Oxytocin and depth level of emotions

17th International Bonding Conference 2009

Bad Grönenbach (15-17 May)

Personal introduction ☺

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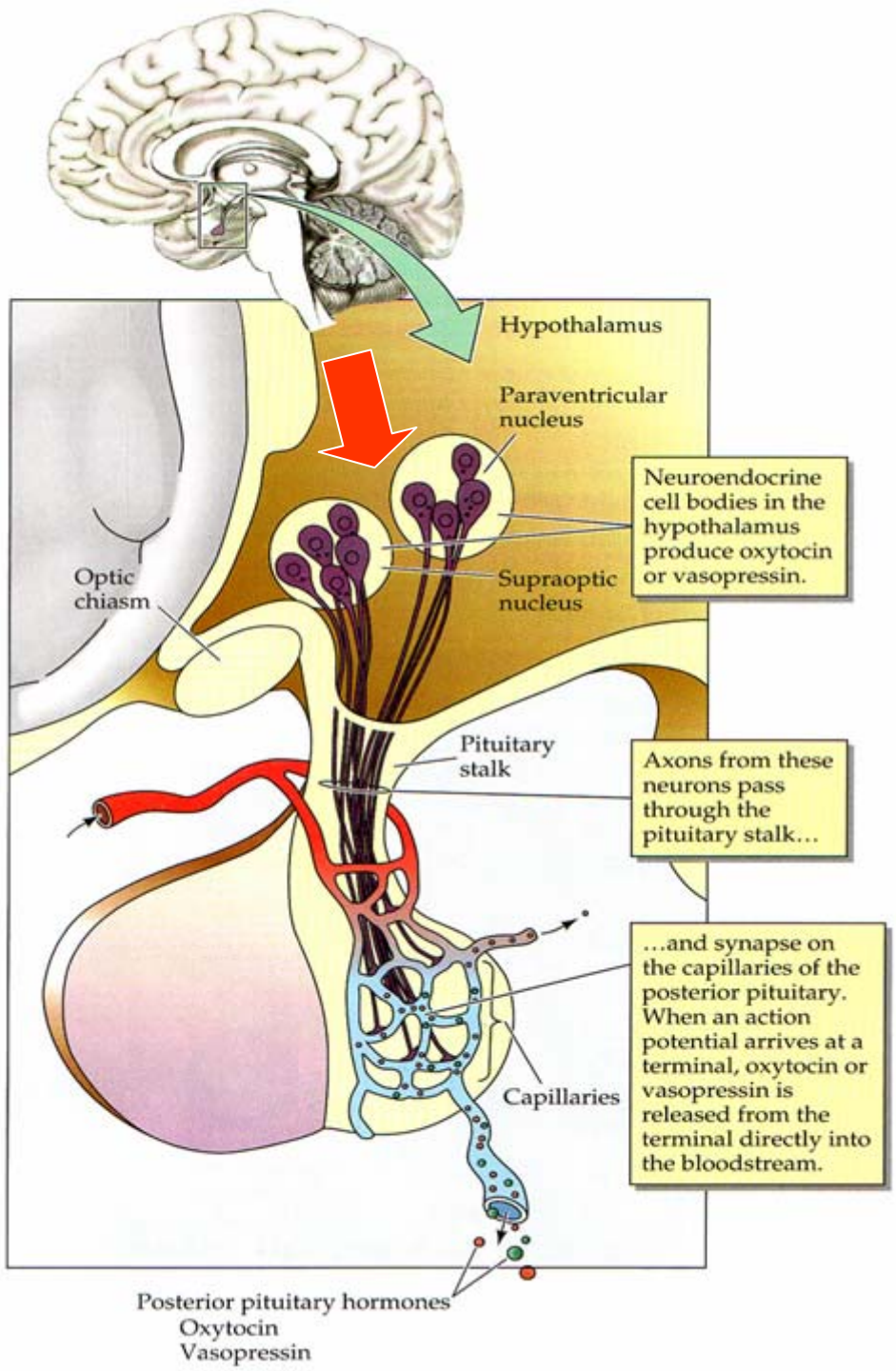
1. Oxytocin: „An exciting neuropeptide“

- very old from an evolutionary perspectice and can be found almost unchanged in all kind of mammals
- consists of nine amino acids differing only in two compared with vasopressin
- neuropeptide in the blood and in the brain
- generated in the hypothalamus (two main cores)

Growing evidence for relvevance in psychological processes...



