

Meta-Analysis of Functional and Dysfunctional Norms for Measures of Treatment Targets for Violence Offender Programs

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Treatment of violent offenders

- 78% violent offenders in Canadian federal population (Correctional Service of Canada, 1997)
 - 21% reoffend with a new violent offence (Johnson, 2002)
- Offenders treated to reduce likelihood of reoffending by targeting anger, arousal, self-control, and attitudes, for example
- Research examining effectiveness of treatment tend to focus on group level change



Group level treatment change

- Can dilute the overall treatment effect
 - Having an offender that does not need an intervention
 - Heterogeneous offenders (Serin & Preston, 2000)
- Does not consider whether the change was meaningful
 - Decision makers are most interested in whether the offender has reached a certain threshold (e.g., level of functioning, skill)
 - The change may be statistically significant, but offenders may still be problematic on the construct of interest

Clinical significance

(Jacobson, Follette, and Revenstorf, 1984)

- Individual level
 - Has the individual reached a target level of functioning (*based on a specific measure*)?
 - Was the amount of change larger than what would be expected by chance alone?
 - Measurement error
- Group level
 - What proportion of offenders improved after treatment?
 - Effectiveness of treatment programs



Clinical significance

- What does a score of 20/35 on the Anger subscale of the Aggression Questionnaire means?
 - Ideally would have norms to determine functional and dysfunctional level
 - Cutoffs are only as good as the norms they are based on



Clinical significance

- Requires three pieces of information for each measure
 - To compute a cutoff (i.e., the score someone must pass to become “functional”):
 - Means (for functional and dysfunctional groups)
 - Standard deviations (for functional and dysfunctional group)
 - To compute the amount of change required to be “reliable” (i.e., not accounted for by measurement error):
 - Reliability coefficient (internal consistency or test-retest)



Purpose

- Establish representative norms on measures commonly used in treatment programs for violent offenders
- Specifically, produce cutoffs for each measure:
 - To distinguish functional from dysfunctional scores
 - To assess the reliability of change



Inclusion criteria

- Measures included in the Violence Prevention Program (VPP) delivered by Correctional Service Canada
- Sufficient information to determine means and standard deviation (or internal consistency)
- Published



Inclusion criteria

- Adult male samples
 - No mixed gender or all female samples
 - *Exception: some samples included females for internal consistency, no females were included in means and standard deviations*
 - No children or adolescents
 - *Exception: some university samples would include students that were 17 years of age and older*
- No modified scales (e.g., missing items, modified scoring)



Measures

- **Aggression Questionnaire (Buss & Perry, 1992)**
 - **Anger:** focus on emotional arousal and irritability
 - **Physical:** measures the use of physical force when expressing anger
 - **Hostility:** repressing attitudes of bitterness, social alienation, and paranoia. Most linked with severe pathology
 - **Verbal:** hostile verbal communication
 - **Total score:** overall level of anger and aggression expressed by the respondents
 - Range from 29-145 (5-point Likert scale)
 - Higher scores = higher self-reported aggression



Measures

- **Reaction to Provocation Test Part A (Novaco, 1994)**
 - Focuses on an individual's experience of anger
 - **Cognitive:** anger justification, rumination, hostile attitude, and suspicion
 - **Arousal:** anger intensity, duration, somatic tension, and irritability
 - **Behaviour:** impulsive reaction, verbal aggression, physical confrontation, and indirect expression
 - Each subscale range from 16-48 (3-point Likert scale)
 - Higher scores = higher self-reported anger

Measures

- **Eysenck I₇ Questionnaire (Eysenck, Pearson, Easting, and Allsopp, 1985)**
 - Impulsiveness defined as risk-taking, non-planning and liveliness, sensation seeking
 - Range from 0-19 (items scored on yes/no scale)
 - Higher scores = greater impulsiveness

Searching for studies

- Search of PsychINFO, PubMed, and Web of Science
- Search reference list of obtained studies & review articles
- End date: March 2011

Level of functionality

- Assumptions
 - Students and unselected community samples are functional
 - If both pre- and post-treatment, select pre-treatment
 - Offenders with violent charges/convictions have dysfunctional levels of aggression

Descriptives


- AQ ($k = 57$)
 - Anger: $k = 39$ functional; $k = 15$ dysfunctional
 - 1992-2010
 - Hostility: $k = 39$ functional; $k = 15$ dysfunctional
 - 1992-2010
 - Physical: $k = 42$ functional; $k = 15$ dysfunctional
 - 1992-2010
 - Verbal: $k = 25$ functional; $k = 19$ dysfunctional
 - 1992-2010
 - Total: $k = 25$ functional; $k = 19$ dysfunctional
 - 1992-2009

Descriptives

- I7 ($k = 20$)
 - $k = 14$ functional, $k = 6$ dysfunctional
 - 1985-2010
- Reaction to Provocation Test Part A ($k = 30$)
 - Arousal: $k = 2$ functional; $k = 28$ dysfunctional
 - 1998-2008
 - Behaviour: $k = 2$ functional; $k = 28$ dysfunctional
 - 1998-2008
 - Cognitive: $k = 2$ functional; $k = 28$ dysfunctional
 - 1998-2008

Statistical Analyses

- Meta-analyses of the means and standard deviations
 - Comprehensive meta-analysis program
 - Means derived from random-effect
 - Standard deviations derived from the standard error of the fixed-effect
- Meta-analyses of the internal consistency alphas
 - SPSS
 - Rodriguez and Maada (2006) formulae and SPSS syntax (fixed-effect meta-analysis)

