A Methodoglogical Framework For Exploring Attachment Hierarchy Stability

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Attachment Hierarchies

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(Trinke & Bartholomew, 1997)

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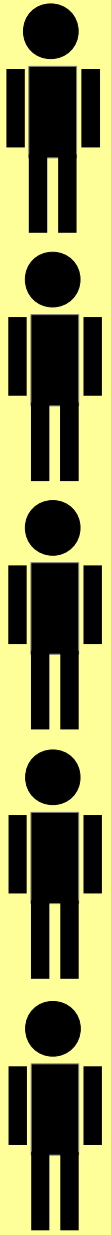

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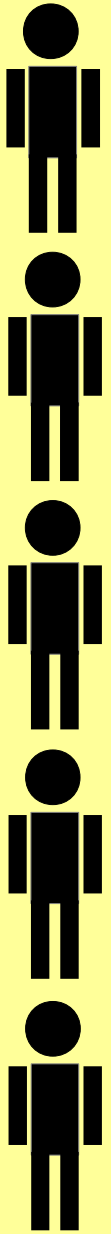

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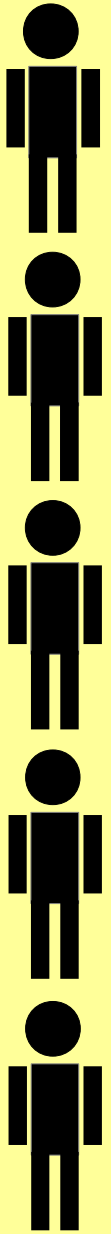

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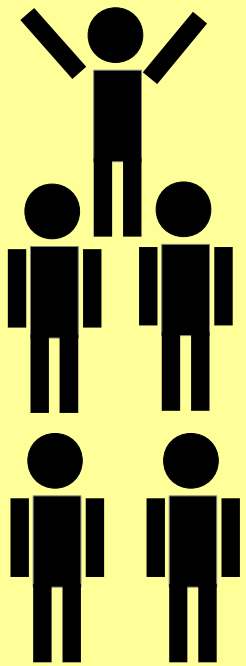

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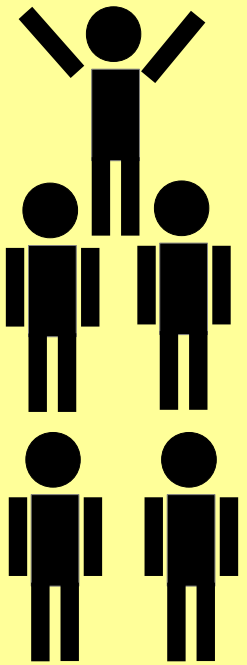

Attachment Hierarchies

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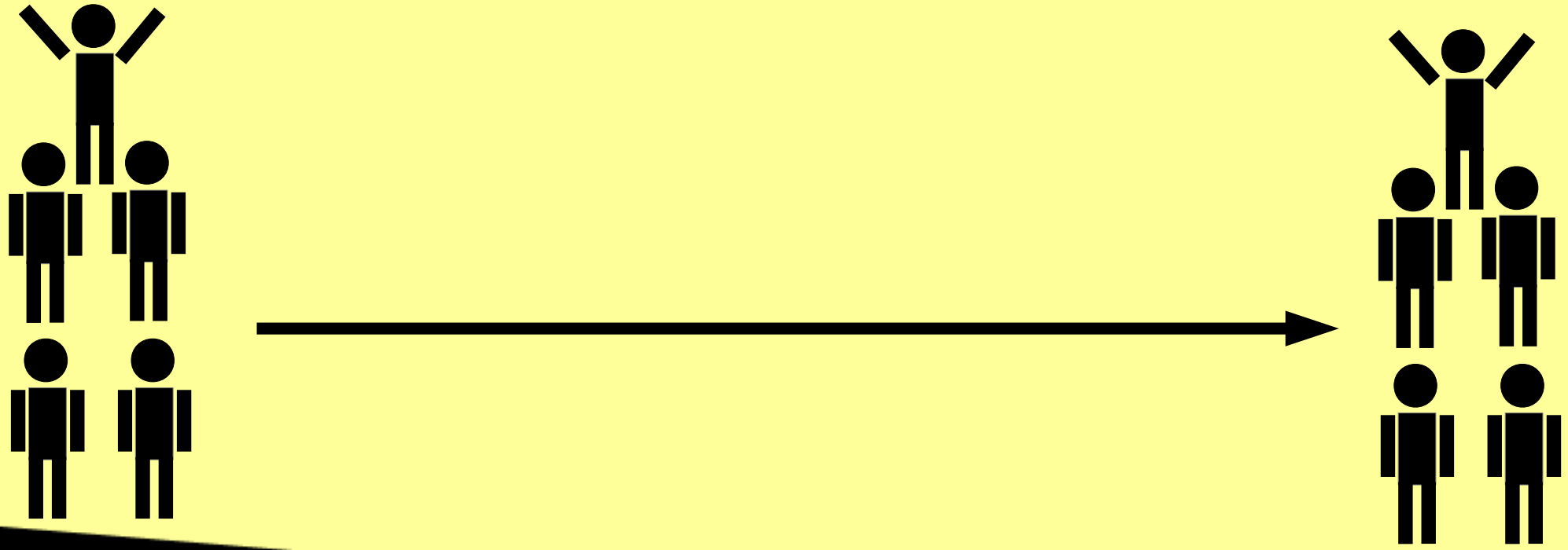
- Limited evidence of stability (Trinke & Bartholomew, 1997)



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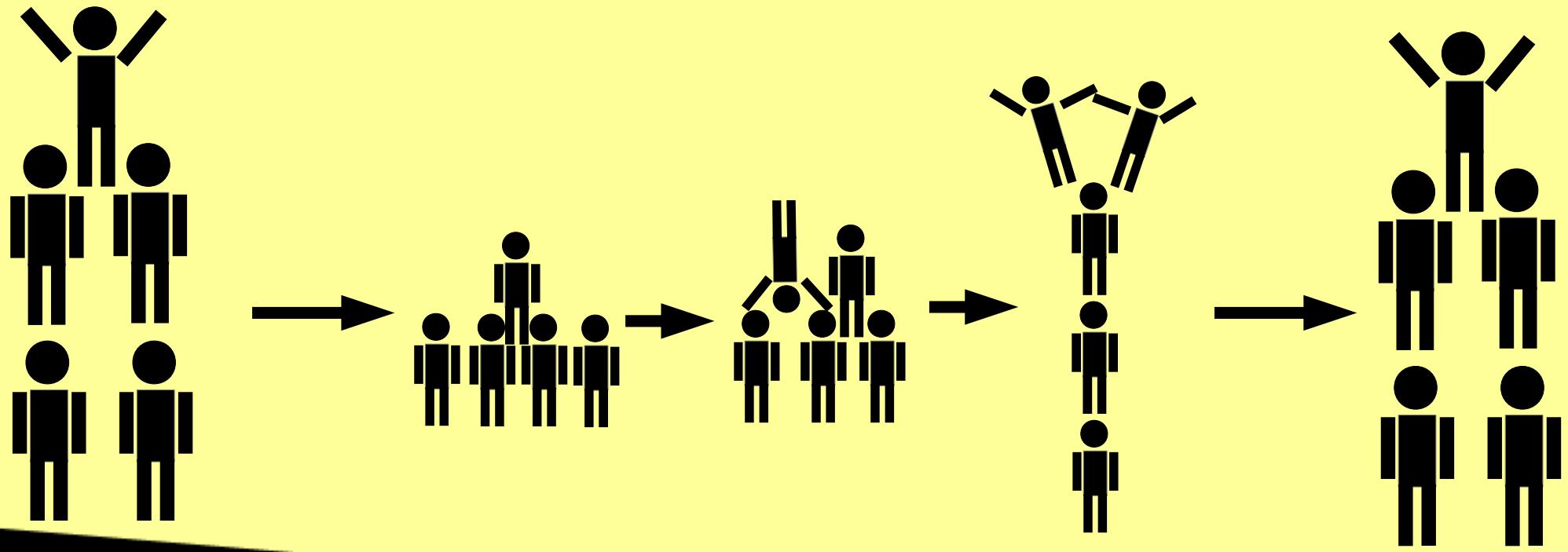

Measures (single point)

33 participants

- Aged 18 - 62 (M = 24) years
- 76% female

Completed measures of attachment style, stress, and nominated between 2 and 5 attachment figures, ranked them according to an adapted version of the Attachment Network Questionnaire (Trinke & Bartholomew, 1997)

Measure

ATTACHMENT STUDY

Please answer as honestly as you can, thinking about the past day.

