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Sensitivity of an MMPI-2-RF Combined Response Inconsistency (CRIN) Scale to Mixed Responding

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- Approved by the California Human Services Agency Committee for the Protection of Human Subjects.

MIXED RESPONDING

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A type of non-content based invalid responding that includes:

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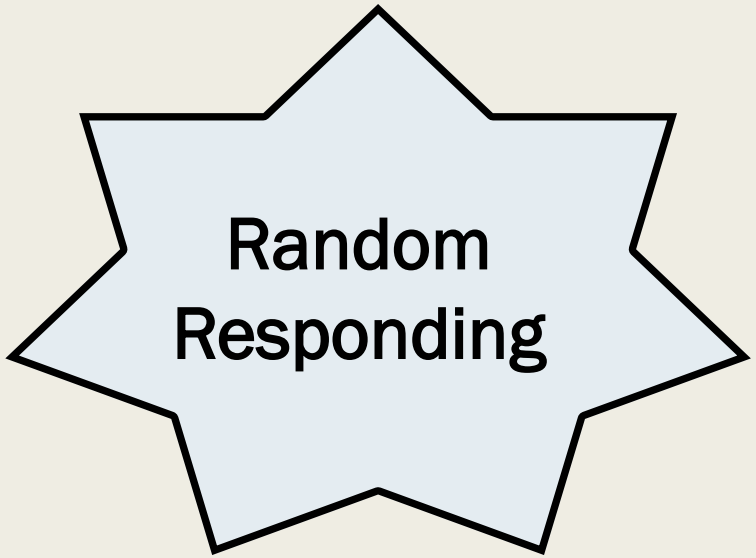

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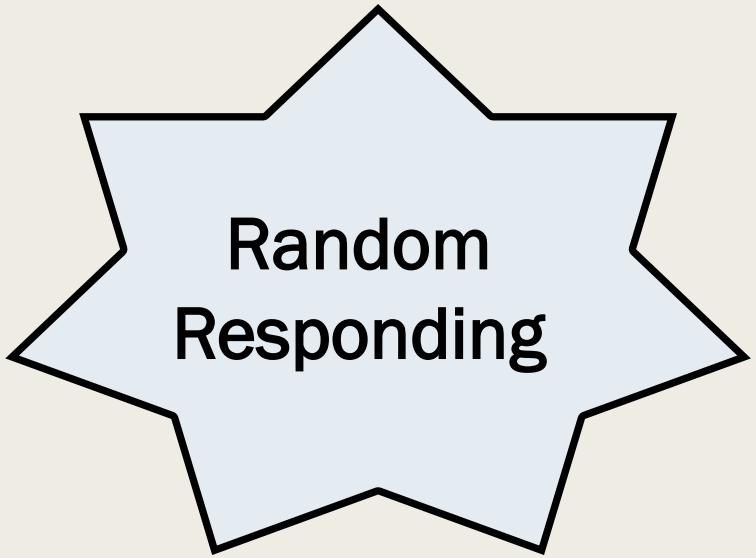

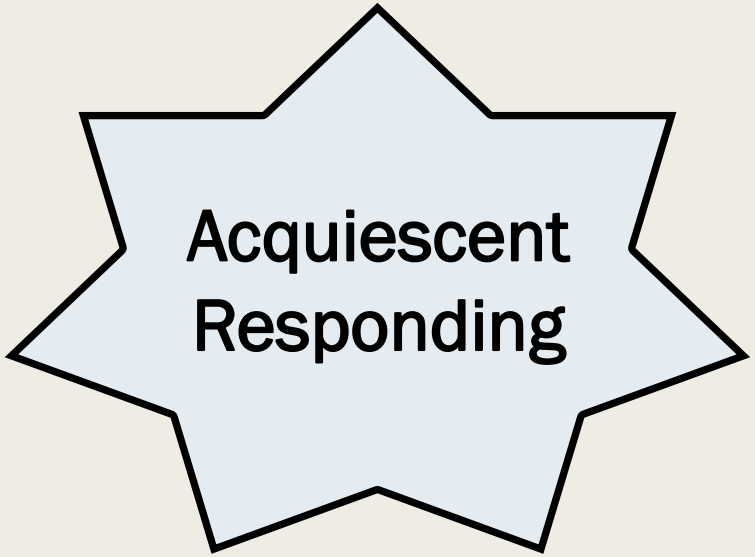

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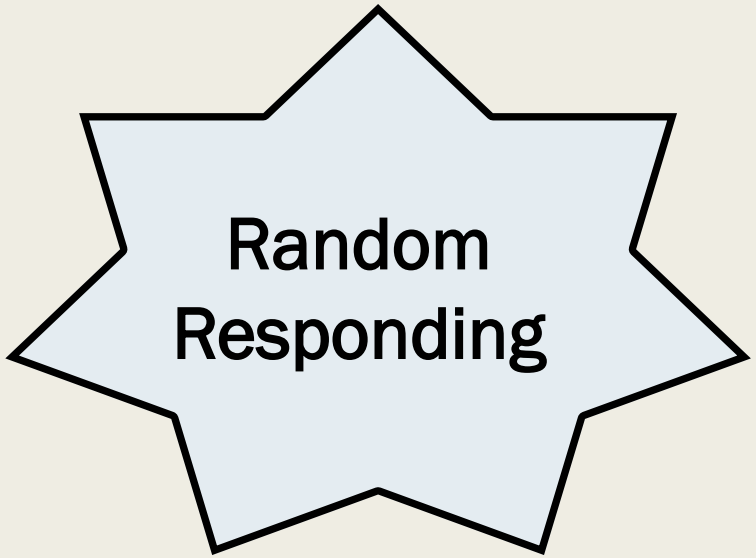
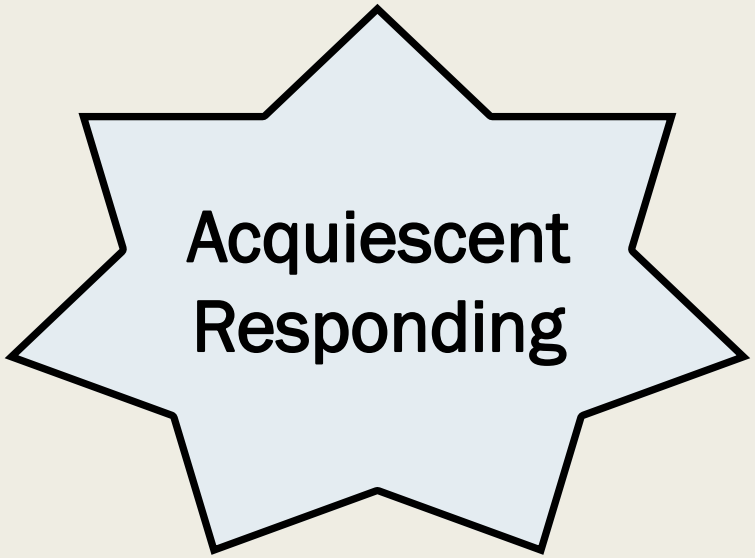


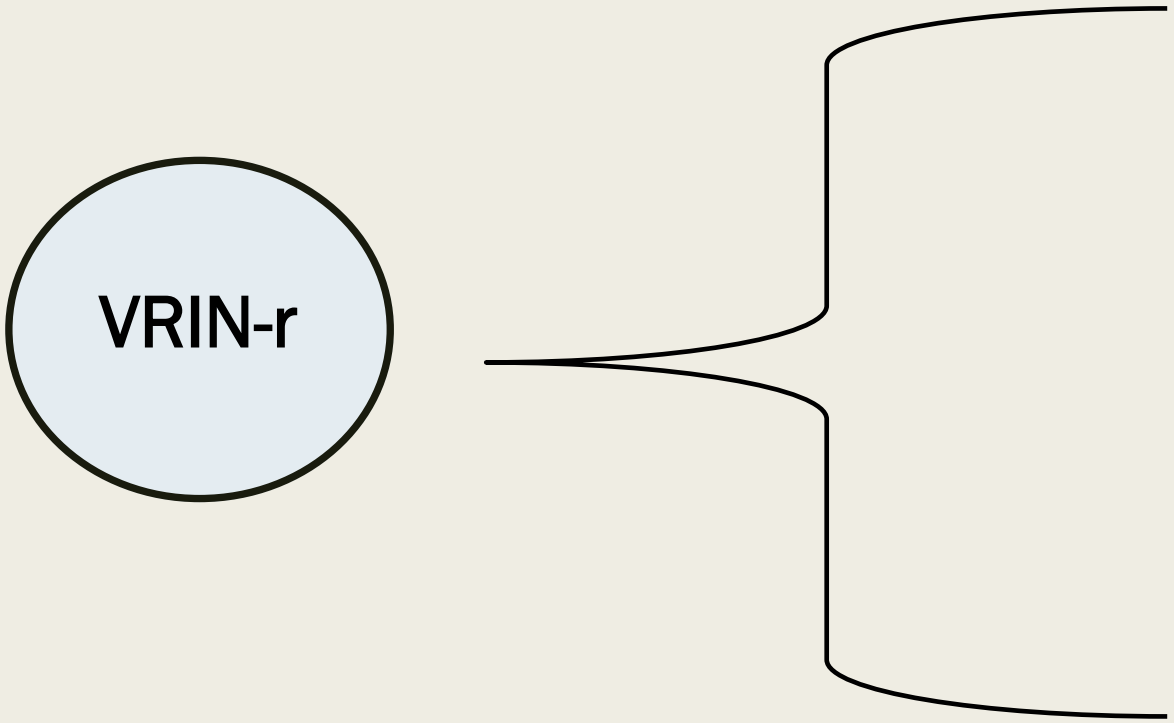


Combined Response Inconsistency Scale (CRIN)

- CRIN was developed on the MMPI-A-RF (Archer, Handel, Ben-Porath, & Tellegen, 2016) to augment the shortened VRIN-r and TRIN-r validity scales
- Quasi-random and fixed responding
- No published literature of CRIN on the MMPI-2-RF

CRIN Components

CRIN Components: VRIN-r



- 53 pairs
- A point is assigned when an examinee inconsistently answers a pair of items written in same direction

Hypothetical VRIN-r Pair

2) Dogs make me happy.
   a. True
   b. False

44) Dogs bring me joy.
   a. True
   b. False

Hypothetical VRIN-r Pair

2) Dogs make me happy.

a. True

b. False

44) Dogs bring me joy.

a. True

b. False

Hypothetical VRIN-r Pair

2) Dogs make me happy.

a. True

b. False

44) Dogs bring me joy.

a. True

b. False

Hypothetical VRIN-r Pair

2) Dogs make me happy.

a. True

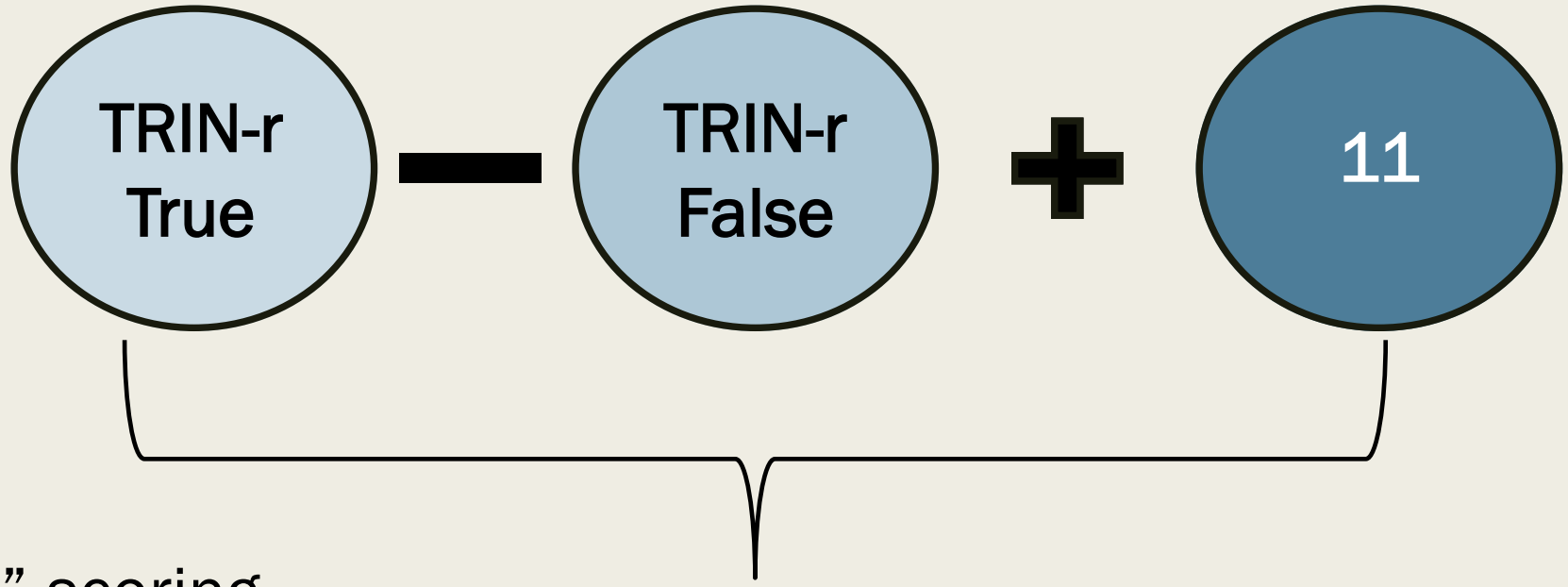
b. False

44) Dogs bring me joy.

a. True

b. False

CRIN Components: TRIN-r



- 26 pairs
- “Tug-o-War” scoring
- A point is added when an examinee gives the same response to a pair of items written in the opposite direction

Hypothetical TRIN-r Pair

2) Dogs make me happy.
   a. True
   b. False

44) Dogs make me sad.
   a. True
   b. False

Hypothetical TRIN-r Pair

2) Dogs make me happy.

a. True

b. False

44) Dogs make me sad.

a. True

b. False

Hypothetical TRIN-r Pair

2) Dogs make me happy.

a. True

b. False

44) Dogs make me sad.

a. True

b. False

Hypothetical TRIN-r Pair

TRIN-r
True
+ 1

2) Dogs make me happy.

a. True

b. False

44) Dogs make me sad.

