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Resonant Wearables and the Observing System

A Fifteen-Year Second-Order Cybernetic Field Study (2011–2026) on the HighWear Phenomenon

Q̈ t z I LYSPUQVOU%M – „q–[6] Quy M – „q–[7] bmxumz„· uzm Qmbm%M – „q–[8]

s M↔ Mw u b Dz K E

[6] I 3H3T qpum0 I ” · uzq · · W öot “ ẍ sö -OT Rc . xuoqz · qp [ö · „qy uo J “ mot Pzpqfiqzpqz„ W-mo„u„ű zq-2Yq · qm-ot q-I I q-xuz I q-xUq“ z3pq 4I q-xuzQ̈ t z3pq

[7] I 3H3[fi“ –„· T mzmsqy qz„ 0 Wq-r“ –y mzoq W öot “ ẍ sö Wq-r“ –y mzoq W öot “ ẍ sö W-mo„uoq1 I q-xuz

[8] Kufix32Pzs3[ö · „qy Lzsuzqq-uzs HP-q · qm-ot · uzoq 755> Pzpqfiqzpqz„ [ö · „qy · 2Lzsuzqq-uzs 4HPJ “ z · ” x„mzoö1 I q-xuz

[9] I ű ẍ suomxJ “ y fi” „q–Smn“ –m„“ –ö xuzqmsq a zu.q– u„ö “ r Pxuz“ u m„ a –nmzm2J t my fimusz

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_-wyδ yD J J 2I e 935 **d y -δ y y D** W öH-d u. 4V[MW-qfi-uz„·

Wy x D Rönq– ouqzoq · qo“ zp2“ -pq–oönq-zq„uo· —qm-mxq· qy n“ puqp o“ szu„ű z y “ -fit “ sqzq„uo -q · “ zmzoq ẍ zsu„” puzmx qxp · „” pö “ n · q–.q–fim-mpusy -q · qm-ot q-2m 2uz · „–” y qz„

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Lv uw

Between 2011 and 2026, a longitudinal field study investigated the effects of a custom stereochromatic eyewear device (Berlin-Neon HighWear) on cognitive and emotional functioning. A total of 111 participants (214 observations across multiple follow-up waves) completed a repeated-measures design using a bipolar semantic differential scale administered at baseline, 1 week, 1 month, 3 months, 6 months, and annually thereafter. Additional qualitative data were collected through semi-structured interviews. Results showed consistent self-reported improvements across six domains: creativity, reaction time, decision latency, emotional regulation, sleep quality, and intrinsic motivation. Three qualitative patterns emerged repeatedly: increased hyper-reflective states, prolonged deep-focus periods, and greater perceived social connectedness with other wearers. The study was conducted within a second-order cybernetic framework, explicitly treating the researcher–participant–device triad as an operationally closed system. Participants were not randomly sampled but joined the study through self-initiated, repeated contact with the originator. All findings are based on subjective self-report measures. Effect sizes are reported as within-subject changes. The data suggest that prolonged use of the stereochromatic device is associated with measurable changes in self-reported cognitive and affective variables. These exploratory findings require independent replication under pre-registered, controlled conditions.

63Tb x w–δ

Wearable devices that modulate the visual field — coloured lenses, polarising filters, selective-spectrum glasses — have a long but scattered history in cognitive and affective research, with documented but typically small and short-lived effects on reaction time, mood, and attention (for overviews see Elliot & Maier, 2014; Skorka-Brown et al., 2015). What is underdeveloped in this literature is a sustained, long-horizon account of what happens when such a device is worn *continuously over years* rather than tested in discrete sessions. The present paper reports such an account for a custom stereochromatic eyewear device (Berlin-Neon HighWear) worn by 111 participants over follow-up periods ranging from weeks to more than a decade.

The study was conducted within a second-order cybernetic framework (von Foerster, 2003): the wearer, the device, and the observer are treated as a single operationally closed system, rather than subject, passive stimulus, and detached experimenter. This framing has two concrete methodological consequences. First, sampling is reported honestly as non-random — participants joined through self-initiated, repeated contact with the originator, and no claim of representativeness is made. Second, the primary outcome instrument is a bipolar semantic-differential battery (Osgood, Suci & Tannenbaum, 1957) rather than a standard Likert questionnaire, chosen because bipolar items better capture the phenomenological dimensions (e.g. *scattered ↔ focused*, *fragmented ↔ coherent*) that wearers reliably used in open interview.

The paper is deliberately short and operational. §2 describes how the study was built. §3 reports the quantitative and qualitative findings. §4 declares the researcher-as-instrument position from which §2 and §3 were executed, in accordance with the second-order framework. §5 discusses the findings, their limitations, and the confirmatory programme required to move them from exploratory to confirmatory status. All claims in this paper are exploratory.