For questions 3 to 6, please give a number between 1-5 for each person listed on your card (higher numbers meaning that person was more important in the last day). There is an example format on the back of this card.

1. How stressed were you today?
(1-7, with greater numbers meaning more stress)

2. Did you experience any stressful events today?
If so please specify briefly? (e.g. exams, break-up, accident)

3. Of your close relationships, who was it important for you to see today? (5 is the most important, to 1 is the least important)

4. Who were you most upset to be separated from today, regardless of the length of time? (5 is most upset, to 1 is least upset)

5. If needed, who would be available for you today?
(5 is most available, 1 is least available)

6. Who, if anyone, did you go to for support and/or comfort today?

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Q: Which figure is ranked the highest?
O: Relationship → rank

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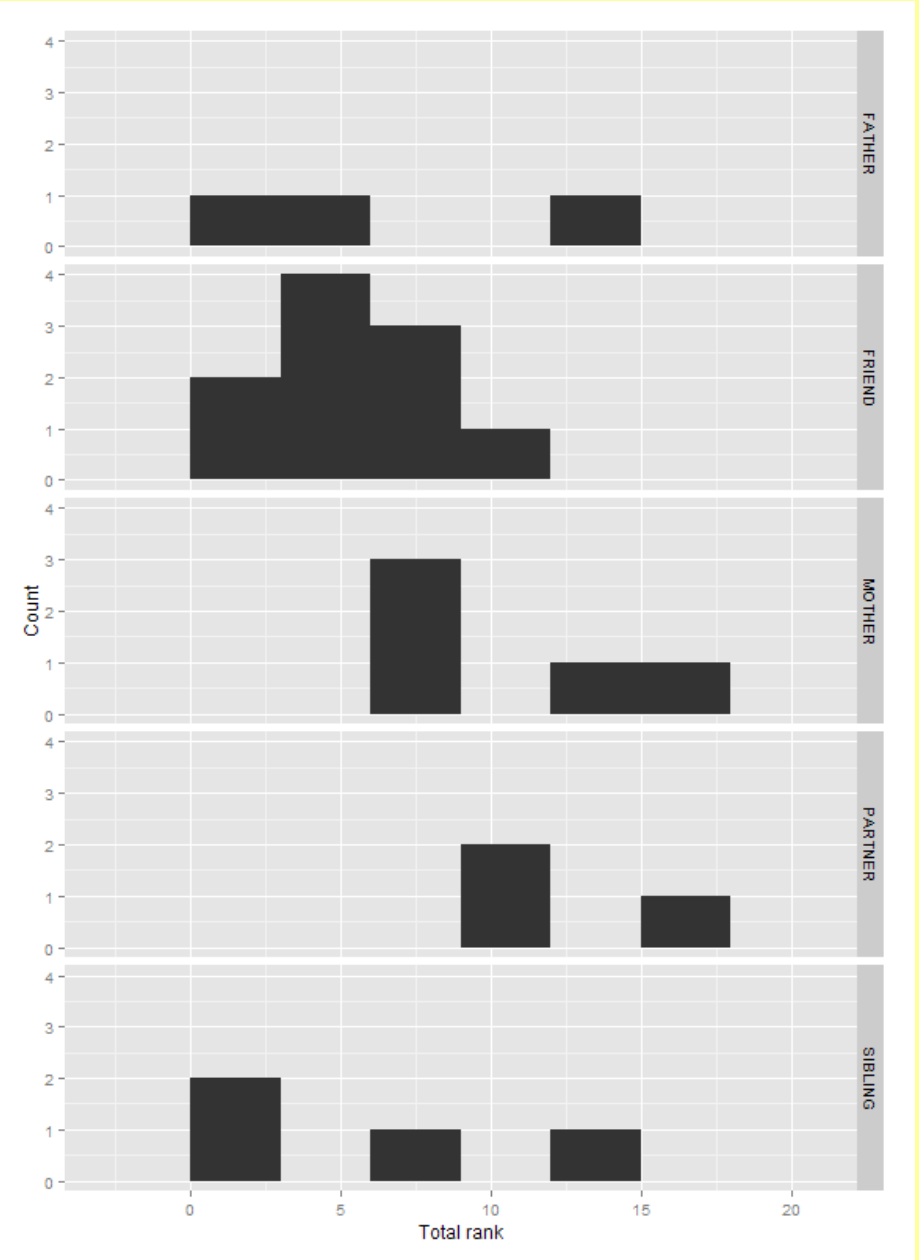
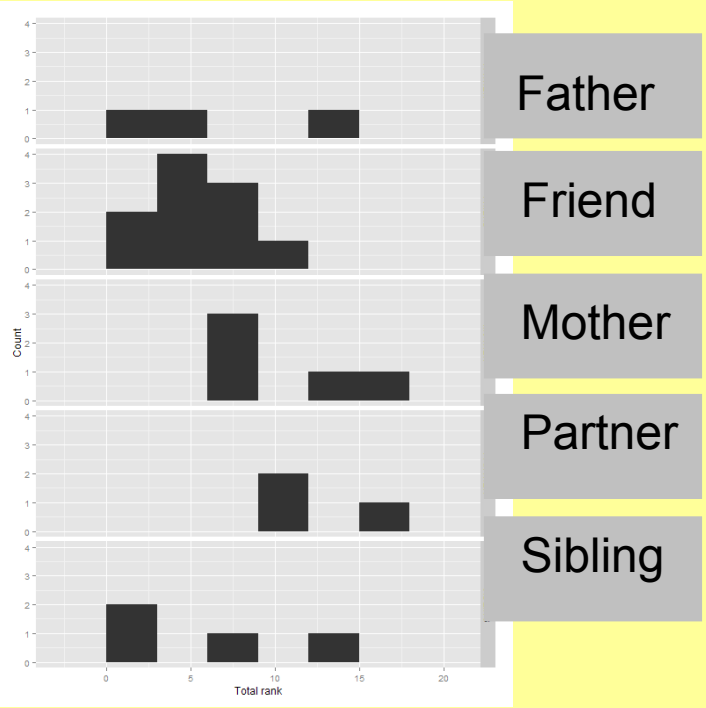
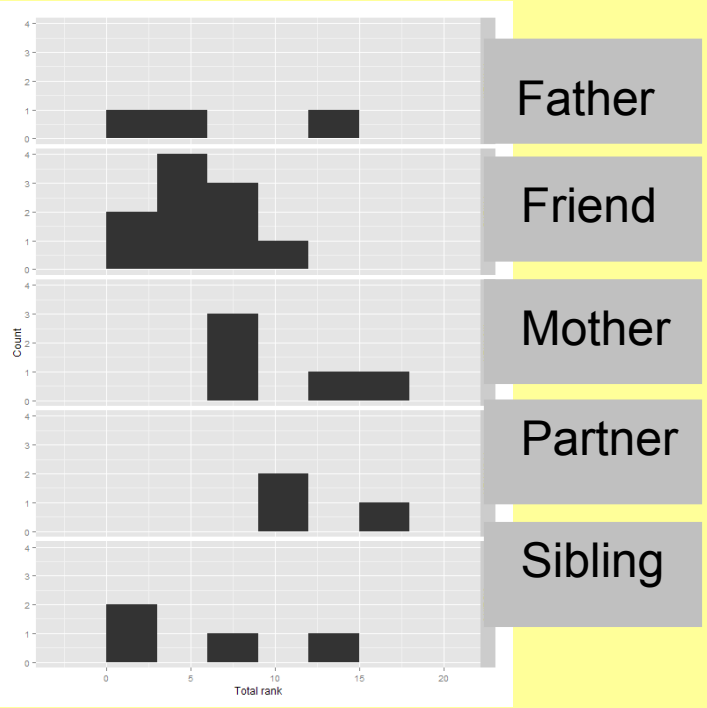
Q: Which figure is ranked the highest?
O: Relationship → rank
A: Partner, mother