Anmerkung: Die Abbildung wurde aus dem Buch „Biological Psychology“ entnommen. (Rosenzweig & Breedlove, 2002) (3. Auflage) (S.132)

Neurobiological background and physiology

- Projections from paraventriculare oxytocinergic neurons in different areas of the brain like bulbus olfactorius, frontal cortex, amygdala u.v.m (Bujjis et al., 1985)

- Some brain systems are especially equipped with oxytocinreceptors like the amygdala (Ferguson et al., 2000; Kirsch et al., 2005) and the limbic system (Insel & Young, 2000)

- Increasement or reduction is ruled through the brain, estrogen and many other NT, as well as sensoric stimulation during suckling, warmth of the body, touch or sexual stimulation (Lund et al., 2002; Kendrick et al., 1986; Sansone et al., 2002; Stock & Uvnäs-Moberg, 1988)

Overall functions of oxytocin

- Uterine contraction during birth and milkletdown

stress protective effects...

- lowering of the heart rate and reduction of blood pressure and stress hormones (Amico et al., 2004; Heinrichs et al., 2003; Neumann, 2002)

Psychological effects of oxytocin in attachment processes (animal studies)

- Induction of motherly behvavior in sheep (Kendrick et al., 1982) and rats (grooming, nestbuilding, suckling) after injections of oxytocin (Pedersten et al., 1982)
- In social situations applications of low doses induces fear reducing effects (more body contact) and attachment behavior (Uvnäs-Moberg, 1994)
- Low doses increase social recognition in rats (Ferguson et al., 2000; Ferguson et al., 2001) and raise memory abilities for social interactions beeing evaluated as positive
- Oxytocin-Knockout mice are charachterised as „social amnestic“

Psychological effects of oxytocin in attachment processes (human studies)

- Effects on the distribution of warmness in the body of the mother (Eriksson et al., 1996)
- reduction of anxiety in stressful situations (Heinrichs et al., 2002)
- augmentation of trust in social situations (Kosfeld & Heinrichs et al., 2005)
- experiences of social deprivation in russian orphans during the first month of life result in lower oxytocin reactions (Wismer- Fries & Pollak et al., 2005)
- Attachment disorders and psychopathological development in general are associated with insufficient levels of oxytocin

2. Pilot study: Development of a new questionnaire (FFET)

Method

- six weeks from the beginning of april till end of mai 2007
- clinic Bad Herrenalb und clinic Bad Grönenbach
- 58 probands (26 male; 32 female)
- questionnaire after bonding session
- sufficient scattering within bonding sessions

Fragebogen für emotionale Tiefenebenen (FFET)

Vielen Dank für Deine Teilnahme bei der Evaluierung dieses Fragebogens.

Versuche den Bogen bitte möglichst zeitnahe nach dem Bonding auszufüllen und nimm Dir bitte etwas Zeit bei der Beantwortung der nachfolgenden Fragen. Setze bitte ein Kreuz unter die Aussage, die am ehesten auf Dich zutrifft und Deine Erlebnisse am treffendsten beschreibt. Bearbeite bitte **alle** Fragen und setze pro Antwort auch nur **ein** Kreuz. Lies Dir jede Aussage bitte sorgfältig durch und folge beim Ankreuzen spontan Deinen ersten Impulsen!

Beispiel:

„Wenn ich meine Wut zeige, kann sie mir und anderen schaden."

trifft voll zu	trifft zu	trifft etwas zu	trifft gar nicht zu	
☐	☐	☐	☐	☐

(Mit den einzelnen Kästchen hast Du die Möglichkeit Deine Aussage zu gewichten)

Ich bin : ☐ weiblich ☐ männlich

Mein Bondingpartner heute war : ☐ weiblich ☐ männlich

Heute ist meine..... Bondingsitzung

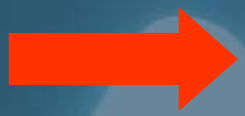
(bitte eintragen die wievielte Bondingsitzung heute war)

Patientencode:
(bitte nicht ausfüllen)

_____

Fragebogen für emotionale Tiefenebenen

- measures subjective experiences in a bonding session
- assessment through 45 items (likert scale with four characteristics)
- procedure of self-evaluation (will take 20-30 minutes)
- What kind of emotional qualities have been experienced?
- Did the person express the feelings?
- How strong was the intensity of feelings?