a. True

b. False

Hypothetical TRIN-r Pair

2) Dogs make me happy.
   a. True
   b. False

44) Dogs make me sad.
   a. True
   b. False

Hypothetical TRIN-r Pair

2) Dogs make me happy.

a. True

b. False

44) Dogs make me sad.

a. True

b. False

Hypothetical TRIN-r Pair

2) Dogs make me happy.

a. True

b. False

44) Dogs make me sad.

a. True

b. False

Hypothetical TRIN-r Pair

TRIN-r
False
+ 1

2) Dogs make me happy.

a. True

b. False

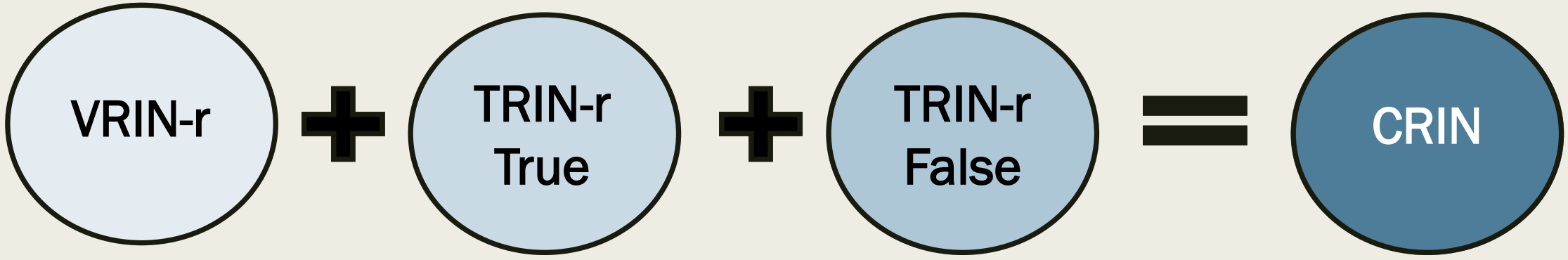
44) Dogs make me sad.

a. True

b. False

Calculation of CRIN

Calculation of CRIN



Adapted from Archer et al. (2016)

Whitney et al. (2018): Calculating CRIN with the MMPI-2-RF Normative Sample

- Whitney et al. (2018) examined CRIN in the MMPI-2-RF normative sample
- Converted raw scores to T Scores

- *How rare is a particular score on CRIN?*

Whitney et al. (2018): Raw Scores Converted to T Scores

Raw Scores	T Scores
19	101
18	97
17	94
16	90
15	87
14	83
13	80
12	76
11	72
10	69
9	65
8	62
7	58
6	55
5	51
4	47
3	44
2	40
1	37
0	33

Whitney et al. (2018): Raw Scores Converted to T Scores

Adapted from Archer et al. (2016) and Ben-Porath & Tellegen (2008/2011):

- There is some evidence of response inconsistency

Raw Scores	T Scores
19	101
18	97
17	94
16	90
15	87
14	83
13	80
12	76
11	72
10	69
9	65
8	62
7	58
6	55
5	51
4	47
3	44
2	40
1	37
0	33

Whitney et al. (2018): Raw Scores Converted to T Scores

Adapted from Archer et al. (2016) and Ben-Porath & Tellegen (2008/2011):

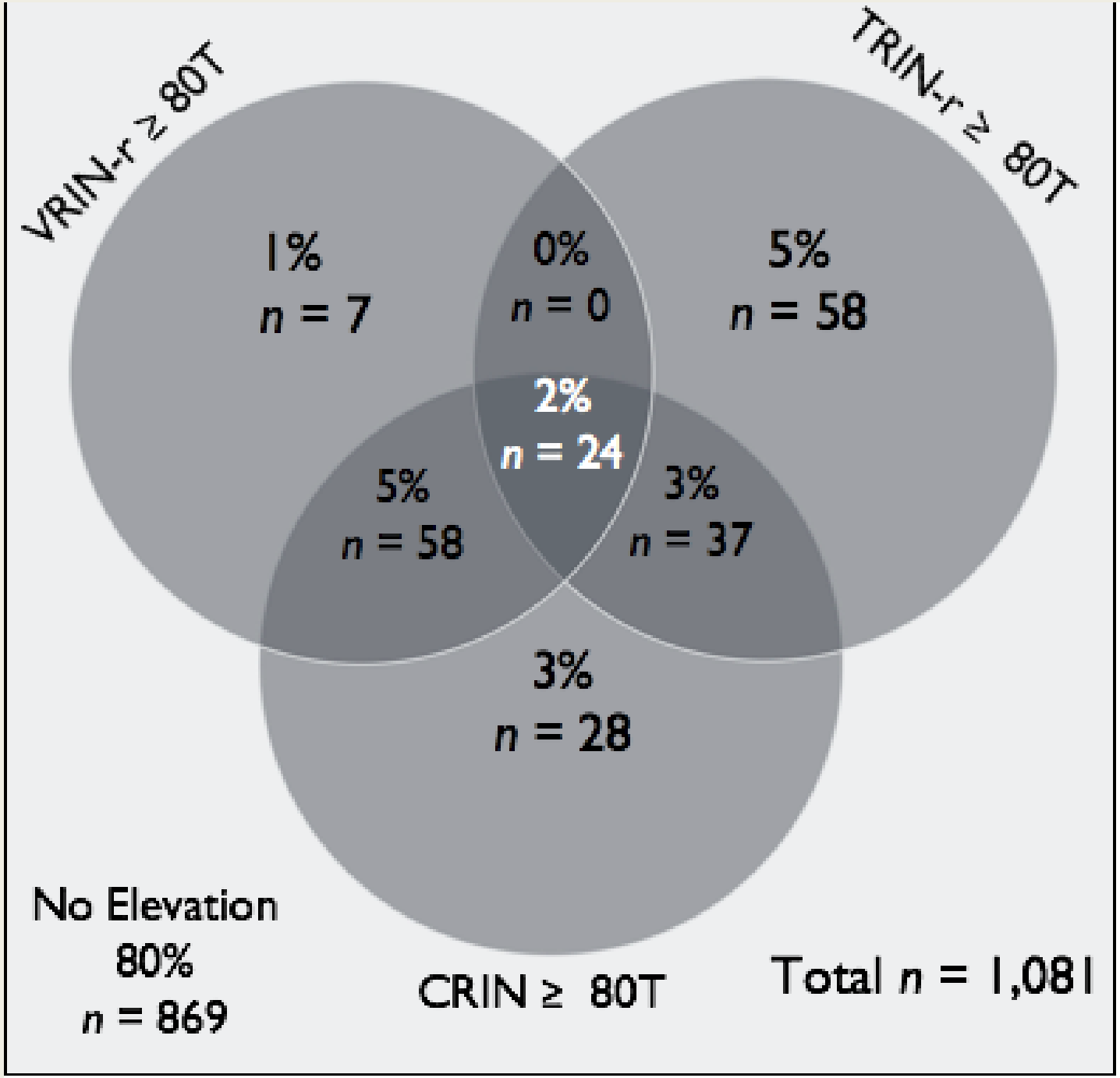
- The protocol is invalid because of excessive response inconsistency

Raw Scores	T Scores
19	101
18	97
17	94
16	90
15	87
14	83
13	80
12	76
11	72
10	69
9	65
8	62
7	58
6	55
5	51
4	47
3	44
2	40
1	37
0	33

Whitney et al. (2018): Examining CRIN in a Forensic Inpatient Sample

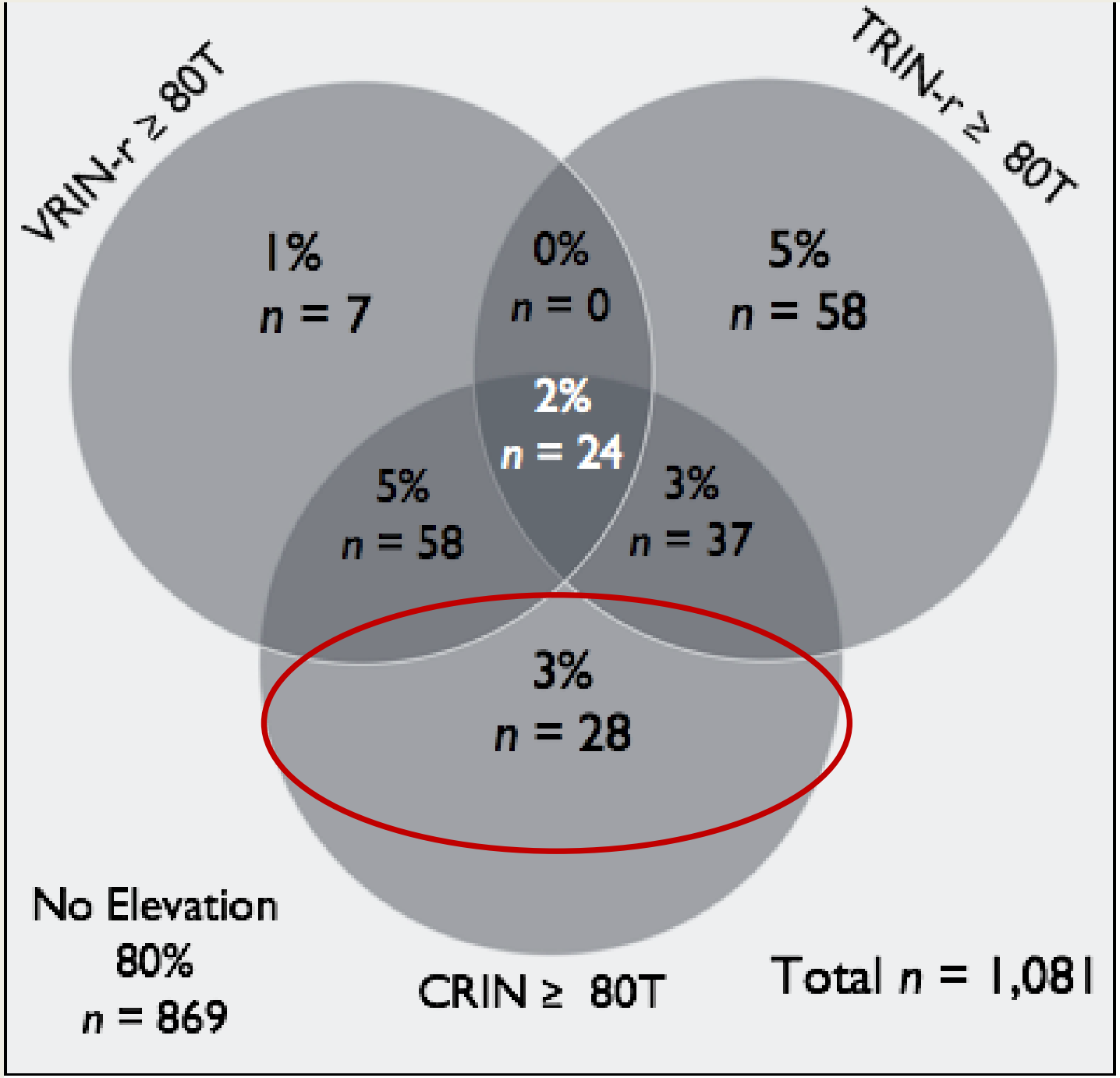
- Participants were from a deidentified archival data set
- Examined CRIN's basic properties

Whitney et al. (2018) CRIN in a Forensic Inpatient Sample



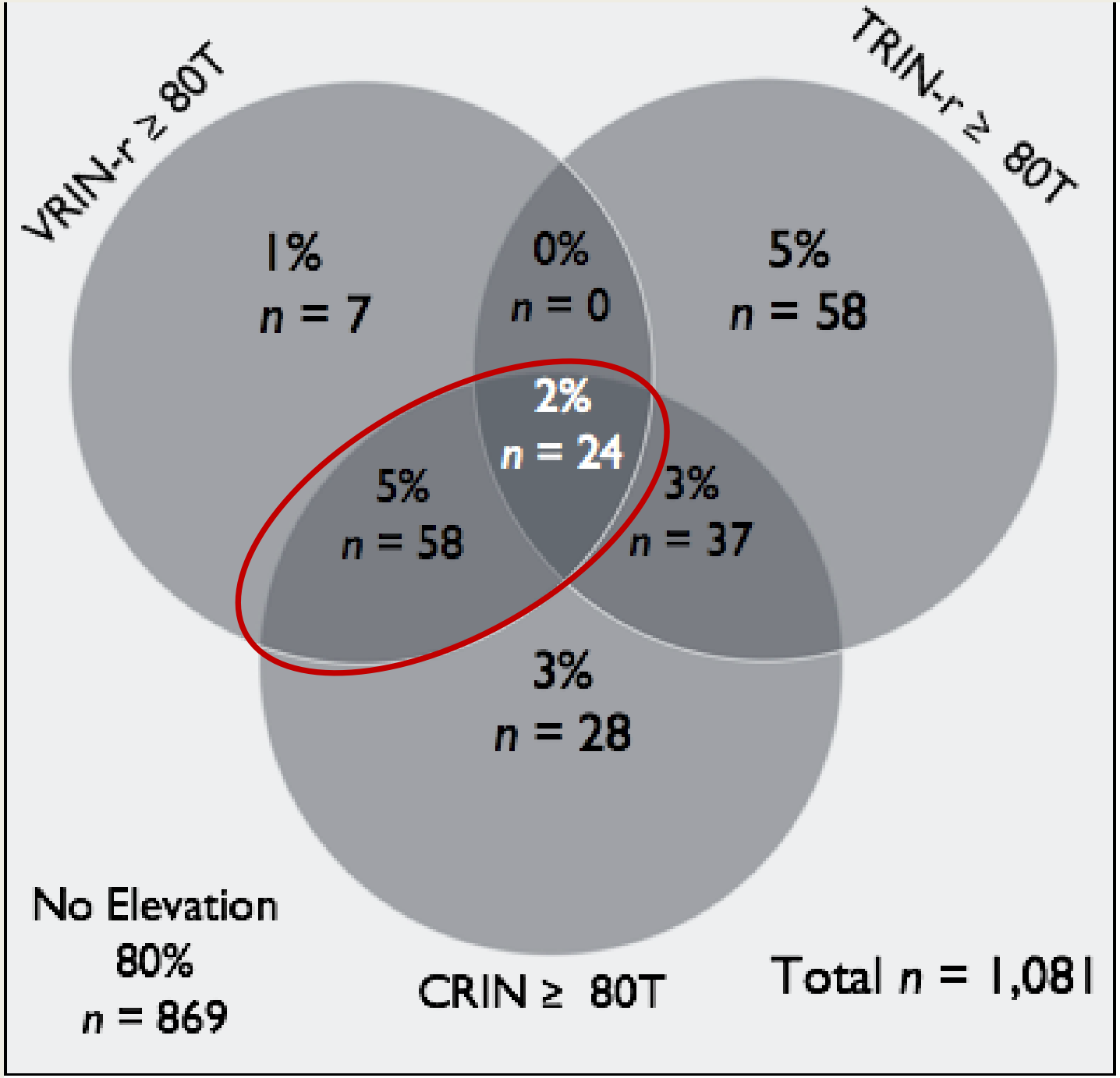
Whitney et al. (2018) CRIN in a Forensic Inpatient Sample

