity of an individual's personality dysfunction (Zimmermann et al., 2020) and therefore served as an indicator of Criterion A of the AMPD. Items describe impairments in three domains of personality functioning (identity diffusion, primitive defenses, and reality testing) and are rated on a 5-point response scale ranging from 1 = *never applies* to 5 = *always applies*. In Sample 3, Cronbach's  $\alpha$  of the total score was .84.

### Childhood Trauma Questionnaire (CTQ)

The CTQ (Bernstein et al., 2003; Wingenfeld et al., 2010) is a 28-item self-report measure assessing different types of abuse (emotional abuse, physical abuse, sexual abuse, emotional neglect, physical neglect) that may have been experienced during childhood or adolescence. Respondents indicate the frequency of abuse on a 5-point scale ranging from 1 = *never* to 5 = *very often*. Cronbach's  $\alpha$  of the CTQ total score was .93 in Sample 3.

### Hypersensitive Narcissism Scale (HSNS)

The HSNS (Hendin & Cheek, 1997) is a 10-item self-report measure that assesses hypersensitive narcissism as the disposition toward hypersensitivity to criticism, narcissistic vulnerability, and entitlement. We used a German translation of the HSNS provided by the original authors. Items are answered on a 5-point scale ranging from 1 = *very uncharacteristic or untrue, strongly disagree* to 5 = *very characteristic or true, strongly agree*. In Sample 4, Cronbach's  $\alpha$  was .78.

### Highly Sensitive Person Scale – German (HSPS-G)

The HSPS-G (Konrad & Herzberg, 2019) is a German 26-item adaptation of the HSPS (Aron & Aron, 1997) and assesses hypersensitivity regarding external and internal stimuli via self-report. Items are answered on a 5-point scale ranging from 0 = *hardly at all* to 4 = *extremely*. Cronbach's  $\alpha$  of the total score was .94 in Sample 4.

## Statistical Analysis

We used the statistical software R 4.1.2 (R Core Team, 2021) for all analyses. More detailed explanations of the statistical analyses are provided in the supplement (Note S1; <https://osf.io/mf2c3/>). The circumplexity of the ISC-G was evaluated in two ways. First, we used RANDALL's correspondence index (Tracey, 1997) to determine how well correlations between both raw and ipsatized octants (i.e.,

after accounting for a general factor) conformed to a circular pattern (e.g., Alden et al., 1990; Hopwood et al., 2011). Second, we tested model fit to a perfect circumplex structure (e.g., Gurtman & Pincus, 2003; Wendt et al., 2019) in confirmatory factor analysis (CFA) using the robust maximum likelihood estimator (MLR) by considering established recommendations for model fit indices (Hu & Bentler, 1999).

The structural summary method (SSM; Zimmermann & Wright, 2017) was used to represent the patterns of correlations between ISC octant scales and external criteria as a cosine curve, which can be seen as projecting a criterion variable onto the circular surface of the ISC-G (see supplemental Figure S1; <https://osf.io/mf2c3/>). *Elevation* reflects the criterion's association with general sensitivity to aversive behaviors. Bootstrapped 95% confidence intervals (95% CI) with 2,000 replicates were used to decide whether elevation is significantly different from zero. The cosine curve's *amplitude* indicates the interpersonal specificity of a variable. For interpreting effect sizes of amplitudes, Zimmermann and Wright (2017) conducted an empirical review of amplitudes across the literature, according to which amplitudes around .10, .16, and .23 can be conceived as relatively small, average, or large effects. *Angular displacement* (from 0°; see Figure 1) reflects the location of the predominant interpersonal theme associated with a criterion within the circumplex. We only took this parameter into account for criteria with a pattern of correlations showing *prototypicality* ( $R^2$ ; Gurtman & Pincus, 2003), meaning that the pattern of correlations forms a cosine wave. Similar to Hopwood et al. (2011), we used an  $R^2$  value of .70 as the cutoff for interpreting displacement.