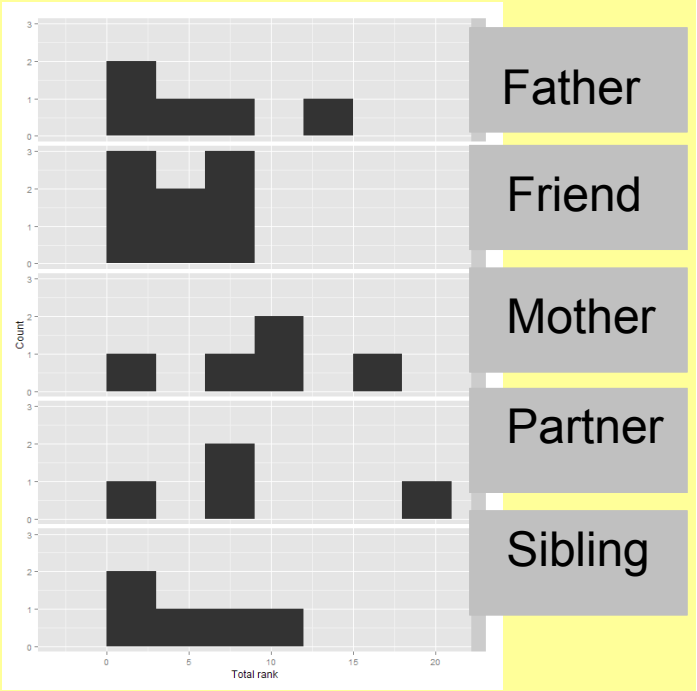


Is this the whole story?



Again!


Father
Friend
Mother
Partner
Sibling
Count
Total rank


Father
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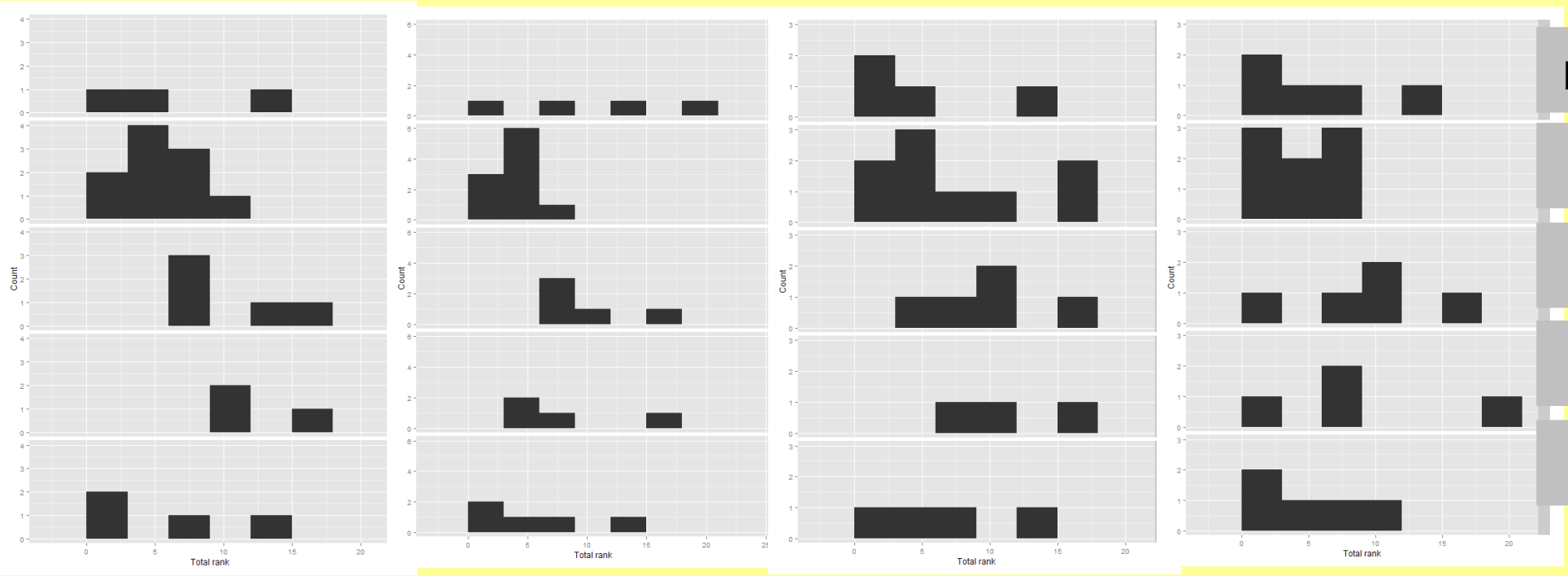
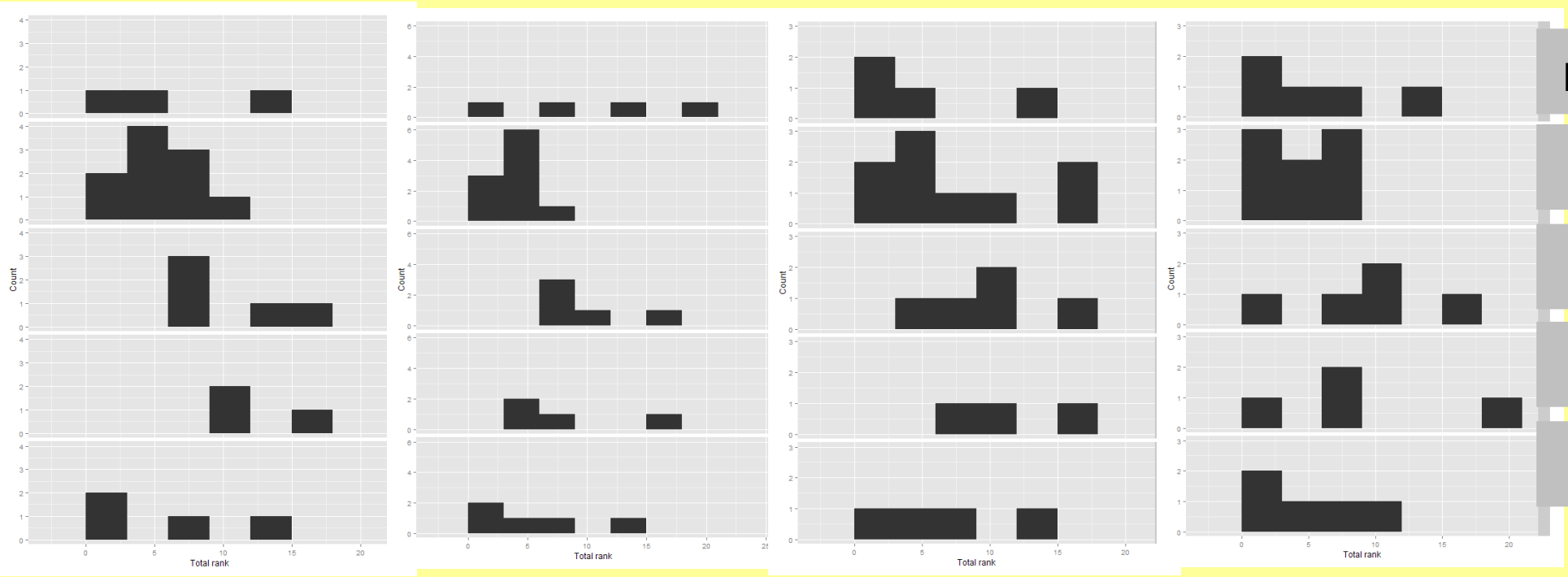
Again again!



