SUPPLEMENTARY MATERIAL

Supplementary Table 1. Characteristics of the SCD group

	SCD
n	13
Amyloid negativity, count (percentage)	10/13 (76.9%)*
GDS score, 0-15, mean (SD)	1.58 (1.68)
NPI score, 0-144, mean (SD)	2.43 (4.16)
Fazekas score, 0-3, median [IQ range]	0.00 [0.00, 1.00]
MTA score, 0-3, median [IQ range]	0.00 [0.00, 1.00]
GCA score, 0-3, median [IQ range]	0.00 [0.00, 1.00]

*In the 3 other cases amyloid status was unknown

Supplementary Table 2. Cognition domain z-scores across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p-value	Group-differences, uncorrected	Group differences, age and sex adjusted
n	11	13	12	13			
Attention, z-score	-1.04 (1.12)	-0.94 (1.30)	-0.67 (0.84)	0.17 (0.60)	0.08	bvAD<SCD, p=0.003, tAD<SCD, p=0.004, bvFTD<SCD, p=0.04	bvAD<SCD, p=0.05, tAD<SCD, p=0.04
Language, z-score	-1.22 (1.85)	-0.59 (0.44)	-1.50 (1.23)	0.05 (0.52)	0.14	bvAD<SCD, p=0.005, bvFTD<SCD, p=0.001, bvFTD<tAD, p=0.05	bvAD<SCD, p=0.002, bvFTD<SCD, p=0.0003, bvFTD<tAD, p=0.04
Memory, z-score	-2.34 (1.55)	-3.38 (2.60)	-1.36 (0.77)	-0.14 (0.73)	0.08	bvAD<SCD, p=0.0009, tAD<SCD, p<0.0001, tAD<bvFTD, p=0.001	bvAD<SCD, p=0.009, tAD<SCD, p<0.0001, tAD<bvFTD, p=0.003
Executive, z-score	-1.49 (1.36)	-0.77 (1.16)	-1.11 (0.73)	0.19 (0.60)	0.11	bvAD<SCD, p=0.0001, tAD<SCD, p=0.02, bvFTD<SCD, p=0.005	bvAD<SCD, p=0.002, bvFTD<SCD, p=0.03

Mean (SD) are depicted.

Supplementary Table 3. Details on the galvanic skin response methodology used in the iMotions R notebook to extract peaks per minute

1	The calibrated GSR signal from the sensor (Shimmer or BIOPAC EDA100C) is retrieved for the given stimulus and respondent (expressed in microSiemens, μS).
2	The sample rate is determined. Parameter [Gap interpolation length threshold [ms]] is used to identify possible gaps in the signal due to signal drops. If a gap in the signal is shorter than this threshold, then the missing data is linearly interpolated. Otherwise, the gap is left and each of the signal fragments is processed separately. Option [Remove signal discontinuities caused by the sensor switching range setting] should only be checked when the recorded signal has many discontinuities caused by the auto-range switching setting of Shimmer.
3	The phasic signal is extracted using a median filter over a fixed length time window: parameter [Phasic filter length [ms]]. The phasic signal is calculated by subtracting the running median from the calibrated signal, smoothing the ends of the signal by using symmetrical medians of subsequently smaller bandwidth, but for the very first and last value where Tukey's robust end-point rule is applied.
4	A low-pass Butterworth filter with cutoff frequency: parameter [Lowpass filter cutoff frequency [Hz]] is applied to the phasic signal (in order to remove powerline noise).
5	Onsets and offsets are detected on the phasic signal. Onsets are all the points where the phasic signal crosses above the onset threshold: parameter [Peak onset threshold [microSiemens]]. Offsets are the points where the phasic signal crosses below the offset threshold: parameter [Peak offset threshold [microSiemens]]. Each onset-offset pair defines a window, and the maximum value attained by the calibrated signal in a window is marked as a possible peak. The amplitude of a possible peak is defined as the difference between the maximum value of the calibrated signal in the window and its value at the onset point. A possible peak is selected if: (1) Its amplitude is above the amplitude threshold: parameter [Peak amplitude threshold [microSiemens]], and (2) the time difference between onset and offset is above the duration threshold: parameter [Minimum peak duration [ms]]. The selected peaks are returned.

Emotion Recognition

Supplementary Table 4. Ekman test scores across groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted	Group differences, adjusted**
N_{ekman}	12	13	14	13			
Happy	9.50 (1.00)	9.62 (0.96)	9.43 (0.85)	10.00 (0.00)	0.07	ns	ns
Angry	6.17 (2.41)	8.38 (1.33)	4.79 (3.14)	8.75 (1.54)	0.0007	bvAD<SCD, p=0.005, bvFTD<SCD, p<0.00001, bvAD<tAD, p=0.01, bvFTD<tAD, p<0.00001	bvAD<SCD, p=0.02, bvFTD<SCD, p<0.0001, SCD, bvAD<tAD, p=0.02 bvFTD<tAD, p<0.0001
Disgust	5.42 (2.54)	6.85 (1.68)	3.71 (2.61)	8.25 (1.60)	<0.00001	bvAD<SCD, p=0.001, bvFTD<SCD, p<0.00001, bvFTD<bvAD, p=0.05, bvFTD<tAD, p=0.0002	bvAD<SCD, p=0.001, tAD<SCD, p=0.05, bvFTD<SCD, p<0.00001, bvAD>bvFTD, p=0.03
Fear	5.08 (2.78)	6.15 (1.99)	3.50 (2.35)	6.67 (2.19)	0.005	bvFTD<SCD, p=0.0006, bvFTD<tAD, p=0.003	bvFTD<SCD, p=0.004, , bvFTD<tAD, p=0.01
Sad	5.83 (2.59)	6.38 (2.26)	3.71 (2.46)	7.00 (2.00)	0.0005	bvFTD<SCD, p=0.0004, bvFTD<bvAD, p=0.02, bvFTD<tAD, p=0.003	bvFTD<SCD, p=0.001, bvFTD<bvAD, p=0.01, bvFTD<tAD, p=0.01
Surprise	8.08 (1.68)	8.85 (1.28)	7.29 (1.86)	9.00 (0.74)	0.002	bvFTD<SCD, p=0.003, bvFTD<tAD, p=0.006	bvAD<SCD, p=0.05, bvFTD<SCD, p=0.001, bvFTD<tAD, p=0.002
Total	40.08 (8.63)	46.23 (5.31)	32.43 (7.26)	49.67 (5.02)	<0.00001	bvAD<SCD, p=0.0005, bvFTD<SCD, p<0.0001, bvAD<tAD, p=0.02, bvFTD<bvAD, p=0.004, bvFTD<tAD, p<0.0001	bvAD<SCD, p=0.003, bvFTD<SCD, p<0.0001, bvAD<tAD, p=0.05, bvAD>bvFTD, p=0.003, tAD>bvFTD, p<0.0001