## Results

### Deriving the Final German ISC (ISC-G)

Similar to existing IPC-based measures, the 40-item ISC was derived by projecting the initial item pool on the IPC in Sample 1 and extracting two orthogonal factors (i.e., agency and communion) from ipsatized items using principal components analysis (e.g., Hopwood et al., 2011) and selecting five items per octant. Items were selected to reflect a specific octant well with respect to angular displacement, amplitude, and fit. In the item selection process, we prioritized a combination of high amplitudes (i.e., high communalities in the two-factorial principal components analysis) on the one hand and an average deviation around 0° from an octant's theoretical angular displacement across items of an octant scale on the other hand. The final ISC-G includes 11 revised, 7 new, and 22 directly translated ISC items (see supplemental Table S1 for a full item list of the ISC-G; <https://osf.io/mf2c3/>).

## Structure and Descriptive Statistics of the ISC-G

We calculated internal consistencies and fit to a circumplex model in all samples (see Table 2). Overall, the data supported the circular structure of the ISC-G with acceptable fit both in terms of RANDALL's correspondence index and fit to the perfect circumplex CFA model. Fit to the latter model was comparable to model fit reported elsewhere (e.g., Wendt et al., 2019) of different versions of the Inventory of Interpersonal Problems (IIP; Alden et al., 1990). Internal consistencies were in the acceptable range as well, with medians across samples ranging from .74 (JK, NO) to .89 (DE).

In line with findings from Hopwood et al. (2011), an inspection of scale means showed that participants consistently were most sensitive to control (PA; *Mdn* = 6.38), antagonism (BC; *Mdn* = 6.18), and attention-seeking (NO; *Mdn* = 6.12) but reported relatively little sensitivity to timidity (FG; *Mdn* = 3.51). In terms of scale usage, individuals thus reported being “quite, frequently” bothered (= 6 on the response scale) by dominant (PA), cold-dominant (BC), and warm-dominant (NO) behaviors, whereas they were “somewhat, more than half of the time” (= 5) bothered by cold behaviors, and “slightly, less than half of the time” (= 4) bothered by cold-submissive (FG), warm (LM), warm-submissive (JK), and submissive (HI) behaviors. With respect to the higher-order dimensions of agency and communion, only 48 (3%) of all 1,519 participants across samples reported being relatively more bothered by submissive behaviors (i.e., negative values on the higher-order dimension of agency), whereas 1,471 (97%) were relatively more bothered by dominant behaviors (i.e., positive values on agency). In contrast, participants were almost equally distributed in terms of whether they found warm (779 individuals, 51%) or cold behaviors (740 individuals, 49%) more disturbing.

## Associations With Criterion Variables

We used the structural summary method (SSM) to project the criterion variables on the circular ISC surface. We report all correlation-based SSM statistics and their 95% confidence intervals in the supplement (Table S2; <https://osf.io/mf2c3/>). Prototypical correlation profiles (i.e.,  $R^2 \geq .70$ ) are displayed in Figures 2 and 3.

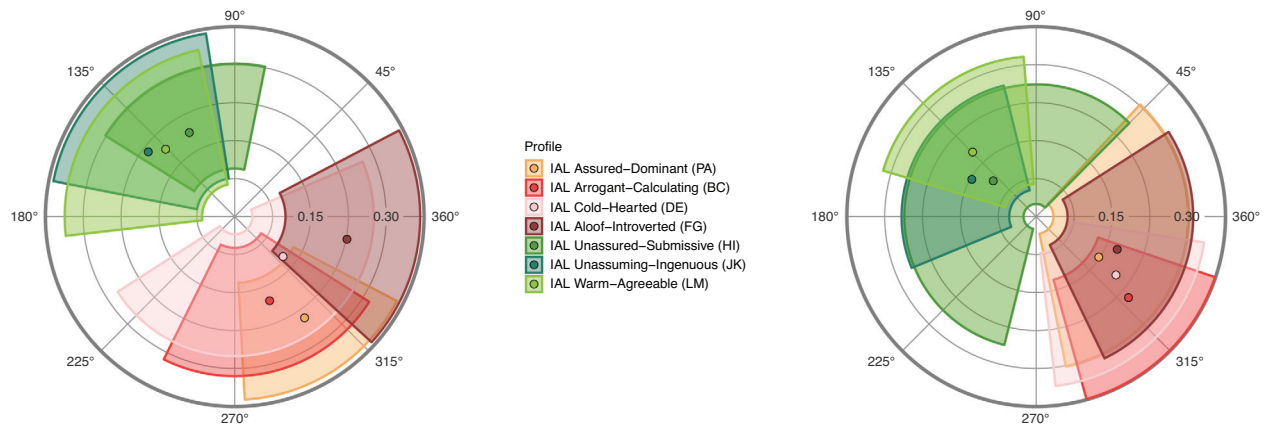
## Self- and Informant Reported Interpersonal Traits