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Statistical Analyses


- For each measure, the cutoff was computed

$$\text{Cutoff} = \frac{s_0 \bar{X}_1 + s_1 \bar{X}_0}{s_0 + s_1}$$

} A midpoint between the functional and dysfunctional group

Where:

- s_0 is the SD of the functional group
- s_1 is the SD of the dysfunctional group
- \bar{X}_1 is the mean of the dysfunctional group
- \bar{X}_0 is the mean of the functional group

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Statistical Analyses


- For each measure the minimum amount of change required to be reliable was calculated

$$\text{RCI} = \frac{x_{\text{post}} - x_{\text{pre}}}{S_{\text{diff}}}$$

If ± 1.64 , significant (one-tailed test, $p < .05$)

Where:


- x_{post} is the participant's post-treatment score
- x_{pre} is the participant's pre-treatment score
- S_{diff} is the standard error of the difference
 - Based on the reliability coefficient of the measure and the standard deviation for the dysfunctional group

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Results- Norms

	Functional Group			Dysfunctional Group		
	Weighted M (SD)	k	n	Weighted M (SD)	k	n
AQ Anger	16.50 (5.03)	39	3,855	21.77 (4.59)	15	609
AQ Hostility	20.02 (5.90)	39	3,855	23.19 (5.92)	15	609
AQ Physical	22.23 (7.28)	42	6,124	28.18 (6.84)	15	609
AQ Verbal	15.67 (4.29)	40	5,861	16.16 (3.23)	16	711
AQ Total	72.30 (16.70)	25	2,290	89.35 (16.98)	19	845


Note. Higher scores indicate greater aggression

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Results- Norms

	Functional Group	Dysfunctional Group	d	95% CI	
	M (SD)	M (SD)		LL	UL
	AQ Anger	16.50 (5.03)	21.77 (4.59)	1.06	0.97
AQ Hostility	20.02 (5.90)	23.19 (5.92)	0.54	0.45	0.62
AQ Physical	22.23 (7.28)	28.18 (6.84)	0.82	0.74	0.91
AQ Verbal	15.67 (4.29)	16.16 (3.23)	0.12	0.04	0.19
AQ Total	72.30 (16.70)	89.35 (16.98)	1.02	0.93	1.10


Note. Dysfunctional group as the referent category

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Results- Norms

	Functional Group			Dysfunctional Group		
	Mean (SD)	k	n	Mean (SD)	k	n
I7 Impulsiveness Scale	5.83 (4.10)	14	1,467	11.01 (3.71)	6	218
Reaction to Provocation Test Part A						
Arousal	24.82 (3.89)	2	28	31.41 (5.39)	6	125
Behaviour	22.81 (2.69)	2	28	30.96 (5.45)	6	125
Cognitive	27.74 (3.32)	2	28	31.72 (4.65)	6	125

Note. Higher scores indicate greater impulsivity and anger

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Results- Norms

	Functional Group	Dysfunctional Group	d	95% CI	
	M (SD)	M (SD)		LL	UL
I7 Impulsiveness Scale	5.83 (4.10)	11.01 (3.71)	1.28	1.13	1.43
Reaction to Provocation Test Part A					
Arousal	24.82 (3.89)	31.41 (5.39)	1.28	0.84	1.71
Behaviour	22.81 (2.69)	30.96 (5.45)	1.61	1.16	2.06
Cognitive	27.74 (3.32)	31.72 (4.65)	0.90	0.47	1.32

Note. Dysfunctional group as the referent category

Measure	α	k	n
Aggression Questionnaire			
Anger	.807	15	2,697
Hostility	.787	15	2,697
Physical	.834	16	2,910
Verbal	.683	18	3,094
Total	.893	10	2,433
I7 Impulsiveness Scale			
	.830	3	548
Reaction to Provocation Test Part A			
Arousal	.854	4	880
Behaviour	.923	4	880
Cognitive	.835	4	880

α of $\geq .80$ as exemplary, $.70 - .79$ as extensive, $.60 - .69$ as moderate, and $< .60$ as minimal (Robinson, Shaver, & Wrightsman, 1991)

	Range	Cut-Off (must be below to be "functional")	Minimum change to be reliable
Aggression Questionnaire			
Anger	7-35	19.26	4.68
Hostility	8-40	21.60	6.34
Physical	9-45	25.30	6.46
Verbal	5-25	15.95	4.22
Total	29-145	80.75	12.88
I7 Impulsiveness Scale			
	0-19	8.55	3.55
Reaction to Provocation Test			
Arousal	16-48	27.58	4.78
Behaviour	16-48	25.50	3.51
Cognitive	16-48	29.40	4.38

Note. Higher scores indicate greater dysfunction

Measure	α	k	n
Aggression Questionnaire			
Anger	.807	15	2,697
Hostility	.787	15	2,697
Physical	.834	16	2,910
Verbal	.683	18	3,094
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Cognitive	16-48	29.40	4.38

Note. Higher scores indicate greater dysfunction

Conclusion

- Mean differences between dysfunctional and functional groups tended to be large
 - Verbal Aggression
 - Hostility
- Internal consistency was good
 - Verbal Aggression
- The minimum amount of change required to be reliable was generally small
- Cutoffs were not at the extreme ranges and instead were at the lower half

Limitations

- Difficult to assess functionality of samples
 - University students and community as functional
 - Level of functioning should be identifiable by criteria other than the measure of interest (e.g., a second aggression scale)
 - Missing in the literature
- Assume offenders who do better in a program have relatively better outcomes (e.g., reoffending)
 - Future research (Kevin Nunes)

Thank you

For questions, copy of the tables, etc., please e-mail Kelly Babchishin
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A copy of this presentation is available online
(<http://carleton.ca/acbrlab>)