classification of client to a level

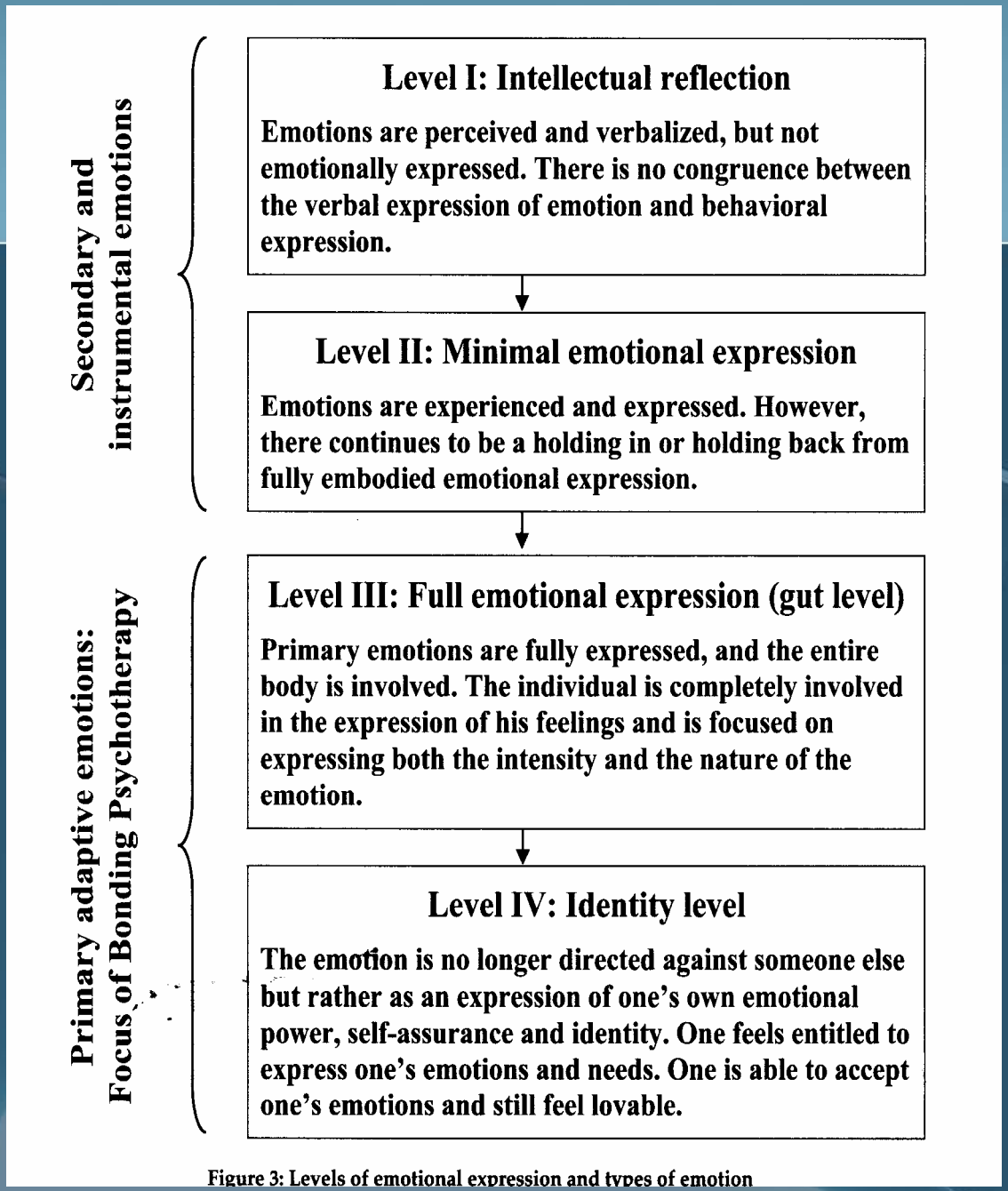


Figure 3: Levels of emotional expression and types of emotion

3. Questions of interest

1. In how far are bonding and attachment similar constructs?
2. Do we find differences in the ability to reach the emotional depth level in dependence of the attachment styles or attachment scales?
3. What relations with oxytocin can be observed at this?
4. Does a bonding session increase the oxytocin level and is this augmentation related to the emotional depth levels?
5. Is bonding able to support the competence to experience or express deeper feelings over time?
6. Can bonding change the reagibility of oxytocin after a number of bonding sessions?