Repeated measures

Q: How does momentary high stress impact the attachment hierarchy?



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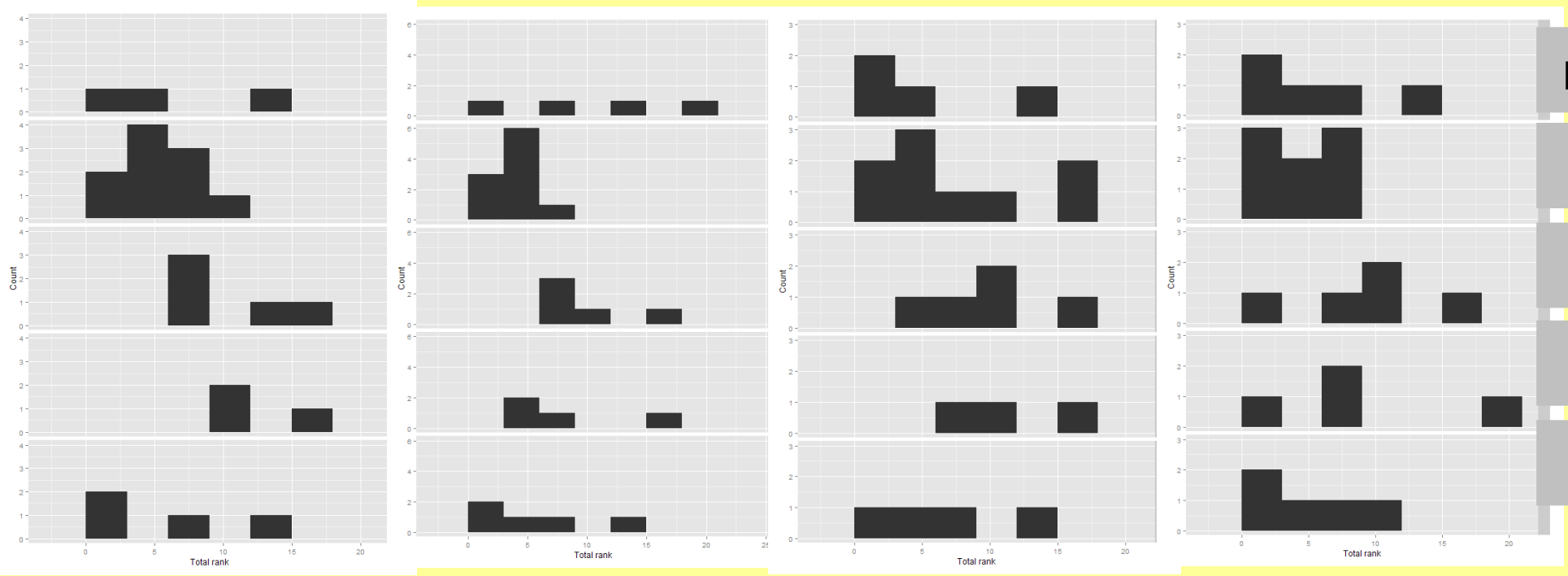

*O: Momentary stress *relationship → attachment hierarchy rank immediately following stress*

A: Participants rank their partners more highly than their mothers, BUT when under higher levels of momentary stress, they turn to their mothers

Repeated measures

- Repeated measures research can extend what single point research does
  - Gave context to general trends
  - Allowed us to look at some causal relationships

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- Repeated measures research can extend what single point research does
  - Gave context to general trends
  - Allowed us to look at some causal relationships
- Also allows us to look at variability

Why isn't this done?

- Pragmatic challenges
  - Repeated measures research is difficult

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- Data parsing challenges: the response format
  - Has to be easy for participants
  - Has to be scalable for researchers

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- Pragmatic challenges
  - Repeated measures research is difficult
- Data parsing challenges: the response format
  - Has to be easy for participants
  - Has to be scalable for researchers
- Analytical challenges
  - Meaningfully analysing repeated measures ordinal data (with ties) is a conceptual headache

Pragmatic challenge

Mobile phones because:

- Mobile ownership ubiquitous (ACMA, 2011)
- Disrupts everyday lives as little as possible

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- Mobile ownership ubiquitous (ACMA, 2011)
- Disrupts everyday lives as little as possible

Use SMS because:

- High SMS usage in Australian population
- Cross-platform compatible (unlike Apps)
- Very suitable for brief communications

Pragmatic challenge

Sampled every second day for 60 days.

(30 sampling occasions)

- Gave them a card with questions

- Sent prompt asking for response

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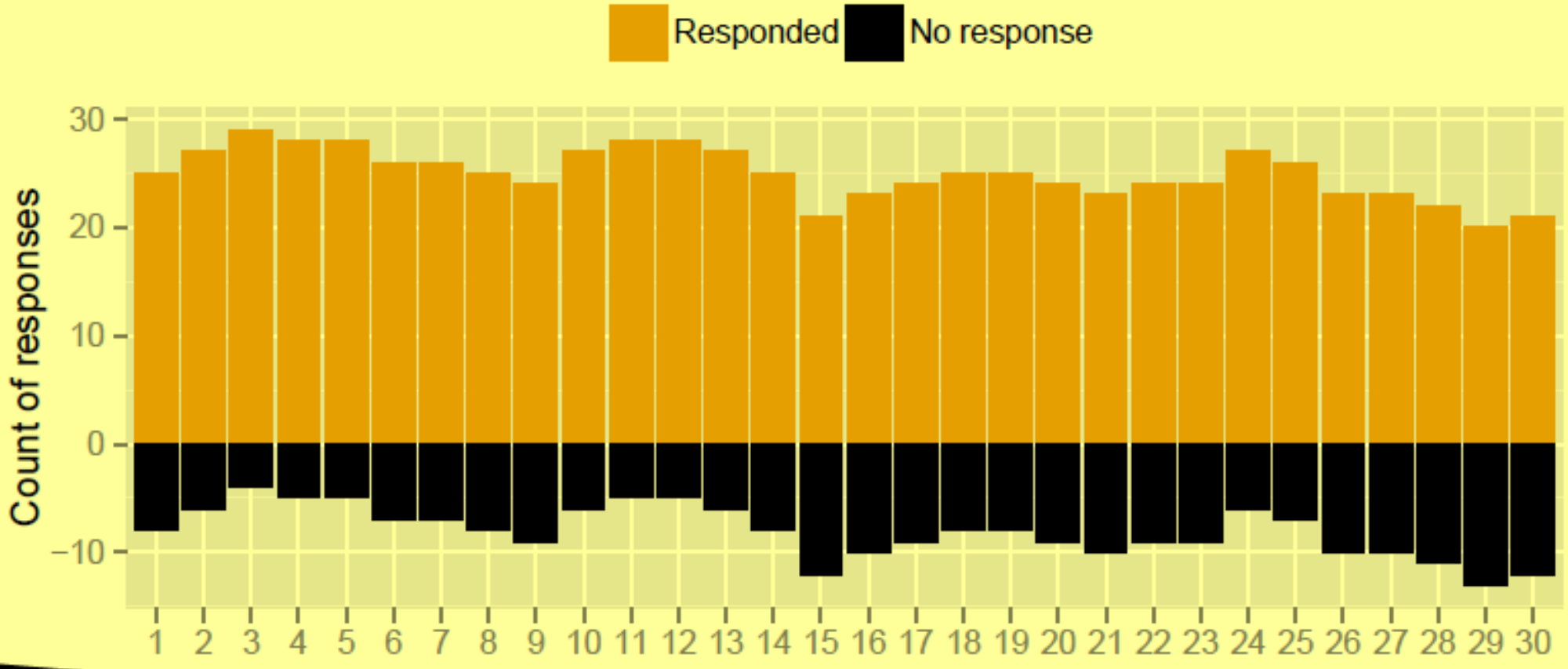
6. Who, if anyone, did you go to for support and/or comfort today?