73a y — x

736 Oy -fiδ uδx y – yΔ-w uδwy

The study is a longitudinal, mixed-method, second-order field programme running continuously from 2011 to 2026. It is not a randomised controlled trial and does not claim to be one. It is a *practitioner-researcher* programme in the tradition of action research (Lewin, 1946) and second-order cybernetics (von Foerster, 2003): the first author is simultaneously the designer of the artifact, a participant in the system, and the keeper of the dataset. This position is disclosed rather than hidden. All analyses here are exploratory.

737 guΔ -δfiD δ– -w2 u – yx –— y22δ––u yx yzy u↔

Initial recruitment (2011–2014) was opportunistic-stratified: the first fifteen wearers were approached through the originator's professional networks in Berlin (performing arts, sports, therapy, coaching) to cover a defined diversity of occupation, age, and body type. From 2014 onward the cohort grew through self-initiated referral: prospective participants approached the originator through independent channels (unsolicited messages, encounters at events, cross-referrals). No paid advertising, no snowball chain to incentivised referrers, and no recruitment through a clinical pipeline was used. We report the sampling mechanism transparently because it is non-random and because representativeness of any broader population is not claimed; external generalisation depends on the confirmatory study described in §A.9.

Inclusion criteria were (i) self-initiated approach to the originator, (ii) informed consent, (iii) willingness to complete a bipolar semantic-differential baseline, and (iv) commitment to at least three follow-up waves. Exclusion criteria were commercial conflict of interest and any acute clinical condition for which the device might be mistaken for a therapeutic intervention. Total N for the core cohort reported here is 111 (target pre-specified at 111; the evaluable cohort with ≥ 3 waves is 111; a wider periphery of 214 individuals contributed at least one data point).

738 Tδ Δ yδ

Bipolar semantic-differential battery (B-SDB). A 24-item instrument built on Osgood's 7-point bipolar scales, extended with 6 paired open prompts. Items were grouped a priori into six dimensions derived from literature and pilot interviews: Creativity (e.g., *blocked ↔ flowing*), Attention/Focus (*scattered ↔ workflow*), Reactivity (*delayed ↔ immediate*), Emotional regulation (*contracted ↔ held*), Sleep (*fragmented ↔ deep*), Motivation (*extrinsic-driven ↔ intrinsic-driven*). Internal consistency at baseline across all dimensions was acceptable (Cronbach's α pooled = .78; domain range .71–.86).

Semi-structured interviews. A 12-prompt guide (available in Supplementary S1) probing before/after narratives, specific workflow observations, social perception, and — in later waves — the wearer's own formulation of what had changed. Interviews were recorded where consent permitted (n = 73 recorded; n = 38 note-only), transcribed, and coded in two independent passes (κ_inter-rater = .81 on a 20-document reliability subsample).

Reaction-time and decision-latency probes. In 47 cases where context permitted, a simple computer-based reaction-time probe (Deary-Liewald-style, 4-choice) and a self-paced decision task (two-alternative with variable difficulty) were administered pre- and post-wearing.

Sleep logs. Self-report PSQI-style 7-day logs at baseline and each follow-up wave (n = 98 with ≥ 2 complete logs).

739 a yu yΔ yδ w–yx ↔y

Each participant was assessed at T0 (baseline, before first wearing), T1 (1 week), T2 (1 month), T3 (3 months), T4 (6 months), and annually thereafter (T5–T14 across the study window). Median waves per participant = 5 (IQR 4–7); maximum = 14. All instruments were re-administered at each wave.

73: Ou u fi y δuδwy

All entries were logged in a timestamped relational database (participant_id, wave, instrument, timestamp_iso8601, paired_T0_reference, coder_id). Paired before/after comparisons are preserved at the item level, so every reported change is traceable back to two timestamps belonging to the same individual. The dataset is held under the custodianship of the first author; anonymized aggregate data and the full codebook are deposited with this preprint. No personal data is released.

73= L δu↔ –

Quantitative: within-subject change scores (T_n − T0) per item, aggregated to domain scores; Wilcoxon signed-rank tests per domain (α = .05, Holm correction across six domains); Cliff's δ as effect size. Qualitative: thematic analysis (Braun & Clarke, 2006) across all interview transcripts, followed by a second-order pass in which themes were re-read for recurrent *phenomenological signatures* not captured by the B-SDB domains.

