

# Psychobiological responses to induction of aggression in schizophrenic delinquents

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## ★ THEORY ★

- Schizophrenics and in particular schizophrenic delinquents are supposed to have a propensity to react more aggressively than healthy subjects (Stahl, 2001; Erb et al., 2001), but also to show higher autoaggressiveness (Comer, 1995)
- Subjects scoring high on aggressiveness as a trait have been found to respond by higher aggressive behavior upon experimentally induced aggression than low scorers (Wyhlidal, 1997; Archer, 1991; Netter et al., 1998)
- High aggressives have higher testosterone baseline levels and aggression induced testosterone increases (Archer, 1991; Christiansen et al., 1985; Netter et al., 1999), sometimes associated with higher decreases in cortisol than low aggressives (Henry, 1986)
- Self ratings obtained in psychiatric patients have been regarded as possibly less valid than observer ratings (Buss et al., 1956)

## ★ QUESTIONS ★

- Can aggressive behavior be validly induced by experimental frustrative competition in schizophrenic delinquents?
- Are high scorers on aggressiveness when exposed to frustrative competition more likely to respond by
  - higher aggressive behavior
  - testosterone increase and cortisol decrease
- 2.1) if divided according to overt behavioral aggressiveness?
- 2.2) if divided according to verbal aggressiveness?
- 2.3) if divided according to autoaggressiveness?
- 3) Are self ratings or observer ratings on these scores of aggressiveness better suited to predict aggressive responses to frustrative competition?

## ★ METHOD ★

- **Design:** balanced cross-over design with condition of aggression induction and control condition 1 week apart
- **Induction of aggression:** paradigm according to the Point Subtraction Aggression Paradigm by Cherek et al. (1991); computer game of 7 minutes against a faked "partner" = computer. Subject has to gain points (button A) and may subtract points (button B) from "partner". "Partner" (= computer) does the same to the subject.

session	computer = partner	result	monetary reward
Experimental	subtracts points from patient	patient loses	withdrawn
Control	no subtraction of points	patient wins	not promised

### Independent variables

- Induction of aggression (yes/no) (= within-subject factor)
- Trait aggressiveness (> median = high, < median = low) (= between-subject factor)

Scales of trait aggressivity		
	Self rating	Observer rating
Inventory:	Buss-Durkee BDHI & Tellegen MPQ	SDAS
Factor:		
Overt aggression (OA)	assault (BDHI) + indirect aggression (BDHI)	Item 6: physical attack towards objects Item 7+8: towards persons
Verbal aggression (VA)	verbal aggression (BDHI)	Item 4: nondirected Item 5: towards persons
Autoaggression (Aa)	guilt (BDHI) + stress reactivity (MPQ)	Item 9: self mutilation Item 10: anxiety

