

MIND.set

Implicit Associations Tests

Arab vs. White and Good vs. Bad in Two Waves

of the DeZIM.panel

Data Release 1.0.0

Test Report

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1 Introduction: Purpose, Data Overview, and Sample Linkage

This Test Report documents the design, implementation, data structure, and analytical properties of the Implicit Association Tests (IAT) conducted within the framework of the MIND.set project (Veit et al., 2025) and released in connection with the DeZIM.panel (Dollmann et al., 2026). The data release of the MIND.set Implicit Association Tests comprises two longitudinal datasets collected from participants of the DeZIM.panel:

- Wave 13: Additional survey (ew1, 2024): $N = 2,811$
- MIND.set short survey (es2, 2025): $N = 2,158$

Both datasets include results from an Implicit Association Test measuring implicit associations towards Arab vs. white persons and the longitudinal structure allows for both cross-sectional analyses and within-person analyses over time. The IAT was administered in the five languages (Arab, English, German, Turkish and Russian) of the panel and participants could use the device of their choice (see Table 1).

Ew1 was part an optional part of the regular DeZIM.panel wave 13 and online from 9th December 2024 to 17th February 2025. We recorded $N = 3,284$ participants before data cleaning, of which $N = 2,811$ finished the IAT completely and were successfully merged with the panel data and equal the final data set.

Table 1

Descriptive Overview of Devices used and languages the test were taken in.

	Ew1 ($N = 2,811$)	Es2 ($N = 2,158$)
Device Type		
Computer	1,045	785
Phone	1,601	1,271
Tablet	165	102
Language		
Arab	59	35
English	57	2,055
German	2,653	44
Russian	29	15
Turkish	13	9

Es 2 was an extra-curricular short survey of the DeZIM panel where all participants who finished an IAT in ew1 were invited to participate. Before data cleaning there were records of $N = 2,258$ of participants. Excluding

incomplete IATs and matching with the panel data yielded to a sample size of $N = 2,158$. Participants in the IAT studies are drawn from the DeZIM.panel, a probability-based longitudinal panel of individuals living in Germany with and without a migration history.

The IAT data can be linked to the main DeZIM.panel data using the unique respondent identifier variable “Ifd”. This linkage enables the combination of implicit measures with extensive sociodemographic and attitudinal information, including migration history, age, gender, social position, political orientations, and experiences of discrimination.

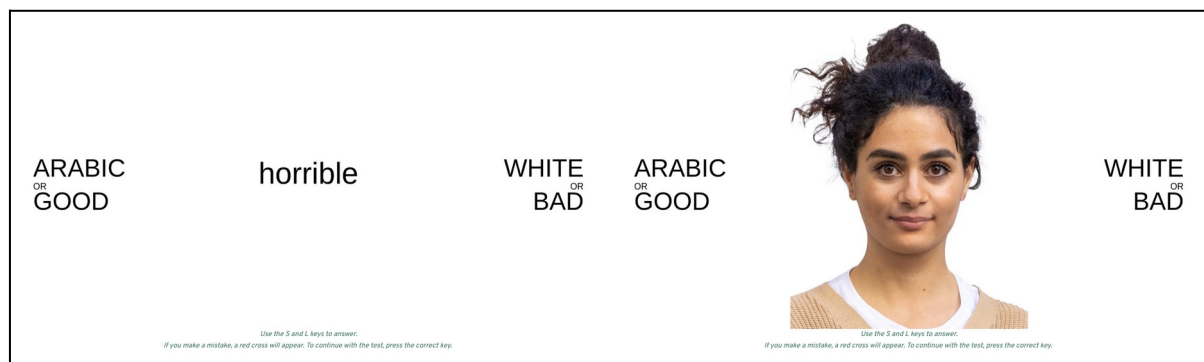
2 Test Design and Procedure

2.1 Implicit Association Test (IAT)

The IAT implemented in MIND.set follows established IAT standards and measures the relative strength of automatic associations between social categories and evaluative attributes.

Figure 1

Example of IAT Test Screens from the conducted test.



Note. Left: stereotype-incongruent pairing (BLACK + GOOD; WHITE + BAD), attribute stimulus “laughter” Right: stereotype-incongruent pairing target group stimulus of the group BLACK; Category label positions were counterbalanced.

The test focuses on spontaneous associations between:

- **Target categories:** Arab vs. White persons
- **Attribute categories:** Good vs. Bad

Reaction times in categorization tasks are used as indicators of implicit evaluative associations.