Pragmatic challenge

Sampled every second day for 60 days.

76% response rate



Pragmatic challenge

Sampled every second day for 60 days.

76% response rate

Item	Complete
1) How stressed were you today?	72%
2) Did you experience any stressful events today?	62%
3) Of your close relationships, who was it important for you to see today?	72%
4) Who were you must upset to be separated from today, regardless of the length of time?	71%
5) If needed, who would be most available for you today?	70%
6) Who, if anyone, did you go to for support and/or comfort today?	31%

Data Parsing Challenge

- Incoming SMS need to be parsed, and matched with baseline questionnaires
  - Avoid human error

614[redacted]	28/09/2013 08:47:36	1. 4 2. Work 3. CL 5 JW 5 GF 1 JM 3 LB 1 4. CL 4 JW 1 GF 1 JM 2 LB 4 5. CL 4 JW 5
614[redacted]	28/09/2013 08:40:00	1. 5 2. Assignment due, sick 3. CL 2 JW 4 GF 1 JM 4 LB 1 4. CL 1 JW 3 GF 1 JM 2 LB
614[redacted]	27/09/2013 23:01:07	1. 1 2. Have a cold 3.jd 3 AA 3 rb 5 rp 3 2. Jd 3 AA 2 rb 3 rp 2 5. Jd 4 AA 4 rb 4 rp
614[redacted]	27/09/2013 22:38:11	1. 3 2. Work 3. KC 4 DS 2 WS 2 TW 1 4. KC 3 DS 1 WS 1 TW 1 5. KC 5 DS 5 WS 5
614[redacted]	27/09/2013 22:30:48	1. 1 2. 3. JW3 FL4 BL2 GM5 4. JW4 FL5 BL3 GM2 5. JW4 FL2 BL3 GM5 6. GM
614[redacted]	27/09/2013 22:02:33	1. 3 2. Report due 3. SP 1 JP 1 HP 1 DP 1 4. SP 1 JP 1 HP 1 DP 1 5. SP 5 JP 3 HP 1
614[redacted]	27/09/2013 21:39:26	1. 3 2. No 3. VG 3 CJ 3 SR 2 MP 1 TP 1 4. CJ 4 SR 4 TP 2 VG 1 MP 1 5. CJ 5 VG 3 M
614[redacted]	27/09/2013 21:04:42	[2 of 2] JM.T - 2 E.O - 1 6. L.S

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father				
H339KN	4	PW	KM	HM	Partner	Mother	Father				
H339KN	4	PW	KM	HM	Partner	Mother	Father				

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father				
H339KN	4	PW	KM	HM	Partner	Mother	Father				

Participants are never perfect...

PW4 KM2 HM1

PW.4.KM.2..HM.1

POW4*KM2HM1

(etc)