### Dependent variables

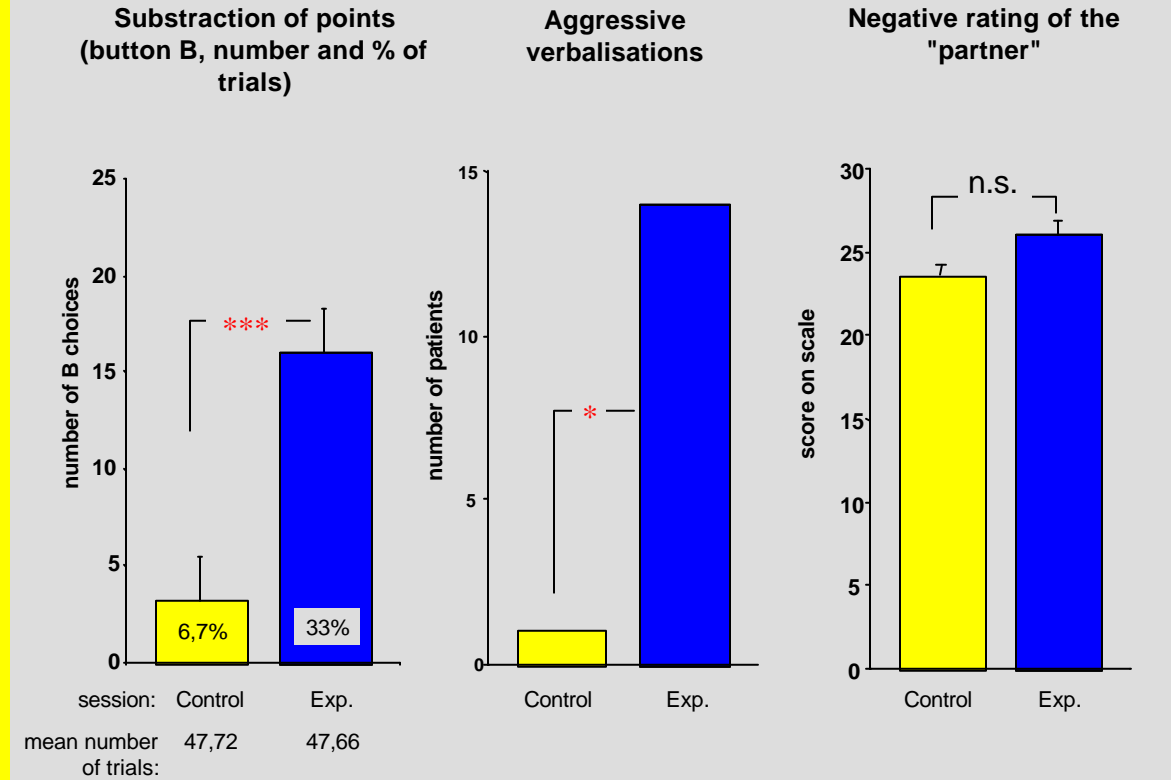
- Points subtracted (button B, % of total trials)
- Aggressive verbalisations yes/no
- Negative rating of the "partner"
- Rating the game as pleasant/stressful
- Change of testosterone (post-pretrial; baseline corrected residuals)
- Change of cortisol post-pretrial

