

PSYCHONEUROIMMUNOLOGY · CONTROLLED PILOT STUDY

Pilot Study in Prague on the Psychoneuroimmunological Effects of Biodanza

Based on the Relative Biocentric Health Theory (Czech Republic)

Marcus Stueck · Kateřina Strnadová · Denis Mainz · Sebastian Mueller-Haugk

International Biocentric Research Academy (IBRA), Germany · University of West Bohemia in Pilsen · Dual University of Applied Sciences, Plauen

Why a Controlled, Biocentric Approach?



Beyond Anthropocentrism

The biocentric paradigm (Toro Araneda, 2009) views humans as part of an overarching web of life – interconnectedness, not human centrality, is the source of health.



A Methodological Gap

The 'Biodanza and Science' sub-committee identified a lack of controlled designs in existing Biodanza research – most studies lack a comparison group.



Ten Biocentric Domains

The Biocentric Health Questionnaire (BSQ 1.0, 46 items) operationalises rbHT across ten thematic domains – from ego defence to source-energy connection.



This Study's Contribution

A waiting-list controlled pre-post design compares Biodanza participants (CZ, n=44) against non-participating controls (CZC, n=17).

Four Holographic Characteristics of Life

Holographic characteristics are fundamental features of life that recur across biological, psychological, social and ecological levels as life unfolds from a source (biospoiesis).

1

Connectedness

Structure of life

Loving relationships with people, others and nature (BSQ scale 2)

2

Flexibility

Process of life

Adapting to changing life conditions – 'accepting turns' (BSQ scale 3)

3

Developmental Leaps

Organisation of life

Biospoietic leaps beyond the comfort zone (BSQ scale 3)

4

Source Energy

Connection to source

Connection to the underlying source of life (BSQ scale 10)

A fifth characteristic – boundary/limit – is theoretically central to rbHT but was not assessed in this study.

Biocentric Quality-of-Life Indicators & Boundary

Beyond the four holographic characteristics, the BSQ 1.0 assesses six further quality-of-life indicators and one biocentric boundary (ego defence).

Biocentric attitudes to life & health

Experience of coherence (SOC)

Self-perception processes

Processing modes

Action orientation & motivation

Perception of life situation



Biocentric Boundary: Ego Defence Mechanisms

Perfectionism, compulsive control, orientation toward others' judgement and guilt originally serve adaptive functions – but may later restrict vital responsiveness. Biodanza aims to loosen these patterns and strengthen inner orientation.

Study Design & Sample

Controlled Pre-Post Design

- N = 61 participants total; waiting-list control design
- CZ intervention group: multi-day Biodanza workshop, Prague, March 2024
- CZC control group: no active intervention
- Assessed immediately before and after the workshop period; $\alpha = .05$
- Demographics (age, gender, prior Biodanza experience) not reported



n =

44

CZ – Intervention Group (EG)

Multi-day Biodanza workshop · Prague



n =

17

CZC – Control Group (CG)

Waiting list · no active intervention

Measures & Statistical Analysis



Biocentric Health Questionnaire (BSQ 1.0)

46 Likert-scaled items across 10 thematic domains (Stueck & Mueller-Haugk, 2024).



Difference-Score Approach

Post-minus-pre difference values used for all statistical analyses across 46 variables.



Four Research Questions

CZ pre-post · CZC pre-post · CZ vs. CZC interaction (MWU) · total-sample time effect.



Multiple Testing Caveat

46 variables × 4 analyses → Bonferroni-corrected $\alpha = .0011$ not applied; results are exploratory.

Wilcoxon signed-rank tests (within-group) · Mann–Whitney U (CZ vs. CZC, difference values) · IBM SPSS Statistics · $\alpha = .05$

Salivary Testosterone — Wilcoxon Test

Testosterone Response

- Wilcoxon signed-rank test on pre–post difference values
- VG showed a pronounced median decrease in salivary testosterone
- KG remained virtually unchanged over the same period
- Difference between groups highly significant
- **$p < .001$**



$\Delta =$

–174

VG – Intervention Group

pg/ml (median change)



$\Delta =$

+5.2

KG – Control Group

pg/ml (median change)

Salivary Cortisol — Wilcoxon Test

Cortisol Response

- Wilcoxon signed-rank test on pre–post difference values
- VG remained virtually stable across the workshop period
- KG showed a distinct median decrease over the same period
- Difference between groups highly significant
- **$p < .001$**