The overall patterns of self- and informant ratings were similar (Figure 2). In general, all self- and informant-rated IAL octants except attention-seeking (NO) showed prototypical profiles. Interpersonal traits ranging counterclockwise from submissive to warm traits (i.e., HI to LM) were

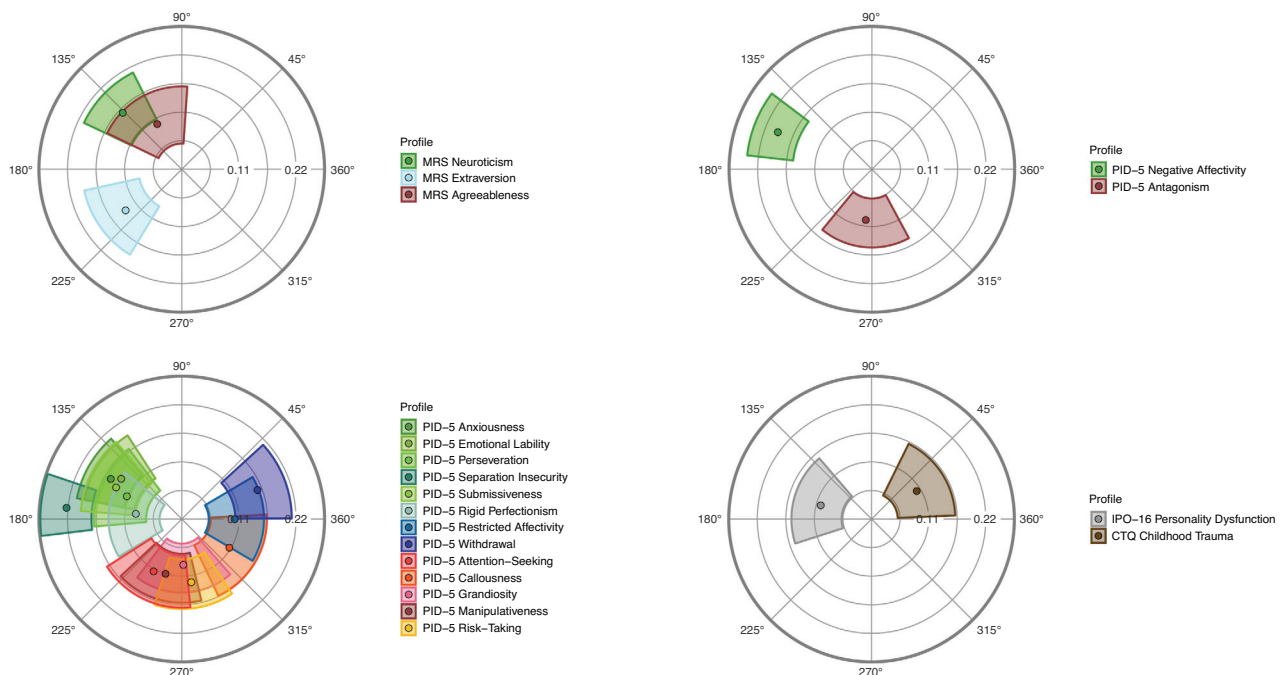
**Table 2.** Fit statistics, internal consistencies, and scale statistics of the ISC-G in all samples

