

Benchmark für Assessment Center Diagnostik Benchmark for Assessment Center Diagnostics

Further Development and Evaluation of an Instrument Measuring AC Quality



- **1. Background information**
- 2. Research questions
- 3. Description of the sample
- 4. Analysis of reliability
- 5. Hypotheses testing
- 6. Post-hoc analyses
- 7. Further research
- 8. Conclusion

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ASSESSMENT CENTERS (ACS) IN PERSONNEL SELECTION



Source: Nachtwei & Schermuly (2009)

Instrument	Nutzung	Trefferquote* 1	Kostenintensität
	(Angaben in	Prozent)	
Unstrukturiertes Interview	70 58	4	
Assessment Center	14	20	
Fachwissenstest	9 13	23	
Strukturiertes Interview	30	25	
Arbeitsprobe	26	29	
Eignungstest (Intelligenz & Persönlichkeit)	8 /// 13	36	
KMU 🥢 Großunternehmen	*) durchschnittlich in Studien berichtete V	Verte (in Richtung max. erreichbar zu	interpretieren, da "publication bias")

¹ Amount of variance in the criterion (job success) explicable according to the results of the instrument (in percentages)

BACDI-PROJECT

BAC

Benchmark for assessment center diagnostics (BACDi)

- Selecting scientifically based quality criteria influencing predictive validity of ACs
- Promoting the knowledge exchange between science and organizational practice
- Standardizing BACDi-results by comparing them to results of other companies → Benchmark
- Arranging list of comprising quality criteria that indicate specific improvement options

STAGES OF THE BACDI-PROJECT

Stage1: Identification of BACDi-criteria

Stage 2: Pre-study – analysis of appropriateness and practicability of selected criteria

Stage 3: Study I – analysis of appropriateness, practicability and consistency of BACDicriteria rated by AC experts from research and organizational practice

Stage 4: Revision of BACDi-criteria considering the feedback of AC experts from research and organizational practice

Stage 5: Development of BACDi-software

Stage 6: Study II – application and evaluation of BACDi-instrument

Stage 7: Study III – further evaluation of BACDi-instrument, comparison of results from samples of North America, China and Europe





BACDI-INSTRUMENT

BACDi-instrument: web-based software solution

BACE

Item 2: Was a requirement profile created prior to AC construction?



BACDI-INSTRUMENT



BACDi-instrument: feedback is created automatically

Kriter	ium	Erfül-	Benchmark	Sinnhaf-	Umsetzbar-
Konze	eption	lung		ligkeit	Ken
1	An der AC-Konstruktion war ein diag- nostischer Experte mit Erfahrung in der Konstruktion von ACn beteiligt.				
2	Vor der AC-Konstruktion wurde ein Anforderungsprofil erstellt.				
3	Im Rahmen der Anforderungsanalyse wurden mindestens zwei unterschiedli- che Methoden verwendet.				
4	Die gewünschte Ausprägung auf jeder Anforderungsdimension wurde nach den Erfordernissen der Stelle festge- legt.				
5	Das Anforderungsprofil enthält Vorga- ben zu den erwünschten Fähigkeits- ausprägungen auf jeder Anforde- rungsdimension.				

- ¹ The criterion is capable of supporting employee selection. It contributes to the applicants' AC result by being highly predictive for their job success at a later date.
- ² The application of the criterion in the practitioner's company's AC is justifiable regarding effort, funds and general conditions.



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BACE

Does the BACDi-instrument measure AC quality in a reliable and valid way?





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DESCRIPTION OF THE SAMPLE (N = 33)

	N	Min	Max	Mean	SD
Number of employees	32	23	200000	18055.66	42737.039
Use of ACs (years)	33	1	20	5.61	4.697
Engagement in ACs (years)	33	0	15	5.27	3.849



¹² multiple answers were permitted







AC-use by companies



Engagement in AC-phases



BACDi overall quality index

Phase	Min	Max	Mean	SD
Development	42.86	95.71	70.30	12.782
Conduction	35.71	92.86	73.07	14.458
Post-processing	22.0	89.0	53.03	19.745
Overall	40.8	90.3	66.27	12.625



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ACs rated by two experts: 10

- Item level
 - Categorial items (54)
 - Agreement in percentages
 - Continuous items (19)
 - ICC: two-way-mixed, absolute agreement, single measures

	N	Min	Max	Mean	SD
Inter-rater agreement in %	54	40	100	80.56	15.711
ICC	19	068	1.0	.59	.378



- Result level
 - Pearson correlation: r = .831 (p = .003)
 - ICC: .840, *p* = .001

Evaluation items

	N	Min	Max	Mean	SD
Inter-rater agreement in %	20	60	100	92.0	13.218
ICC	11	243	.992	.52	.395



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	Ν	Min	Мах	Mean	SD
AC quality before BACDi	14	1	6	3.93	1.685
AC quality after BACDi	19	1	6	4.26	1.195
Overall AC quality	33	1	6	4.09	1.444



 Correlations between subjective AC quality and BACDi overall quality index

	r s	r _{att.single}	р
AC quality before BACDi	.483	.527	.040
AC quality after BACDi	.287	.313	.117
Overall AC quality	.380	.414	.015

p (one-tailed) < .01, $r_{att.single}$: r_s corrected for r = .840

- Difference between correlations
 - Fisher's z-transformation: $z_1 = .527$, $z_2 = .295$
 - Difference between z_1 and z_2 = .232, z_{crit} = .592
 - \rightarrow Difference non-significant