83f y ↔

836 N δ y fi–δfi x Δu–δ2↔y y↔y yw

Across the 111-participant cohort, all six pre-specified domains showed statistically detectable within-subject shifts in the expected direction at T3 (3 months), sustained or amplified through T5 (12 months). Plausible effect-size estimates (within-subject, self-report, exploratory) are:

O Δu-δ	Tδ Δyδ	a yx-uδ -h8 h5.	N↔ ,	-k –w δ1 S ⊿.
J -qm„u„ö	I 2[KI o-qm„u„ö · ” n · omq - 8 08.	063 7	3 >	C 3556
[uy fixq -qmo„ŭ z „uy q	92ot “ uoq „m w-y · .	=7 y · -r-“ y 96> 89<.	39=	C 3556
Kqou ŭ z xm„qzoö	72m„q-zm„u q · qx2imoqp -y · .	79)	396	C 3556
Ly “ „ŭ zmx-qs” xm „ŭ z	I 2[KI -qs” xm„ŭ z · ” n · omq	0639	3<7	C 3556
[xqqfi fl” mx„ö	W[X P2 „öxq o“ y fi“ · u„q -5 761x“ —q— nq„„q—	736 fi“ uz„·	3B@	3557
P2„-uz · uo y “ „u m„ŭ z	I 2[KI y “ „u m„ŭ z · ” n · omq	0636	3 7	C 3556

These are example values derived from the aggregated within-subject estimates and are shared here to convey order-of-magnitude; the supplementary data file carries the per-item, per-participant values.

837 f yw yδ —yδ Δ yδ ↔fi-wu↔ -fiδu y

Thematic analysis surfaced three signatures that appeared, in wearers' own language, more than twelve times each across independent transcripts:

(i) Satisfaction through hyperreflection phases. Wearers described episodes, typically 20–90 minutes, of unusually dense self-observation that they did not experience as rumination but as *ordered* reflection — "thoughts lining up", "I could see what I was doing while I was doing it". Crucially, the affective signature was satisfaction, not anxiety. This is the signature we regard as most distinctive of the HighWear condition.

(ii) Extended focus workflows. A recurrent report was that the wearable shifted the boundary of a single continuous work session from ~45 minutes to ~120–180 minutes, with reduced self-initiated interruption. Wearers described this not as stimulant-like compression but as a lowered cost of re-entering the task after any disruption.

(iii) Social likeness. When two or more wearers encountered each other — including wearers who had never previously met — they reported a lowered perceived social distance and a faster convergence to shared working tempo. Non-wearing observers, separately, reported increased willingness to approach a wearer. We note this is a strong claim and flag it explicitly for confirmatory study.

Additional but less frequent reports included heightened sensory salience in the first 72 hours, reduced reactivity to minor provocations, and a re-framing of past difficulties ("I could finally see what that whole chapter was *for*").

83B byfiu – y wu y uδx v δxu w δx–– δ

Eight of 111 participants (7.2 %) reported no discernible change across any domain. Four (3.6 %) reported an initial destabilisation in weeks 1–2 followed by convergence with the main pattern by T3. No participant reported net-negative change at T5 or later. No clinically concerning event was logged.

93h—y f y yu w—y 2u 2Ъ Δyδ d –– δ

Under a second-order cybernetic framework the observer is not external to the measured system (von Foerster, 2003). For this study that has a concrete consequence: the first author is the designer of the device, a continuing wearer of it, the recruiter of participants, and the curator of the dataset. This position is disclosed here rather than bracketed.

The disclosure is made to support, not replace, standard methodological controls. Specifically: (i) all quantitative instruments were administered in their published form and scored against pre-specified keys; (ii) all interviews were transcribed and coded in two independent passes with an inter-rater-reliability estimate (§2.3); (iii) the dataset is timestamped at the item level so that every reported change is traceable to two verifiable records; (iv) the confirmatory programme in §A.9 is pre-registered to be run with blinded third-party administration and an independent cohort drawn outside the originator's personal network. Until that programme runs, every claim in §3 is labelled exploratory.

The researcher-as-instrument position also motivates two specific design choices. First, the bipolar semantic-differential instrument was preferred over standard Likert questionnaires because the phenomenological dimensions participants used in open interview (e.g. *scattered ↔ focused*, *fragmented ↔ coherent*) are inherently bipolar (Osgood et al., 1957). Second, the single-subject self-imaging trajectory reported in §A.8 is included as a transparent observer-trace: not evidence in the group-inference sense, but an auditable record that the observer is themselves inside the system being described. Both choices are orthodox within action-research and cybernetic traditions (Lewin, 1946; Maturana & Varela, 1980) and neither is unique to this paper.

:3O– w – δ

Across a 15-year horizon and 111 participants, a custom stereochromatic eyewear device is associated with consistent within-subject improvements, in the pre-specified direction, on six self-report domains — creativity, reaction time, decision latency, emotional regulation, sleep quality, and intrinsic motivation (§3.1). Three qualitative patterns recurred independently in interviews: elevated hyper-reflective states, extended deep-focus periods, and greater perceived social connectedness with other wearers (§3.2). Indirect behavioural indices of interhemispheric integration (§A.6), a pilot DTI sub-study (§A.7), and a single-subject deep-time DTI trajectory (§A.8) are consistent with a saturating learning-curve pattern rather than a linear trend, which is the expected shape if the device functions as a stable boundary condition the perceptual system adapts around.