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

PW	partner
KM	mother
HM	father

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

PW	partner
KM	mother
HM	father

	T1
PW	4
KM	2
HM	1

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

PW	partner
KM	mother
HM	father

	T1
PW	4
KM	2
HM	1

	T2
KM	1
PW	4
HM	1

Data Parsing

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

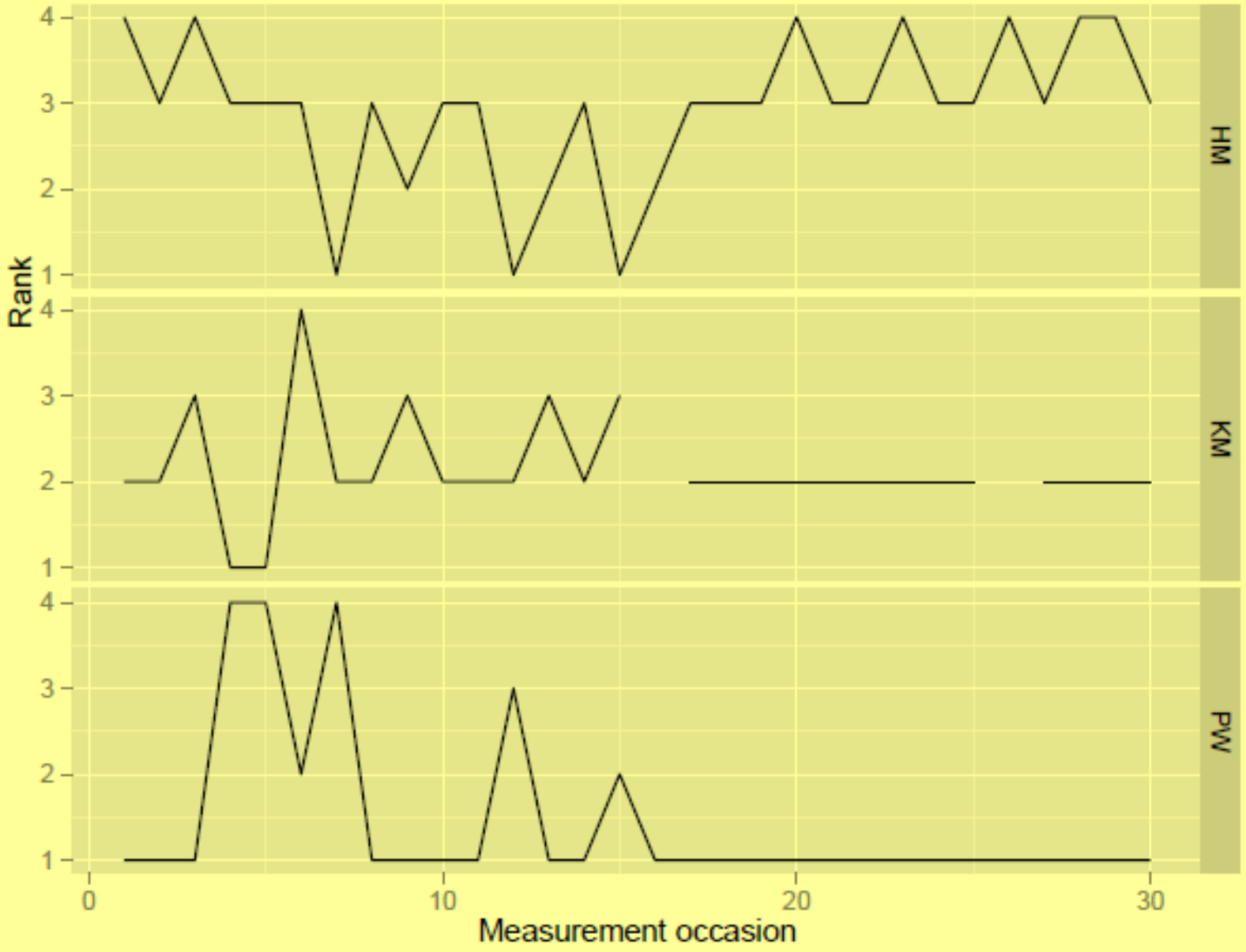
PW	partner
KM	mother
HM	father

	T1
PW	4
KM	2
HM	1

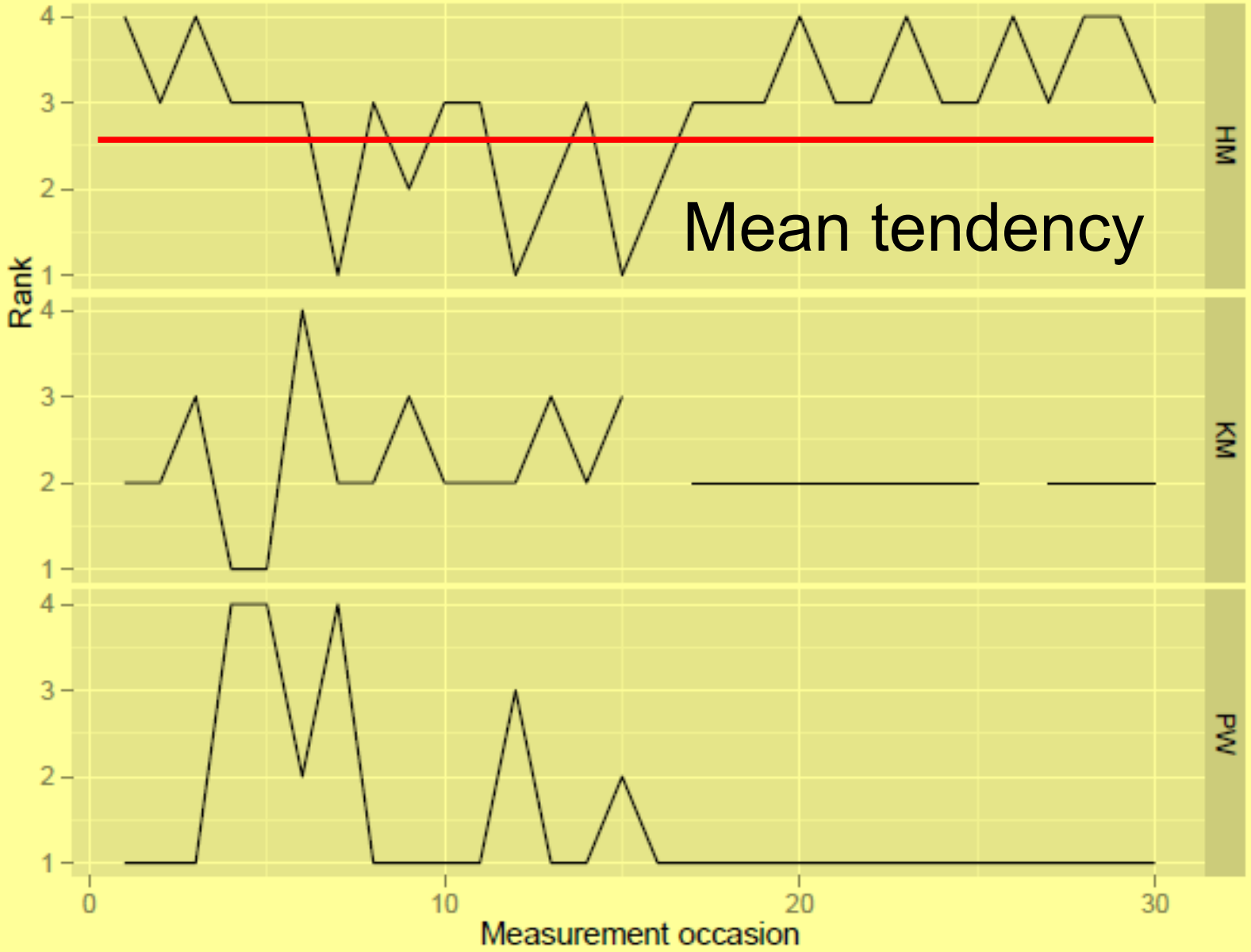
	T3
KM	1
PW	4
HM	1

				T1	T2	T3	
H339KN	PW	partner	4	1	3	5	6
H339KN	KM	mother	4	5	2	3	6
H339KN	HM	father	4	2	5	2	6

Data Parsing



Analysis options



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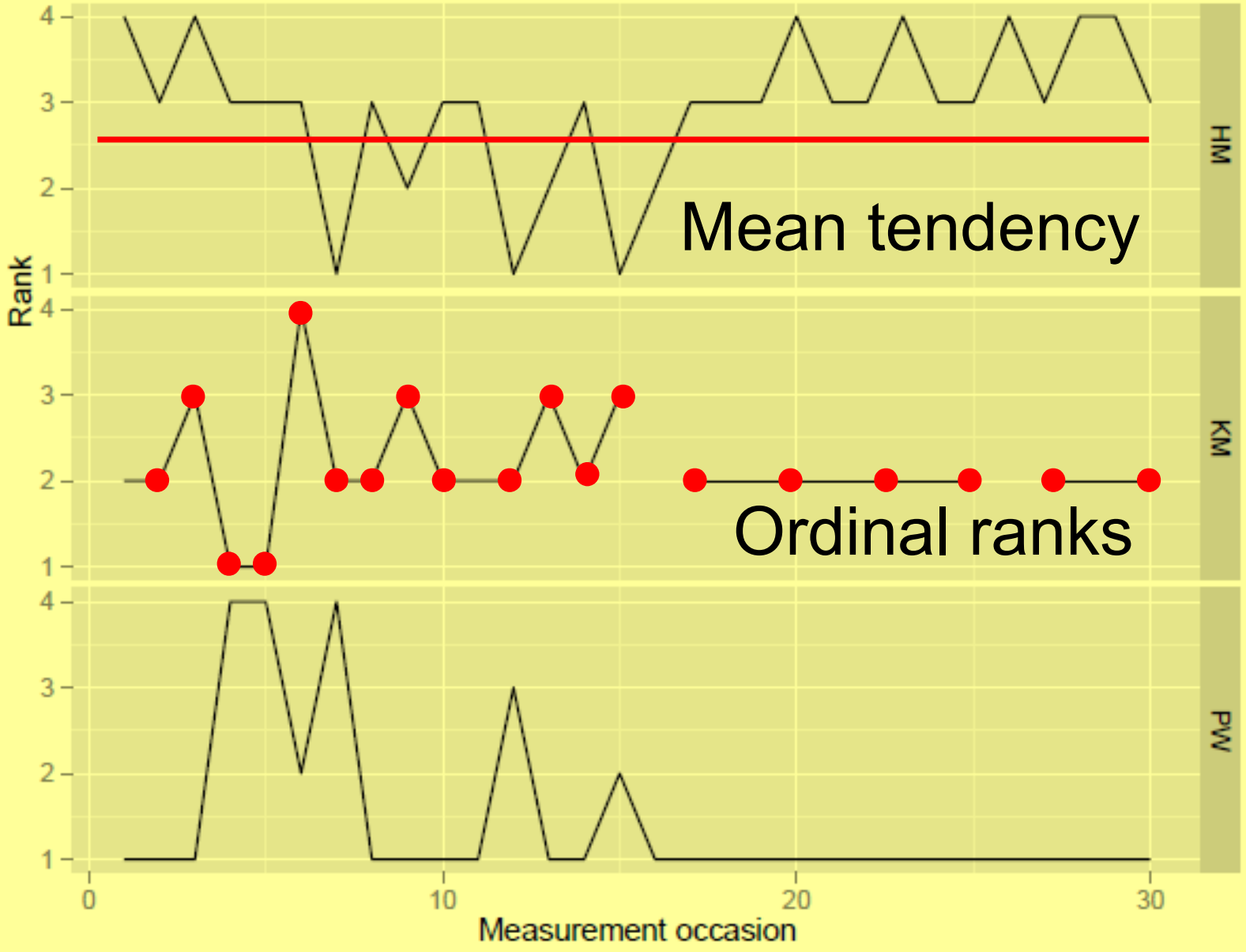