- Identified a unique 3% of protocols not identified by VRIN-r or TRIN-r



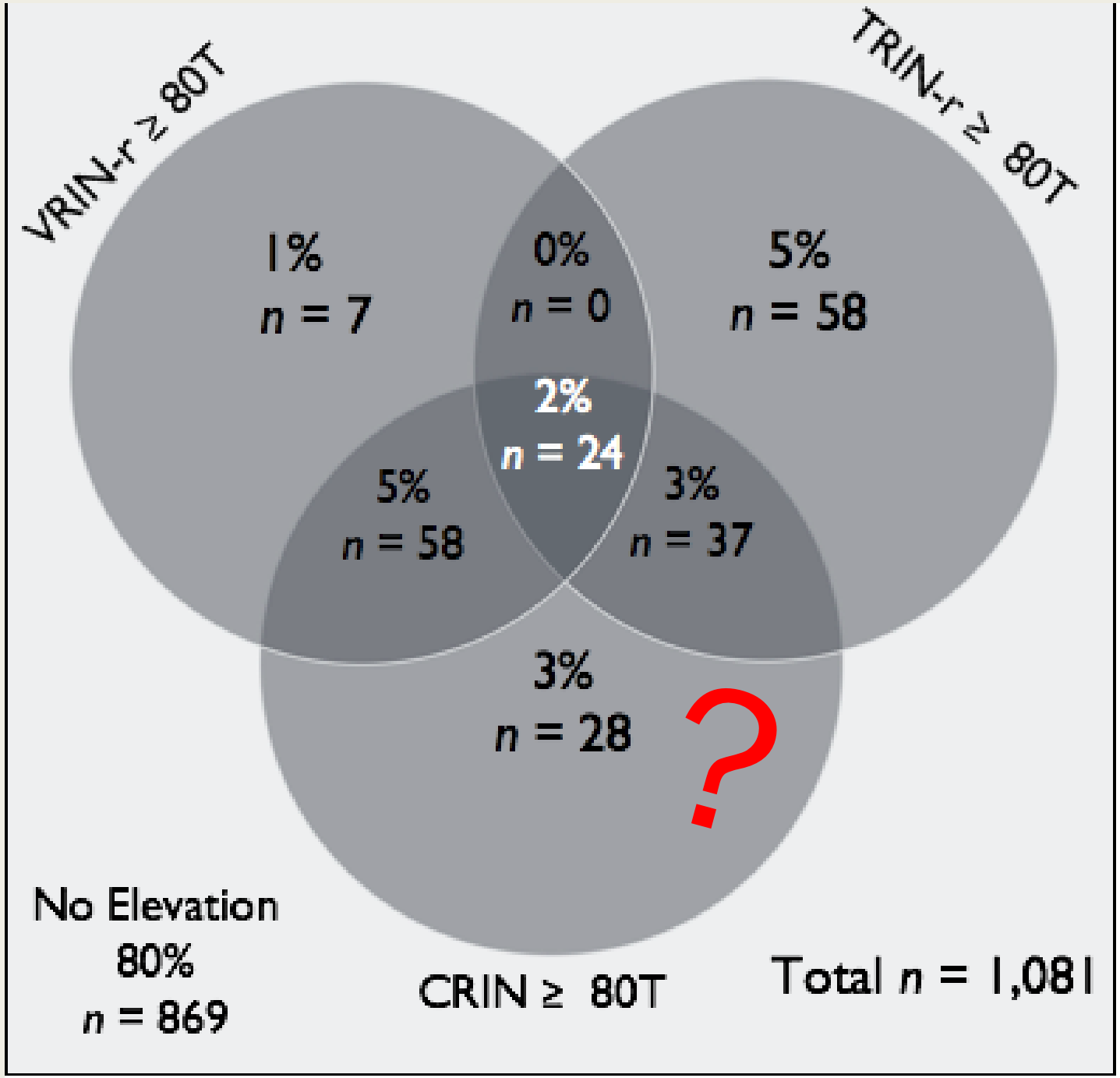
Whitney et al. (2018) CRIN in a Forensic Inpatient Sample

- Considerable overlap between CRIN and VRIN-r



Whitney et al. (2018) CRIN in a Forensic Inpatient Sample

- Is CRIN detecting mixed responding?



Current Study

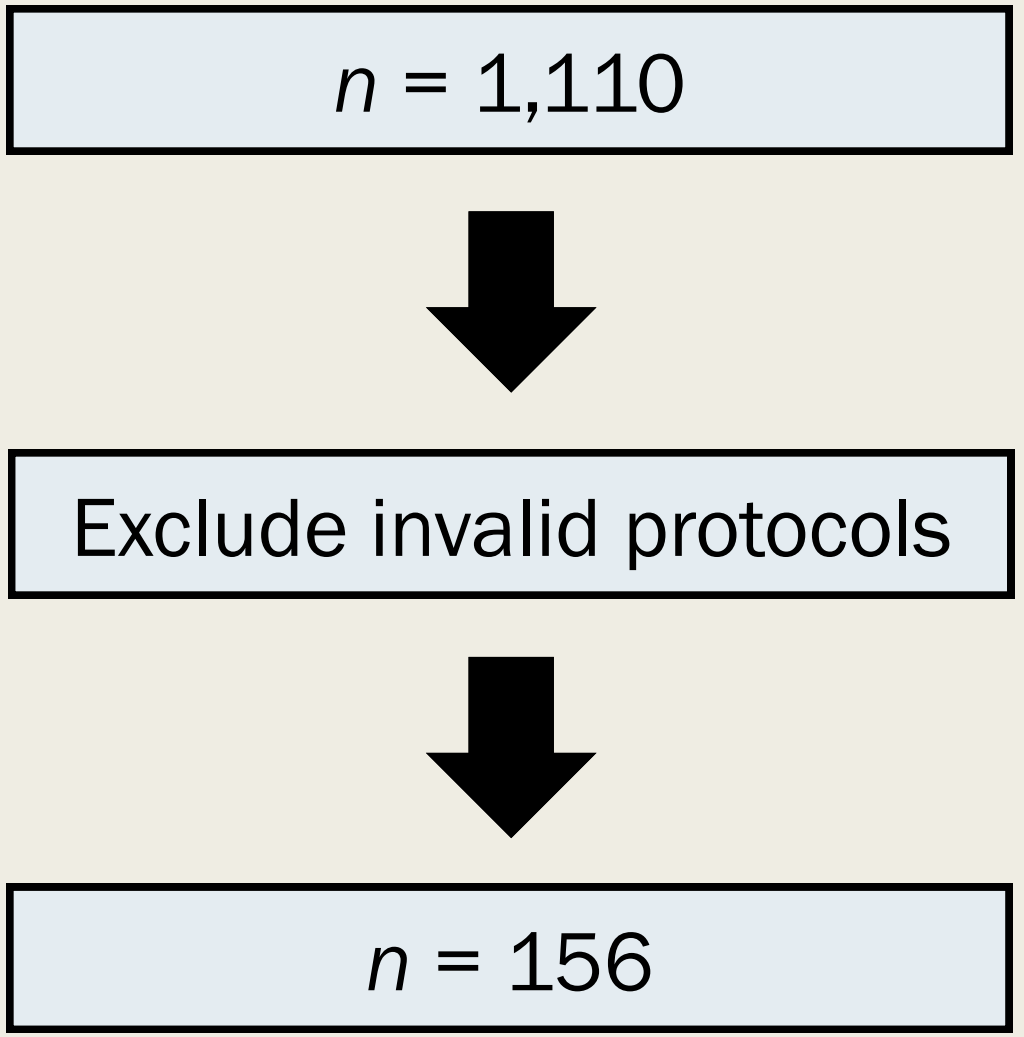
- Examined if CRIN is useful in detecting mixed responding on the MMPI-2-RF
- Used a computer-generated mixed responding research design

Method

Method

Participants

- Stringent exclusionary criteria were used to exclude all invalid protocols (Burchett et al., 2016)
- CNS ≥ 15; VRIN-r ≥ 70; TRIN-r ≥ 70; F-r ≥ 79; Fp-r ≥ 70; Fs ≥ 80; FBS ≥ 80; RBS ≥ 80; L-r ≥ 65; K ≥ 60

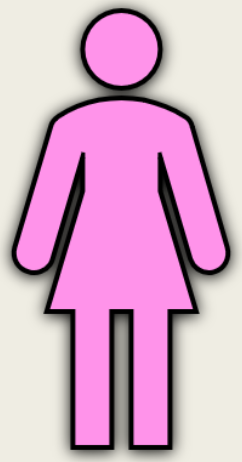


Participants

Age

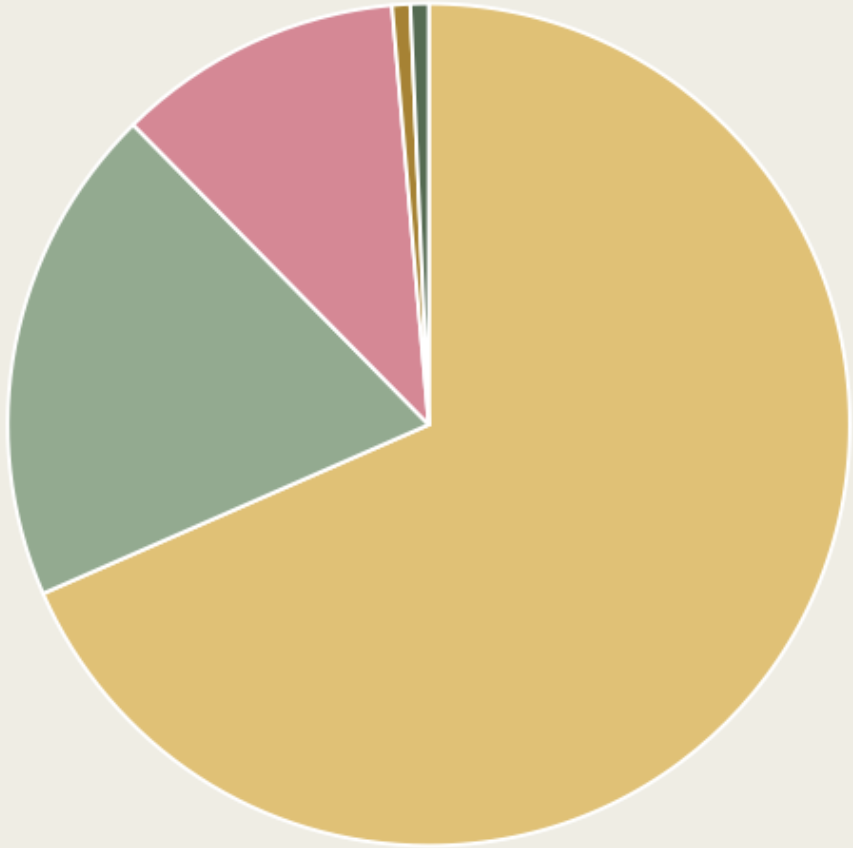
M (*SD*) = 42.28 (10.60)

75% Male



25% Female

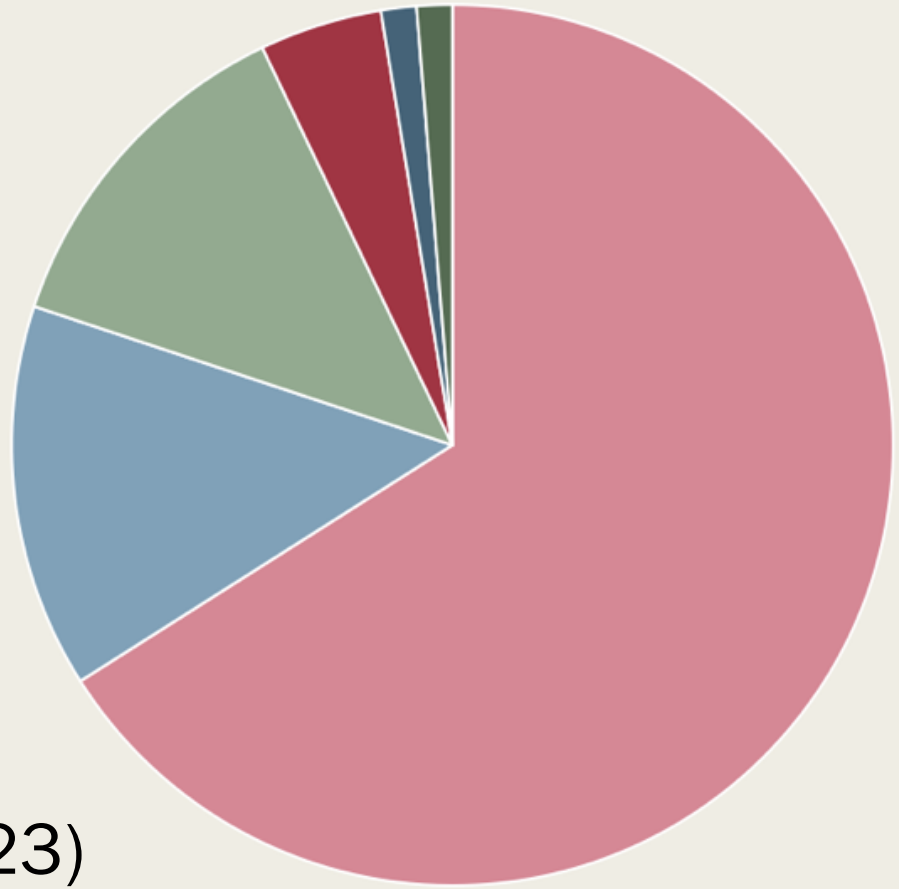
Ethnicity



Participants

Years Hospitalized
M (*SD*) = 2.46 (4.23)

Commitment Codes



Method

Measures

- The *Minnesota Multiphasic Personality Inventory-2-Restructured Form* (Ben-Porath & Tellegen, 2008/2011)

Method

Procedure

- We divided each participant's data into 3 sections
  - Section 1: Items 1-113
  - Section 2: Items 114-226
  - Section 3: Items 227-338

Items 1-113			Items 114-226			Items 227-338		
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F

Method

Procedure

- We selected 40% as our guide to insert random, acquiescent, and counter-acquiescent responses.
- 40% non-content-based invalid responding has a notable impact on VRIN-r and TRIN-r scores (Handel et al., 2010).