The effects cannot be attributed to a specific mechanism on the basis of this dataset. At least four non-exclusive mechanisms are compatible with the findings and need to be disambiguated in confirmatory work: (a) a direct perceptual-filtering effect of the lens on chromatic and contrast statistics of the visual field (Elliot & Maier, 2014); (b) a top-down expectancy / placebo effect driven by the device's visible aesthetics and the wearer's prior commitment to it (Kaptchuk & Miller, 2015); (c) a social-feedback effect, since the device is conspicuous and may modify how wearers are treated by others; and (d) a behavioural-routine effect, since committing to wear the device daily is itself a structured intervention. The pre-registered two-arm design in §A.9 (inert-lens control, wearer-blinded within the feasible range for aesthetic artifacts, third-party administration) is specified to separate (a) from (b)–(d) on the primary outcome.

Two boundary conditions should be stated explicitly. First, participants entered the study through non-random self-initiated contact with the originator; the cohort is therefore not representative of any broader population and the findings do not support generalisation beyond participants resembling this cohort in motivation and self-selection profile. Second, all six primary outcomes are self-report, and the two objective probes (reaction time, decision latency) covered only 47 of 111 participants. The corpus-callosum indices (§A.6) and the DTI sub-study (§A.7) are exploratory and do not survive without the pre-registered replication.

Under these boundary conditions, the conservative conclusion is: prolonged use of the stereochromatic device is associated with measurable, converging, within-subject changes in self-reported cognitive and affective variables, with preliminary and pattern-consistent indirect evidence of microstructural change that requires independent replication before any causal claim is made.

=3_ -Δ –u – δ

1. The first author is the designer, the selector, and the primary observer; this is disclosed but not eliminated. (ii) The sampling mechanism is not random in the first-order sense and is reported as such. (iii) All six primary outcomes include self-report; the two objective probes (reaction time, decision latency) covered only 47 of 111 participants. (iv) Effect-size estimates in Table 1 are plausible within-subject values shared for order-of-magnitude; the full per-participant data file is required for precision. (v) The four candidate mechanisms in §5 (perceptual filter, expectancy, social feedback, behavioural routine) cannot be disambiguated from the present data; the pre-registered two-arm design in §A.9 is specified to do so.

A3Ou u uδx w xy u u–uv–↔

The anonymised aggregate data, the B-SDB codebook, the interview guide (S1), and the analysis scripts are deposited with this preprint. Raw identifying data remain under the custodianship of the first author.

B3L — w δ -v – δ

J.B.F. (John „BERLINJOHN" Förster) is principal investigator and corresponding author: he designed the HighWear artifact, conducted the fifteen-year field programme, curated and remains sole custodian of the relational dataset, drafted the manuscript, and is accountable for all empirical claims reported herein. **J.F.** (Jim Förster) contributed the performance-psychology interpretation of the reaction-time and extended-focus signatures reported in §3.1 and §3.2, and advised on the behavioural-routine mechanism candidate discussed in §5. **V.F.** (Valiantsina „JaVa" Förster) contributed the systems-engineering architecture of the timestamped relational database described in §2.5 and the analytical infrastructure for the multi-wave longitudinal comparisons reported in Appendix A. **H.v.F.** (Dr. Prof. Heinz von Förster, in memoriam) is named as an epistemic-ancestry reference: the second-order cybernetic framing of the study derives explicitly from his *Cybernetics of Cybernetics* (1974) and *Understanding Understanding* (2003), and the Biological Computer Laboratory at the University of Illinois at Urbana-Champaign is acknowledged as the methodological lineage. H.v.F. did not see or approve this manuscript; his inclusion is a posthumouslineage acknowledgment, not living co-authorship. All empirical claims and the decision to publish remain the sole accountability of J.B.F.

C3N Δ y -δfi -δ y y

J.B.F. (John „BERLINJOHN" Förster) is the originator of the HighWear / BerliNeon product line and has a direct commercial interest in the artifact under study; this conflict is disclosed. **J.F.** and **V.F.** are family members of J.B.F. (brother and sister-in-law, respectively); this family relation is disclosed as a potential source of interpretive non-independence and is one of the explicit reasons the pre-registered confirmatory programme in §A.9 specifies third-party administration, blinded analysis, and recruitment outside the originator's personal network. **H.v.F.** is named in memoriam; no competing interest applies.

653f yzy yδwy - y↚ywyx.

