



**Pädagogische Hochschule
Weingarten
University of Education**

“Crossover Mixed Analyses–Reflections about Data Analysis and Data Visualization”

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Agenda

Crossover Mixed Analyses

QUANqual:
Qualitative explanation of variance

QUALquan:
Clustering qualitative categories

Summary and outlook

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CROSSOVER MIXED ANALYSES



Crossover Analyses—some basic information

(Hitchcock & Onwuegbuzie, 2019; Onwuegbuzie & Combs, 2010; Onwuegbuzie & Hitchcock, 2015)

- Crossover mixed analyses are characterized by the idea that data associated with one road paradigm is analyzed utilizing techniques usually related to the alternative paradigm to achieve a higher level of data integration (Greene, 2007; Onwuegbuzie & Teddlie, 2003)
- The general idea behind these concepts is the conviction that a certain epistemological stance, e. g., post-positivist, might benefit from the addition or inclusion of different data.
- Variations of crossover mixed analyses:
 - Quantitative-dominant approaches (QUANqual)
 - Qualitative-dominant approaches (QUALquan)
 - Equal status approaches (QUANQUAL)
- Crossover analyses are regarded to be one of the more fruitful areas for the further development of mixed methods analytical strategies (Teddlie & Tashakkori, 2009, p. 281) because they represent data integration in an exemplary manner.

Crossover Analysis Framework—our examples

(based on Hitchcock & Onwuegbuzie, 2019, p. 5)

Study	Crossover Approach	Primary Method	Primary Technique	Crossover
Common features	Main strand from one paradigm	A mesoanalysis on a level of intermediate complexity	A microanalysis on a level of intermediate to high complexity	Implementing data analysis techniques from the other paradigm
HIIT-Study (Heckel, 2021)	Crossover QUAN-dom	Repeated measures ANOVA (2x3)	Explanation of within-between interaction (Field, 2018)	Understanding statistical variance beyond variables (η^2 ; ω^2) using categories
HoPo-Study (König & Greve, 2021)	Crossover QUAL-dom	Within & cross- case analysis	Inductive category building (Kuckartz, 2014)	Clustering & comparing categories using correspondence analysis

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QUANqual: QUALITATIVE EXPLANATION OF VARIANCE