Sample	RANDALL CI		CFA model fit			Scale mean (SD)/internal consistency ( $\alpha$ )							
	Raw	Ipsatized	CFI	RMSEA	SRMR	PA	BC	DE	FG	HI	JK	LM	NO
1	.91 [.82, .95]	.99 [.96, 1]	.96	.07	.07	6.4 (1.1)/.79	6.2 (1.1)/.73	4.4 (1.6)/.90	3.3 (1.2)/.82	4.3 (1.3)/.81	4.4 (1.3)/.76	4.4 (1.4)/.79	6.2 (1.1)/.74
2	–	–	–	–	–	6.5 (1.0)/.71	6.2 (1.2)/.83	5.1 (1.5)/.87	3.6 (1.2)/.78	4.4 (1.1)/.70	4.3 (1.2)/.72	4.0 (1.1)/.62	6.1 (1.0)/.73
3	.88 [.79, .92]	.97 [.91, .99]	.93	.09	.07	6.3 (1.0)/.73	6.2 (1.1)/.76	5.0 (1.4)/.88	3.5 (1.2)/.80	4.3 (1.2)/.78	4.3 (1.2)/.73	4.1 (1.3)/.74	6.0 (1.1)/.71
4	.77 [.69, .83]	.92 [.85, .97]	.94	.10	.06	6.2 (1.3)/.82	5.6 (1.5)/.83	4.4 (1.7)/.89	3.6 (1.4)/.84	4.5 (1.4)/.82	4.2 (1.3)/.75	4.2 (1.5)/.80	6.1 (1.3)/.79

Notes. Sample sizes were  $N_1 = 379$ ,  $N_2 = 129$ ,  $N_3 = 507$ ,  $N_4 = 504$ . RANDALL CI = RANDALL's correspondence index (with 95% confidence interval); Raw = raw octant scores; Ipsatized = ipsatized octant scores; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; PA = sensitive to control; BC = sensitive to antagonism; DE = sensitive to remoteness; FG = sensitive to timidity; HI = sensitive to passivity; JK = sensitive to dependence; LM = sensitive to affection; NO = sensitive to attention-seeking. The CFA model tests a perfect circumplex structure for octants and accounts for a general factor. Model fit was not evaluated in Sample 2 due to limited sample size.



**Figure 2.** Projecting Self- and Informant Reported Interpersonal Traits on the ISC-G in Sample 2. Self-ratings on the IAL are displayed on the left and (averaged) informant ratings are displayed on the right. IAL ratings were projected on the ISC-G using the structural summary method with bootstrapped 95% confidence intervals. IAL gregarious-extraverted (NO) is not displayed due to low prototypicality in both ratings ( $R^2 < .70$ ). For ISC octant labels, please see Figure 1, left panel.



**Figure 3.** Projecting Normal-Range and Maladaptive Personality Traits, Personality Dysfunction, and Adverse Childhood Experiences on the ISC-G in Sample 3. Only patterns of associations characterized by prototypicality ( $R^2 \geq .70$ ) are displayed. For ISC octant labels, please see Figure 1, left panel.

associated with relatively greater sensitivity to cold-dominant behaviors. Interpersonal traits ranging counter-clockwise from dominant to cold-submissive traits (i.e., PA to FG) were associated with greater sensitivity to warm-submissive behaviors. Although no self-rated interpersonal trait exhibited significant elevation, targets who were judged as assured-dominant (PA;  $e = .14$  [.04, .24]) or arrogant-calculating (BC;  $e = .14$  [.02, .25]) by their informants reported higher overall sensitivities as indicated by higher scores across ISC octants. By contrast,

targets who were judged as unassured-submissive by informants reported overall lower sensitivities (HI;  $e = -.11$  [-.21, -.01]).

### Normal-Range Personality Traits

MRS neuroticism, extraversion, and agreeableness exhibited prototypical profiles (Figure 3), whereas conscientiousness and openness did not. Neuroticism ( $a = .16$  [.11, .21],  $\delta = 136^\circ$  [117°, 156°]) and agreeableness ( $a = .10$  [.05, .16],  $\delta = 119^\circ$  [88°, 155°]) were associated with

sensitivity to antagonism (BC), and extraversion ( $a = 14$ . [08, .19],  $\delta = 216^\circ$  [194°, 239°]) was associated with sensitivity to timidity (FG). In addition, neuroticism showed a significant elevation ( $e = .09$  [.03, .15]).