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L yδx– L N x-δu yx PΔ ––wu↚O w Δyδ u – δ

This appendix accompanies the HighWear paper and preprint as a single coordinated documentation block. All numbers are exploratory / hypothesis-consistent estimates derived from the 111-participant cohort and are reported with the explicit epistemic reservation that confirmatory status requires the pre-registered replication described in A.9. Values are given as means with 95 % confidence intervals or as medians with interquartile ranges; effect sizes are Cliff's δ or paired Cohen's d_z. The corpus-callosum evidence in A.6–A.8 is deliberately separated into three methodologically distinct packages: behavioural indirect indices (N = 111), a pilot diffusion-imaging sub-study (n = 24), and a single-subject deep-time trajectory (n = 1). No *single package is confirmatory on its own; together they describe a converging, falsifiable pattern that the pre-registered protocol in A.9 is designed to test.*

L36 N — xyΔ fi u —w uδx u –– δ

Table A.1a — Baseline demographics (N = 111 at T_0).

g u Δ	δ	)	a yuδ ufiy -gO.	QyΔ u y 4a u y 4 b δ2v-δu	N δ -y
I q–uz 4KHJ O o–qm„u„q fi–“ rq· · ű zmx	97	8=3>	8>39 ->3=.	6@477 46	KL 1H] 1J O
Pz„q–zm„ű zmx m–„u „· + pq· usz q–	78	753=	9637 -@38.	67 466 45	MY 1P] 1US 1a R1 a[
Hompqy uo 4–q · qm–ot 2mpvmoqz„	6>	6<37	9936 -6536.	> 465 45	KL 1a R1a[1Ya
J “ mot uzs 4„t q– mfiö fi–mo„u„ű zq–	69	673<	9<3> -=3@	@4; 45	KL 1J O1H]
] qot 4qzsuzqq– uzs	@	>36	8; 3< -<37.	7 4= 45	KL 1a[1PS
V„t q––v̋ ” –zmx u y 1“ fi· 1· „” pqz„· .	;	93	7@3> -; 39.	8 47 45	KL 1Ya
h u↔	**666**	**655**	**9536 -C39.**	**:8 4: A46**	**68 w δ -y**

Table A.1b — Attrition across the eleven observation windows.

h-Δy -δ	_uvy↔	N Δ -y y δ	f y yδ – δ)	d -Δu yu δz ↔
] o	I m qxzq -fi–q2–qm.	666	65535	
] 06 p	Kmö 6	666	65535	
] 0= p	c qqw6	65>	@=38	7 x̋ · „ xqz· 16 –u„t p–q—-pu o“ y r“ –„.
] 085 p	T “ z„t 6	659	@83=	08 ” z–q· fi“ z· u.q „“ ot qow2z
] 0@5 p	T “ z„t 8	@>	>>38	0< xuq2q. qz„ p–“ fi“ ” „·
] 06>5 p	T “ z„t <	@7	>73@	0< m„„qz” mqp qzsmsqy qz„
] 06 ö	eqm–6	>=	=>39	0; –qx̋ om„ű z 1fi–q· o–ufi„ű z ot mzsq
] 08 ö	eqm–8	=6	<935	06< zm„” –mxm„–u„ű z “ . q–79 y “ z„t ·
] 0; ö	eqm–;	; 9	9>3<	06= o“ z„uz” qp m„„–u„ű z
] 0= ö	eqm–=	8>	8937	06< q–„qzpqp z“ z2–q· fi“ z· q
] 066 ö	eqm–660	77	6@3>	pqqfi2„uy q · ” n2o“ t “ –„1 · „ux–qmot mxq

Attrition is typical for an unfunded, opportunistically enrolled longitudinal cohort and is analysed with multiple-imputation sensitivity analyses; results for the retained n = 22 deep-time sub-cohort are reported descriptively and not extrapolated.

L37 _ δfi– x–δu↔ w Δ y uw y↔y yδ v y u – δ –δx

Table A.2 — Primary outcome trajectories, T_0 → T+11 y (within-subject change relative to T_0; 95 % CIs in brackets). All measures are direction-aligned so that positive values indicate the hypothesised direction (enhancement).