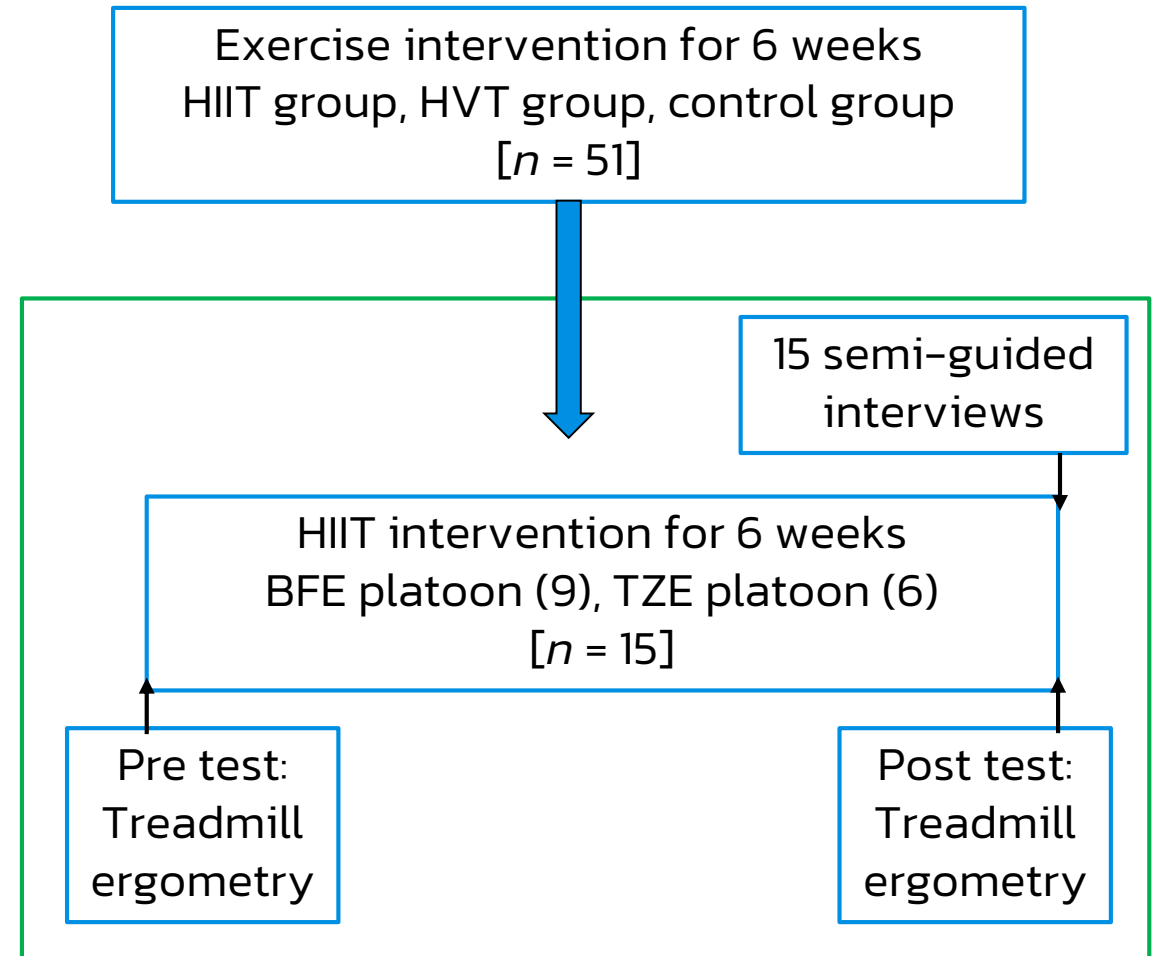


HIIT-Study: Research Design

(Creswell & Plano Clark, 2017; Heckel, 2021)

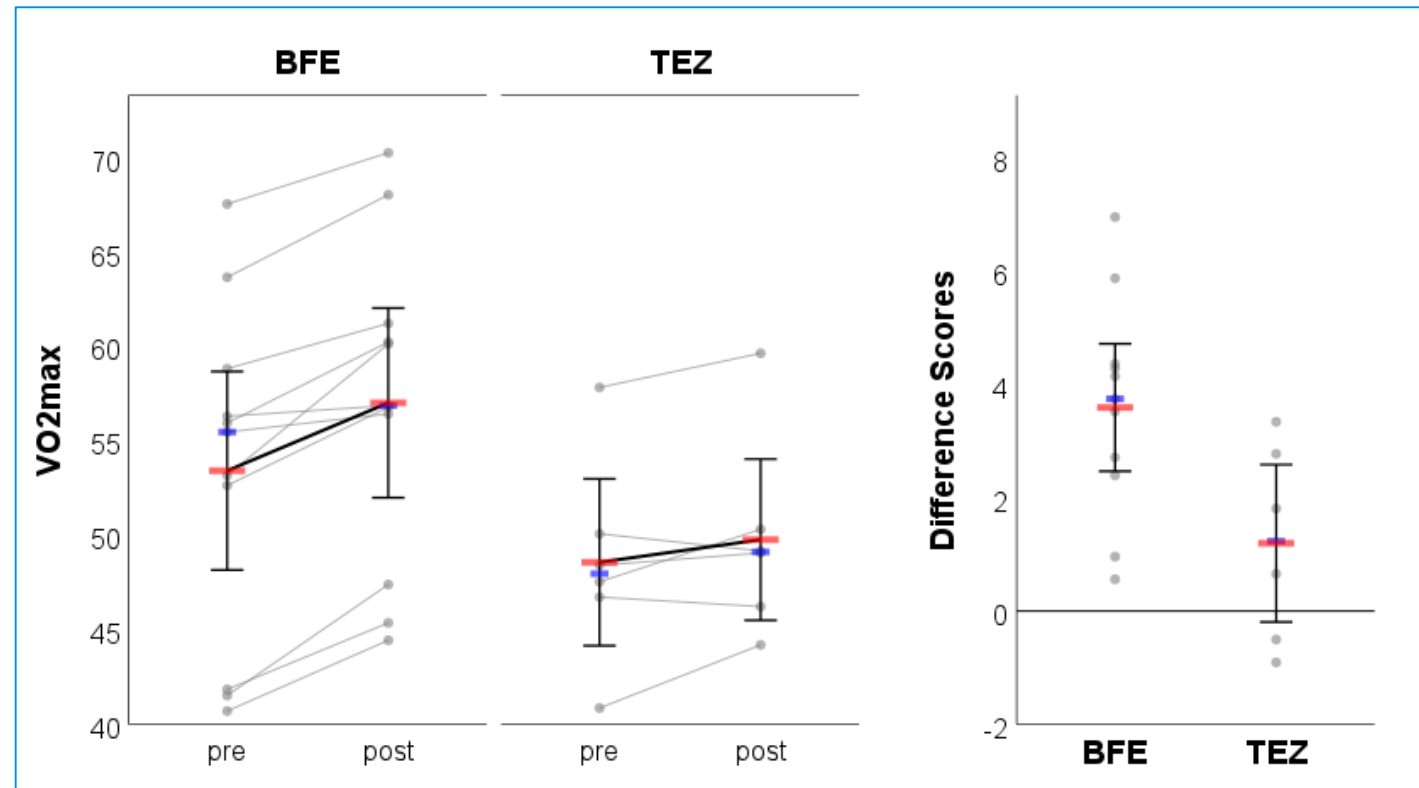
Research questions we addressed:

- (1) QUAN: Which exercise intervention does improve endurance performance under everyday conditions more effectively?
- (2) QUAL: How do participants judge the practicability and feasibility of HIIT in their daily lives?



HIIT-Study: Quantitative Results

Platoon	N	Diff $t_2 - t_1$	SD	T-value	Df	P-value	Cohen's d
BFE (group 1)	11	3.595	1.904	6.261	10	< .001	1,9 [0,9 – 2,9]
TEZ (group 2)	6 (5)	1.197	1.737	1.688	5	.076	0,7 [-0,2 – 1,5]



HIIT-Study: Qualitative Explanation of Variance

Category	Platoon 1: BFE	Platoon 2: TEZ
Attitude towards intensive physical strain	More likely positive	More likely negative
Group factor	Competition & performance comparison as an incentive	Group experience is crucial
Motivation problems	Less present, proud of what has been achieved after training	More pronounced, exhaustion after training in the foreground
Integration of HIIT into everyday life/company sport	Easy to integrate	Regarded as rather critically
Suitable target subgroup	Nearly all participants	Only persons with clear objectives

BFE has more ambition, self-discipline as well as perseverance und rates HIIT as an opportunity of improvement despite the high effort

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QUALquan: CLUSTERING QUALITATIVE CATEGORIES



The HoPo–Study: Design

(König & Greve, 2020, p. 341)

Research questions we addressed:

- (1) QUAL: What are the reasons for people to take up, to maintain, and to finish honorary work?
- (2) QUAN: Why do young people (18–25) increasingly avoid conducting honorary work?

Step of Analysis	Qualitative Strand	Quantitative Strand
Data collection	Semi-structured interviews ($n = 41$)	-----
Data analysis	Qualitative Content Analysis (Kuckartz, 2014)	-----
Data conversion		Categories => Variables (2 = present, 1 = not present)
Data analysis		Non-parametric Analyses: Correspondence Analysis / Analysis of Homogeneity
Inference	Categories	Visual patterns
Meta-Inference	Visual patterns of groups + categories	

The HoPo–Study: Results from QCA

(König & Greve, 2020)

Conditions in clubs (CC): Structural, personal, and financial aspects of clubs participants regard as relevant.

„So young people [...] are usually given a more experienced person to help them (0)

Individual living conditions (CP): Specific situations in which participants live.

Attitudes (A): Aspects of participants' individual thinking and preferences of honorary posts.