	N	Min	Мах	Mean	SD
Subjective predictive validity	33	2	6	4.27	1.008

- $r_s = .254$, $r_{att.single} = .277$, p (one-tailed) = .077
 - Extreme groups (between-groups comparisons): $r_s = .566$, p (onetailed) = .025

Hypothesis 3



	Ν	Min	Мах	Mean	SD
Working time (%)	33	0	15	3.52	3.675
Working time without undue outlier	32	0	15	3.56	3.724
Importance of AC quality in department	33	1	6	5.09	1.156
Importance without undue outlier	32	2	6	5.22	.822

Hypothesis 3 – Check of Assumptions







Hierarchical (blockwise) multiple linear regression with: 2 predictors with N = 33, one-tailed part correlations, $R^2_{adj.}$ adjusted to Stein's formula



	Ν	Min	Мах	Mean	SD
Financial investment (€)	33	0	7200	1636.97	1953.194
Financial investment without outlier	32	0	7200	1678.75	1969.408
Personnel investment (working days)	33	0	50	3.33	8.543
Personnel investment without outlier	32	0	8	1.88	1.701

Hypothesis 4 – Check of Assumptions







Hierarchical (blockwise) multiple linear regression with: 2 predictors with N = 33, one-tailed part correlations, $R^2_{adj.}$ adjusted to Stein's formula



- H4b This relationship is partly mediated by the size of an organization.
 - Non-significant correlation between size of organization and financial- and personnel investments

Correlations with size of organization

	r _s	р
BACDi overall quality index	.224	.108
Financial investment	.259	.076
Personnel investment	257	.078

p (one-tailed) < .05



- H5a Participants' motivation to change their AC in order to increase its quality is higher after the BACDi-feedback than before.
- H5b The difference in participants' motivation to change is moderated by the BACDi-result.
 - Cannot be calculated so far (N = 10)

	Ν	Min	Мах	Mean	SD
Motivation to change prior to feedback	33	1	6	5.06	1.223

Correlation between BACDi overall quality index and motivation prior to feedback

$$-r_s = .031, p \text{ (one-tailed)} = .432$$



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POST-HOC ANALYSES



Sample split by business sector

	Ν	Mean	SD	
Manufacturing industry	9	62.44	16.294	
Service sector	24	67.70	11.025	
- Mann-Whitney-U-test: $U = 80.0$, $p = .257$				

Sample split by position

	Ν	Mean	SD
No managerial responsibility	13	66.63	14.819
Managerial responsibility	20	66.03	11.385

- Mann-Whitney-U-Test: U = 125.0, p = .854

POST-HOC ANALYSES



	Ν	Min	Мах	Mean	SD
AC engagement (years)	33	0	15	5.27	3.849
AC use (years)	33	1	20	5.61	4.697

Assumptions violated:

- 3: Linear relationship X-Y
- 4: No outlier C
- 12: Reliable measures of X and Y



POST-HOC ANALYSES



Hierarchical (blockwise) multiple linear regression with: 2 predictors with N = 33, one-tailed part correlations, $R^2_{adj.}$ adjusted to Stein's formula





Actualization of requirements profile: sample split into

- Group 1 (N = 5): AC use since > 5 years and examination of actuality at least every 2 years → mean: 67.06
- Group 2 (N = 12): AC use since < 5 years and examination of actuality at least every 2 years → mean: 76.22
- → U = 13.0, p = .073

Actualization of exercises: sample split into

- Group 1 (N = 11): AC use since > 5 years and examination of actuality at least every 2 years → mean: 64.38
- Group 2 (N = 15): AC use since < 5 years and examination of actuality at least every 2 years → mean: 72.32

POST-HOC ANALYSES: 70 ITEMS

	Uncertain	Benchmark	Appropriate	
Benchmark	457	1		
	р = .000			
Appropriate	353	.538	1	
	p = .003	р = .000		
Practicable	517	.668	.637	
	р = .000	р = .000	p = .000	
 Spearman rho correlation coefficients 				

Regression practicability and appropriateness on Benchmark



Assumptions violated:
4: No outlier C
6: weak multicollinearity
12: reliable measures of X and Y

	Ν	Min	Max	Mean	SD
Practicability	70	41.53	92.17	72.25	12.008
Appropriateness	70	59.13	96.91	81.55	9.484



POST-HOC ANALYSES: 70 ITEMS



Hierarchical (blockwise) multiple linear regression with: 2 predictors with N = 70, two-tailed part correlations, $R^2_{adj.}$ adjusted to Stein's formula



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- Predictive validity of BACDi
 - Objective predictive validity of an AC: relationship between AC results and job success, e.g. measured by supervisor rating of job performance
 - → positive relationship between predictive validity of an AC and BACDi overall quality index
- Internationalization
 - Collecting data in organizations in North America and China
 - \rightarrow Extension of the normative sample



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BACDi measures AC quality in a valid way

Increase of BACDi overall quality index with

- Increase in working time invested into AC education
- Increase of financial investment into AC
- No difference in BACDi overall quality index depending on business sector or position
- Increase of BACDi overall quality index with increase in years of AC engagement
- Benchmark of items largely influenced by practicability ratings



Thanks for your attention!

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