### Maladaptive Personality Traits and Facets

Of the PID-5 domains with sufficient prototypicality (Figure 3), negative affectivity ( $a = .20$  [.15, .25],  $\delta = 159^\circ$  [143°, 174°]) was associated with sensitivity to antagonism (BC), and antagonism ( $a = .10$  [.05, .15],  $\delta = 263^\circ$  [232°, 299°]) was associated with sensitivity to passivity (HI). Negative affectivity ( $e = .11$  [.05, .16]) and detachment ( $e = .08$  [.01, .14]) were further associated with general sensitivity.

PID-5 facets that can be grouped under the same domain according to meta-analytical associations (Somma et al., 2019) generally exhibited the same interpersonal themes but differed with respect to prototypicality and specificity (Figure 3). Separation insecurity ( $a = .23$  [.18, .28],  $\delta = 174^\circ$  [162°, 186°]) stood out as the facet with the strongest specificity with sensitivity to remoteness (DE). All facets of negative affectivity tended to peak at sensitivities to cold and cold-dominant behaviors. Although detachment and disinhibition did not show prototypicality at the domain level, some of their facets were characterized by predominant interpersonal themes. Among detachment facets, withdrawal ( $a = .16$  [.11, .22],  $\delta = 21^\circ$  [1°, 42°]) and restricted affectivity ( $a = .10$  [.05, .16],  $\delta = 0^\circ$  [329°, 30°]) peaked at sensitivities to warm and warm-dominant behaviors. Among disinhibition facets, risk-taking ( $a = .13$  [.08, .18],  $\delta = 279^\circ$  [252°, 306°]) was associated with sensitivity to passivity (HI). A slightly greater differentiation was found for facets of antagonism. Whereas attention-seeking ( $a = .12$  [.07, .17],  $\delta = 242^\circ$  [215°, 276°]) and manipulateness ( $a = .11$  [.07, .16],  $\delta = 254^\circ$  [225°, 287°]) peaked in the range of sensitivities to submissive or cold-submissive behaviors, callousness ( $a = .11$  [.06, .17],  $\delta = 329^\circ$  [295°, 3°]) was associated with sensitivity to dependence (JK). Many facets were associated with heightened elevation, but hostility ( $e = .15$  [.10, .20]) and suspiciousness ( $e = .13$  [.07, .19]) showed particularly strong elevations while also not being characterized by a predominant interpersonal theme.

### Personality Dysfunction, Adverse Childhood Experiences, Hypersensitive Narcissism, and Hypersensitivity to Stimuli

All criteria for which we expected associations with general sensitivity exhibited significant elevations, including the severity of personality dysfunction as measured by the IPO-16 ( $e = .11$  [.06, .17], Sample 3), adverse childhood experiences as reported in the CTQ ( $e = .11$  [.05, .17], Sample 3), hypersensitive narcissism as measured by the HSNS ( $e = .33$  [.26, .39], Sample 4), and HSPS-G generalized

hypersensitivity ( $e = .35$  [.29, .41], Sample 4). Personality dysfunction further peaked at sensitivities to cold or cold-dominant behaviors ( $a = .10$  [.06, .16],  $\delta = 165^\circ$  [131°, 197°]). Interestingly, childhood maltreatment ( $a = .10$  [.05, .17],  $\delta = 32^\circ$  [2°, 64°]) also exhibited specificity in terms of sensitivity to warm-dominant behavior as interpersonal content.