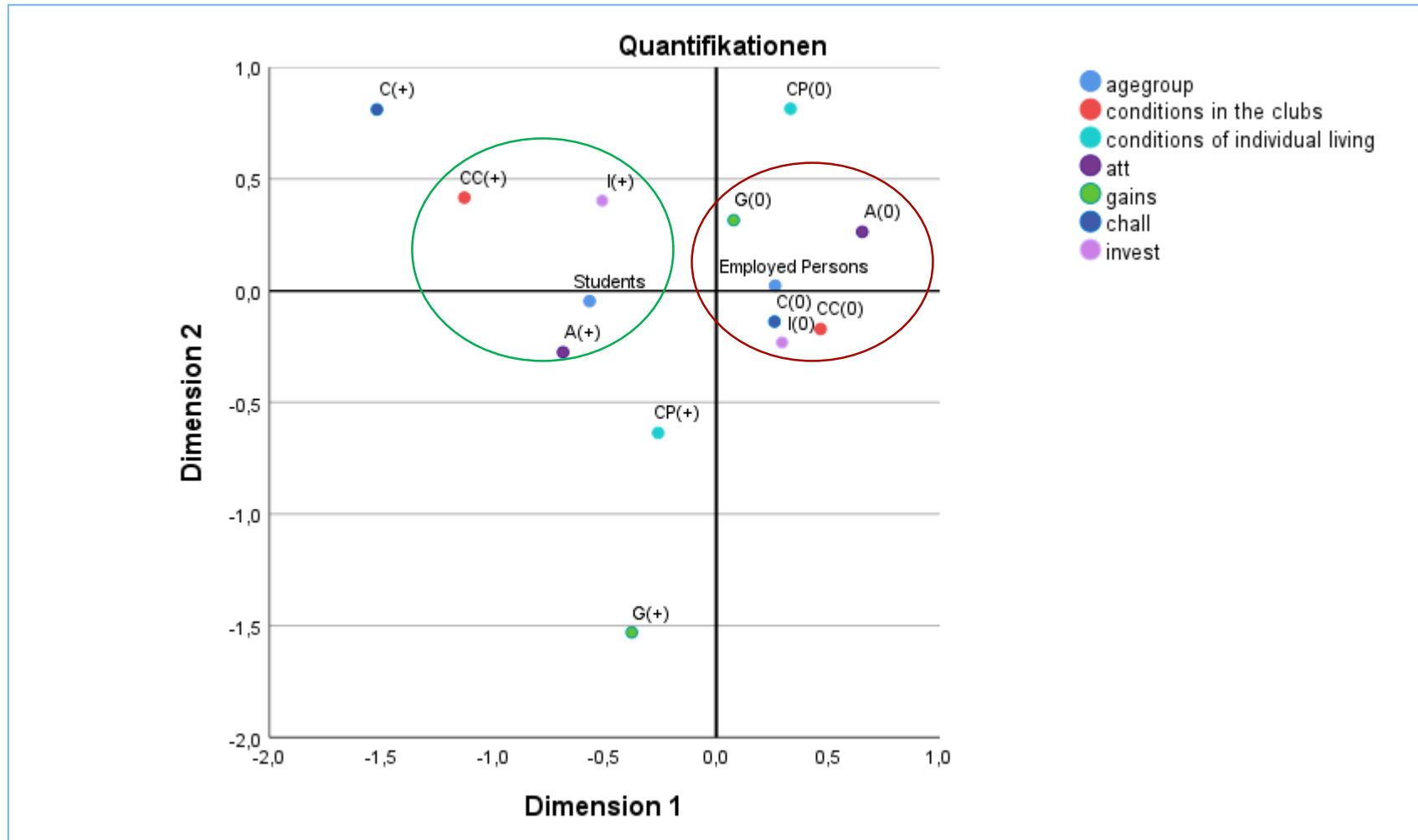
„There are too often egoistic elders dictating procedures in the clubs" (+)

Gains (G): Personal benefits participants profit from their honorary posts.

Challenges (C): participants' estimations of significant defiances through honorary posts.

Investments (I): aspects that participants contribute to the club or association.

The HoPo-Study: Crossover Analysis



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SUMMARY AND OUTLOOK



- Our aim was to show that crossover mixed approaches bring along a deeper understanding of specific issues in various disciplines of sport science.
- The most important take away message of the HIIT study is that we can now understand the difference in effect because categories from QCA can help to understand quantitative coefficients where covariates might fail.
- As to the HoPo-Study we can say that our most important take away message is that correspondence analysis and non-parametric testing can enhance a category system from QCA by bringing group patterns and comparisons into the system.
- Thus, in further crossover mixed research approaches scientists should take into account that sticking to one paradigm might limit one's own potentials. Consequently, a systematic development of crossover is needed because in our opinion crossover stands for smooth integration of different sorts of data. In this data visualization can be a valuable aid.



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**Thank you for
your attention**



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