4. Methods of the main study

- 21. of june till 16. of october 2007
- datacollection in clinic Bad Herrenalb with a **sample** of 40 testsubjects (27 female, 13 male; Ø 43,38 years; range of age 18-65)
- heterogeneous distribution of ICD 10 diagnoses
- two dates for statistical investigation (2. appointment = 26 probands 16 female, 10 male)
- blood collection (10ml),each time the same amount, depending on the number of appointments 8-14 samples (serum and plasma)
- centrifugation (3500g for six minutes) and dry ice (-70 degrees) for conservation, storage of the freezed samples in a laboratory till posting)

Used measurements for investigation

- Investigation of attachment behavior ➡ RSQ
- Investigation of bonding-experiences ➡ FFET
- Health questionnaire (diseases and physical disorders)
- Personal documentation (demographical data, ICD 10, addiction, daily consumption of cigarrettes, medication)
- Consent form (contact details, voluntariness)
- Investigation of the neurochemical correlates oxytocin, vasopressin; RIA examination with high testsensitivity of 0,05- 0,1pg/ml)

Legend of the applied neurochemical und psychological measures

- base value oxytocin (no bonding; 1 sample)
- pre-value oxytocin (before bonding session and for the first and second appointment)
- post-value oxytocin (after bonding session and for the first and second appointment)
- release of oxytocin Diff.1 (Post-Prä)
- release of oxytocin Diff.2 (Post-Prä)
- attachment scales
- attachment styles (median; classification after Maertens, 2006)

Variables of control

- 1. age
- 2. sex
- 3. contraception
- 4. first day of the last menstruation before the 1. appointment of examination
- 5. first day of the last menstruation before the 2. appointment of examination
- 6. smoking and smoking behavior
- 7. addiction
- 8. number and kind of ICD 10 Diagnose
- 9. antidepressants
- 10. anxiolytics
- 11. medication affecting the serotonin system
- 12. information of the health questionnaire
- 13. consumption of alcohol before stationary inhabitation (wine)
- 14. consumption of alcohol before stationary inhabitation (beer)
- 15. consumption of alcohol before stationary inhabitation (hard liquor)
- 17. number of bonding sessions

Short delineation of the procedure

Thursday

- public recruiting in the plenary meeting following a detailed information meeting (one hour) plus RSQ (test diagnostics)

Friday

- blood collection in oder to measure the base value

Tuesday

- blood collection before and after bonding session in order to determine pre-, post and differences of oxytocin release

8:45 taking blood (pre)

9:15 start of the bonding session

ca.10:45 changing of the bonding partners + short break

ca. 11:50 taking blood (post)

ca. 12:00 FFET (instructions)

ca. 12:05 sample fabrication (Ø= 30-35 minutes from blood taking till conservation in dry ice

Short description about what happened on tuesday….

Hypotheses 1a

Higher values in the attachment scales (RSQ) are associated with higher levels in scale level one and two (FFET)

5. Hypotheses and results of the main study

Korrelationen

		Tiefenebene 1	Tiefenebene 2	Tiefenebene 3	Tiefenebene 4	Skala Verbundenheit
Skala 1 Mittelwerte Angst vor Trennung	Korrelation nach Pearson	,031	,184	-,213	-,290	-,078
	Signifikanz (2-seitig)	,851	,255	,188	,069	,633
	N	40	40	40	40	40
Skala 2 Mittelwerte Angst vor Nähe	Korrelation nach Pearson	,369*	,470**	-,092	-,090	-,084
	Signifikanz (2-seitig)	,019	,002	,573	,581	,606
	N	40	40	40	40	40
Skala 3 Mittelwerte Fehlendes Vertrauen	Korrelation nach Pearson	,226	,147	,092	,057	,094
	Signifikanz (2-seitig)	,162	,366	,573	,728	,562
	N	40	40	40	40	40
Skala 4 Mittelwerte Wunsch n. Unabh.	Korrelation nach Pearson	,041	,098	,153	,239	,208
	Signifikanz (2-seitig)	,803	,548	,346	,138	,198
	N	40	40	40	40	40

**. Die Korrelation ist auf dem Niveau von 0,01 (2-seitig) signifikant.

*. Die Korrelation ist auf dem Niveau von 0,05 (2-seitig) signifikant.

Hypotheses 1b,c

- unsecure attachment styles-> high values in the low emotional depth levels (FFET scale level one and two)

- secure attachment styles -> high scores in the deeper emotional levels (FFET scale level three, four, bonding scale)

Results of ANOVA (mean *M* and standard deviation *SD*) in dependence of the measured attachment styles (n= 40)

	M unsecure	*SD* unsecure	*M* secure	*SD* secure	*F*	significance *p*
scale level one	15,06	4,28	12,33	2,73	1,971	.08
scale level two	23,85	5,82	19,50	5,13	2,979	.04 *
scale level three	52,12	16,07	63,17	24,60	1,471	.12
scale level four	18,06	5,43	22.33	5,54	2,557	.05*

Bonding scale no significance (Mann-Whitney-U-test)