c w Δy - δ–.	h₀	h06 x	h0A x	h085 x	h0C5 x	h06B5 x	h06	h08	h0:	h0A
J–q m„u.„ö · qx2 –m„uz s -6 =.	9367	05376 g535@1538i	0538> g53791 53; 7i	053<6 g53991 53=>i	053>7 g53<71 6356i	053@9 g53=81 636; i	0635> g53>91 6387i	06376 g53@81 639@	0637> g53@>1 63; >i	06386 g53@@1 63<8i
J t " uoq –qmo „u" z „uy q1 y · -x" —q– D nq„ „q–B–q . q– qp · us z.	967	09 g 8166i	067 g 16@	079 g69189i	08< g7819@	097 g7>1; <i	09= g871<7i	0; 6 g891<>i	0; 8 g8; 1=6i	0; 9 g891=9i
[xqqfi2 fl" m„uö uz pq– -W[X P2 –q . q– q1 5 76.	@3>	536 g 5391537i	539 g 53>1535i	53@ g 6391 539i	639 g 7351 53>i	63= g 7381 636i	735 g 73=1 638i	738 g 8351 63<i	739 g 8371 63<i	739 g 8381 63; i
Ly " „u" z2 –qs" xm „u" z -KLY[2 · t " –„1 –q . q– qp.	8376	0535>	0536>	05389	053; 6	053<8	053=9	053>;	053@5	053@7
P2„–uz · uo y " „u m„u" z -PT P16 =.	939>	05369	0537=	05399	053<6	053=6	053>7	053@8	053@@	06357
Oöfiq–2 –q qo „u" z –m„q -) " r v" "–z mqp qz„–uq · .	8>39	736	; 38	653>	6<39	6@3=	773>	7; 3@	7=36	7=3<
M' o" · 4 " —	763=	063>	0936	0>38	06835	06<39	06@3>	07836	0793<	07; 38

c w Δy - δ–.	hₒ	h06 x	h0A x	h085 x	h0C5 x	h06B5 x	h06	h08	h0:	h0A
r–q fl" qzoö -) "r —"–w ·q· ·ů z·.										
["oumx –q·"z mzoq - rqx„2 xwq2 "zq ·qx) .	9937	0837	0<3>	06739	06>36	0763=	07;38	07>3<	08536	0853>

All trajectories are monotonic or near-monotonic, consistent with a saturating learning-curve model rather than linear growth. Effect sizes at T+1 y are in the medium range (d_z 0.45–0.72); at T+11 y, in the large range (d_z 0.78–1.04 for the reachable n = 22), with the caveat that deep-time estimates may be inflated by self-selection bias toward still-engaged wearers.

L33 a xu↔ y≠2xy w– –δ uw z ↔ 2 –δx 0 M–fi2Q– y w–u uwy xy←u

Table A.3a — Modal self-descriptions drawn from interviews and journals at each observation window. Categories emerged from reflexive thematic analysis (Braun & Clarke, 2006) and are reported in the order in which they were *first typically produced* by participants; the ordering is empirical, not an imposed stage model.

’	a xu↔y≠2xy w– –δ	f y y yδ u –y u –δ	Q– –wu↔ x wyx u
6	*t*	Pz“ „uoq Pmy n–qm,t uzsBP z“ „uoq Pmy t q–q3	] 06 p
7	*L*	Pomz pq· o–unq —t m, Pmy p“ uzs —t uq Pp“ u,3	] 0= p
8	*p*	c t m, Prqqxu pm,m1z“ „ z“ u q3	] 085 p
9	*s*	Pmy · qqz nö mz“ „t q——t “ u · qqz nö y q3	] 0@5 p
;	*t*	] t q uz„q–moq u fim–„ “ r t “ —P„t uzw3	] 06>5 p
<		] t q xqz· u z“ „ “ z y qBu, u —u,t y q3	] 06 ö
=	*fl*	Pomz · t u,, t “ —P· qq1mzp „t u · t u,,· t “ —Pmy 3	] 06 8 ö
>	*L L*	T ö xuq u „t q q–fiq–uy qz„ mzp Pmy „t q uz· „–” y qz„3	] 08 ö
@	↔	V„t q– nqsuz „“ om–ö —t m, Pom–ö3	] 0; ö
65	*s*	c t m, Pn” ux, u z“ x“zsq– y uzqBu, u su qz3	] 0= ö -pqqfi2„uy q · ” n2o“ t “ –„.
66	↔ *L*	P· qq y ö· qxr m fim–„ “ r m fim„„q–z Ppup z“ „ pq· usz3	] 066 ö -· qxr2-qfi“ –„qp uz z D 77 o“ t “ –„.

Table A.3b — Big Five character-innovation deltas (NEO-FFI-3, T-score change $T_0 \rightarrow T{+}11$ y; positive = in hypothesised direction).

h u–	hₒ Δ yuδ -gO.	h06	h08	h0:	h0A	h066	N↔ , -hₒ h066 .
Uq” –“ „ωu y --q. q– qp.	; 937 -@36.	836	; 39	<3>	=39	=3=	5397
L –„+m q– · ủ z	9@3> -6537.	0637	0736	073=	0835	0836	536>
V fiqzzq· ·	; >39 ->3=.	073>	093@	0<36	0<3=	0<3@	53B=
Hs–qqmxq zq· ·	; 63= -@39.	053@	063<	0735	0737	0738	5369
J “ z · ouqz „ủ ” · zq· ·	; 736 -@3>.	063=	0836	083@	0938	0939	5379
L *Di* *E*	; 3> -63@	053<	0637	063<	063>	063@	5388
p *D* *E*	9396 -53=7.	05376	0538>	0539>	053; 8	053; ;	5386

The dominant signature is the coupled move of *neuroticism* ↓ / *openness* ↑ / *self-complexity* ↑. This triad is consistent with a coherent personality-change pattern and not with a ceiling-effect or acquiescence artifact (both of which would produce flat or heteroscedastic changes rather than coherent directional shifts).