### Statistics

- Analysis of variance and Chi square test

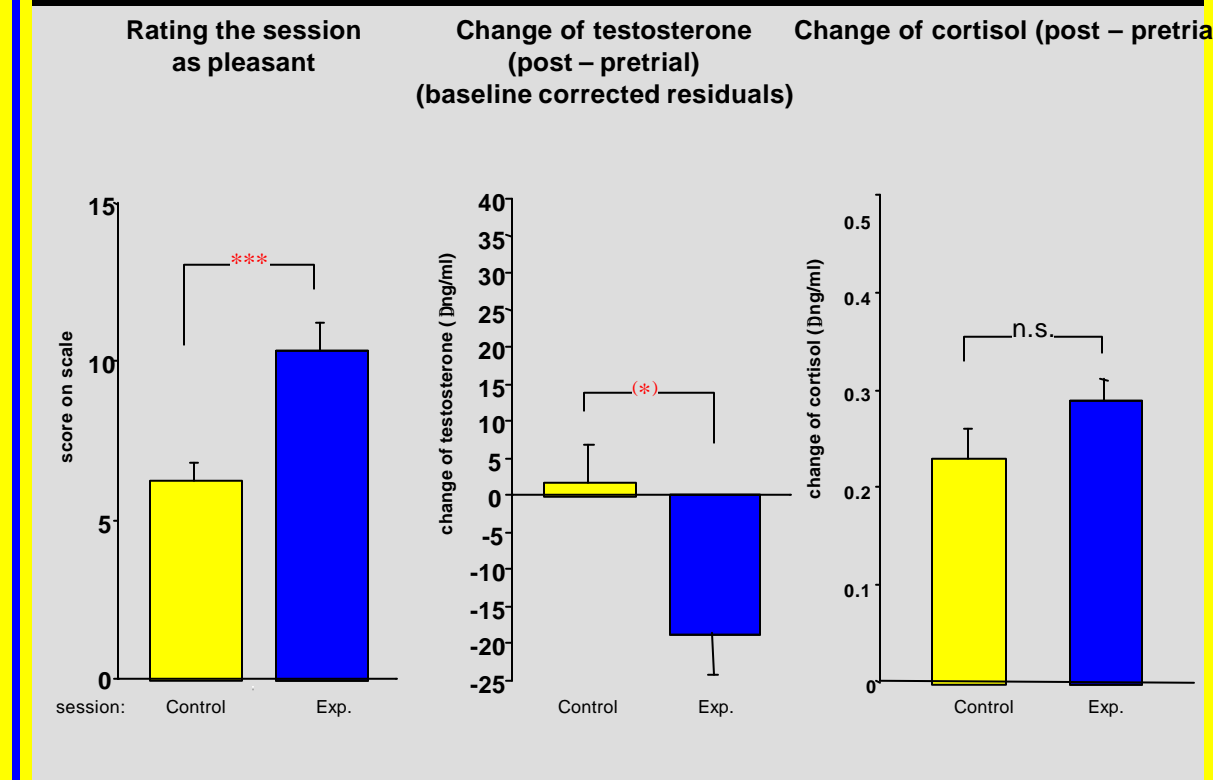
## ★ RESULTS ★

### 1a) Manipulation Check: Induction of Aggression: Total group (n = 32)

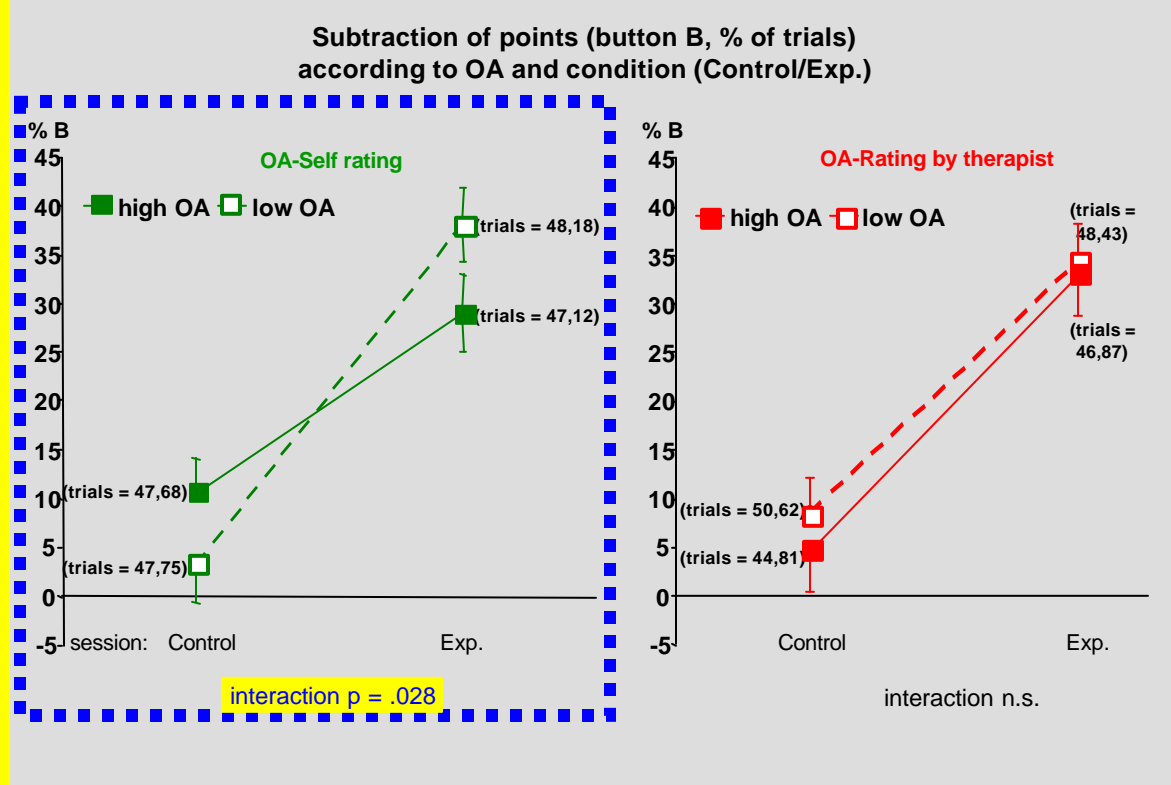


Acknowledgement: We are grateful to Dr. Jöckel and Dr. Hofstetter for selecting and rating the patients.