	VRIN-r (R)			TRIN-r (A)			TRIN-r (C)		
	M	*SD*	Percentage ≥ *T*-score of 80	*M*	*SD*	Percentage ≥ *T*-score of 80T	*M*	*SD*	Percentage ≥ *T*-score of 80F
0%	49.5	9.5	0.5	50.2F	9.3	0.8	50.2F	9.3	0.6
10%	57.1	10.6	2.5	59.5T	11.8	8.0	57.3F	10.8	4.0
20%	64.3	10.8	8.1	69.7T	13.2	29.4	64.7F	12.4	16.5
30%	70.4	11.9	21.0	79.9T	14.5	58.8	72.0F	12.6	36.0
40%	76.0	12.7	36.8	90.1T	15.0	82.3	80.5F	13.6	62.3
50%	81.5	12.8	53.7	101.1T	15.0	95.2	88.5F	13.5	81.1
60%	86.0	13.7	66.5	113.1T	14.7	99.3	96.7F	12.9	94.0
70%	90.0	13.6	77.0	125.5T	13.4	100.0	105.1F	12.2	99.1

Brace Yourself...

Items 1-113			Items 114-226			Items 227-338		
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F

Items 1-113			Items 114-226			Items 227-338		
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F

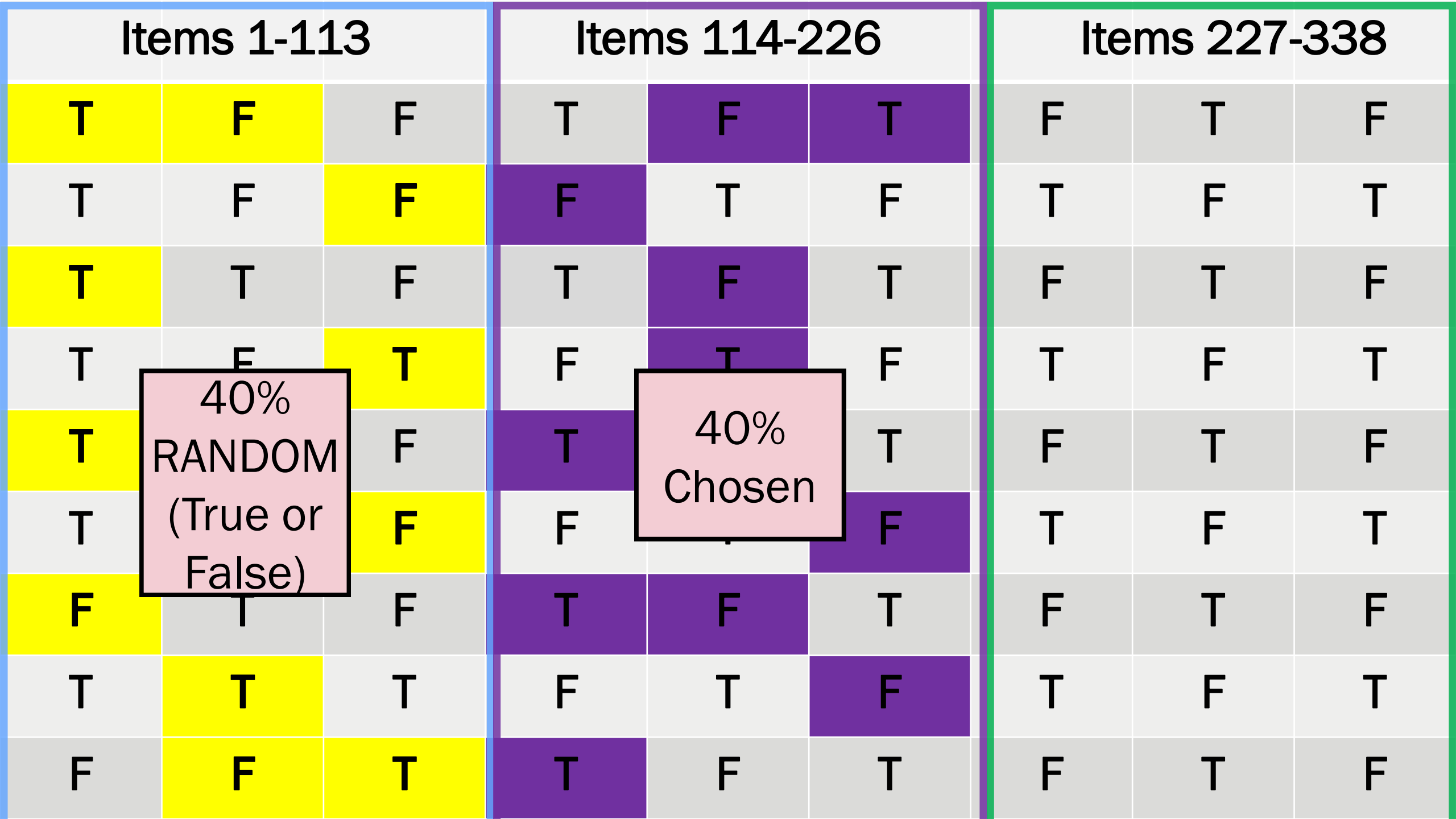
40% Chosen

Items 1-113			Items 114-226			Items 227-338		
		F	T	F	T	F	T	F
T	F		F	T	F	T	F	T
	T	F	T	F	T	F	T	F
T			F	T	F	T	F	T
		F	T	F	T	F	T	F
T			F	T	F	T	F	T
	T	F	T	F	T	F	T	F
T		T	F	T	F	T	F	T
F			T	F	T	F	T	F

40% Chosen

Items 1-113			Items 114-226			Items 227-338		
T	F	F	T	F	T	F	T	F
T	F	F	F	T	F	T	F	T
T	T	F	T	F	T	F	T	F
T	F	T	F	T	F	T	F	T
T	F	F	T	F	T	F	T	F
T	T	F	F	T	F	T	F	T
F	T	F	T	F	T	F	T	F
T	T	T	F	T	F	T	F	T
F	F	T	T	F	T	F	T	F

40% RANDOM (True or False)


Items 1-113
Items 114-226
Items 227-338
40% RANDOM (True or False)
40% Chosen

Items 1-113			Items 114-226			Items 227-338		
T	F	F	T			F	T	F
T	F	F		T	F	T	F	T
T	T	F	T		T	F	T	F
T	F	T	F		F	T	F	T
T		F			T	F	T	F
T		F	F			T	F	T
F	T	F			T	F	T	F
T	T	T	F	T		F	T	F
F	F	T		F	T	F	T	F

40% RANDOM (True or False)

40% Chosen

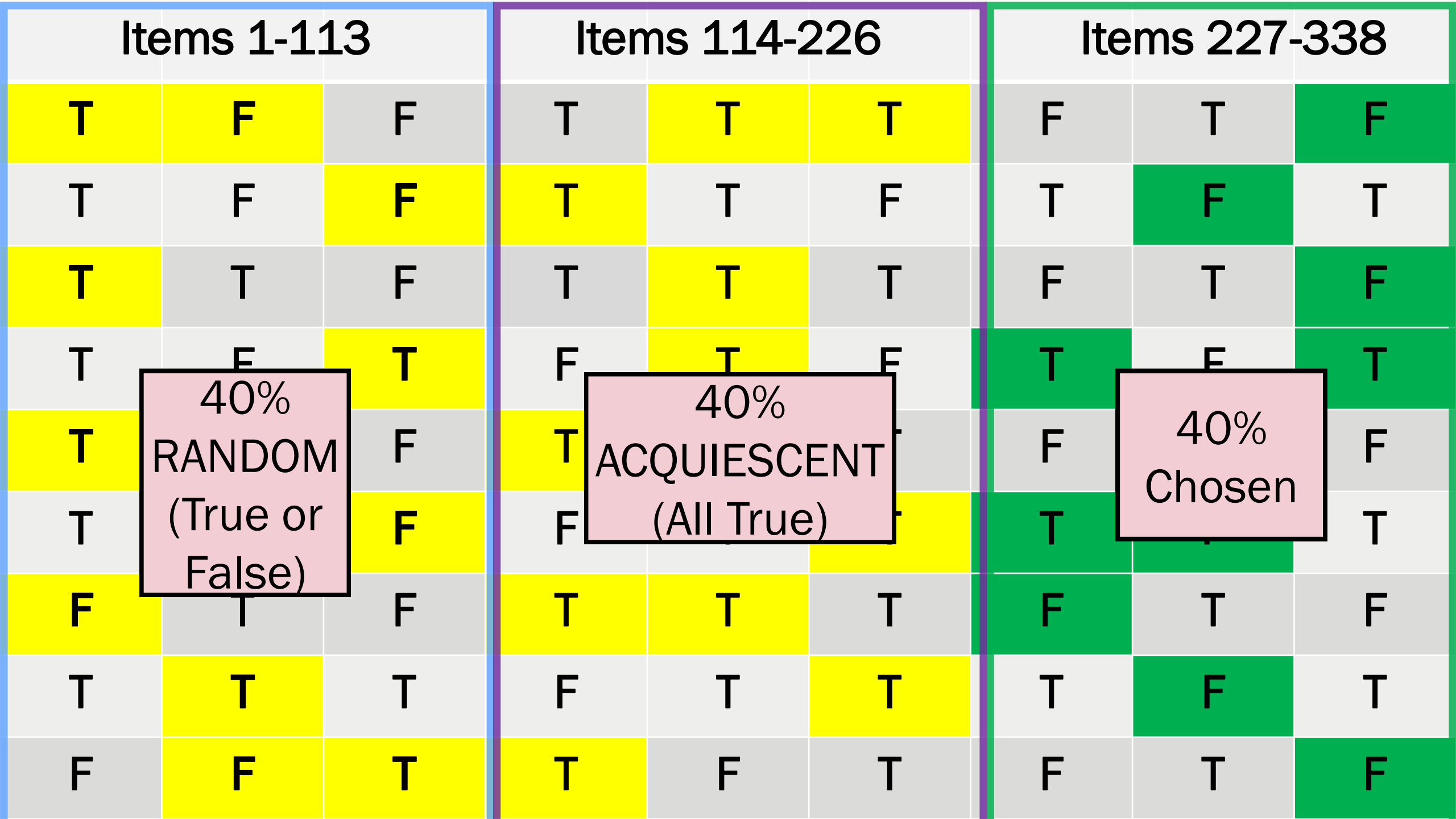
Items 1-113		
T	F	F
T	F	F
T	T	F
T	F	T
T	F	F
T	F	F
F	T	F
T	T	T
F	F	T

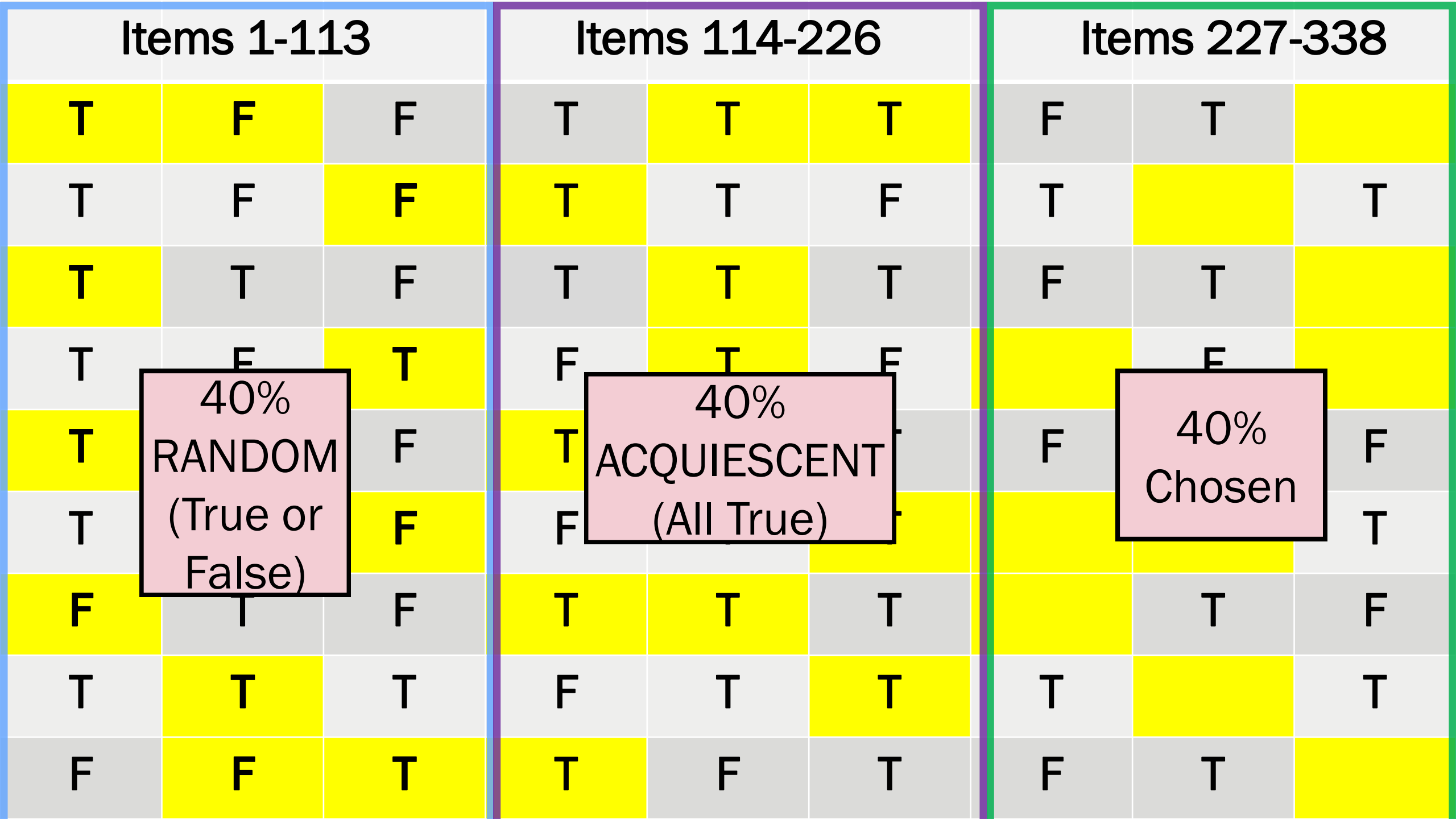
40% RANDOM (True or False)