*based on anova test

**based on post hoc group comparisons

***based on post hoc group comparisons adjusted for age and sex

Supplementary Table 5. Dwell time within Areas of Interest (AOI) Eyes in Ekman faces across groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted	Group differences, adjusted **
N_{AOI}	12	13	12	13			
Happy	30.99 (13.58)	27.27 (13.58)	27.27 (17.15)	28.53 (12.57)	ns	ns	ns
Angry	43.74 (17.42)	34.45 (16.03)	32.50 (26.08)	38.97 (16.11)	ns	ns	ns
Disgust	44.59 (17.62)	33.37 (19.74)	31.08 (25.79)	38.45 (15.53)	ns	ns	ns
Fear	45.12 (17.68)	45.12 (16.82)	33.34 (26.26)	40.69 (17.06)	ns	ns	ns
Sad	50.21 (17.62)	38.11 (18.58)	35.09 (24.62)	43.10 (15.12)	ns	ns	ns
Surprise	43.59 (18.85)	31.09 (15.84)	30.72 (26.42)	36.20 (16.12)	ns	ns	ns
Total	43.06 (15.65)	32.95 (16.58)	30.86 (24.94)	37.66 (14.44)	ns	ns	ns

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Supplementary Table 6. Dwell time within Areas of Interest (AOI) Mouth in Ekman faces across groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted**	Group differences, adjusted **
N_{AOI}	12	13	12	13			
Happy	21.10 (12.43)	34.47 (13.19)	20.40 (14.46)	35.24 (8.27)	ns	bvAD<SCD, p=0.004, bvFTD<SCD, p=0.003, bvAD<tAD, p=0.006, bvFTD<tAD, p=0.004	bvAD<SCD, p=0.01, bvFTD<SCD, p=0.008, bvAD<tAD, p=0.006, bvFTD<tAD, p=0.003
Angry	18.55 (9.27)	33.17 (11.17)	19.60 (15.86)	31.67 (13.00)	ns	bvAD<SCD, p=0.0009 , bvFTD<SCD, p=0.02, bvAD<tAD, p=0.004, bvFTD<tAD, p=0.007	bvAD<SCD, p=0.008 , bvFTD<SCD, p=0.02, bvAD<tAD, p=0.002, bvFTD<tAD, p=0.005
Disgust	19.69 (10.02)	33.93 (13.42)	20.18 (15.04)	31.78 (14.31)	ns	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.008, bvAD<bvFTD, p=0.01	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.04 , bvAD<tAD, p=0.002, bvFTD<tAD, p=0.004
Fear	19.30 (9.82)	32.67 (12.84)	18.89 (13.75)	30.43 (12.20)	ns	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.02, bvAD<tAD, p=0.006, bvFTD<tAD, p=0.005	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.02, bvAD<tAD, p=0.002, bvFTD<tAD, p=0.003
Sad	15.29 (8.44)	30.27 (12.08)	17.78 (15.52)	27.23 (13.60)	ns	bvAD<SCD, p=0.02, bvAD<tAD, p=0.003, bvFTD<tAD, p=0.01	bvAD<SCD, p=0.005, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.0006, bvFTD<tAD, p=0.005
Surprise	18.49 (10.46)	31.81 (12.58)	19.33 (13.56)	27.93 (11.64)	ns	bvAD<SCD, p=0.04, bvAD<tAD, p=0.006, bvFTD<tAD, p=0.01	bvAD<SCD, p=0.04, bvAD<tAD, p=0.004, bvFTD<tAD, p=0.007
Total	18.74 (9.53)	32.72 (12.08)	19.37 (14.28)	30.71 (11.58)	ns	bvAD<SCD, p=0.01, bvFTD<SCD, p=0.02, bvAD<tAD, p=0.004, bvFTD<tAD, p=0.005	bvAD<SCD, p=0.01, bvFTD<SCD, p=0.02, bvAD<tAD, p=0.001, bvFTD<tAD, p=0.003

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Empathy - Interpersonal Reactivity Index

Supplementary Table 7. Scores on the Interpersonal Reactivity Index, a questionnaire measuring empathy, across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted	Group differences, age and sex adjusted**
n	9	10	11	13			
Perspective Taking	11.33 (4.58)	13.00 (3.19)	8.73 (5.61)	15.62 (3.07)	0.0001	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.0001, bvFTD<tAD, p=0.02	bvAD<SCD, p=0.05, bvFTD<SCD, p=0.0007, bvFTD<tAD, p=0.03
Empathetic Concern	12.89 (4.28)	12.40 (4.19)	12.00 (3.00)	13.77 (1.24)	0.23	ns	ns
Fantasy	10.33 (5.22)	13.00 (3.09)	8.64 (3.96)	13.62 (1.89)	0.0005	bvAD<SCD, p=0.04, bvFTD<SCD, p=0.0007, bvFTD<tAD, p=0.005	bvFTD<SCD, p=0.01, bvFTD<tAD, p=0.02
Personal Distress	13.11 (3.52)	14.50 (2.95)	14.45 (3.01)	14.69 (1.93)	0.59	ns	ns