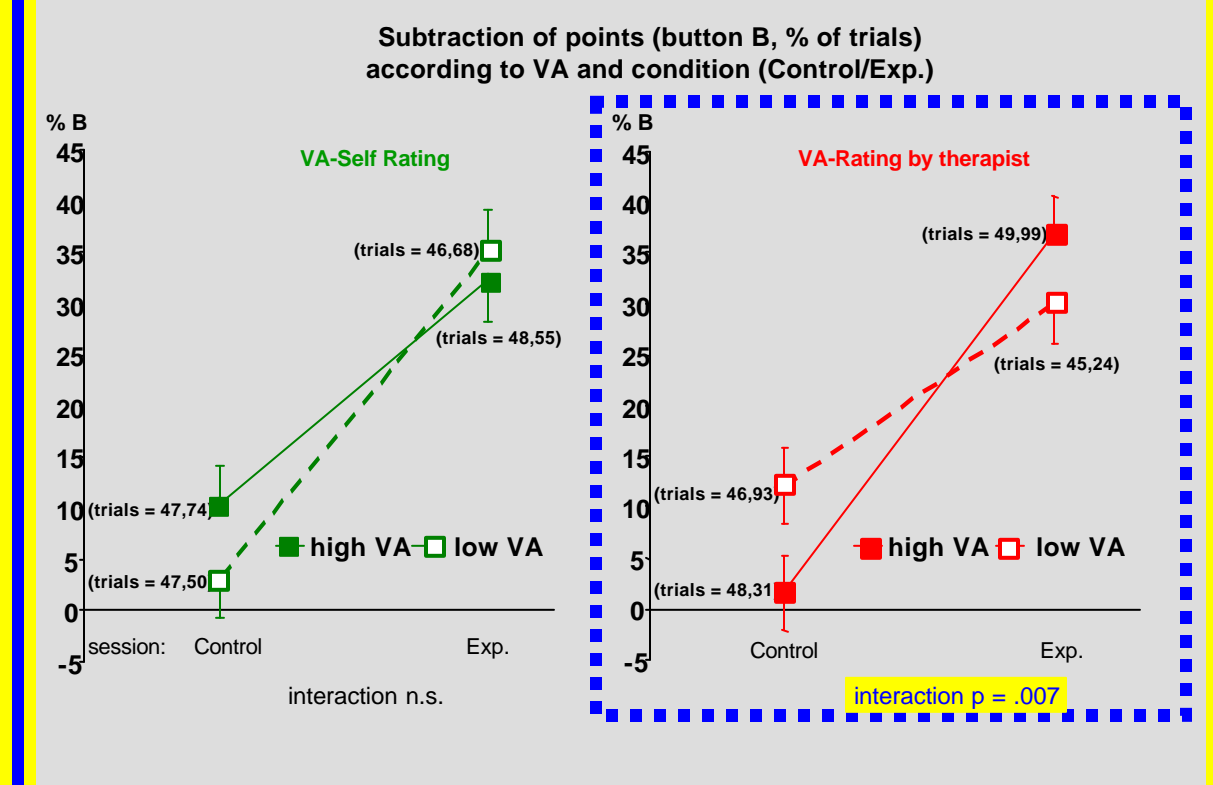
### 1a,b) Manipulation Check: Induction of Aggression: Total group (n = 32)