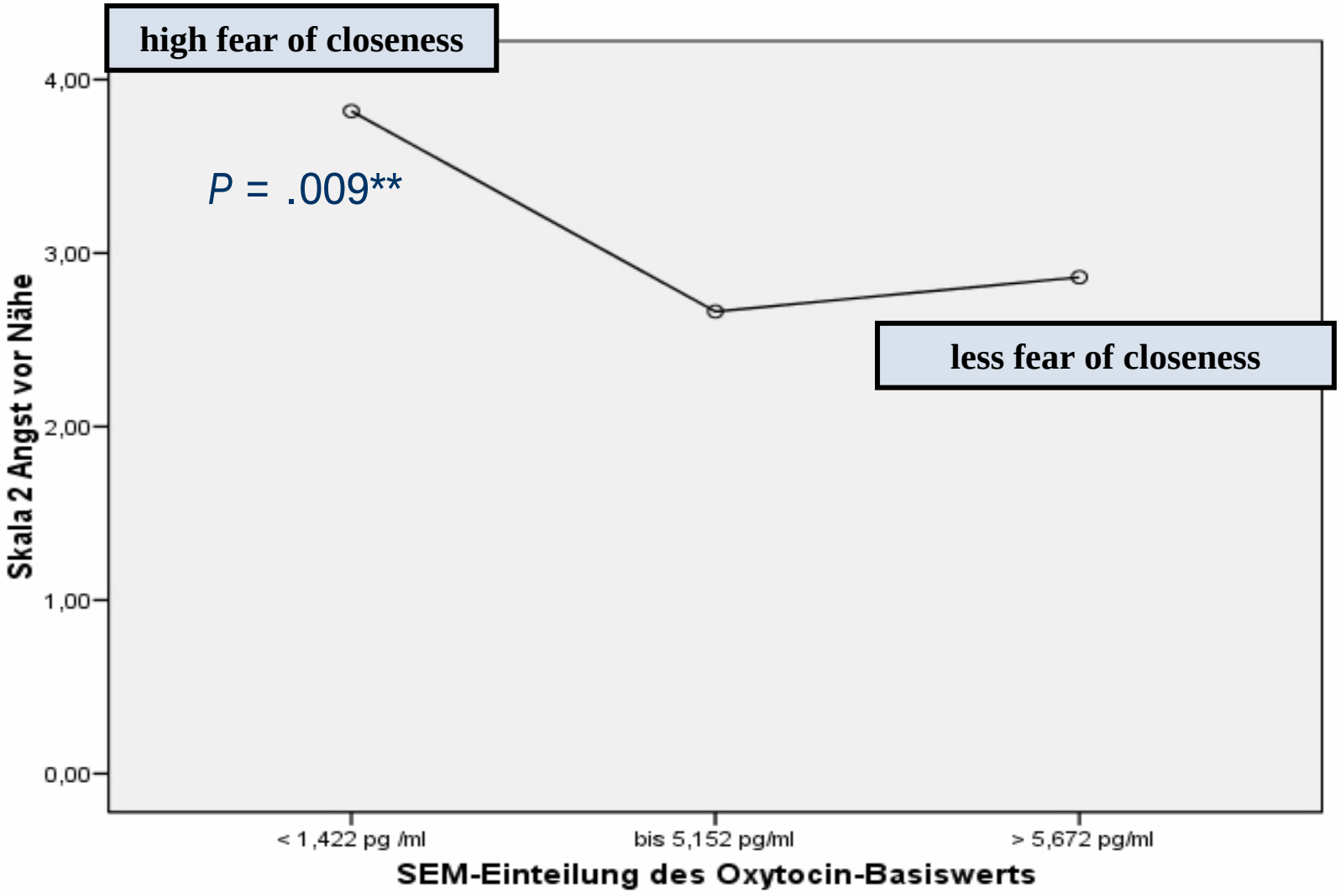
Distribution of attachment styles in the sample (n = 40)

	fear of closeness (Skala 2) ≤ 2,88	fear of closeness (Skala 2) ≥ Median 2,88
fear of separation (Skala 1) ≤ 2,75	secure (n = 6)	dismissive (n = 5)
fear of separation (Skala 1) ≥ 2,75	preoppucied (n = 9)	fearful-avoidant (n = 20)

Hypotheses 2a,b,c

- High values on the attachment scales (fear of closeness, fear of separation) are connected with a low base value of oxytocin
- as well as a reduced release of oxytocin

Mean of the three base value groups (just women) in dependence on the attachment scale „fear of closeness“ (n = 23)



Hypotheses 3a,b

- A bonding session results in an increase of oxytocin (pre to post)
- A stronger release is connected with higher values in deeper emotional depth level (bonding scale, scale level three and four FFET) and lower ones in scale level one and two