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Empathy – empathy eliciting videos

Supplementary Table 8. Results of empathy videos across diagnostic groups: empathetic concern and personal distress scores and galvanic skin response while watching empathy eliciting videos

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted	Group differences, age and sex adjusted**
n	11	11	11	12			
Empathetic concern	2.55 (1.08)	2.61 (1.21)	2.11 (1.20)	2.74 (0.73)	0.17	ns	ns
Personal distress	1.61 (0.66)	1.64 (0.66)	1.87 (1.20)	1.56 (0.55)	0.42	ns	ns
n	11	11	10	12			
GSR PPM uplifting video	1.56 (1.99)	1.56 (1.99)	2.31 (2.66)	2.11 (1.85)	0.08	ns	ns
GSR PPM distressing video	1.97 (2.41)	1.97 (2.41)	2.06 (3.10)	1.73 (1.88)	0.38	ns	ns

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Supplementary Table 9. Mean GSR per baseline condition and empathy video condition across groups.

	bvAD (N=10)	tAD (N=11)	bvFTD (N=11)	SCD (N=13)	p-value	Group differences adjusted	Group differences, age and sex adjusted
GSR Nature videos, mean (SD)	1.48 (1.45)	1.58 (1.26)	0.762 (0.547)	1.31 (0.781)	0.40	ns	tAD>bvFTD, p=0.05
GSR Empathy videos, Mean (SD)	1.51 (0.998)	1.49 (1.26)	0.995 (0.736)	1.92 (1.68)	0.16	ns	ns
Δ GSR Empathy-Nature videos, Mean (SD)	0.0305 (0.721)	0.142 (0.320)	0.178 (0.311)	0.271 (0.532)	0.67	ns	ns
P-value difference Empathy vs Nature videos	0.55	0.90	0.91	0.96	-	-	-

Knowledge of Social Norms

Supplementary Table 10. Scores on Social Norms Questionnaire across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted**	Group differences, sex and age adjusted***
n	11	11	11	13			
SNQ total score	16.00 (1.61)	17.82 (2.14)	15.18 (2.23)	18.33 (1.37)	0.00003	bvAD<SCD, p=0.003, bvFTD<SCD, p<0.0001, bvAD<tAD, p=0.02, bvFTD<tAD, p=0.009	bvAD<SCD, p=0.01, bvFTD<SCD, p=0.0003, bvAD<tAD, p=0.05, bvFTD<tAD, p=0.002
SNQ break score	2.09 (1.51)	1.09 (0.54)	1.73 (1.42)	1.08 (0.51)	0.05	bvAD<SCD, p=0.05	bvAD<SCD, p=0.05
SNQ overadherence score	3.91 (1.58)	3.09 (2.12)	5.09 (2.30)	2.58 (1.08)	0.001	bvFTD<SCD, p=0.001, bvFTD<tAD, p=0.01	bvFTD<SCD, p=0.004, bvFTD<tAD, p=0.02

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Moral reasoning

Supplementary Table 11. Scores on and galvanic skin response to moral dilemmas, across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted	Group differences, age and sex adjusted**
n	10	11	11	12			
Personal dilemma, percentage rational responses	50.00	36.36	18.18	16.67	0.	ns	ns
Impersonal dilemma, percentage rational responses	90.00	90.91	81.82	92.30	0.	ns	ns
n	10	11	9	10			
Impersonal dilemma, GSR PPM	3.17 (2.34)	3.16 (3.65)	1.48 (1.71)	2.66 (2.11)	0.38	ns	ns
Personal dilemma, GSR PPM	2.89 (2.29)	3.43 (4.07)	0.86 (1.08)	3.44 (3.33)	0.06	ns	bvFTD<SCD, p=0.01

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Supplementary Tables – sensitivity analyses without the three unknown amyloid status cases in the SCD group.

Supplementary Table 12. Characteristics of the SCD group

	SCD
n	10
Amyloid negativity, count (percentage)	10/10 (100%)*
GDS score, 0-15, mean (SD)	2.20 (2.04)
NPI score, 0-144, mean (SD)	8.10 (16.72)
Fazekas score, 0-3, median [IQ range]	0.00 [0.00, 1.00]
MTA score, 0-3, median [IQ range]	0.00 [0.00, 1.00]
GCA score, 0-3, median [IQ range]	0.00 [0.00, 1.00]

Supplementary Table 13. Demographic characteristics across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p-value
N	12	12	14	10	
Age	66.6 (5.7)	64.6 (6.7)	66.4 (7.0)	58.0 (5.1)	0.07
Sex, % men	75	38.5	64.3	40.0	0.24**
MMSE	24.8 (2.5)	24.7 (4.6)	26.2 (2.3)	28.0 (1.6)	**0.03***
Education (Verhage score 1-7)	5.1 (1.4)	5.8 (1.3)	5.4 (0.9)	5.6 (0.7)	**0.02***
APOEe4 (% carrier)	6/10 (60.0)	10/12 (83.3)	1/6 (17.0)	5/10 (50)	**0.05***
Attention domain z-score	-1.04 (1.12)	-0.94 (1.30)	-0.67 (0.84)	0.06 (0.55)	ns
Language domain z-score	-1.22 (1.85)	-0.59 (0.44)	-1.50 (1.23)	0.06 (0.46)	bvAD<SCD, p=0.004, bvFTD<SCD, p=0.0008
Memory domain z-score	-2.34 (1.55)	-3.38 (2.60)	-1.36 (0.77)	-0.15 (0.62)	bvAD<SCD, p=0.02, tAD<SCD, p=0.0001
Executive domain z-score	-1.49 (1.36)	-0.77 (1.16)	-1.11 (0.73)	0.15 (0.51)	bvAD<SCD, p=0.006

Mean (SD) are reported unless stated otherwise. Domain z-scores were calculated in reference to a cognitively normal amyloid-negative control group (n=583)[23]. Cognition p-values are age and sex adjusted.

