IOA Formulas Cheat Sheet

The 9 standard interobserver agreement formulas, each with a tiny worked example. For RBT and BCBA students. All examples are fictional.

Every formula: what the two observers agreed on ÷ the total possible × 100. Smaller number always goes on top. Pick the formula from how the data were recorded, before you see the result.

Event recording (counts and trials)

1. Total count IOA

Session totals only

Smaller count ÷ larger count × 100

EXAMPLE
A counts 18, B counts 20
18 ÷ 20 × 100 = **90%**

2. Mean count-per-interval IOA

Counts split into intervals

Sum of (smaller ÷ larger) for each interval ÷ number of intervals × 100

EXAMPLE (4 intervals)
A: 2, 0, 3, 1 · B: 2, 0, 2, 2
100 + 100 + 66.7 + 50 = 316.7; ÷ 4 = **79.2%**
Both zero = 100%

3. Exact count-per-interval IOA

Counts split into intervals (stricter)

Intervals with the same count ÷ total intervals × 100

EXAMPLE (same 4 intervals)
Same count in intervals 1 and 2
2 ÷ 4 × 100 = **50%**

4. Trial-by-trial IOA

Discrete trials scored + or –

Trials with agreement ÷ total trials × 100

EXAMPLE
Observers agree on 9 of 10 trials
9 ÷ 10 × 100 = **90%**

Timing (duration, latency, IRT)

5. Total duration IOA

Only the session total is kept

Shorter total ÷ longer total × 100

EXAMPLE
A: 40 + 120 + 20 = 180 s
B: 50 + 110 + 40 = 200 s
180 ÷ 200 × 100 = **90%**

6. Mean duration-per-occurrence IOA

Each episode timed

Sum of (shorter ÷ longer) for each occurrence ÷ number of occurrences × 100

EXAMPLE (same 3 episodes)
40÷50 = 80, 110÷120 = 91.7, 20÷40 = 50
221.7 ÷ 3 = **73.9%**

Latency and IRT

Same shorter ÷ longer arithmetic

One latency timed at 5 s and 6 s:
5 ÷ 6 × 100 = **83.3%**

Total duration can look better than per-occurrence: a long episode absorbs errors on short ones.

Interval recording and time sampling

partial, whole interval, momentary time sampling

Example record, 10 intervals: Observer A scored intervals **3** and **6**. Observer B scored intervals **3** and **8**. All others blank for both.

7. Interval-by-interval IOA

Mid-rate behavior

Agreed intervals ÷ total intervals × 100
= agreements ÷ (agreements + disagreements)

Agreements: every interval but 6 and 8
8 ÷ 10 × 100 = **80%**

8. Scored-interval IOA

Low-rate behavior (occurrence agreement)

Intervals both scored ÷ intervals at least one observer scored × 100

At least one scored: 3, 6, 8 · both: 3
1 ÷ 3 × 100 = **33.3%**

9. Unscored-interval IOA

High-rate behavior (nonoccurrence agreement)

Intervals both left unscored ÷ intervals at least one observer left unscored × 100

At least one unscored: 9 · both: 7
7 ÷ 9 × 100 = **77.8%**

What IOA percentage is acceptable?

The conventional minimum is **80%**. It comes from research standards and convention (the What Works Clearinghouse sets at least .80 for percentage agreement in single-case research), not from a BACB document. Always report the formula with the number: the record above is 80% interval-by-interval but 33.3% scored-interval.

Common mistakes

- Reporting a percentage without naming the formula
- Putting the larger count on top
- Scoring "both zero" as a miss in the count formulas
- Interval-by-interval for low-rate behavior (quiet intervals inflate it)
- Choosing the formula after seeing the result

Formulas: Cooper, Heron & Heward (2020), *Applied Behavior Analysis*, 3rd ed.; Reed & Azulay (2011).

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