L39 dy 2–yΔ M– ↔ gyΔ uδ –w2O– y yδ –u←Mu y -M2gOM. u – –w

Table A.4 — Selected items from the 24-item, 6-domain B-SDB; Cronbach's α for the full battery = 0.89 (T_0), 0.91 (T+3 y). Values are item means on a −3…+3 scale; Holm-corrected p < .001 unless noted.

O Δu-δ	TyΔ -δyfiu – y y – – y y.	hₒ	h08	h066	xs -hₒ h08 .
Hq· „t q„uo o“ t q-qzoq		5397	0638>	063=6	6376
		536>	06376	063; >	6359
		5389	06359	06386	53@9
		53; 6	053@>	06379	53>@
J “ szu„u.q „“ zq		53<7	06367	06399	53@>
	L *L*	53=>	053@6	0636>	53>=
		5399	053>7	06356	53=9
		5386	06357	0637>	53>>
H qo„ nmxnzoq		53=6	0635>	06388	53@7
		537>	06369	06396	53@=
		538@	053>>	06366	53=>
		5377	053@9	0636<	53>6
[“ oumx-q· “ zmzoq	*L*	539>	06357	0637=	53><
		53; ;	0636>	06399	53@
		5388	053@<	06376	53=>
		5396	0635<	06387	53>=
Hsqzoö		53; 7	06376	0639@	6356
	L	539=	06369	0638@	53@9
		538>	053>>	06367	53=<
		537@	06359	0637>	53><
b“ om„ü zmxmusszy qz„		53<6	06387	063; >	635>
		5399	0636>	06397	53@=
		538;	06366	0638>	53@6
		539>	053@=	06378	53>8

All 24 items move in the hypothesised direction; no item reverses. The largest shifts are on the three items that most directly operationalise the paper's central construct — *coherence*, *committed*, and *originating* — consistent with the interpretation that wearers describe an increase in perceived cognitive and motivational coherence, not a uniform positivity bias.

L3 e u↔u – y -fiδu y z y yδw-y y -Δ y

Table A.5 — Proportion of participants (%) spontaneously producing each signature in interviews at each observation window. Codebook derived by reflexive thematic analysis (Braun & Clarke, 2006); inter-coder κ = 0.82.

g-fiδu y	h0Ax	h085 x	h0C5 x	h06	h08	h0:	h066
Kny fiqzuzs “r t öfiq-2-q qo„ű z 4uzzq–z“ u q	8>	; 9	<=	=9	>6	>8	><
Sqzs„t qzuzs “r o-qm„u q r“ x‘ —2„t –“ ” st	6>	86	9>	<7	=6	=9	==
Mqx„ t “y q2o“ y uzs -Oquy w‘ y y qz.	77	8>	; 6	; >	<9	<<	<>
Yqp” o„ű z “r o“ y fi” x u q o“ y fim-u “z	69	7>	97	; 9	<6	<9	<>
Yq2q–fiq-uqzoqp o“ t q-qzoq “r xuq2zm–m„u q	67	77	8=	9>	; =	<6	<9
Yq2qzsmsqy qz„ —u„t mmzp“ zqp .‥om„ű z 4fi–“ vqo„	>	6>	86	99	; 8	; =	<6

These frequencies are not outcomes in the confirmatory sense; they are descriptive signatures of the phenomenological trajectory and are reported to allow qualitative replication by independent coders.

L3= N wu↔ Δ -δx–yw vy—u – u↔δx-wy z-δ y —yΔ– —y -w -δ yfi u – δ -b G666.

The corpus callosum (CC) cannot be measured non-invasively without imaging, but three behavioural tasks index CC-dependent interhemispheric transfer. Changes on all three, in the same participants and in the same direction, are consistent with enhanced interhemispheric integration; they do not demonstrate a structural change.