Supplementary Table 14. Cognition domain z-scores across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p-value	Group-differences, uncorrected	Group differences, age and sex adjusted
n	11	13	12	10			
Attention, z-score	-1.04 (1.12)	-0.94 (1.30)	-0.67 (0.84)	0.06 (0.55)	0.04	bvAD<SCD, p=0.01, tAD<SCD, p=0.02	ns
Language, z-score	-1.22 (1.85)	-0.59 (0.44)	-1.50 (1.23)	0.06 (0.46)	0.11	bvAD<SCD, p=0.01, bvFTD<SCD, p=0.002	bvAD<SCD, p=0.004, bvFTD<SCD, p=0.0008
Memory, z-score	-2.34 (1.55)	-3.38 (2.60)	-1.36 (0.77)	-0.15 (0.62)	0.06	bvAD<SCD, p=0.002, tAD<SCD, p<0.0001, tAD<bvFTD, p=0.002	bvAD<SCD, p=0.02, tAD<SCD, p=0.0001
Executive, z-score	-1.49 (1.36)	-0.77 (1.16)	-1.11 (0.73)	0.15 (0.51)	0.08	bvAD<SCD, p=0.0003, tAD<SCD, p=0.03, bvFTD<SCD, p=0.01	bvAD<SCD, p=0.006

Mean (SD) are depicted.

Emotion Recognition

Supplementary Table 15. Ekman test scores across groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted**	Group differences, adjusted***
N_{ekman}	12	13	14	10			
Happy	9.50 (1.00)	9.62 (0.96)	9.43 (0.85)	10.00 (0.00)	0.11	ns	ns
Angry	6.17 (2.41)	8.38 (1.33)	4.79 (3.14)	8.67 (1.80)	0.00002	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.0001, bvAD<tAD, p=0.02, bvFTD<tAD, p=0.0001	bvAD<SCD, p=0.02, bvFTD<SCD, p<0.0001, SCD, bvAD<tAD, p=0.02 bvFTD<tAD, p=0.0003
Disgust	5.42 (2.54)	6.85 (1.68)	3.71 (2.61)	8.55 (1.42)	<0.00001	bvAD<SCD, p=0.001, bvFTD<SCD, p<0.00001, bvFTD<bvAD, p=0.05, bvFTD<tAD, p=0.0002	bvAD<SCD, p=0.0008, tAD<SCD, p=0.03, bvFTD<SCD, p<0.00001, bvAD>bvFTD, p=0.04
Fear	5.08 (2.78)	6.15 (1.99)	3.50 (2.35)	6.22 (2.33)	0.003	bvFTD<SCD, p=0.007, bvFTD<tAD, p=0.004	bvFTD<SCD, p=0.02, bvFTD<tAD, p=0.01
Sad	5.83 (2.59)	6.38 (2.26)	3.71 (2.46)	7.00 (1.58)	0.0007	bvFTD<SCD, p=0.0008, bvFTD<bvAD, p=0.02, bvFTD<tAD, p=0.003	bvFTD<SCD, p=0.002, bvFTD<tAD, p=0.003
Surprise	8.08 (1.68)	8.85 (1.28)	7.29 (1.86)	9.11 (0.78)	0.002	bvFTD<SCD, p=0.005, bvFTD<tAD, p=0.007	bvFTD<SCD, p=0.002, bvFTD<tAD, p=0.003

Total	40.08 (8.63)	46.23 (5.31)	32.43 (7.26)	49.55 (5.03)	<0.00001	bvAD<SCD, p=0.002, bvFTD<SCD, p<0.0001, bvAD<tAD, p=0.02, bvFTD<bvAD, p=0.004, bvFTD<tAD, p<0.0001	bvAD<SCD, p=0.006, bvFTD<SCD, p<0.0001, bvAD>bvFTD, p=0.004, tAD>bvFTD, p<0.0001

*based on anova test
**based on post hoc group comparisons
***based on post hoc group comparisons adjusted for age and sex

Supplementary Table 16. Dwell time within Areas of Interest (AOI) Eyes in Ekman faces across groups

	bvAD	tAD	bvFTD	SCD	p-value*	Group differences, unadjusted**	Group differences, adjusted ***
N_{AOI}	12	13	12	10			
Happy	30.99 (13.58)	27.27 (13.58)	27.27 (17.15)	28.71 (14.17)	0.50	ns	ns
Angry	43.74 (17.42)	34.45 (16.03)	32.50 (26.08)	39.69 (17.46)	0.65	ns	ns
Disgust	44.59 (17.62)	33.37 (19.74)	31.08 (25.79)	39.01 (17.34)	0.66	ns	ns
Fear	45.12 (17.68)	45.12 (16.82)	33.34 (26.26)	41.96 (19.37)	0.64	ns	ns
Sad	50.21 (17.62)	38.11 (18.58)	35.09 (24.62)	44.40 (16.54)	0.57	ns	ns
Surprise	43.59 (18.85)	31.09 (15.84)	30.72 (26.42)	38.86 (17.58)	0.69	ns	ns
Total	43.06 (15.65)	32.95 (16.58)	30.86 (24.94)	38.77 (16.21)	0.60	ns	ns