$\Delta =$

+0.02

VG – Intervention Group

$\mu\text{g/dl}$ (median change)



$\Delta =$

–0.14

KG – Control Group

$\mu\text{g/dl}$ (median change)

Salivary sIgA — Wilcoxon Test

Secretory IgA Response

- Wilcoxon signed-rank test on pre–post difference values
- VG showed a marked median increase in secretory IgA
- KG showed a median decrease over the same period
- Difference between groups highly significant
- **$p < .001$**



$\Delta =$

+30

VG – Intervention Group

ng/ml (median change)



$\Delta =$

–42

KG – Control Group

ng/ml (median change)

Interpretation: Convergent Psychoneuroimmunological Effects

3

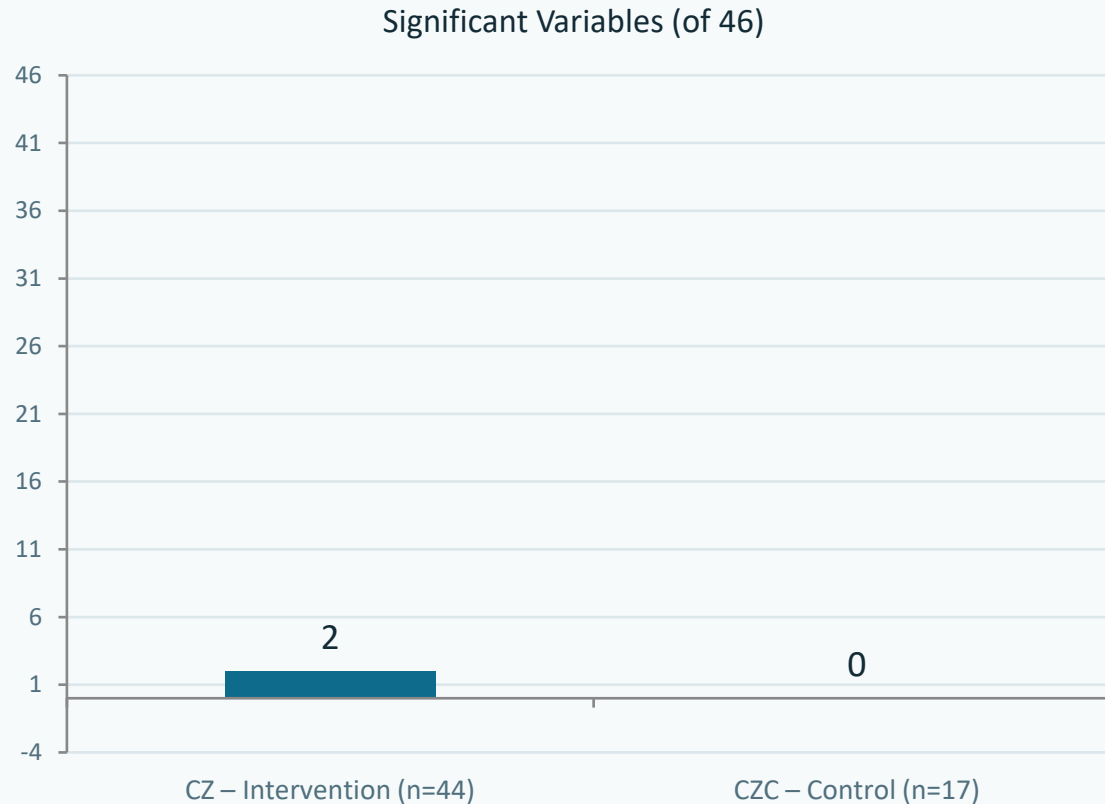
salivary biomarkers
changed significantly
($p < .001$ each)

Testosterone, cortisol, and sIgA each differed significantly between groups

- Testosterone decreased markedly in VG (-174 pg/ml) while KG stayed virtually unchanged ($+5.2$ pg/ml) — a calming, tension-releasing effect.
- Cortisol remained stable in VG ($+0.02$ μ g/dl) but decreased distinctly in KG (-0.14 μ g/dl), suggesting a different habituation pattern between groups.
- Secretory IgA increased in VG ($+30$ ng/ml) while decreasing in KG (-42 ng/ml), pointing to an immune-supportive effect of the intervention.
- All three biomarkers differed significantly between groups ($p < .001$ each) — convergent evidence for psychoneuroimmunological effects of Biodanza.