## Discussion

This research aimed to construct and validate a German adaptation of the ISC (Hopwood et al., 2011). Overall, we achieved our goal of a shorter 40-item ISC-G that exhibits an acceptable fit to a perfect circumplex structure. Using various measures of constructs established in clinical and personality science, we found associations with general and specific sensitivities that align with previous research. For example, we replicated the link between general personality dysfunction and general interpersonal sensitivity, indicating that individuals with greater impairments in personality functioning tend to be more sensitive with respect to others' interpersonal behaviors regardless of the specific interpersonal style (Dowgwillo et al., 2018; Hopwood et al., 2018). We extended the nomological net of interpersonal sensitivities by investigating associations with the maladaptive traits and facets model of DSM-5, experiences of childhood maltreatment, and general hypersensitivity, of which the latter two were also characterized by elevated overall sensitivity.

### Interpersonal Sensitivities and Opposites

Perhaps the most important findings pertained to the patterns of specific associations between traits and sensitivities. Interpersonal theory posits the principle of complementarity (e.g., Carson, 1969) for dyadic interactions, according to which behaviors opposite on communion and similar on agency should be perceived as particularly bothersome. Hopwood et al. (2011) first presented results indicating that individuals report being irritated by interpersonal opposites (i.e., behaviors opposite on both agency and communion) when asked to fill out the ISC outside of a specific interactional context. Thus, complementarity may not pertain to self-descriptions of individuals' traits. In the present study, the strongest evidence of interpersonal opposites being reported as most bothersome was provided by IAL projections onto the ISC, which showed that this pattern applied to self-reported interpersonal styles and ratings by three informants per subject. As self- and informant ratings produced similar results, we filled the gap of Hopwood et al. (2011) questioning the reliance on self-reports of interpersonal style. We also directly replicated the previously



reported interpersonal sensitivities associated with Big Five neuroticism, extraversion, and agreeableness. Maladaptive traits and facets of the PID-5 also conformed to a pattern of opposites when considering previous findings of problematic interpersonal behaviors consistently associated with many of them (Williams & Simms, 2016; Wright et al., 2012). All traits and facets that showed prototypicality for specific interpersonal problems in previous research and specific interpersonal sensitivities in Sample 3 mapped onto the opposite octant on the IPC (see supplemental Figure S2; <https://osf.io/mf2c3/>). For instance, individuals high in antagonism tend to report problems with being too dominant themselves. In the ISC-G, such individuals reported being bothered by submissive behavior. The PID-5 facet of restricted affectivity is associated with problems of being too cold and exhibited prototypicality for sensitivity to warmth in this study. However, it remains to be seen whether these patterns emerge with such oppositional symmetry when tested in the same sample. For example, similar to previous results by Hopwood et al. (2011), individuals' own interpersonal traits did not directly map onto the opposite octant in each case in Sample 2, even though all patterns corresponded to a general notion of opposition in that interpersonal traits were associated with sensitivities to behaviors on the opposite side of at least one or both axes. Thus, more research is needed to examine the level of precision with which patterns of interpersonal opposites being most bothersome apply to traits.

Overall, the perception of interpersonal opposites being disturbing in research using the ISC seems compatible with the robust similarity-attraction effect (Byrne, 1997). In particular, individuals tending to be bothered by behaviors dissimilar to their own in terms of agency and communion best aligns with the assumption that – akin to similarity generating liking – dissimilarity generates repulsion (Rosenbaum, 1986). However, it should be noted that this latter effect is less empirically established and that it is rather unclear whether dissimilarity actually leads to disliking or whether it merely does not lead to liking (e.g., Sprecher, 2019). Furthermore, in our view, conclusions with respect to the effects of (dis)similarity are limited by the response format of the ISC. In the questionnaire, respondents only indicate the degree to which they are bothered by a respective behavior, which does not necessarily convey a degree of liking for the opposite or the same behavior (e.g., indicating being “not at all” bothered when someone “cannot assert themselves” may merely reflect indifference to said behavior and does not provide information about liking for dominant behavior). The exact relationship between the tendencies to like and dislike the behaviors rated in the ISC remains an open research question.