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Supplementary Table 17. Dwell time within Areas of Interest (AOI) Mouth in Ekman faces across groups

	bvAD	tAD	bvFTD	SCD	p- value	Group differences, unadjusted**	Group differences, adjusted **
N_{AOI}	12	13	12	10			
Happy	21.10 (12.43)	34.47 (13.19)	20.40 (14.46)	34.15 (7.70)	0.002	bvAD<SCD, p=0.01, bvFTD<SCD, p=0.01, bvAD<tAD, p=0.007, bvFTD<tAD, p=0.005	bvAD<SCD, p=0.04, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.009, bvFTD<tAD, p=0.005
Angry	18.55 (9.27)	33.17 (11.17)	19.60 (15.86)	32.42 (12.67)	0.003	bvAD<SCD, p=0.0009 , bvFTD<SCD, p=0.02, bvAD<tAD, p=0.003, bvFTD<tAD, p=0.006	bvAD<SCD, p=0.01 , bvFTD<SCD, p=0.02, bvAD<tAD, p=0.003, bvFTD<tAD, p=0.006
Disgust	19.69 (10.02)	33.93 (13.42)	20.18 (15.04)	32.10 (14.24)	0.005	bvAD<SCD, p=0.03, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.007, tAD<bvFTD, p=0.01	bvAD<SCD, p=0.03, bvFTD<SCD, p=0.05, bvAD<tAD, p=0.003, bvFTD<tAD, p=0.005
Fear	19.30 (9.82)	32.67 (12.84)	18.89 (13.75)	29.56 (12.96)	0.008	bvFTD<SCD, p=0.05, bvAD<tAD, p=0.007, bvFTD<tAD, p=0.006	bvAD<SCD, p=0.05, bvFTD<SCD, p=0.05, bvAD<tAD, p=0.004, bvFTD<tAD, p=0.004
Sad	15.29 (8.44)	30.27 (12.08)	17.78 (15.52)	27.17 (13.46)	0.01	bvAD<SCD, p=0.03, bvAD<tAD, p=0.003, bvFTD<tAD, p=0.01	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.001, bvFTD<tAD, p=0.007

Surprise	18.49 (10.46)	31.81 (12.58)	19.33 (13.56)	27.89 (12.17)	0.02	bvAD<tAD, p=0.007, bvFTD<tAD, p=0.01	bvAD<tAD, p=0.006, bvFTD<tAD, p=0.01
Total	18.74 (9.53)	32.72 (12.08)	19.37 (14.28)	30.60 (11.69)	0.005	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.004, bvFTD<tAD, p=0.006	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.03, bvAD<tAD, p=0.002

*based on ANOVA test
**based on post hoc group comparisons
*** based on post hoc group comparisons adjusted for age and sex

Empathy – Interpersonal Reactivity Index

Supplementary Table 18. Scores on the Interpersonal Reactivity Index, a questionnaire measuring empathy, across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p- value*	Group differences, unadjusted**	Group differences, age and sex adjusted***
n	9	10	11	10			
Perspective Taking	11.33 (4.58)	13.00 (3.19)	8.73 (5.61)	15.90 (2.60)	0.0003	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.0001, bvFTD<tAD, p=0.02	bvFTD<SCD, p=0.001, bvFTD<tAD, p=0.05
Empathetic Concern	12.89 (4.28)	12.40 (4.19)	12.00 (3.00)	14.00 (0.94)	0.24	ns	ns
Fantasy	10.33 (5.22)	13.00 (3.09)	8.64 (3.96)	13.60 (1.65)	0.001	bvAD<SCD, p=0.05, bvFTD<SCD, p=0.002, bvFTD<tAD, p=0.007	bvFTD<SCD, p=0.03, bvFTD<tAD, p=0.03
Personal Distress	13.11 (3.52)	14.50 (2.95)	14.45 (3.01)	14.80 (1.87)	0.60	ns	ns

*based on ANOVA test adjusted for age and sex

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Empathy – empathy eliciting videos

Supplementary Table 19. Results of empathy videos across diagnostic groups: empathetic concern and personal distress scores and galvanic skin response while watching empathy eliciting videos

	bvAD	tAD	bvFTD	SCD	p- value*	Group differences, unadjusted**	Group differences, age and sex adjusted***
n	11	11	11	9			
Empathetic concern	2.55 (1.08)	2.61 (1.21)	2.11 (1.20)	2.81 (0.65)	0.14	ns	ns
Personal distress	1.61 (0.66)	1.64 (0.66)	1.87 (1.20)	1.67 (0.60)	0.63	ns	ns
n	11	11	10	9			
GSR PPM uplifting video	1.56 (1.99)	1.56 (1.99)	2.31 (2.66)	1.49 (1.44)	0.65	ns	ns
GSR PPM distressing video	1.97 (2.41)	1.97 (2.41)	2.06 (3.10)	1.20 (1.76)	0.26	ns	ns

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Supplementary Table 20. Mean GSR per baseline condition and empathy video condition across groups.

	bvAD (N=10)	tAD (N=11)	bvFTD (N=11)	SCD (N=10)	p-value*	Group differences adjusted**	Group differences, age and sex adjusted***
GSR Nature videos, mean (SD)	1.48 (1.45)	1.58 (1.26)	0.762 (0.547)	2.16 (1.89)	0.05	ns	bvFTD<SCD, p=0.03, tAD>bvFTD, p=0.05
GSR Empathy videos, Mean (SD)	1.51 (0.998)	1.49 (1.26)	0.995 (0.736)	1.35 (1.50)	0.42	ns	ns
Δ GSR Empathy-Nature videos, Mean (SD)	0.0305 (0.721)	0.142 (0.320)	0.178 (0.311)	-0.817 (1.34)	0.15	ns	ns
P-value difference Empathy vs Nature videos	0.55	0.90	0.91	0.96	-	-	-