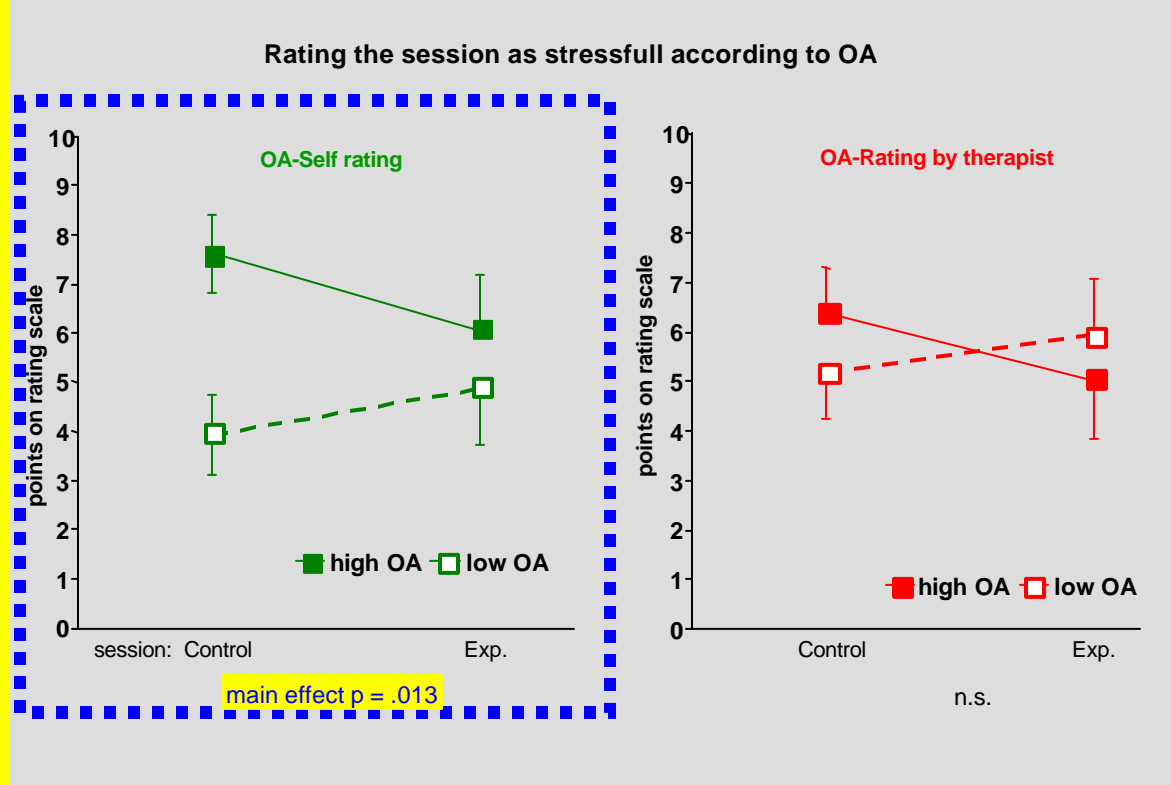
### 2.1a) Overt aggressiveness (OA)



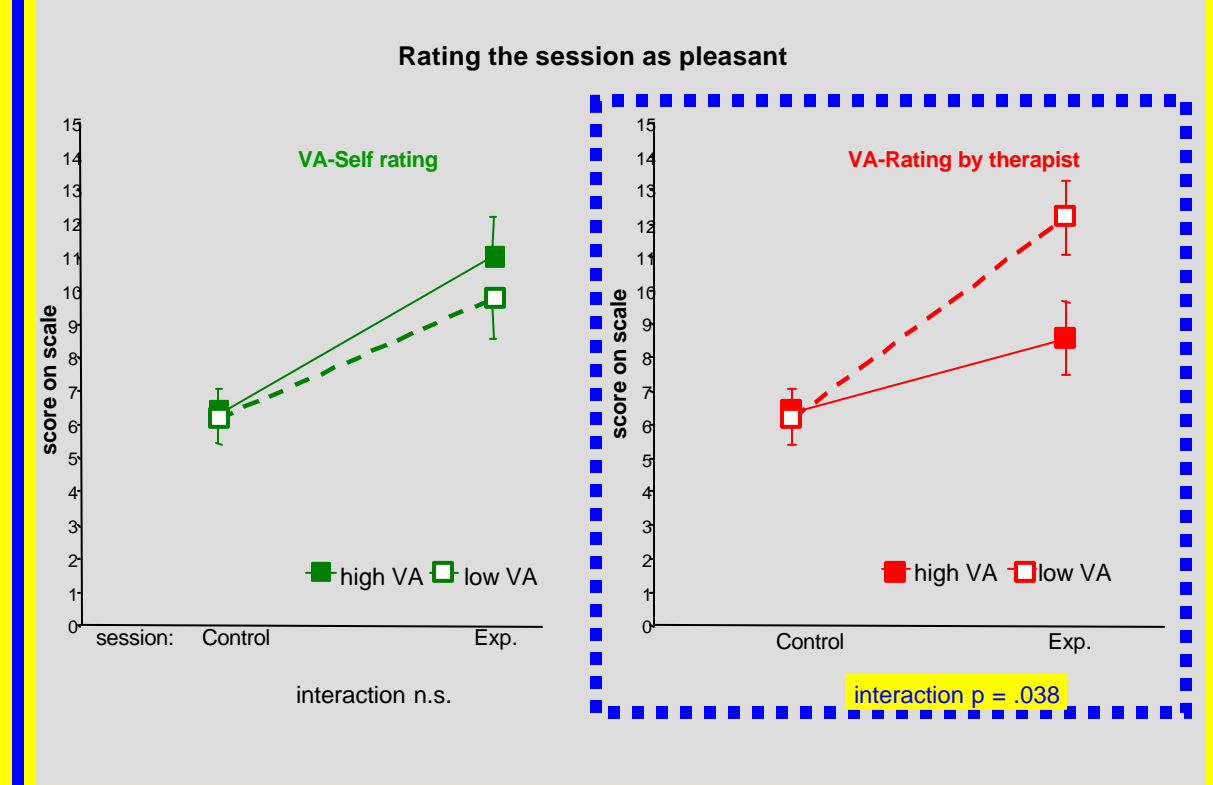
### 2.2a) Verbal aggressiveness (VA)