Items 114-226		
T	T	T
T	T	F
T	T	T
F	T	F
T	F	F
F	T	T
T	T	T
F	T	T
T	F	T

40% ACQUIESCENT (All True)

Items 227-338		
F	T	F
T	F	T
F	T	F
T	F	T
F	T	F
T	F	T
F	T	F
T	F	T
F	T	F


Items 1-113
Items 114-226
Items 227-338
40% RANDOM (True or False)
40% ACQUIESCENT (All True)
40% Chosen


Items 1-113
Items 114-226
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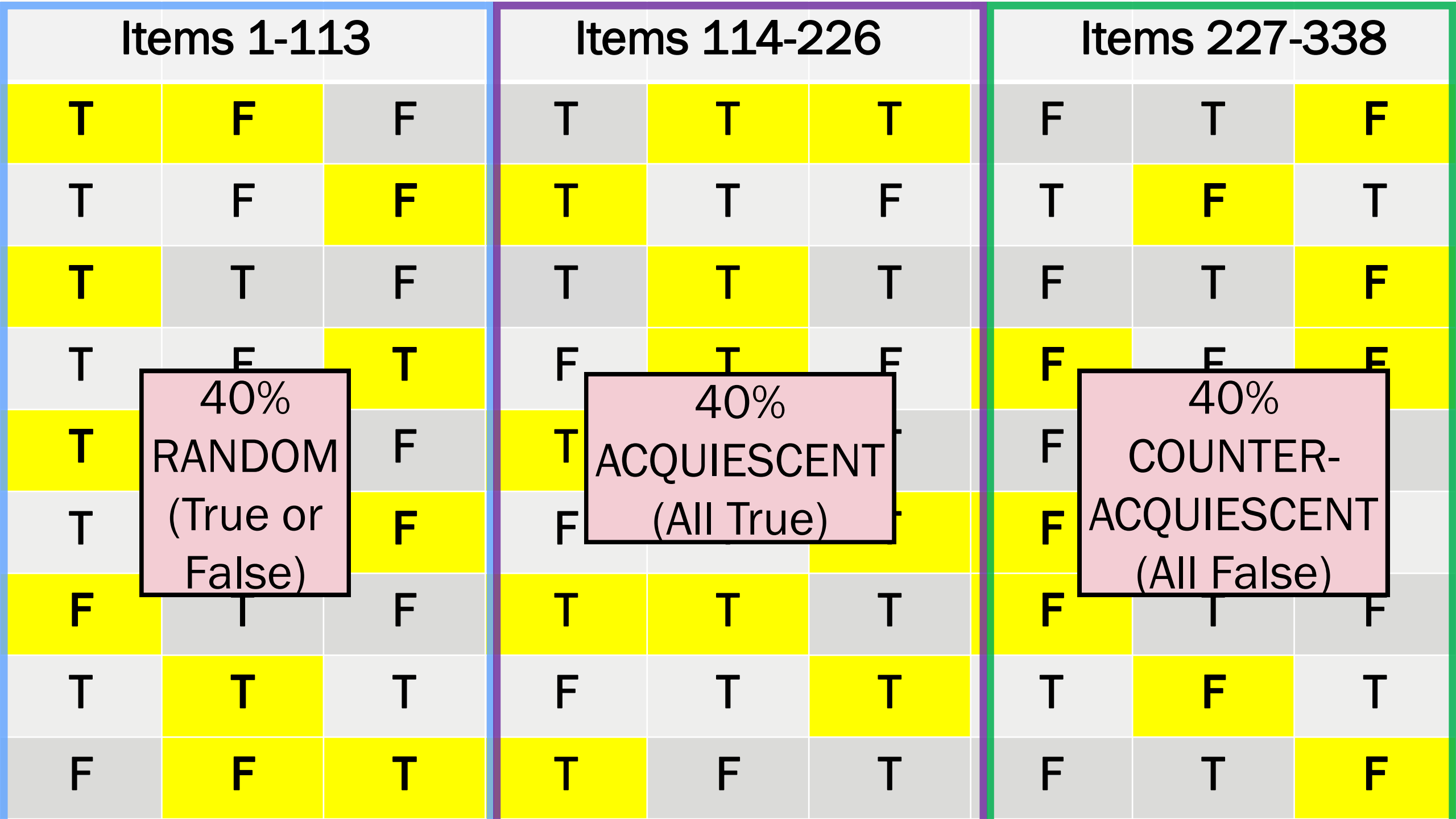
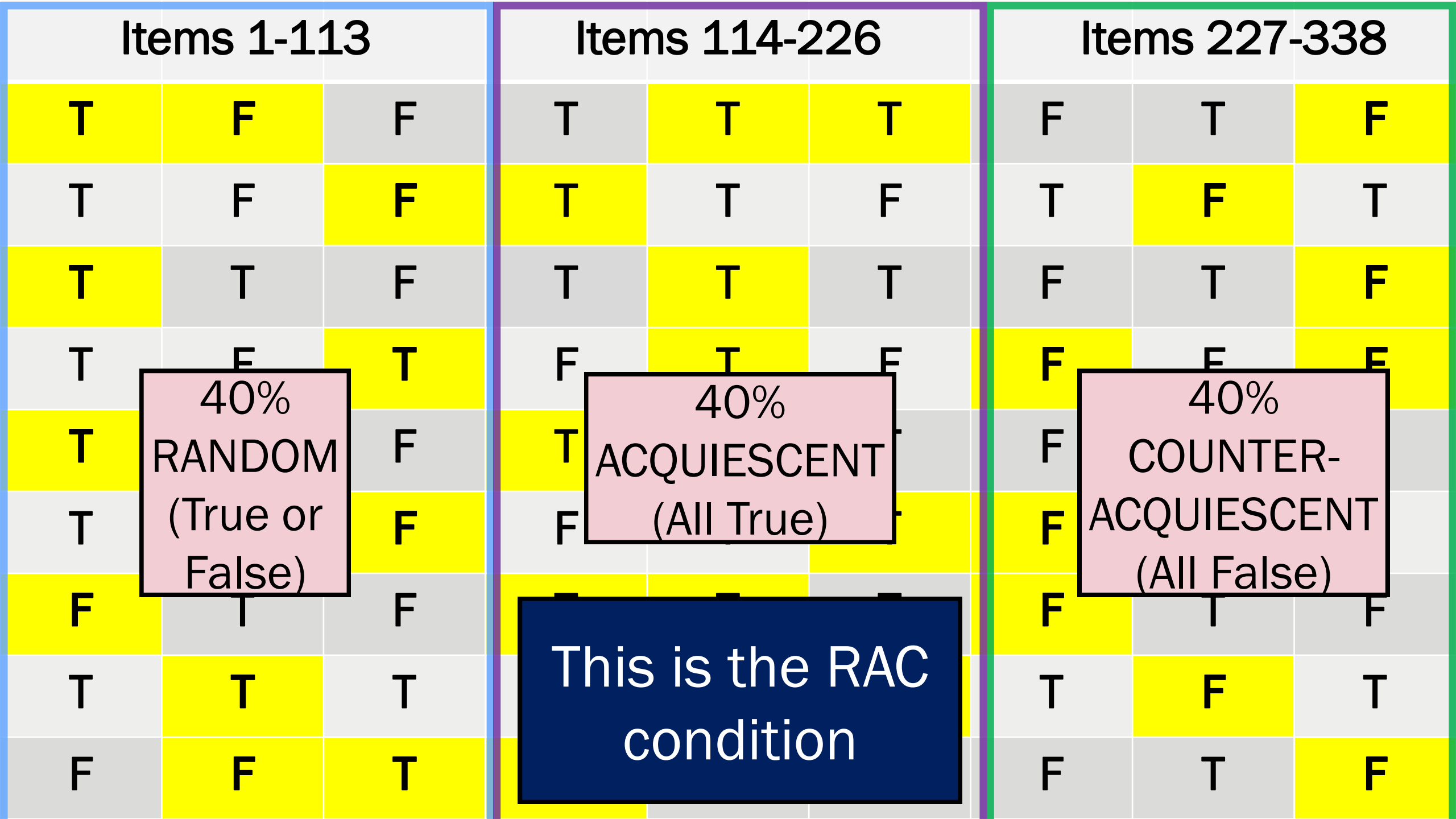
40% RANDOM (True or False)
40% ACQUIESCENT (All True)
40% Chosen


Items 1-113
Items 114-226
Items 227-338
40% RANDOM (True or False)
40% ACQUIESCENT (All True)
40% COUNTER-ACQUIESCENT (All False)


Items 1-113
Items 114-226
Items 227-338
40% RANDOM (True or False)
40% ACQUIESCENT (All True)
40% COUNTER-ACQUIESCENT (All False)
This is the RAC condition

Method

Procedure

- We did this six different times to account for six different mixed responding variations

ACR

ARC

CAR

RAC

RCA

CRA

Hypotheses

Hypothesis 1

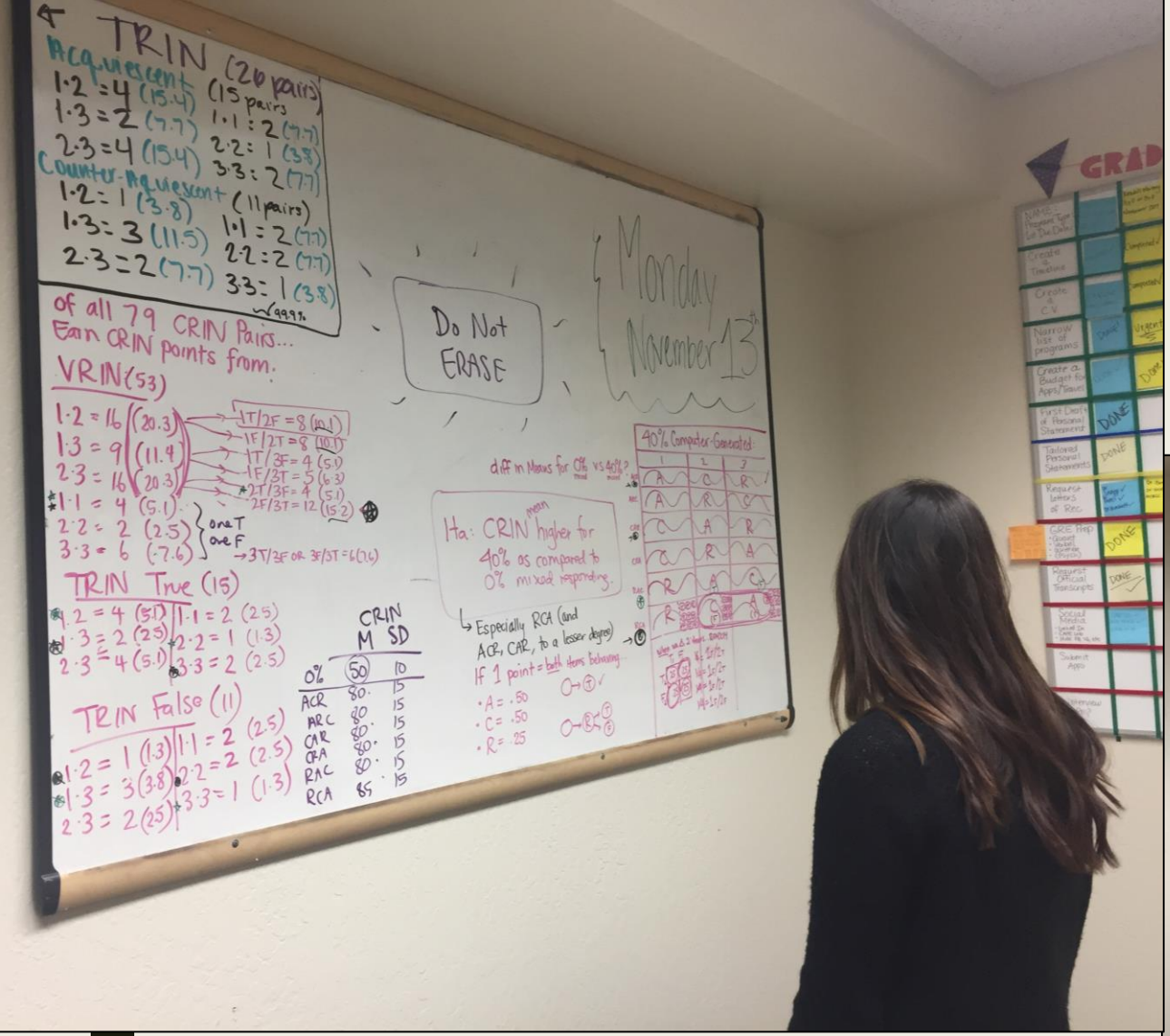
CRIN mean scores will be elevated in the presence of mixed responding.

Hypothesis 2

CRIN will incrementally add to VRIN-r and TRIN-r in the detection of mixed responding.