Within-Group Changes: CZ vs. CZC

Wilcoxon signed-rank test, of 46 variables examined per group



CZ (Intervention Group)

- Tolerance of criticism (V08) ↓ – $p = .009$
- Ability to form connections (V09) ↑ – $p = .009$
- Remaining 44 of 46 variables: no significant change

CZC (Control Group)

- No variable reached $p < .05$ (0 of 46)
- Consistent with expectation for a waiting-list group with no active intervention
- Supports the internal validity of the controlled design

Interaction Effects: CZ Shows a Specific Advantage

Mann–Whitney U test on difference values – 4 of 46 variables differed significantly between CZ and CZC, even though they were not significant in CZ's within-group test alone.



Internal Orientation

$p = .007$

V01 – CZ shows greater reduction in external, defence-driven orientation than CZC



Accepting Turns

$p = .005$

V15 – CZ improves flexibility / turn-acceptance more than CZC (process of life)



Perception of Life Situation

$p = .008$

V18 – CZ shows more realistic, positive appraisal of current living conditions



Goal-Orientation

$p = .003$

V35 – CZ shows greater increase in awareness of and clarity about life goals

Total Sample: No Time Effect Detected

0

of 46 variables
reached $p < .05$
($N = 61$, Wilcoxon)

Why does the combined analysis show nothing, when CZ alone shows effects?

- Combining CZ (changing) and CZC (stable) cases mixes heterogeneous directions of change
- The largely unchanged CZC group dampens and dilutes the CZ intervention effects
- This illustrates the methodological importance of group-specific analysis over pooled time-effect testing

All Significant Findings at a Glance

6 of 46 variables reached significance across all analyses combined (Table 3)

Analysis	Variable	p	Domain
CZ within-group	Tolerance of criticism (V08)	.009	D1 – Defence
CZ within-group	Ability to connect (V09)	.009	D2 – Connectedness
CZ vs. CZC (MWU)	Internal orientation (V01)	.007	D1 – Defence
CZ vs. CZC (MWU)	Accepting turns (V15)	.005	D3 – Flexibility
CZ vs. CZC (MWU)	Perception of life situation (V18)	.008	D4 – Attitude to life
CZ vs. CZC (MWU)	Goal-orientation (V35)	.003	D8 – Action
CZC within-group	– none significant –	n.s.	–
Total sample	– none significant –	n.s.	–

Selective but Conceptually Coherent Effects

Within-Group Findings (CZ)

- Tolerance of criticism ↑ and connectedness ↑, both $p = .009$
- Theoretically coherent: loosening defence patterns and strengthening connectedness are core Biodanza aims (Toro, 2010)
- Not confirmed against CZC – causal attribution remains limited

Interaction Findings (CZ vs. CZC)

- 4 variables invisible within-group become detectable only vs. control
- Internal orientation, turn-acceptance, life-situation perception, goal-orientation
- Suggests small intervention effects below the individual significance threshold at $n = 44$

Internal Validity: What the Control Group Shows



Rules Out Regression to the Mean

Zero significant changes in CZC largely excludes spontaneous regression as the primary explanation for CZ's effects.



Group-Size Asymmetry

CZC (n=17) is considerably smaller than CZ (n=44), which weakens MWU test power and complicates direct comparison.



No Randomisation

Group allocation was not randomised, so pre-existing selection effects between CZ and CZC cannot be excluded.

Limitations & Outlook



Limitations

- No randomisation – selection effects cannot be ruled out
- Disparate group sizes (CZ n=44 vs. CZC n=17)
- No demographic data (age, gender, prior Biodanza experience)
- No correction for multiple testing (46×4 analyses)
- No follow-up measurement to assess sustainability



Outlook

- Randomised designs with equivalent group sizes
- Calculate effect sizes (Cohen's d, r)
- Distinguish short-term workshops from longer-term programmes
- Identify mediators (group atmosphere, musical experience) of effects
- Follow-up measurements to test sustainability

Biodanza Shows Selective, Theoretically Coherent Effects on Biocentric Quality of Life

- Tolerance of criticism and connectedness improved significantly within the intervention group
- Four further variables showed genuine intervention-specific effects vs. the control group
- The control group's stability supports the internal validity of the design
- First controlled pilot on rbHT-based biocentric quality-of-life indicators – a foundation for confirmatory research

Thank you