Taking into account all criteria we investigated, it becomes evident that specific interpersonal sensitivities

were mostly located on the diagonal axis of the IPC, ranging from cold-dominant (BC) to warm-submissive (JK) behavior (and thus representing antagonism vs. agreeableness). The other diagonal axis, ranging from cold-submissive (FG) to warm-dominant (NO) behavior (and thus representing introversion vs. extraversion), was less frequently associated with specific sensitivities. Still, criteria such as extraversion and its maladaptive PID-5 facet variant of attention-seeking, for instance, were associated with sensitivity to their supposed opposite of timidity (FG). The only criteria characterized by sensitivities toward warm-dominant behavior were the PID-5 facet of withdrawal and CTQ adverse childhood experiences. Given that individuals with adverse childhood experiences can exhibit problems with being interpersonally distant and nonassertive toward others in their own behavior (Huh et al., 2014; Maier et al., 2020; Paradis & Boucher, 2010), which corresponds to a cold-submissive style, this could also be in line with an oppositional pattern.

## Future Directions

In future studies, the limitations of this research should be addressed. First, cross-cultural and cross-language equivalence needs to be considered, given that the translated original items of the ISC-64 yielded rather poor results in the pilot study. The ISC-G, however, replicated and extended several central findings of the English version in an expected manner and thus appears to be a useful tool to study the construct of interpersonal sensitivity. It is noteworthy that similar problems of a direct translation affected other IPC-based measures, such as the German adaption (Thomas et al., 2012) of the Circumplex Scales of Interpersonal Values (CSIV; Locke, 2000). This highlights the need to ensure cultural fit for items assessing constructs from the interpersonal realm. In the present case of interpersonal sensitivity, divergences between the English and German versions mainly pertained to the affiliative octant scales. These could be rooted in differing cultural norms concerning appropriate affiliative behavior. In general, German items needed to be more extreme; for example, with respect to the intensity of behaviors (e.g., ISC-64 Item 31: “Expresses concern about me” worked better in German when framed as Item 39: “Always expresses concern about me”). To further examine these differences, the translated ISC-G with its revised and new items as compared to the ISC-64 could be tested in US samples.

The fact that indicators of both Criterion A (IPO-16) and B (PID-5 traits and facets) of the AMPD could be described by general and/or specific sensitivities highlights once more the importance of interpersonal dysfunction within personality pathology (e.g., Benjamin, 2002; Hopwood et al., 2013; Pincus, 2005). Until now, the closest proxy of subjects' actual interpersonal behavior was the combination

of self-reported and informant-rated interpersonal styles in Sample 2. However, a diary study would have the potential to explicitly highlight the effects of interpersonal sensitivity on individuals' perception of interpersonal interaction. For example, ambulatory assessment methods could be used to examine whether a baseline assessment of interpersonal sensitivity predicts certain behavioral and experiential patterns in subjects' everyday life (Lewis & Ridenour, 2020; Roche et al., 2014). For instance, highly sensitive individuals could encounter many irritating interpersonal situations or avoid them and just encounter few, which then impact even more heavily.

The ISC-G should also be assessed in clinical samples to test whether the measure distinguishes between healthy individuals and patients. Thus far, results using the ISC suggest that psychotherapy could benefit from insights into patients' sensitivities provided by the ISC, particularly in the presence of personality pathology. Although it is established that therapists' ability to relate to patients in a warm and empathic manner is important for a therapeutic alliance (Ackerman & Hilsenroth, 2003; Nienhuis et al., 2018), research using the ISC shows that warm behavior can also be aversive to some patients and therefore threaten the therapeutic relationship.

## Conclusion

Herein, we constructed a German adaptation of the ISC and used the new measure to gain a better understanding of the construct. Results suggest that individuals generally find behaviors aversive that are dissimilar to their own personality and that interpersonal sensitivity may be important to understanding interpersonal dysfunction in individuals with personality pathology. This insight can be used for future research investigating interpersonal dysfunction, its antecedents, and consequences.

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## Open Science

Supplemental Materials: The data sets, an analysis script, and all supplementary materials are available at <https://osf.io/mf2c3/> (Müller, 2022).

Open Data: I confirm that there is sufficient information for an independent researcher to reproduce all of the reported results (Müller, 2022).

Open Materials: I confirm that there is sufficient information for an independent researcher to reproduce all of the reported methodology (Müller, 2022).

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