*based on ANOVA test

**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Knowledge of Social Norms

Supplementary Table 21. Scores on Social Norms Questionnaire across diagnostic groups

	bvAD	tAD	bvFTD	SCD	p- value*	Group differences, unadjusted**	Group differences, sex and age adjusted***
n	11	11	11	10			
SNQ total score	16.00 (1.61)	17.82 (2.14)	15.18 (2.23)	18.44 (1.59)	0.0003	bvAD<SCD, p=0.005, bvFTD<SCD, p=0.0002, bvAD<tAD, p=0.03, bvFTD<tAD, p=0.001	bvAD<SCD, p=0.02, bvFTD<SCD, p=0.0006, bvAD<tAD, p=0.05, bvFTD<tAD, p=0.003
SNQ break score	2.09 (1.51)	1.09 (0.54)	1.73 (1.42)	1.11 (0.60)	0.06	ns	ns
SNQ overadherence score	3.91 (1.58)	3.09 (2.12)	5.09 (2.30)	2.44 (1.24)	0.005	bvFTD<SCD, p=0.002, bvFTD<tAD, p=0.01	bvFTD<SCD, p=0.006, bvFTD<tAD, p=0.02

*based on ANOVA test adjusted for age and sex
**based on post hoc group comparisons
*** based on post hoc group comparisons adjusted for age and sex

Moral reasoning

Supplementary Table 22. Scores on and galvanic skin response to moral dilemmas, across diagnostic groups

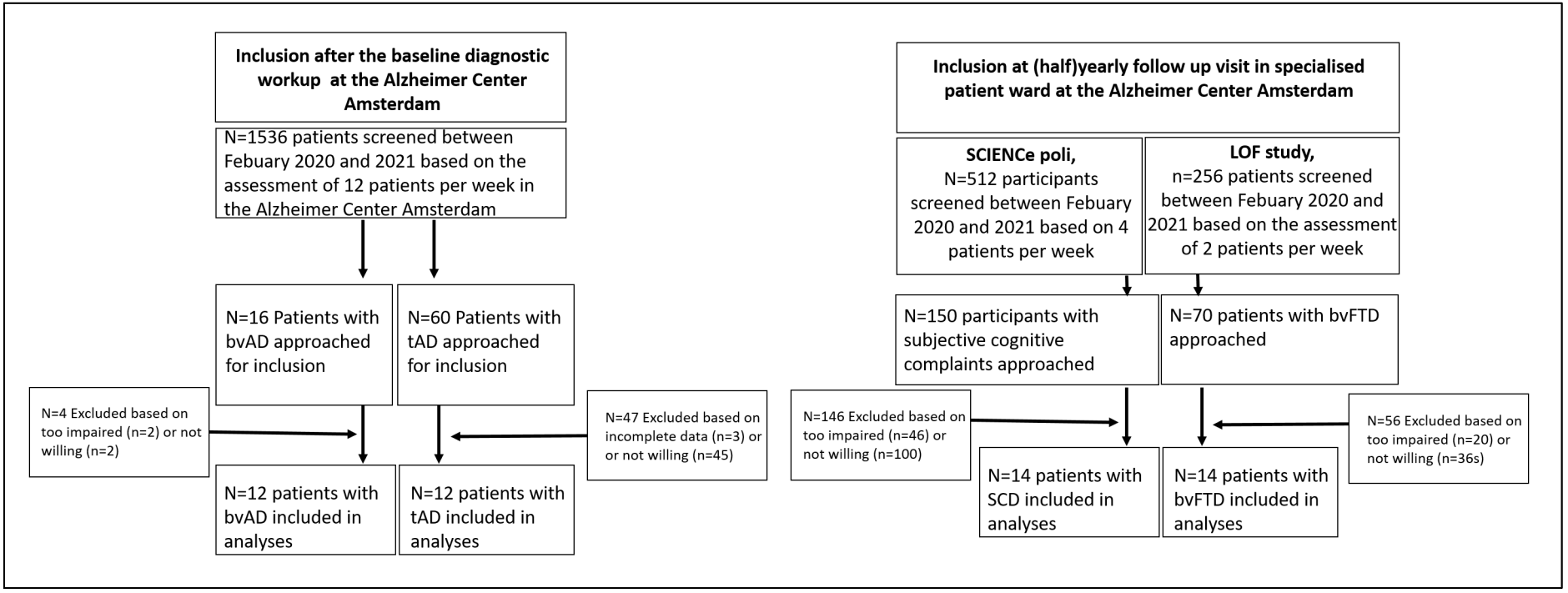
	bvAD	tAD	bvFTD	SCD	p- value*	Group differences, unadjusted	Group differences, age and sex adjusted**
n	10	11	11	9			
Personal dilemma, percentage rational responses	50.00	36.36	18.18	46.88	0.45	ns	ns
Impersonal dilemma, percentage rational responses	90.00	90.91	81.82	96.88	0.91	ns	ns
n	10	11	9	8			
Impersonal dilemma, GSR PPM	3.17 (2.34)	3.16 (3.65)	1.48 (1.71)	3.33 (3.46)	0.55	ns	ns
Personal dilemma, GSR PPM	2.89 (2.29)	3.43 (4.07)	0.86 (1.08)	2.18 (2.07)	0.06	ns	bvFTD<SCD, p=0.03