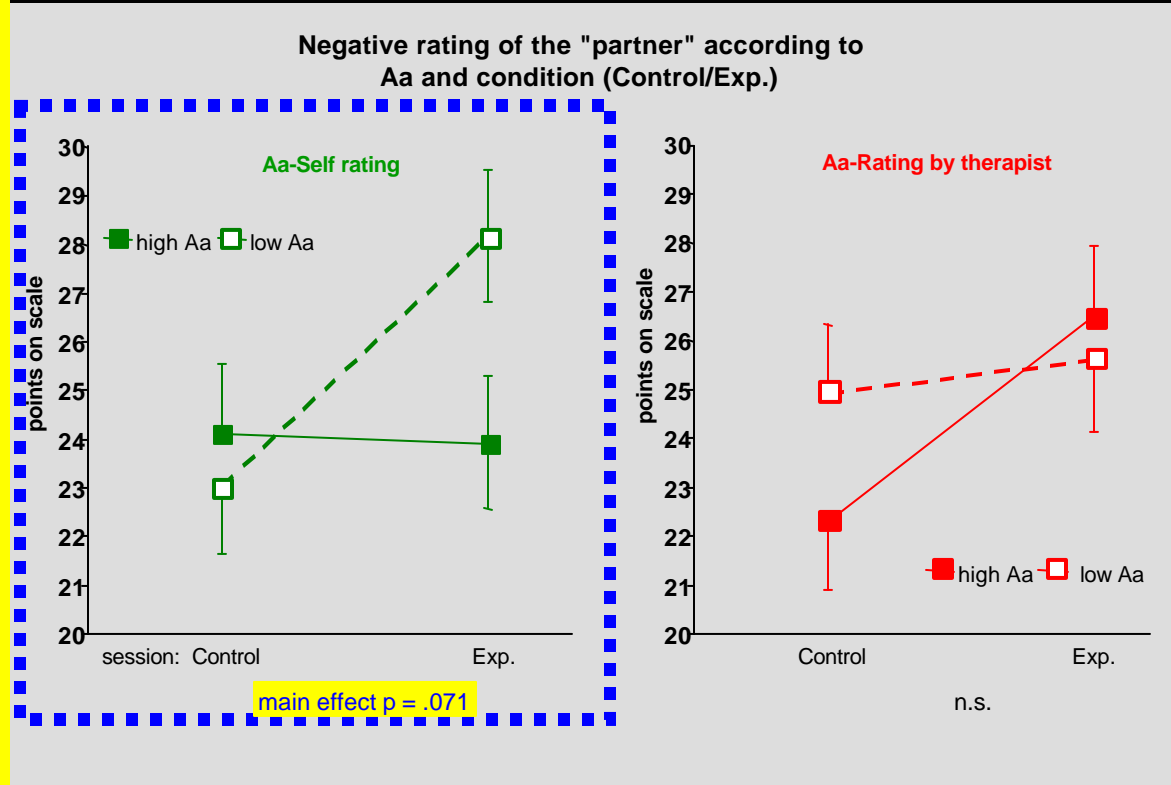
### 2.1b) Overt aggressiveness (OA)