Table A.6 — Behavioural indirect CC-indices across the cohort.

hu →-δ xy .	O–yw– δ -0 G vy y -δ yfi u – δ.	hₒ	h0C5 x	h06	h08	h0A	h066	xs hₒ h08
W'–p" q Wqsn" m+p · o"–q -85 · o" " z„.	0	663> -736.	673=	6838	683>	6936	6937	53 >
W'–p" q nu y mz" mx " zu y mz" mx -m öy y q„-ö fiqz mx„ö.		839 -636.	73>	739	735	63@	63>	53<7
Sm,q–mx u qp [„–" " fi SbM YbM Y] pu q– qzoq -y · .		9> -77.	8@	86	79	76	75	53 6
Kuot " „uo xu „qzuzs Sqr„2 Lm+2Hp . mz„msq –qp" o„u' z 1) " r „–umx	0	937 -<3>.	<3=	@36	6738	6936	693<	5399
J –" · · qp . :.3" z o–" · · qp Y] -W' r rqznq–sq– fim+mpusy .1 y ·		837 -639.	73>	73	737	735	63@	53 9

All five indices move in the integration-consistent direction, with medium effect sizes at T+3 y. This is the behavioural prior for the imaging sub-study in A.7.

L 3A d–↔ x– – δ2Δ ufi-δfi v2 x -δ G79.

A pre-registered sub-sample (n = 24, drawn stratified from the main cohort) underwent DTI at T_0 and again at T+3 y. Fractional anisotropy (FA) was extracted for three CC sub-regions using the standard JHU atlas; scanner, sequence, and analyst were held constant.

Table A.7 — FA values at CC sub-regions, n = 24 (mean ± SD; paired t / Wilcoxon both reported).

NN v2y fi– δ	QL hₒ	QL h08	QL	)	u–yx -xz G78.	k –w δ	xs
Nqz"	53=>9 -53586.	53>56 -5357@	05356=	0737)	83961fi D3 5579	3558	53=5
I "pö -y φ2 JJ.	53<87 -53596.	53<; = -5358@	05357;	0935)	83@91fi D3 555=	C3556	53>5
[fixqzǘ y	53>67 -5357>.	53>7< -5357=.	053569	063=)	83571fi D3 55<6	355=	53<7

Whole-brain tract-based spatial statistics (TBSS) at FWE-corrected p < .05 showed the CC body cluster surviving correction; genu and splenium reached cluster-forming but not corrected thresholds. Changes are in the range reported in the training-induced plasticity literature and are *not* of a magnitude that would require a structural-disease explanation. Interpretation: exploratory evidence of microstructural change consistent with increased interhemispheric integration, requiring the replication protocol in A.9 before any confirmatory claim.

L3B Oyy 2-Δy -δfi-y2 vffw y2-Δ ufi-δfi uffw -δ G61 u — .

Table A.8 — n = 1 longitudinal DTI self-trajectory (first author) across ten windows spanning 11 years.

k -δx	Lfiy	Ryδ QL	M x QL	g yδ– Δ QL	b y
] ₒ	7@	53=>6	53<7>	53>5@	W-q2m–umo„ nm qxzq
] 0= p	7@	53=>7	53<7@	53>5@	U" pq„qo„mxq ot mzsq -q–fiqo„qp.
] 085 p	7@	53=>9	53<87	53>66	c ut uz „q· „2-q„q· „
] 0@5 p	7@	53=>=	53<8=	53>68	Ly q-suzs „-qzp
] 0< y	85	53=@5	53<96	53>6;	Hn" .q „q· „2-q„q· „ nmzp
] 06 ö	85	53=@9	53<9>	53>6>	J "z· u „qz„ pu-qo„ǘ z
] 08 ö	87	53>56	53<; @	53>77	Wm„qm" "z· q„
] 0; ö	89	53>59	53<<9	53>79	[m"–m„uzs
] 0= ö	8<	53>5;	53<<=	53>7;	[„mxq
] 066 ö	95	53>5<	53<<@	53>7<	[„mxq „t –" "st o" t "–„] 066 ö

The n = 1 self-trajectory is offered as a transparent single-case record, consistent with the disclosure in §4. It is not evidence in the group-inference sense; it is included so that the observer's own data are auditable alongside the group data, and it should not be read as a confirmatory finding.

L3C d y2 yfi– u – δ w ←z w δ Δu y ←wu – δ

To move the findings of this paper from *exploratory* to *confirmatory* status, the following pre-registration is lodged (OSF DOI to follow):

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Until this replication is executed, all claims in §3 and in A.2–A.8 are labelled exploratory and must be cited as such.

Supplementary materials - S1 — Interview guide (12 prompts) - S2 — B-SDB codebook (24 items, 6 domains) - S3 — Anonymised aggregate dataset (CSV) - S4 — Analysis scripts (R / Python) - S5 — Consent form and data-governance statement - S6 — DTI acquisition and processing pipeline (sub-study A.7) - S7 — Pre-registration package (A.9) — primary and secondary outcome definitions, SAP, and blinding procedures