*based on ANOVA test

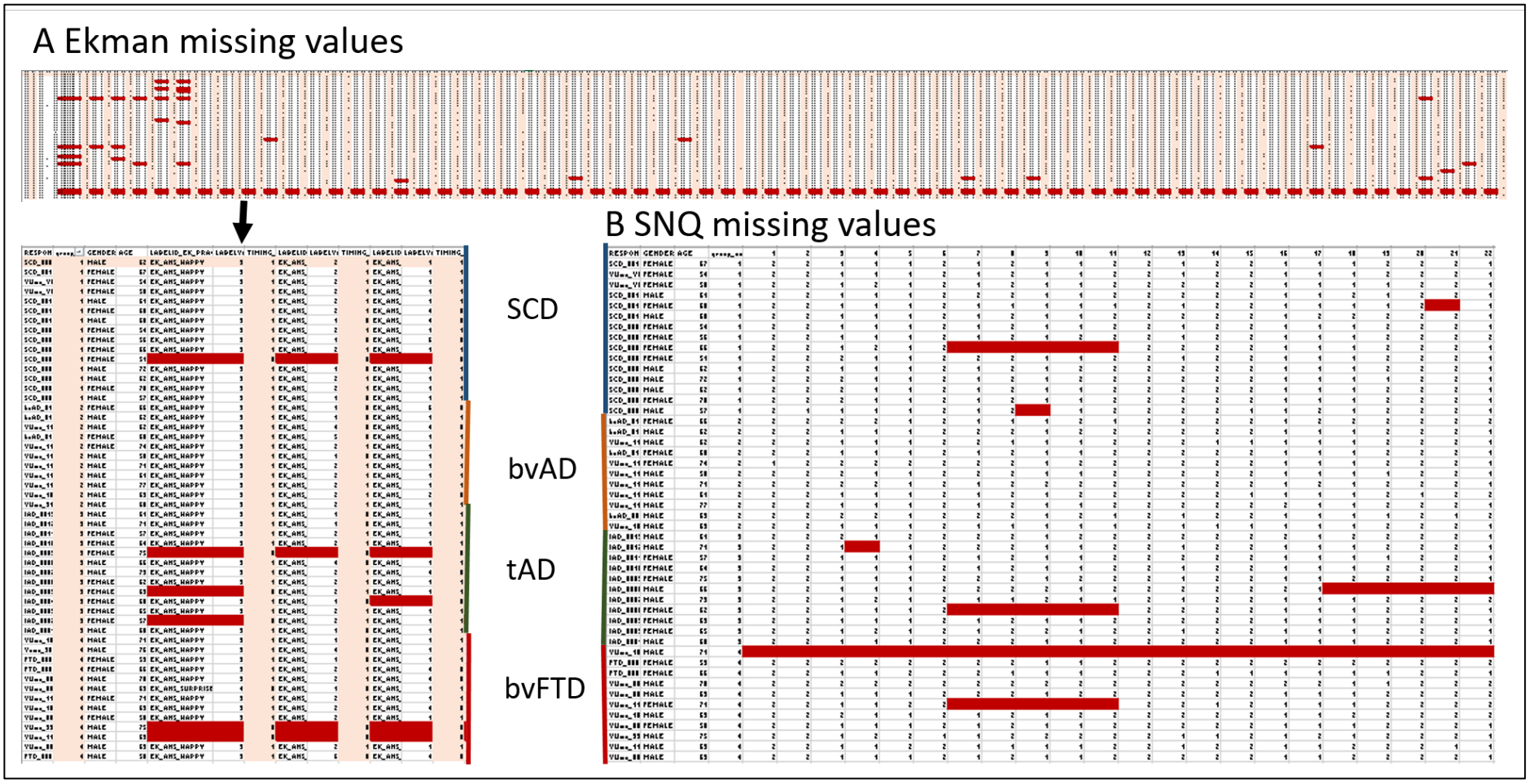
**based on post hoc group comparisons

*** based on post hoc group comparisons adjusted for age and sex

Supplementary Fig. 1. Inclusion flow of participants into the current study



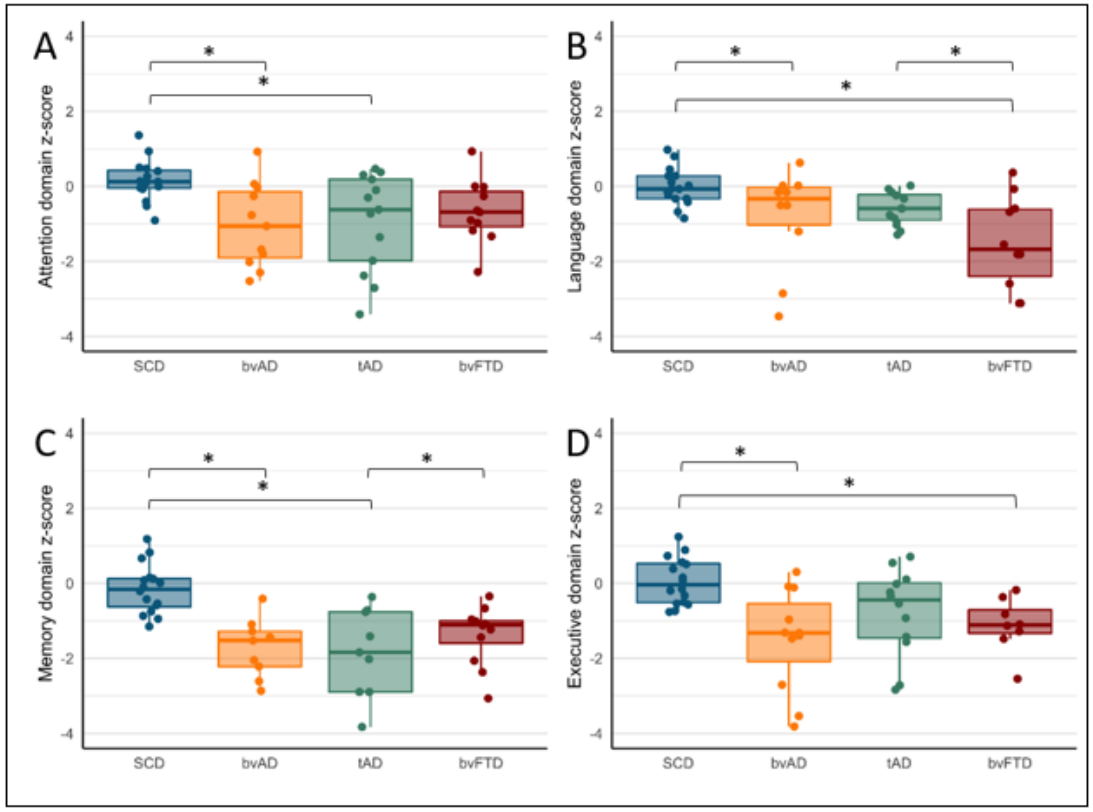
Supplementary Fig. 2. Matrices of missing values on the Ekman and SNQ prior to imputing procedures.