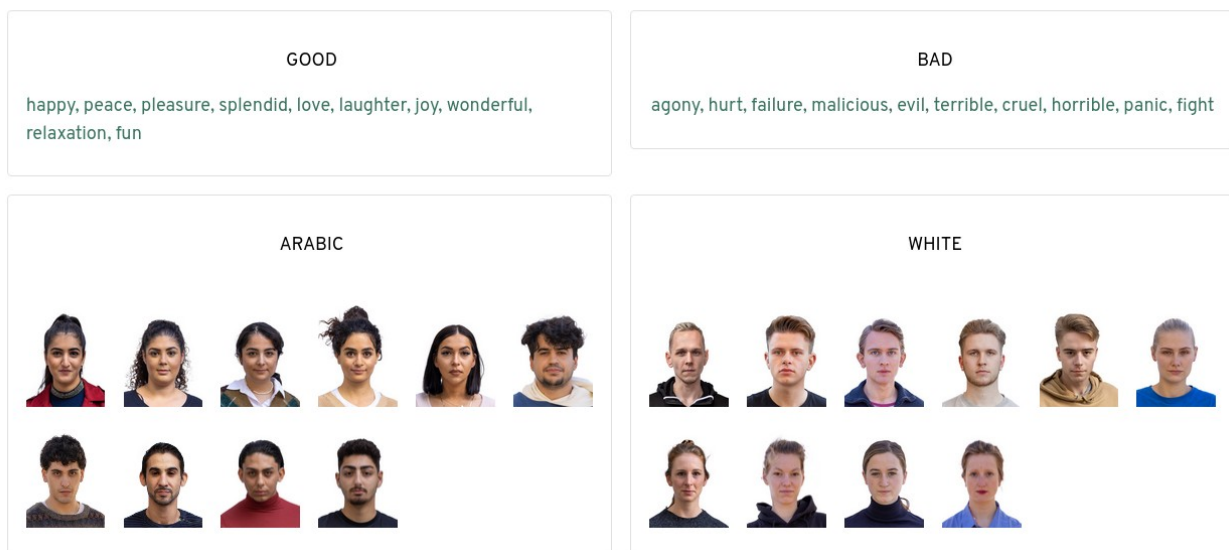
2.2 Target Categories (Images) and Attribute Categories (Words)

The target stimuli consist of photographs of persons perceived as prototypically Arab or White selected from the DeZIM Picture Database (DPD). Image selection was based on a prior picture validation study assessing

perceived typicality. For each target category, those images with the highest typicality ratings were chosen. Figure 2 illustrates the part with the overview of categories on the start screen of an English version of the IAT.

Figure 2

Start Screen with Attribute and Target Categories.



The attribute categories represent positive and negative valence dimensions. In the English version, the following examples were used:

- **Good:** happy, peace, pleasure, splendid, love, laughter, joy, wonderful, relaxation, fun
- **Bad:** agony, hurt, failure, malicious, evil, terrible, cruel, horrible, panic, fight

Equivalent translations were used in other language versions. The selected words cover a broad range of emotional and evaluative meanings and are consistent with established IAT research practices.

3 Data Merging and *D*-Score Calculation

The IAT data is in a long data format, meaning that every participant (“lfd”) has several rows each row representing one trial of the IAT. We strongly suggest calculating the *D*-Score for each participant before merging with the panel data using the unique identifier “lfd” but we provide a *D*-Score in the long-data-format.

3.1 D-score calculation using the Built-in Error Penalty Procedure

In both waves, we used the built-in error penalty (Greenwald et al., 2003), so participants saw a red cross in case of incorrect responses and had to give the correct response to proceed. Therefore, we strongly suggest computing the *D*-score by following a **built-in error penalty procedure**, as proposed by Greenwald et al. (2022). In both tests we used the built-in error penalty procedure, meaning that each trial latency is recorded up to the correct response, and trials with an initial error are retained (with the corrected latency). This procedure provides a standardized approach to computing IAT effects and is widely used in the literature. The steps below reproduce the original procedure by Greenwald and colleagues (2022, p.1177, Appendix B) verbatim. Figure 3 shows the mathematical equation of SD_1 and SD_2 for the *D*-Score.

IAT *D*-Score Calculation using the Built-in Error Penalty Procedure

1. Designate combined tasks as A (faster performance = positive score) and B (faster = negative score).
With counterbalancing: half of participants encounter A in Blocks 3 & 4, the other half in Blocks 6 & 7.
2. Discard all trials in Blocks 1, 2, and 5.
3. Identify blocks for combined task A as A1 and A2; and for task B as B1 and B2. If task A = Blocks 3 & 4:
Block 3 = A1, Block 4 = A2.
4. Eliminate from remaining data (Blocks 3, 4, 6, and 7) only trials with latencies > 10,000 ms.
5. Eliminate all participants for whom more than 10% of remaining trials have latencies faster than 300 ms.
6. Compute latency means (MnA1, MnA2, MnB1, MnB2) and standard deviations (SDA1, SDA2, SDB1, SDB2) for each of the four blocks using all remaining trials.
7. Compute two mean latency differences:
 - a. $B1 - A1 = (MnB1 - MnA1)$
 - b. $B2 - A2 = (MnB2 - MnA2)$
8. Compute an inclusive (not pooled) SD_1 using all latencies in Blocks A1 & B1; and another (SD_2) using all latencies for A2 & B2. These can be computed from the means and SDs from Step 6 using the formulas below.
9. Compute:
 - a. $(B1 - A1) / SD_1$
 - b. $(B2 - A2) / SD_2$
10. D = Average of the two quotients computed in Step 9.

Note: Calculation of SD_1 and SD_2 (Step 8) uses inclusive (not pooled) standard deviations, ensuring sensitivity to individual block variability.

Figure 3

Formula of D-Score Calculation (SD_1 and SD_2)

$$SD_1 = \sqrt{\frac{(N_{A1} - 1) \cdot SD_{A1}^2 + (N_{B1} - 1) \cdot SD_{B1}^2 + \frac{(N_{A1} + N_{B1}) \cdot (M_{A1} - M_{B1})^2}{4}}{N_{A1} + N_{B1} - 1}}$$

$$SD_2 = \sqrt{\frac{(N_{A2} - 1) \cdot SD_{A2}^2 + (N_{B2} - 1) \cdot SD_{B2}^2 + \frac{(N_{A2} + N_{B2}) \cdot (M_{A2} - M_{B2})^2}{4}}{N_{A2} + N_{B2} - 1}}$$

A reproducible R script showing how the steps are used on MIND.set IAT data and supporting materials for scoring and analysis are provided via OSF <https://osf.io/bs7fy> (Zey & Veit, 2025).

4 Literature

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