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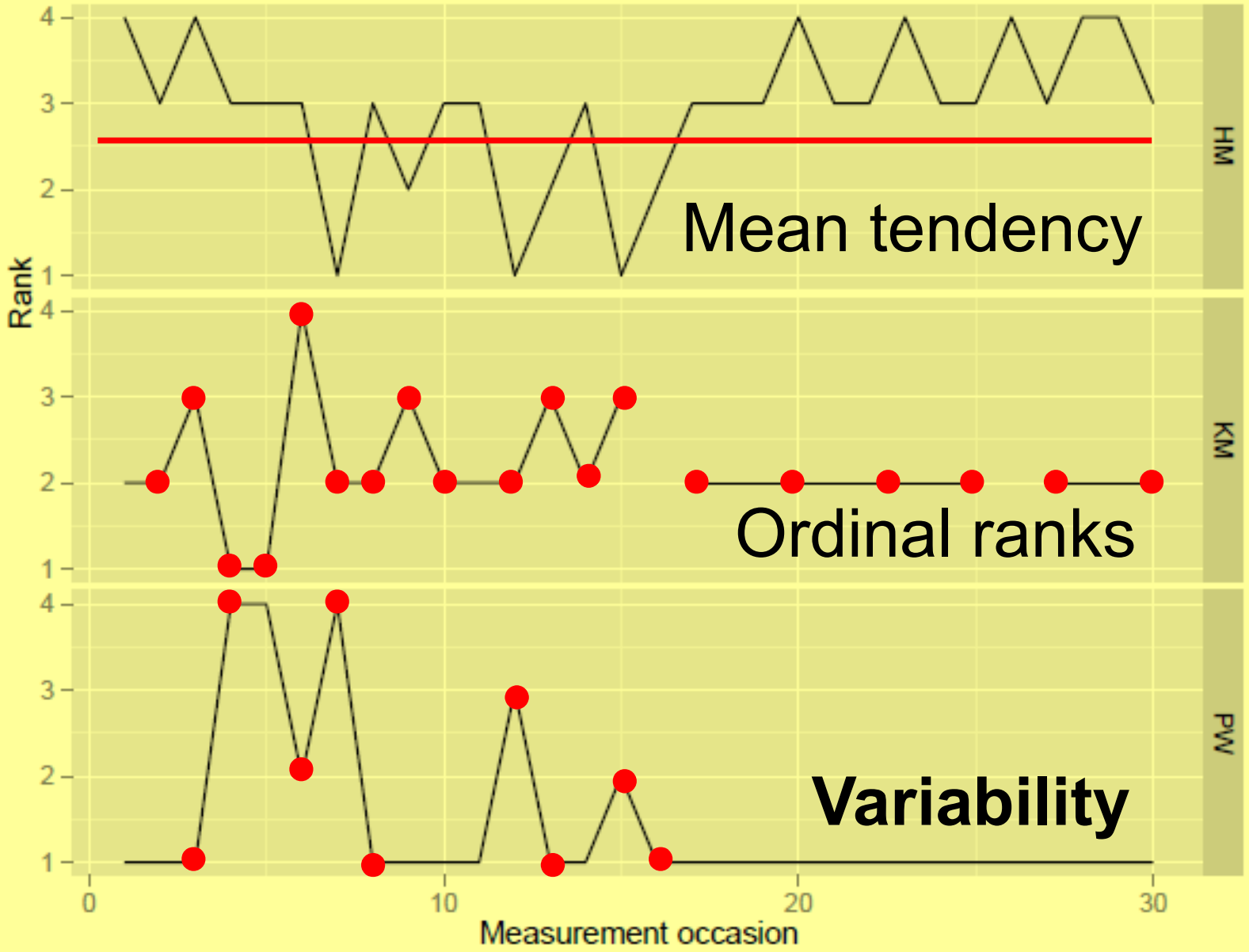

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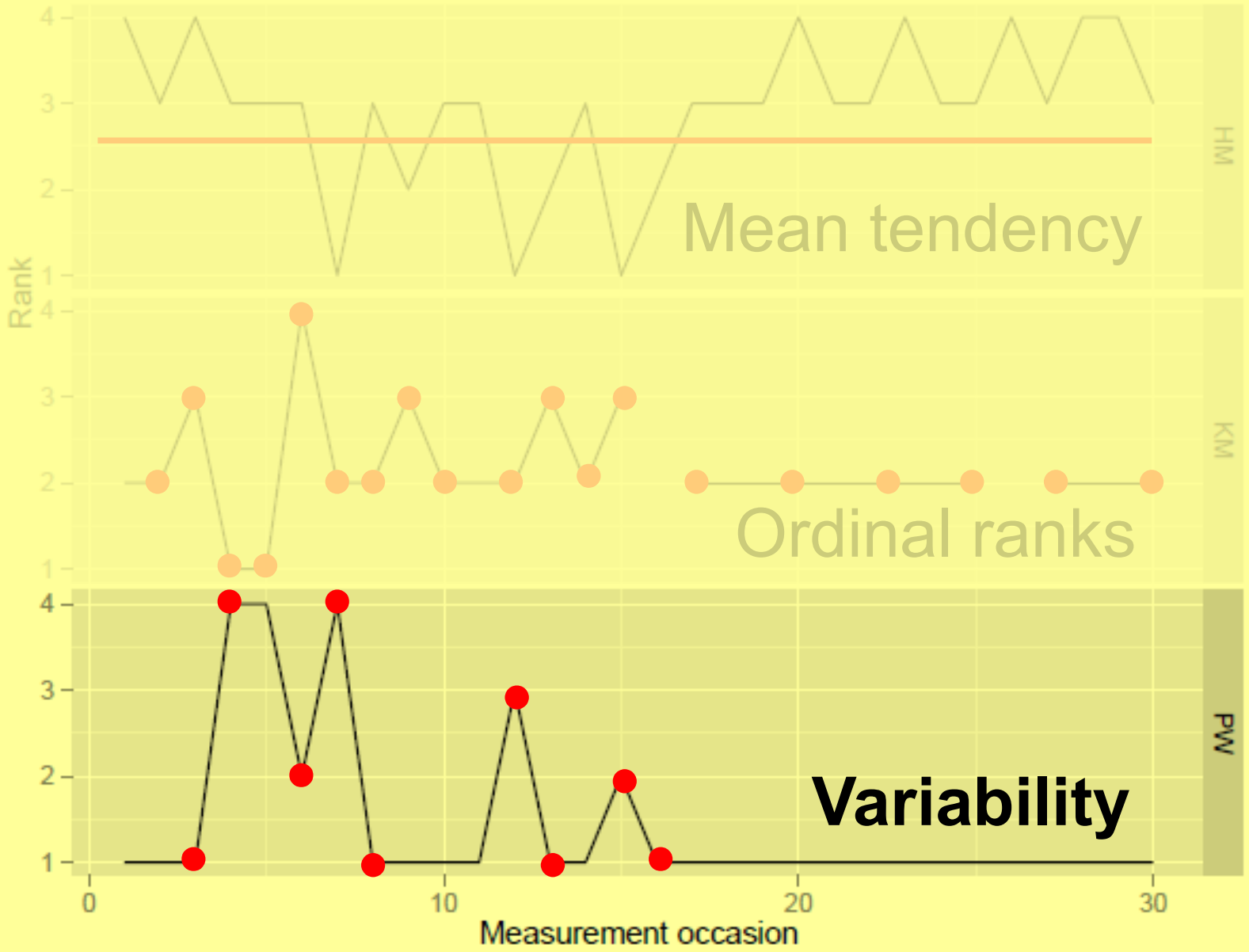