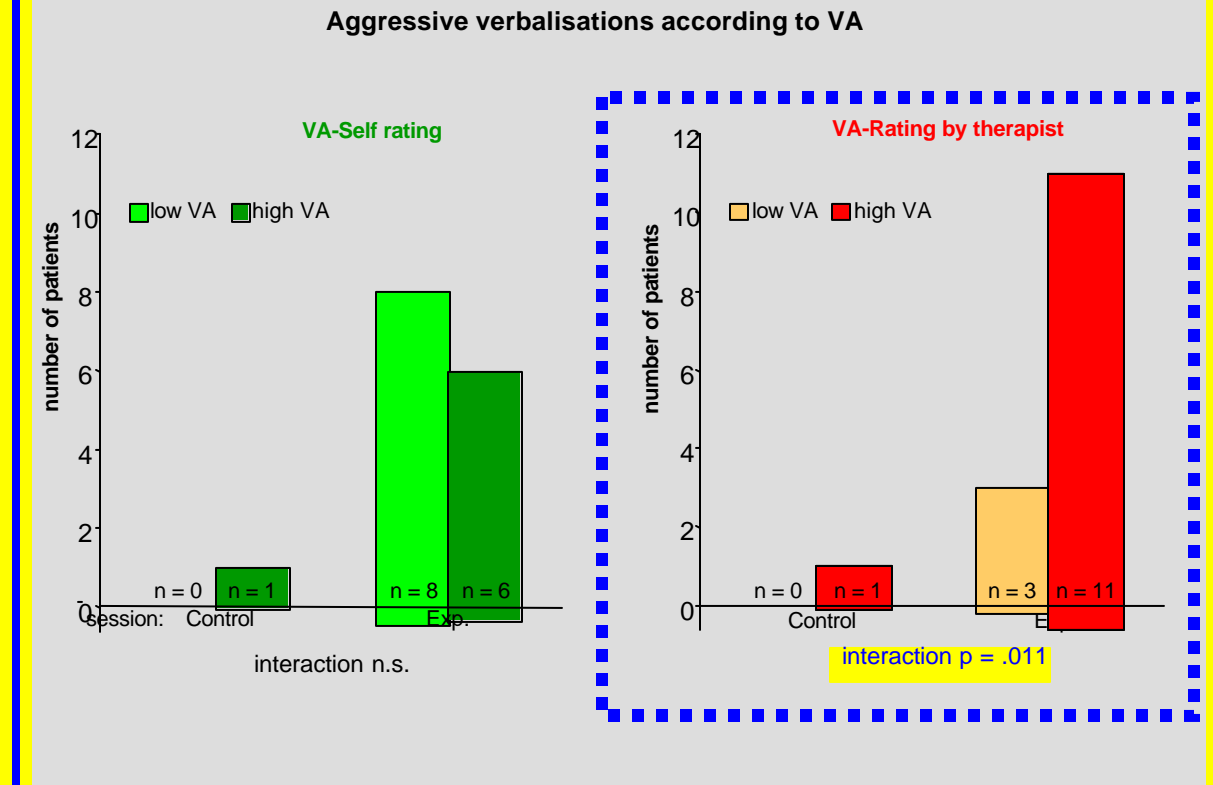
### 2.2b) Verbal aggressiveness (VA)



### 2.3) Autoaggressiveness (Aa)



### 2.2c) Verbal aggressiveness (VA)



## ★ SUMMARY & CONCLUSIONS ★

- 1a) The aggressive condition of the game induced aggressive behavior (% B), but not more negative ratings of partner and was enjoyed more than the control session (perhaps less boring)
- 1b) Biochemical responses resembled those of "defeat stress", not of aggression (Testosterone ↑, Cortisol ↓)
- 2a) Highly overt aggressive subjects (OA high) displayed less aggressive behavior (% B) and experienced the experimental session as more stressful than lows (social desirability in self ratings as well as in aggressive behavior due to institutional restrictions?)
- 2b) Highly verbal aggressives (VA high) displayed more aggressive behavior (% B and verbalisations) and rated the session as less pleasant than lows (VA better predictive power than OA)
- 2c) Highly autoaggressives (Aa high) rated the "partner" as less negative than lows (as expected)
- Overt aggressiveness and Autoaggressiveness based on self ratings and Verbal aggressiveness based therapist ratings are more suitable to predict induced aggressive behavior (there is little overlap between corresponding self and observer ratings (correlations non significant) which explains their specificity in predicting aggressive behavior)

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