(A) shows the distribution of missing values across individuals and across items of the Ekman test. Each row indicates an individual and each column indicates a) the response label (i.e. EK_ANS_HAPPY), b) the corresponding answer response code (i.e. 3), c) the score ascribed to this answer (i.e. 0 or 1). The full dataset is shown on the top and the first 6 columns are depicted below the arrow for visualization purposes. **(B)** shows the distribution of missing values across individuals and across items of the Social Norms Questionnaire. The cases are ordered per diagnostic group (SCD-bvAD-tAD-bvFTD) and missing values are indicated with red colors.

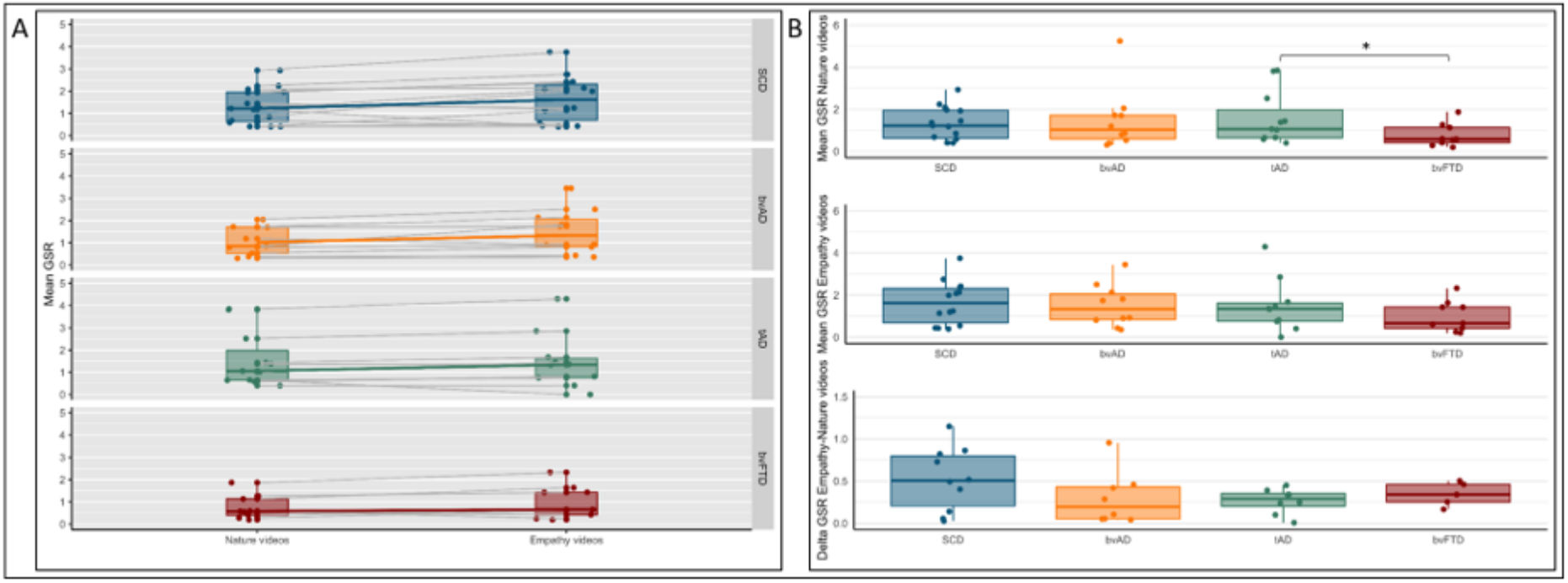
Supplementary Fig. 3. Example of Area of Interest imposed on the Ekman faces to retrieve eye tracking dwell time

Supplementary Fig. 4. Cognition domain z-scores across groups



Domain z-scores presented in this figure are normalized to a reference group of 583 cognitively normal individuals with negative amyloid-beta biomarker status[1]. **(A)** Attention domain z-scores, based on the Digit Span forward, Trail Making Test A and Stroop 1 and 2 cards, **(B)** Memory domain z-scores, based on the Rey Verbal Auditory Memory Test immediate and delayed recall conditions and the Visual Association Test, **(C)** Language domain z-scores, based on the Visual Association Test naming condition and Animal Fluency, **(D)** Executive domain z-scores, based on the Digit Span backward, Trail Making Test B, Stroop card 3 and Letter Fluency[2].

Supplementary Fig. 5. Mean GSR in a nature video condition compared to a empathy eliciting video condition across groups



(A) shows the mean GSR within the nature video versus the empathy eliciting video across different groups, showing no significant differences between the two conditions in any of the diagnostic groups. **(B)** shows the mean GSR within the nature video, empathy eliciting video and the difference between the empathy and nature video conditions across groups, showing only significantly higher GSR in the typical AD group versus the bvFTD group in the nature video condition.

References

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2. van der Flier WM, Scheltens P. Amsterdam Dementia Cohort: Performing Research to Optimize Care. *Journal of Alzheimer's Disease*. 2018;62:1091-1111. doi:10.3233/JAD-170850