Bonding and oxytocin

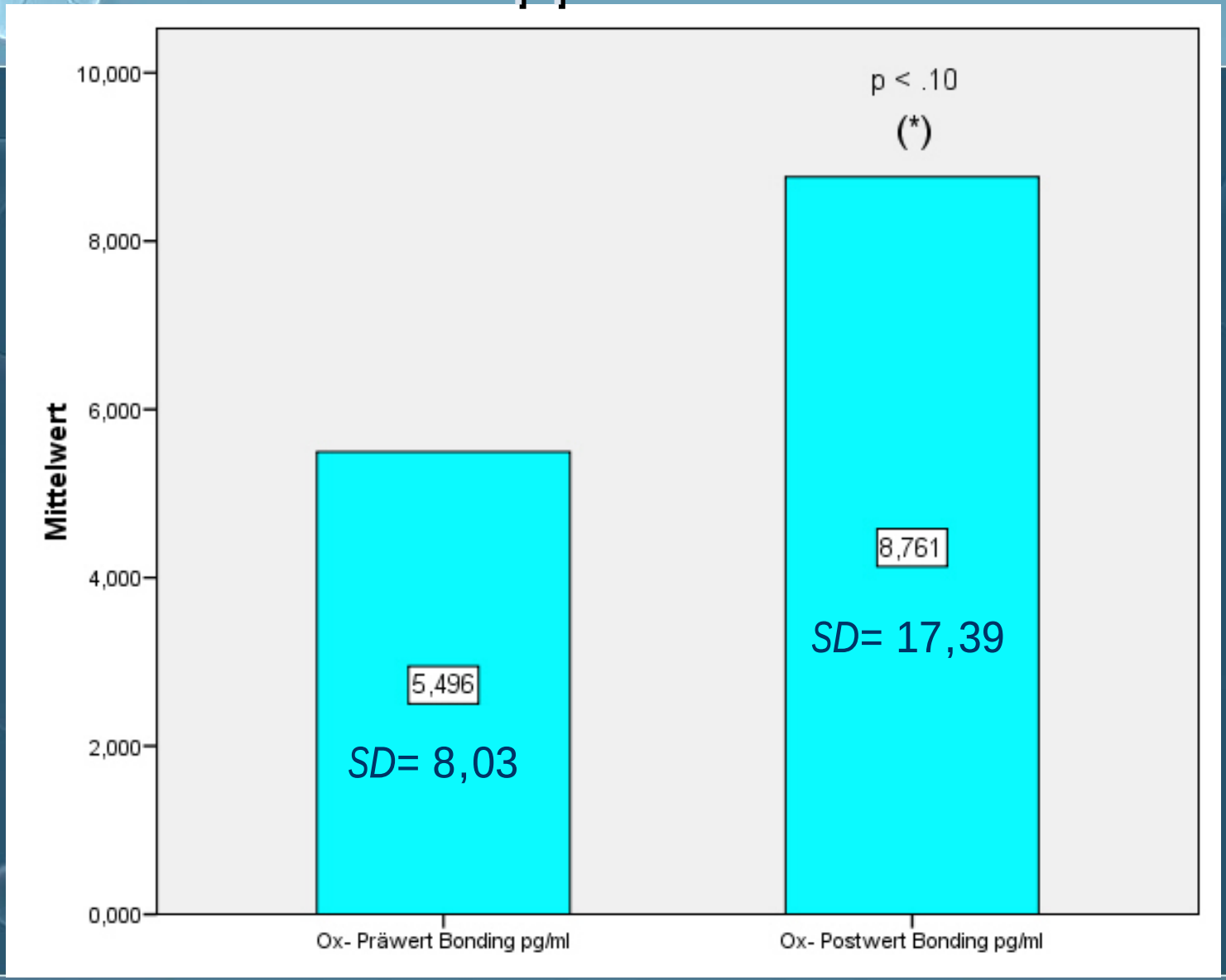
1. session no differences from pre- to post-values (pre *M* = 6,71 pg/ml post *M* = 6,28 pg/ml)

1. session no connections with the scales of the FFET

1. session no differences in the release of oxytocin within the emotional depth level

	Oxytocin low < -1.004 pg/ml	Oxytocin middle von -,763 bis 0,848 pg/ml	Oxytocin high > 1,191 pg/ml	*F*	Significance *p*
probands (n)	10	21	9	-	-
scale level one	13,60	14,28	16,66	1,360	.14
scale level two	23,40	22,85	23,78	,086	.46
scale level three	50,10	52,48	60,89	1,717	.09 (*)
scale level four	17,90	18,43	20,22	,849	.21
bonding scale	29,60	28,85	31,55	,348	.35