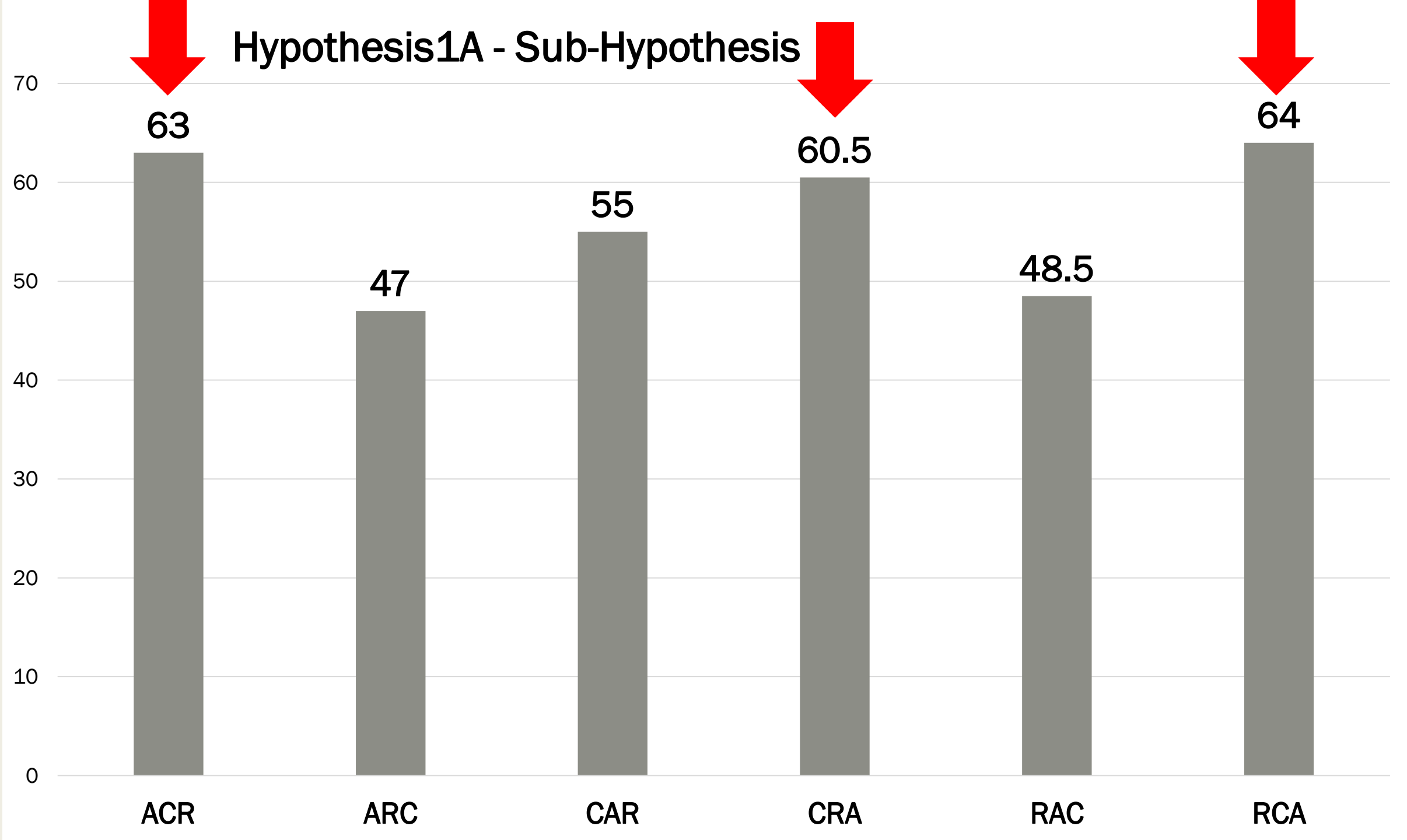
Hypothesis 1A – Sub-Hypothesis

- To develop informed sub-hypotheses, we examined where item pairs lay on the instrument.


TRIN (20 pairs)
Acquiescent (15 pairs)
Counter-Acquiescent (11 pairs)
Do Not ERASE
Monday November 13th
of all 79 CRIN Pairs...
Earn CRIN points from.
VRIN(53)
TRIN True (15)
TRIN False (11)
40% Computer-Generated
Ha: CRIN higher for 40% as compared to 0% mixed responding.
Especially RCA (and ACR, CAR, to a lesser degree)
If 1 point = both items behaving
CRIN M SD
0% (50) 10
ACR $0. 15
ARC $0. 15
CAR $0. 15
CRA $0. 15
RAC $0. 15
RCA $5 15


TRIN (20 pairs)
Do Not ERASE
Monday November 13th
VRIN(53)
TRIN True (15)
TRIN False (11)
40% Computer-Generated
Ha: CRIN higher for 40% as compared to 0% mixed responding.
CRIN M SD
GRAD APP PLANNER
DIRTY

ACR Condition	Section 1 (A)	Section 2 (C)	Section 3 (R)	Total
VRIN-r				
1T/2F	8 *1 = 8	8 * 1 = 8		16
1T/3F	4 * 1 = 8		4 * ½ = 2	6
2F/3T		12 * 1 = 12	12 * ½ = 6	18
3F/3T or 3T/3F			6 * ½ = 3 & 6 * ½ = 3	6
TRIN-r True				
1T/3T	2*1=2		2*½ = 1	3
1T/1T	2*1=2 & 2*1=2			4
3T/3T			2*½ =.5 & 2*½ =.5	2
TRIN-r False				
2F/3F		2*1=2	2*½ =1	3
2F/2F		2*1=2 & 2*1=2		4
3F/3F			1*½ =.5 1*½ =.5	1

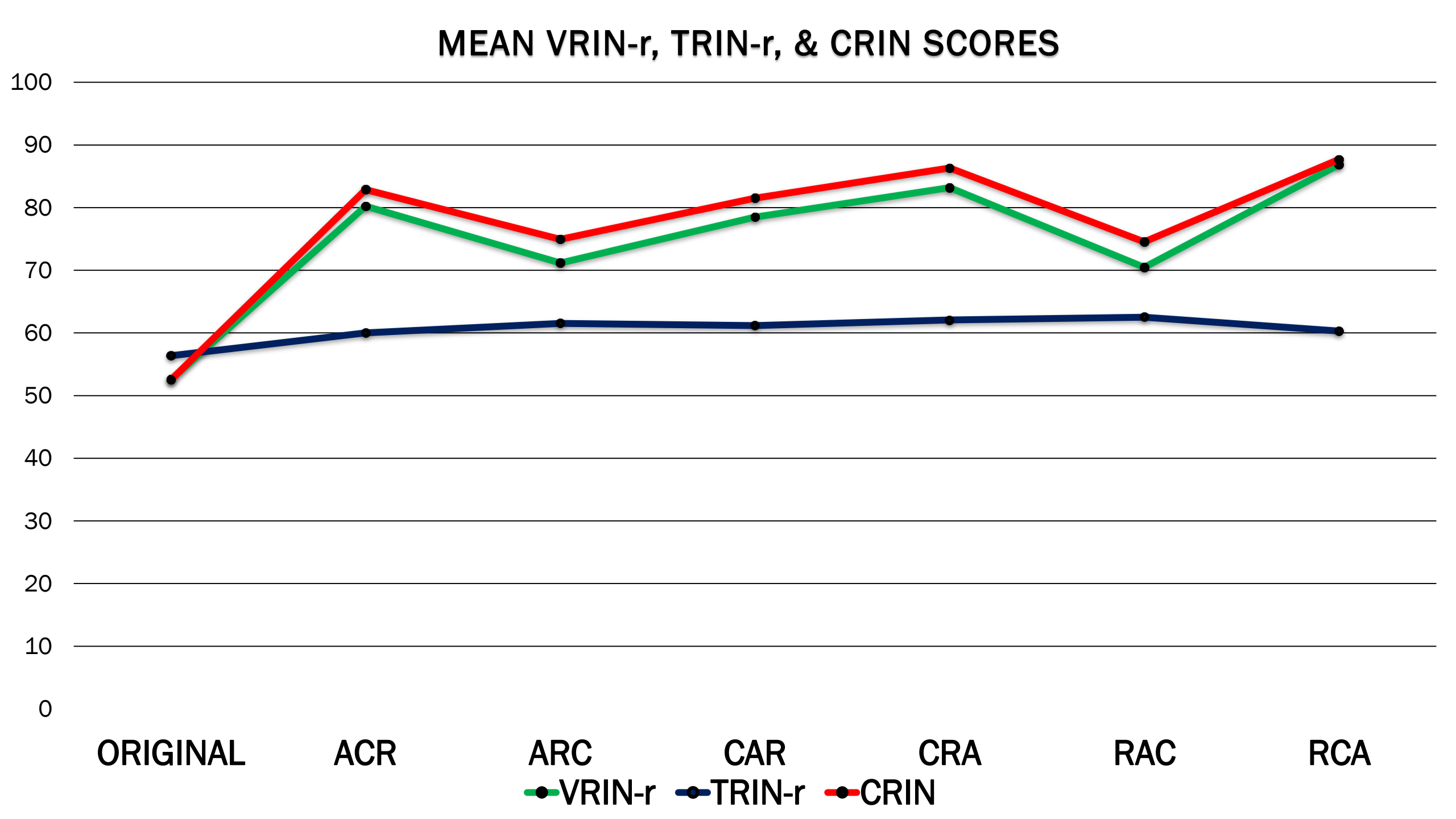

Hypothesis1A - Sub-Hypothesis
70
60
50
40
30
20
10
0
63
47
55
60.5
48.5
64
ACR
ARC
CAR
CRA
RAC
RCA

