THE PRIMARY CARE COMPANION
FOR CNS DISORDERS

Supplementary Material

Article Title: Psychometrics of the Violence Nonlinear Dynamics Scale

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List of Supplementary Material for the article

1. Supplementary Appendix. Descriptions of Terminology

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Supplementary Appendix

Descriptions of Terminology

CATEGORY	TERM	DESCRIPTION (measurement example)
GENERAL	Complexity	Degree of interconnected and interdependent network interactions within a system
	Nonlinearity	Phenomena with irregular trajectories, dynamic and variable relationships, and a disproportional response to interventions
	Fractal Dimension	Special dimension of self-similar patterns seen over different scales (Grassberger-Procaccia algorithm)
TYPES OF NONLINEARITY	Algorithmic Complexity	Amount of information needed to describe the data (LZ complexity)
	Irregularity	Degree of irregularity of fluctuations over time (Approximate entropy)
	Sensitivity To Initial Conditions	Speed with which two adjacent points diverge over time (Lyapunov exponent)
DYNAMICAL PATTERNS	Periodic	System which cycle behaviors, results when actions and outcomes are tightly coupled, and when current behavior is dependent on previous behavior. Periodic systems have strong attractors influencing possible behaviors and are stable and insensitive to small changes in their state. Periodic systems are predictable and respond predictably to interventions
	Chaotic	System where behavior recurs but the specific path is unpredictable; this results when actions and outcomes are separated in time, and when feedback within the system varies in strength and direction. Chaotic systems have attractors influencing their behavior but they are sensitive to small changes in terms of the specific path they follow
	Random	System where behavior does not recur and path is unpredictable. Random systems have no attractors limiting or influencing their behavior, and may or may not be sensitive to initial conditions. These systems are unpredictable in behavior and in response to intervention

Key References:

1. Morrison F: *Art of Modeling Dynamic Systems*. NY: Wiley, 1991
2. Heath RA: Complexity and mental health. In Holt TA (ed): *Complexity For Clinicians*. Abingdon, UK: Radcliffe Publishing, 2004
3. Guastello SJ: Entropy, in Guastello SJ, Gregson RAM (eds): *Nonlinear Dynamical Systems Analysis for the Behavioral Sciences Using Real Data*. NY: CRC Press, 2011

Sensitivity Analyses

SUBGROUP (n)	NONLINEARITY COMPARISONS (mean)[#]			VNDS-NONLINEARITY FACTOR SCORE CORRELATION (r)
	Lz Complexity	ApEn	VNDS	
Ethnicity				
Hispanic (93)	.979	.501	22.2	.325*
NonHispanic (24)	.915	.452	23.3	ns
Age[@]				
≤ 45 Years Old (59)	.950	.544	22.8	ns
➢ 45 Years Old (59)	.907	.450	22.1	.341*
IPV Duration[@]				
≤ 5 Years (55)	.959	.531	23.0	.404*
➢ 5 Years (54)	.916	.482	22.4	ns

[@]Based on median
[#]All t-tests nonsignificant
*p ≤ .05, ns = nonsignificant