Reactions of oxytocin at the second appointment

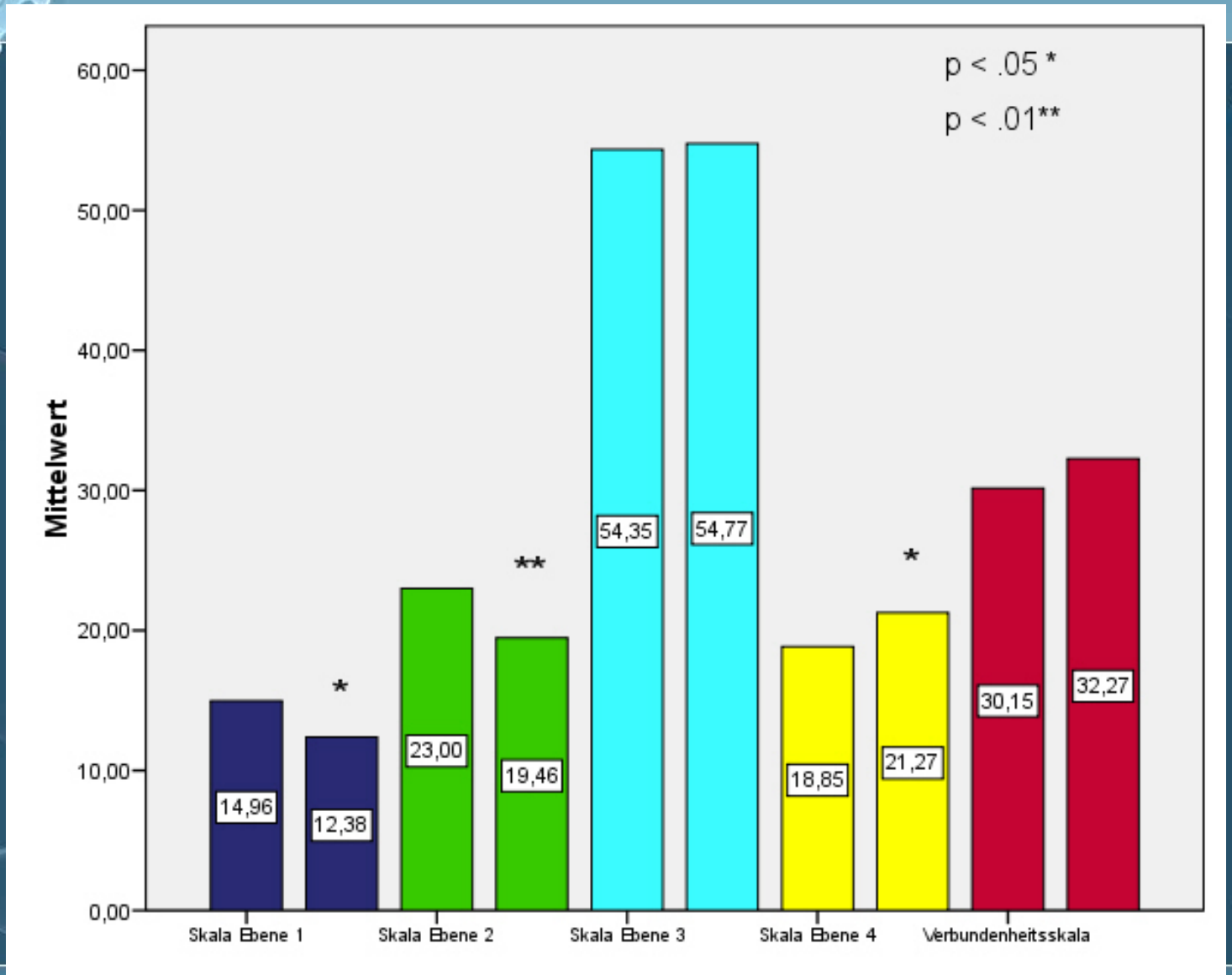


Hypotheses 4a,b

Changes in FFET from the first to the second appointment should lead to

- lower values in scale level one and two
- higher values in the bondingscale, scale level three and four