Variability

ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

ID	Init	Rel	T1	T2	T3	T3	T4	AFV
H339KN	PW	partner	TRUE	TRUE	FALSE	FALSE	-	2
H339KN	KM	mother	TRUE	TRUE	FALSE	TRUE	-	3
H339KN	HM	father	TRUE	TRUE	FALSE	FALSE	-	2
TPV			3	3	0	1		

Variability

ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

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H339KN	PW	partner	1	1	0	0	-	2
H339KN	KM	mother	TRUE	TRUE	FALSE	TRUE	-	3
H339KN	HM	father	TRUE	TRUE	FALSE	FALSE	-	2
TPV			3	3	0	1		

Variability

ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

ID	Init	Rel	T1	T2	T3	T4	T5	AFV
H339KN	PW	partner	1	1	0	0	-	2
H339KN	KM	mother	1	1	0	1	-	3
H339KN	HM	father	1	1	0	0	-	2
TPV			3	3	0	1		

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ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

ID	Init	Rel	T1	T2	T3	T4	T5	AFV
H339KN	PW	partner	1	1	0	0	-	2
H339KN	KM	mother	1	1	0	1	-	3
H339KN	HM	father	1	1	0	0	-	2
TPV			3	3	0	1		

Attachment Figure Variability

ID	Initials	relationship	AFV
H339KN	CM	SIBLING	15
H339KN	HM	FATHER	14
H339KN	KM	MOTHER	18
AAAAA	PW	PARTNER	21
AAAAA	FL	SIBLING	2
AAAAA	AA	MOTHER	9
AAAAA	JD	PARTNER	5
BBBBB	RB	FATHER	16
BBBBB	RP	FRIEND	8

Analysable as a multilevel model, i.e.

AFV ~ relationship + (1|ID)

- Not all individuals need to have the same number of relationships/all the same relationships
- Easily extensible (i.e. add in covariates or other predictors)

Variability

ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

ID	Init	Rel	T1	T2	T3	T4	T5	AFV
H339KN	PW	partner	1	1	0	0	-	2
H339KN	KM	mother	1	1	0	1	-	3
H339KN	HM	father	1	1	0	0	-	2
TPV			3	3	0	1		

Time Point Variability

	T1	T2	T3
H339KN	3	3	0
AAAAA	4	4	3
	2	0	1

Convert to

'tall'

H339KN	T1	3	5
AAAAA	T1	4	4
BBBBB	T1	2	3
H339KN	T2	3	5
AAAAA	T2	4	4
BBBBB	T2	0	3
H339KN	T3	0	5
AAAAA	T3	3	4
BBBBB	T3	1	3

Time Point Variability

	T1	T2	T3
H339KN	3	3	0
AAAAA	4	4	3
BBBBB	2	0	1

Convert to

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H339KN	T1	3	5
AAAAA	T1	4	4
BBBBB	T1	2	3
H339KN	T2	3	5
AAAAA	T2	4	4
BBBBB	T2	0	3
H339KN	T3	0	5
AAAAA	T3	3	4
BBBBB	T3	1	3

Time Point Variability

	T1	T2	T3
H339KN	3	3	0
AAAAA	4	4	3
BBBBB	2	0	1

Convert to

'tall'

H339KN	T1	3	5
AAAAA	T1	4	4
BBBBB	T1	2	3
H339KN	T2	3	5
AAAAA	T2	4	4
BBBBB	T2	0	3
H339KN	T3	0	5
AAAAA	T3	3	4
BBBBB	T3	1	3

Analysable as a multilevel model, i.e.
TPV ~ stress + (1|ID)

- Hierarchical nesting allows comparison across individuals with different numbers of attachment figures
- Easily extensible (i.e. add in covariates or other predictors)

Methodology Summary

SMS repeated measures data collection

- Unobtrusiveness
- Accessibility
- Good response rate

Methodology Summary

SMS repeated measures data collection ↓ (Manual parsing)

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

- Format easy for participants to understand
- Quick for the researcher to parse

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(Script) ↓ Ordinal rankings

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- Maximise automated data reshaping
- Extract mean scores (more accurate than generalising from a single measurement)

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SMS repeated measures data collection ↓ (Manual parsing)

H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

(Script) ↓ Ordinal rankings

Mean tendency ↑

ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

(Script) ↓ Attachment Figure Variability

ID	Init	Rel	T1	T2	T3	T4	T5	AFV
H339KN	PW	partner	1	1	0	0	-	2
H339KN	KM	mother	1	1	0	1	-	3
H339KN	HM	father	1	1	0	FALSE	-	2
TPV			3	3	0	1		

Methodology Summary

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H339KN	HM	father	1	1	0	FALSE	-	2
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(Script) ←

H339KN	T1	3	5
AAAAA	T1	4	4
BBBBB	T1	2	3
H339KN	T2	3	5
AAAAA	T2	4	4
BBBBB	T2	0	3
H339KN	T3	0	5
AAAAA	T3	3	4
BBBBB	T3	1	3

Time Point Variability

Methodology Summary

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H339KN	4	PW	KM	HM	Partner	Mother	Father	PW4	KM 2	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	KM 1	PW4	HM 1	6
H339KN	4	PW	KM	HM	Partner	Mother	Father	HM 2	PW 5	KM 3	6

(Script) ↓ Ordinal rankings

Mean tendency ↑

Multilevel analysis ←

ID	Init	Rel	T1	T2	T3	T4	T5
H339KN	PW	partner	1	3	5	5	5
H339KN	KM	mother	5	2	3	3	2
H339KN	HM	father	2	5	2	2	2

(Script) ↓ Attachment Figure Variability

ID	Init	Rel	T1	T2	T3	T4	T5	AFV
H339KN	PW	partner	1	1	0	0	-	2
H339KN	KM	mother	1	1	0	1	-	3
H339KN	HM	father	1	1	0	FALSE	-	2
TPV			3	3	0	1		

(Script) ←

H339KN	T1	3	5
AAAAA	T1	4	4
BBBBB	T1	2	3
H339KN	T2	3	5
AAAAA	T2	4	4
BBBBB	T2	0	3
H339KN	T3	0	5
AAAAA	T3	3	4
BBBBB	T3	1	3

Time Point Variability

Conclusion

- This methodology overcomes pragmatic, parsing, and analysis issues associated with repeated measures ordinal data

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  - IQ
  - Personality traits and preferences
  - Causal judgements
  - Pain levels

Conclusion

- This methodology overcomes pragmatic, parsing, and analysis issues associated with repeated measures ordinal data
- It is theoretically applicable to any ordinal concept where variability might be interesting, e.g.
  - IQ
  - Personality traits and preferences
  - Causal judgements
  - Pain levels
- Happy to share the R script with anyone interested in giving it a try.

The paper associated with this talk is currently under review.

References

- ACMA. (2011). ACMA Communications report 2010-2011.
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