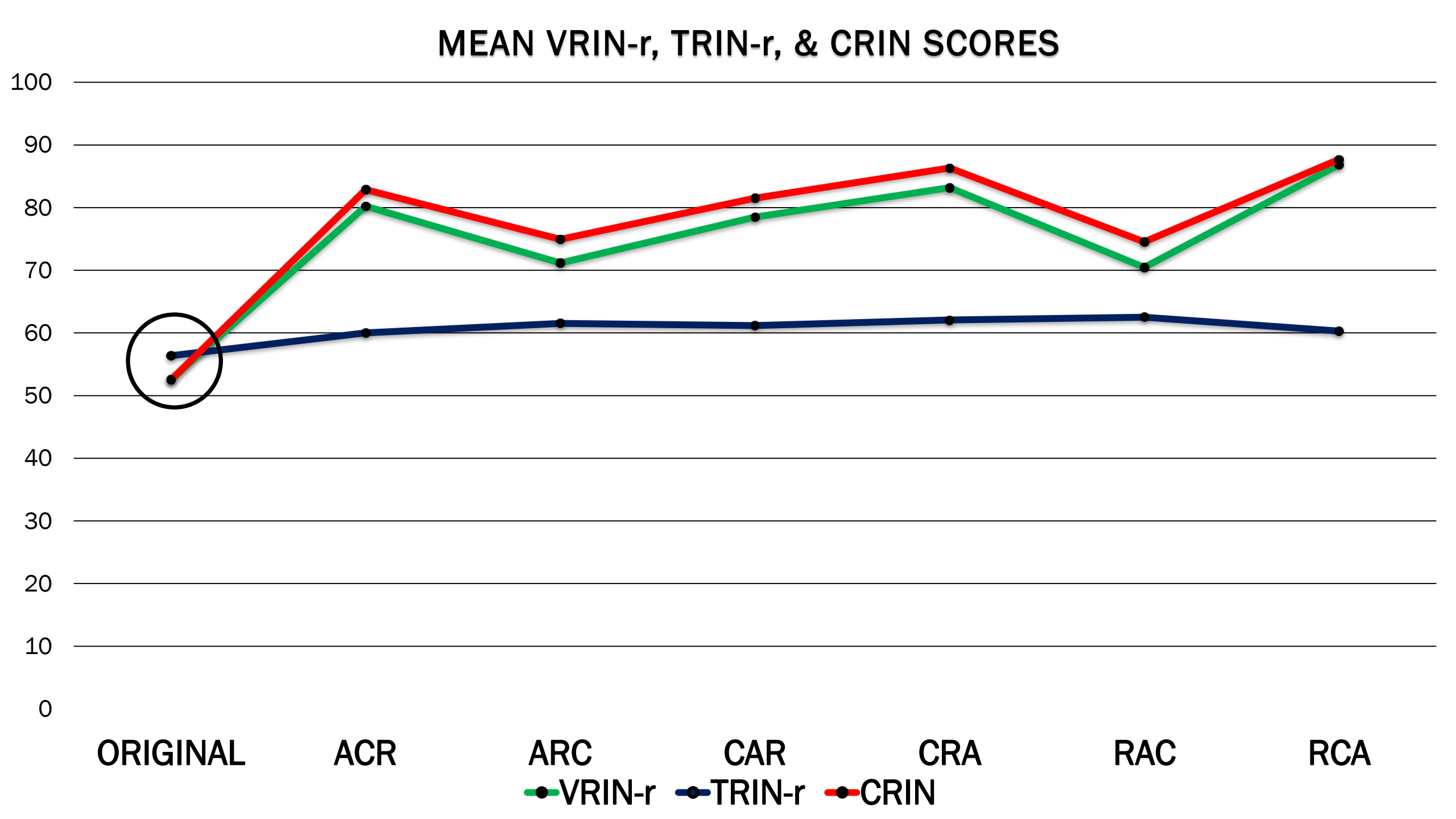
Results

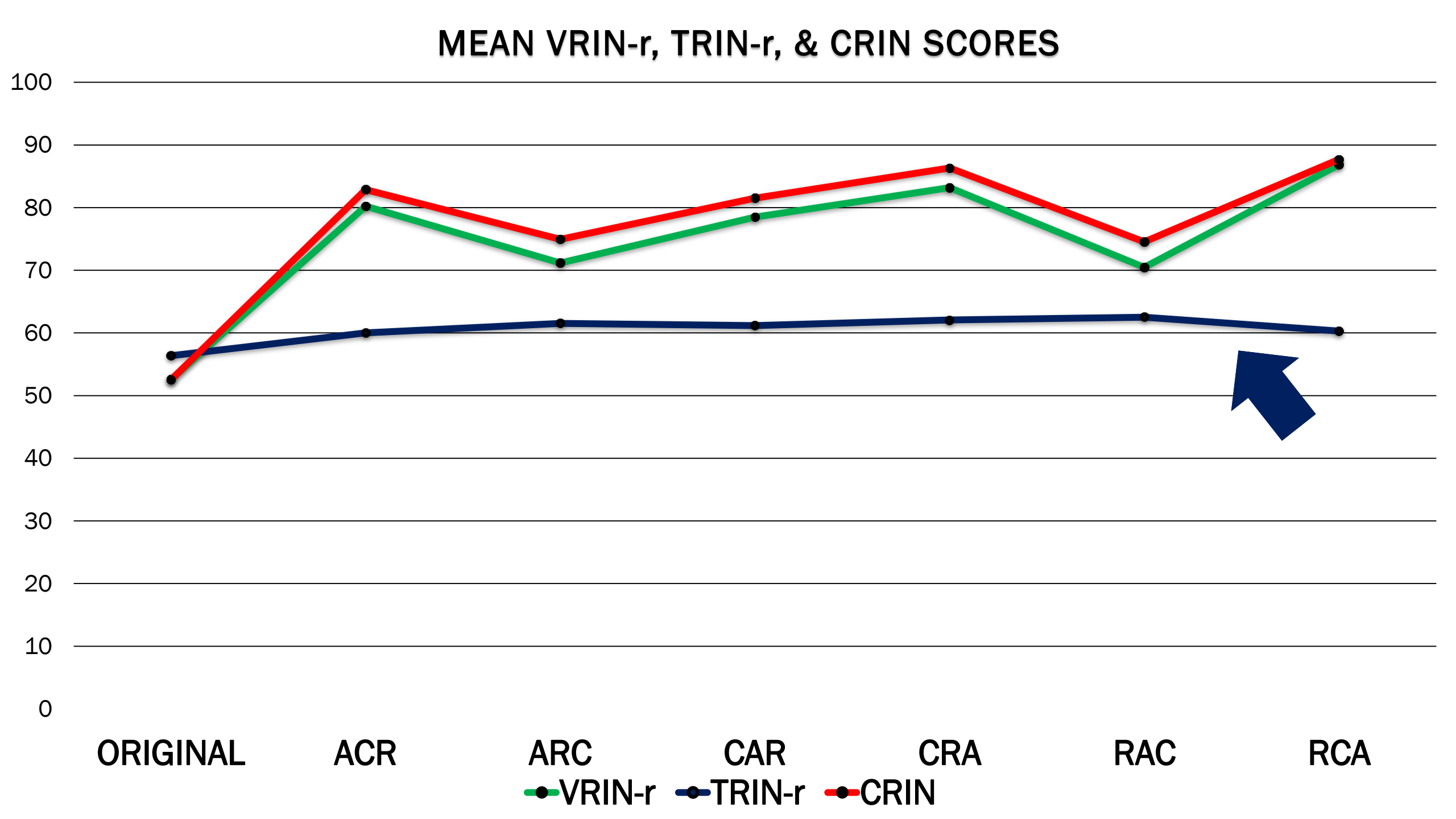
Results

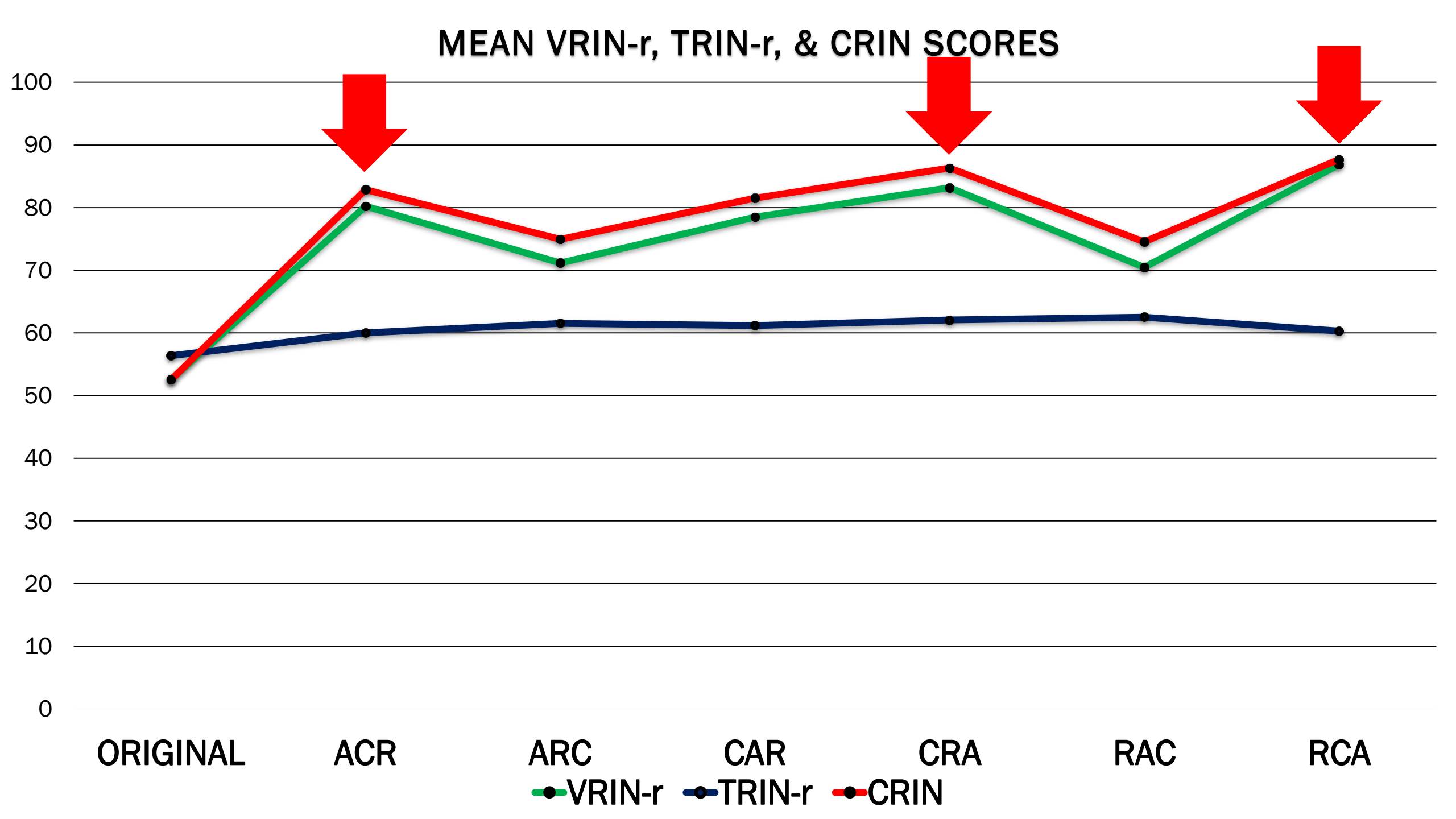
Hypothesis 1

- CRIN means were notably higher in the presence of mixed responding as compared to the original data