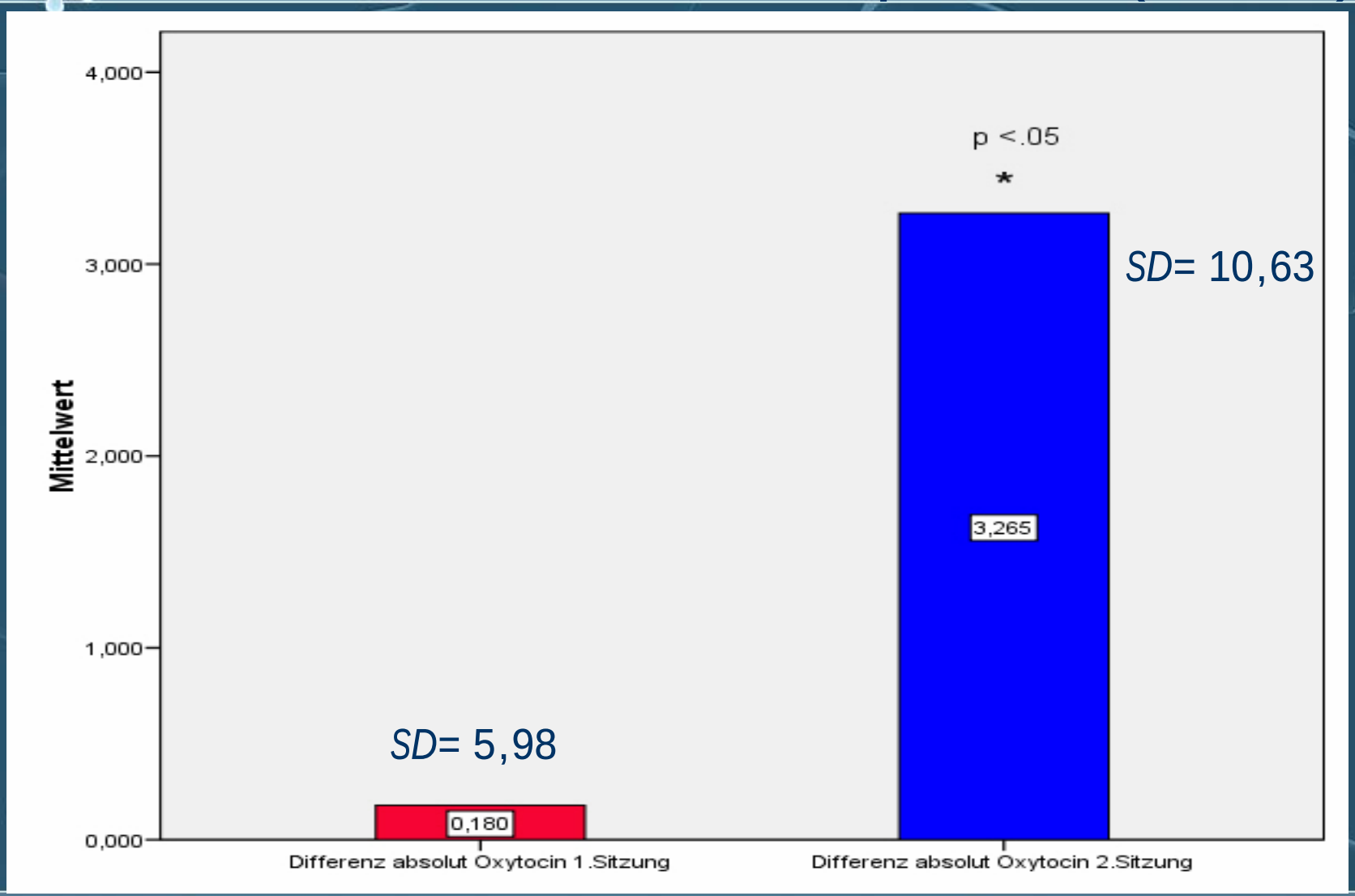
Development of the emotional depth level during bonding-therapy (FFET)



Hypotheses 5a

- From the first to the second appointment bonding leads to a changed (higher) reagibility of oxytocin

Mean values of the absolute oxytocin differences between the first and second session in comparison (n = 26)



6. Criticism

- no control group
- unequal number of cases for each group of the single attachment styles
- Influences of other therapeutical interventions cannot be separated from bonding during a stationary inhabitation
- other variables of control or confounding yet unidentified?

7. Implications for future research

Replication of the study results under consideration of following improvements

a) Implication of control group(s) and a more sophisticated design
b) Implication of a homogeneous sample (age, sex, diagnoses)
c) Implication of more differentiated measurements for the attachment styles (AAI?) or at least two different questionnaires given before and **after** stationary inhabitation

- Is the higher oxytocin level stable over time?
- Is this augmentation related with a recovering in psychopathological symptoms and disorders in general?
- Do other forms of psychotherapy are able to achieve similar or even better results concerning neuroendocrinology?

Thank you for your attention !

Questions ???

Please ask ! ☺

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