MEAN VRIN-r, TRIN-r, & CRIN SCORES
100
90
80
70
60
50
40
30
20
10
0
ORIGINAL
ACR
ARC
CAR
CRA
RAC
RCA
VRIN-r
TRIN-r
CRIN


MEAN VRIN-r, TRIN-r, & CRIN SCORES
100
90
80
70
60
50
40
30
20
10
0
ORIGINAL
ACR
ARC
CAR
CRA
RAC
RCA
VRIN-r
TRIN-r
CRIN

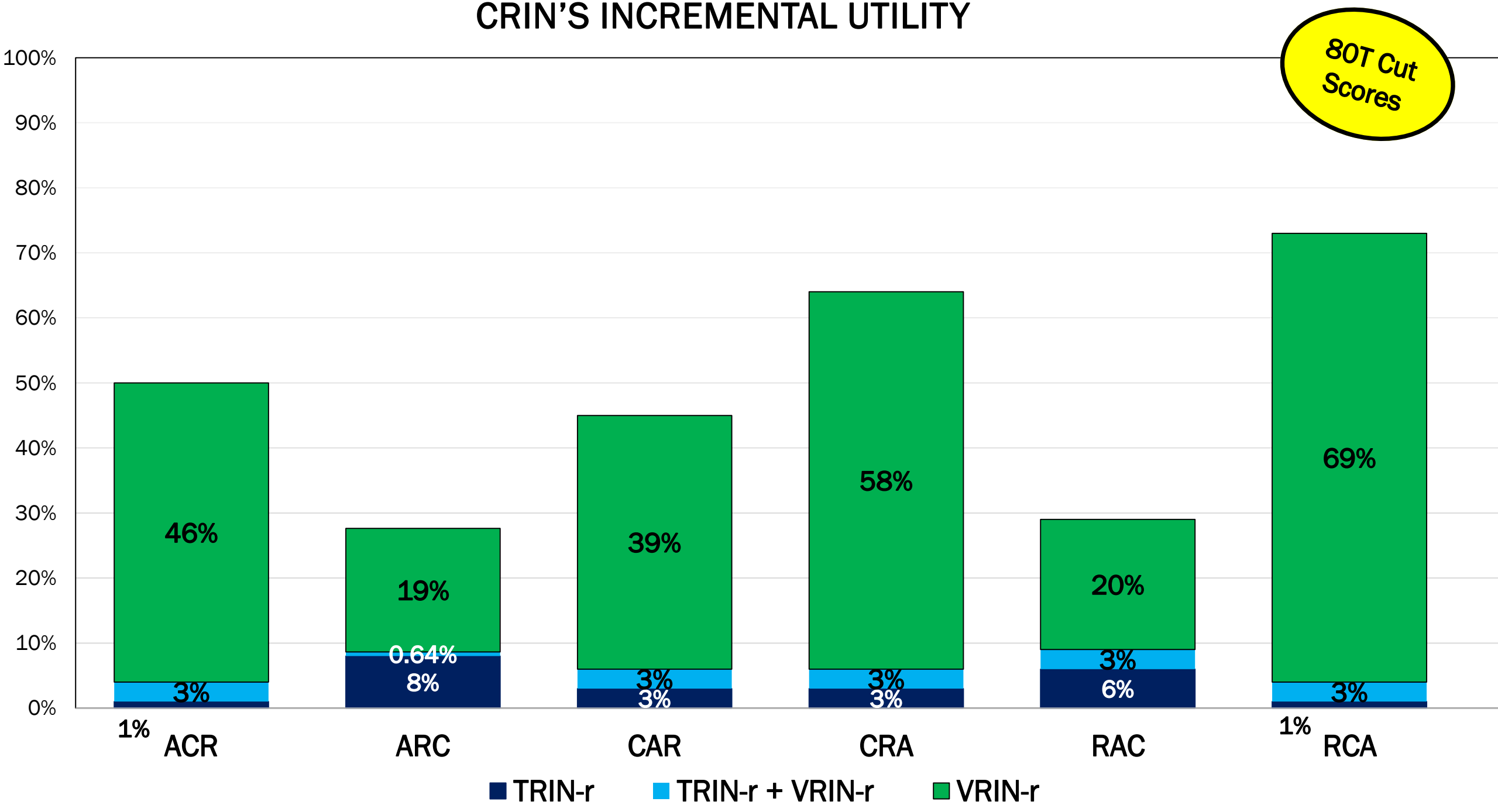

MEAN VRIN-r, TRIN-r, & CRIN SCORES
100
90
80
70
60
50
40
30
20
10
0
ORIGINAL
ACR
ARC
CAR
CRA
RAC
RCA
VRIN-r
TRIN-r
CRIN

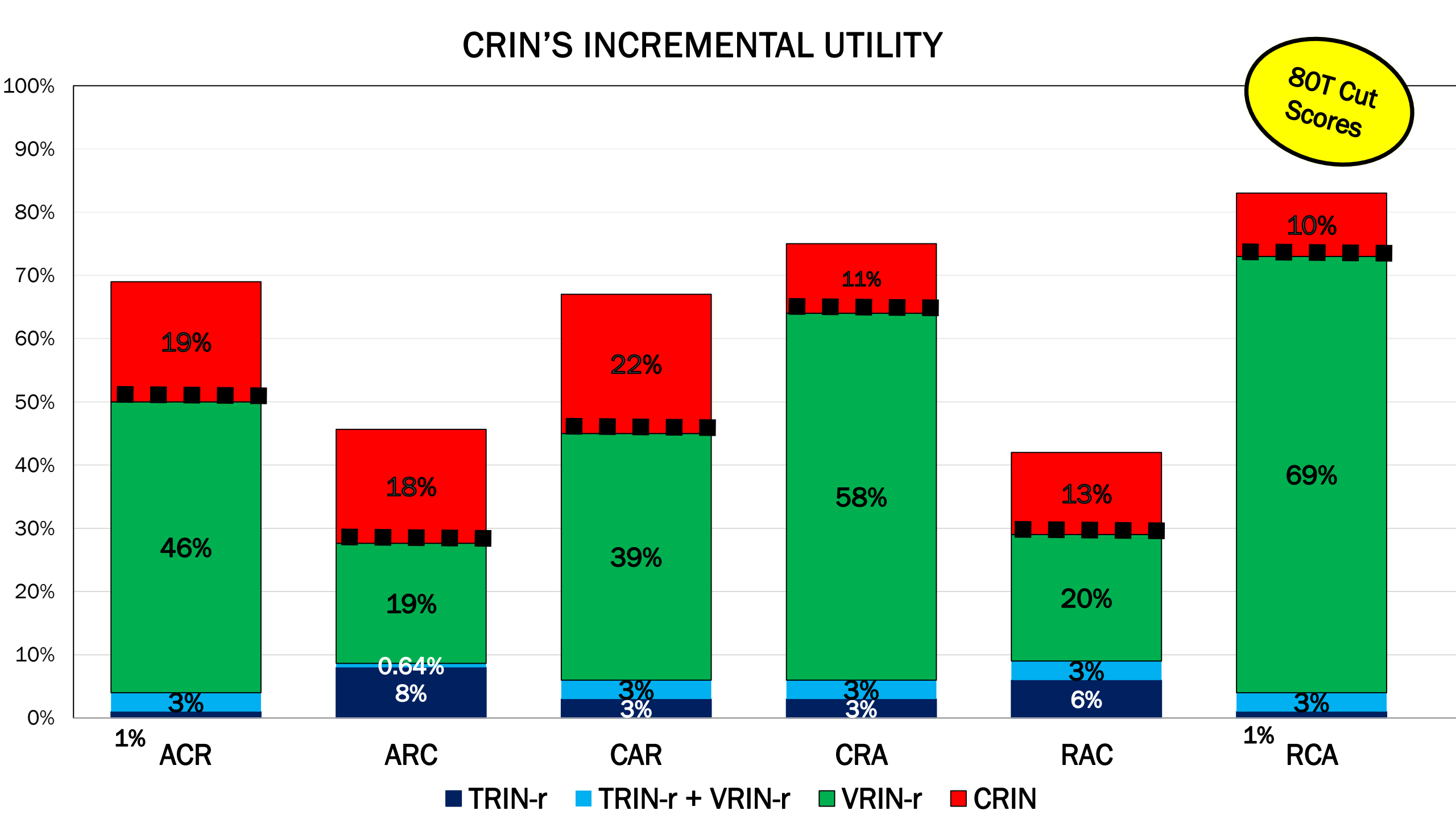

MEAN VRIN-r, TRIN-r, & CRIN SCORES
100
90
80
70
60
50
40
30
20
10
0
ORIGINAL
ACR
ARC
CAR
CRA
RAC
RCA
VRIN-r
TRIN-r
CRIN

Hypothesis 2

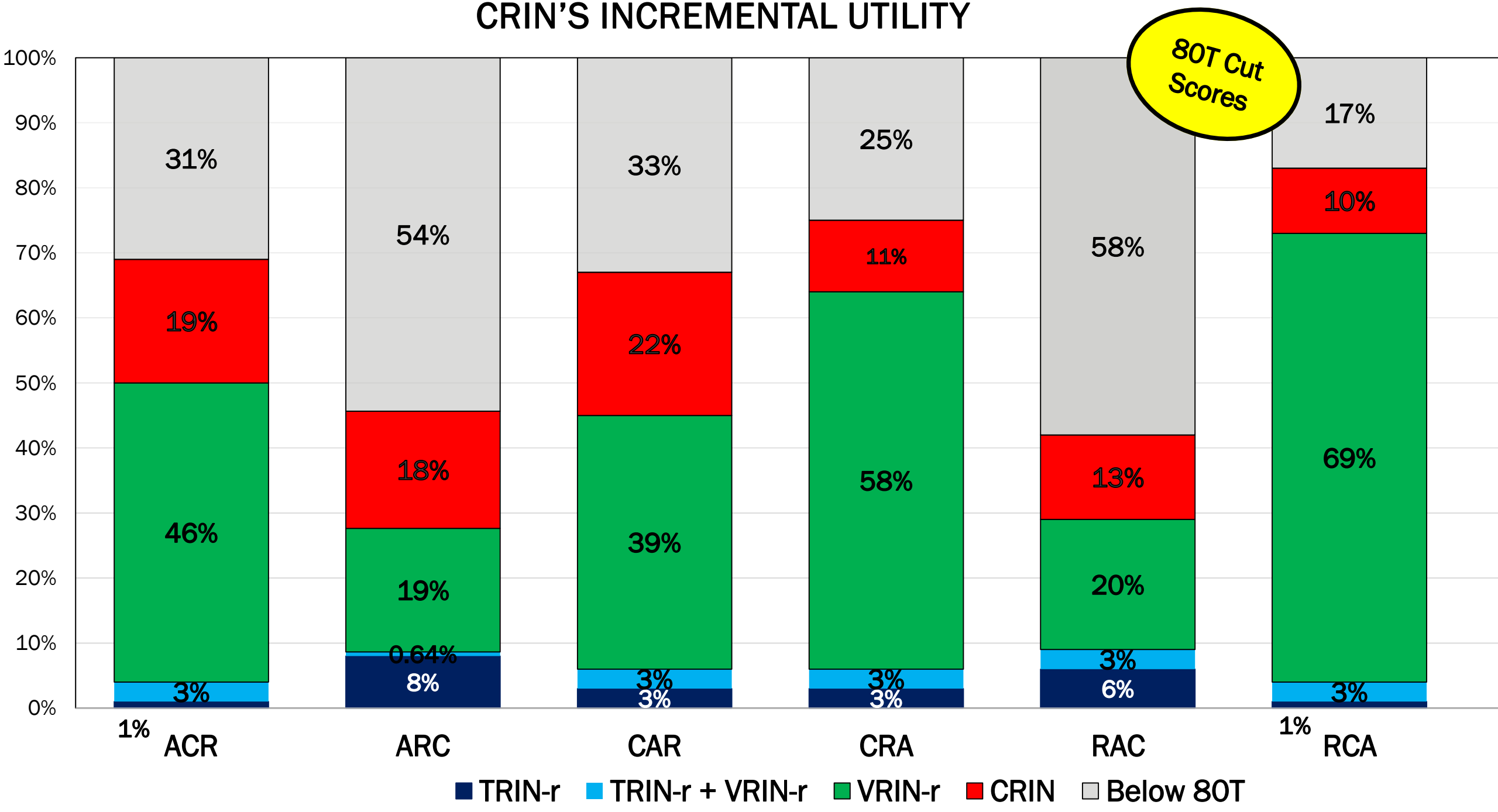
CRIN will incrementally add to VRIN-r and TRIN-r in the detection of mixed responding.

CRIN'S INCREMENTAL UTILITY

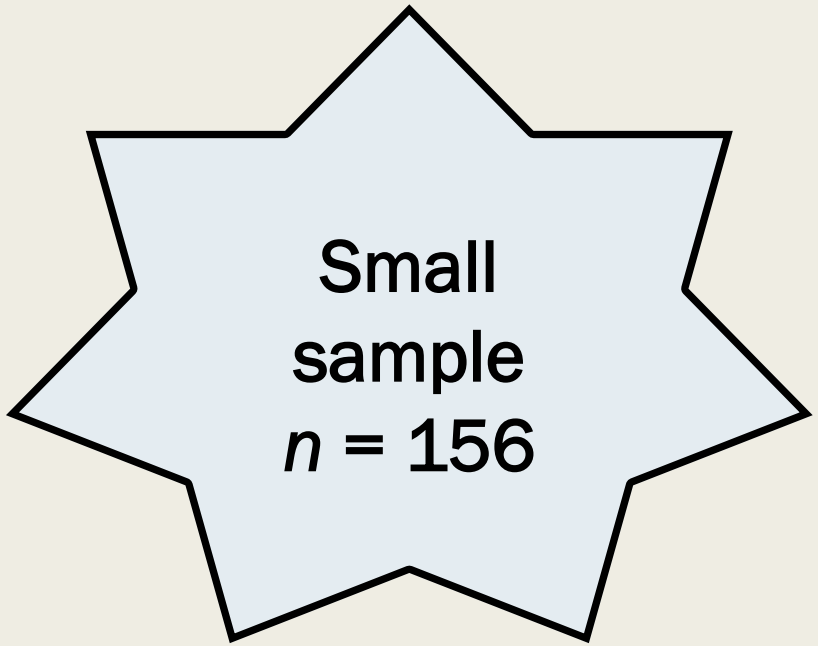



CRIN'S INCREMENTAL UTILITY
80T Cut Scores
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
19%
46%
3%
1%
ACR
18%
19%
0.64%
8%
ARC
22%
39%
3%
3%
CAR
11%
58%
3%
3%
CRA
13%
20%
3%
6%
RAC
10%
69%
3%
1%
RCA
TRIN-r
TRIN-r + VRIN-r
VRIN-r
CRIN

CRIN'S INCREMENTAL UTILITY



Limitations



Limitations

Small sample
n = 156

Mixed Responding

Limitations

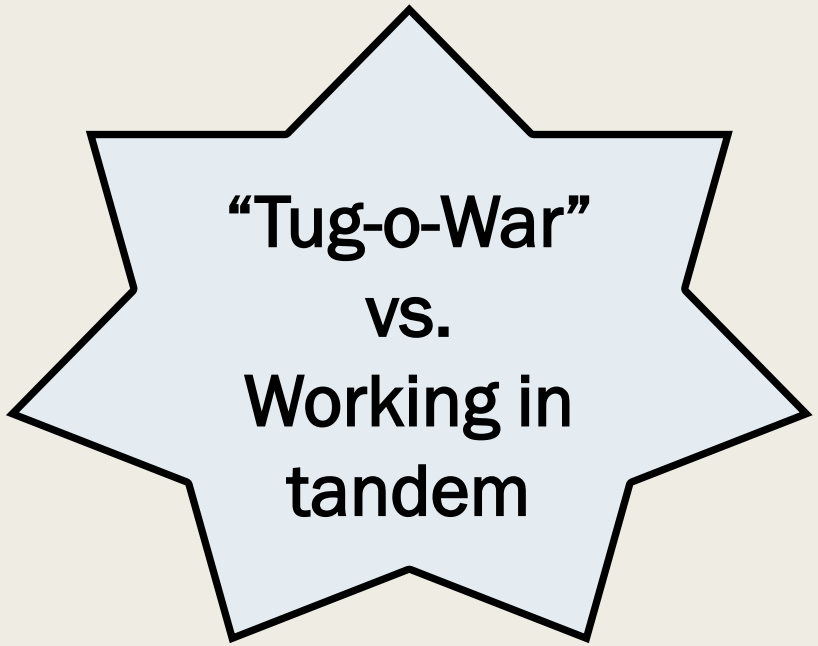
Small sample
n = 156

Mixed Responding

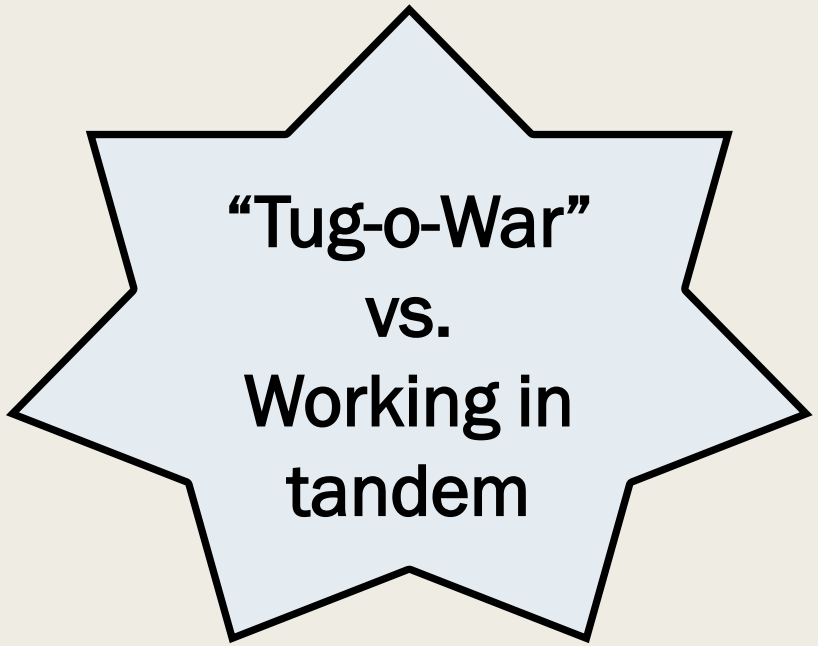
Various possible conceptualizations

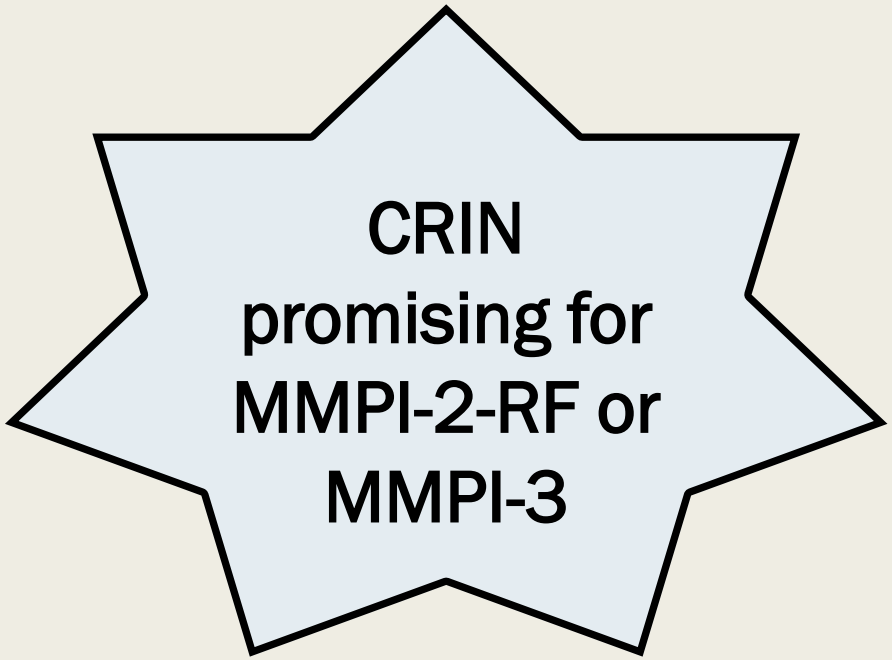
Only examined 40%

Implications



Implications





Implications

"Tug-o-War" vs. Working in tandem

CRIN promising for MMPI-2-RF or MMPI-3

Consider carefully spacing items

Consider equal balance of random vs. fixed pairs

References

Archer, R.P., Handel, R.W., Ben-Porath, Y.S. & Tellegen, A. (2016). *Minnesota Multiphasic Personality Inventory – Adolescent Restructured Form; Administration, Scoring, Interpretation and Technical Manual.* Minneapolis, MN: University of Minnesota Press.

Ben-Porath, Y. S., & Tellegen, A. (2008/2011). *MMPI-2-RF: Manual for administration, scoring and interpretation*. University of Minnesota Press.

Burchett, D., Dragon, W. R., Smith Holbert, A. M., Tarescavage, A. M., Mattson, C. A., Handel, R. W., & Ben-Porath, Y. S. (2016). 'False feigners': Examining the impact of non-content-based invalid responding on the Minnesota Multiphasic Personality Inventory-2 Restructured Form content-based invalid responding indicators. *Psychological Assessment*, *28*(5), 458-470. doi:10.1037/pas0000205

Handel, R. W., Ben-Porath, Y. S., Tellegen, A., & Archer, R. P. (2010). Psychometric functioning of the MMPI-2-RF VRIN-r and TRIN-r scales with varying degrees of randomness, acquiescence, and counter- acquiescence. *Psychological Assessment, 22,* 87–95. http://dx.doi.org/ 10.1037/a0017061

THANK YOU!

California State University
MONTEREY BAY