Repeatability and Reliability of an approach test to determine calves' responsiveness to humans: "a brief report"

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Overview of Experiment:

◆ A test to measure animal responsiveness was conducted in 2 steps:

– Step 1 (approach phase) : with drawl or not from the calves to the unknown person

– Step 2 (touch phase): Calves reaction to outstretching arm and touching on the head on a 1-4 scale

THEY COMPARED THE RESULTS TO ARENA TESTS AND SAW SIMILARITIES

Purpose of the Experiment:

♦ Under commercial conditions, arena tests are rarely possible because no special arena is available or it's not possible to enter the animals pen, and the tests are time consuming

♦ The approach test is used because it's easy, fast, and comparable to arena test through the experimental findings

Theory:

♦ The approach test is a reliable way to determine animals responsiveness to humans

Hypothesis:

♦ The approach test is a good assessment instrument that can be used to look at responsiveness of animals to humans

Theoretical Construct:

◆ Responsiveness to humans

◆ **<u>Operational Definition</u>**: with drawl from humans on the approach and touch phase

Quasi-Experimental or Experimental??

◆ **Neither…..**

  – The experiment was performed to develop an assessment instrument

Subjects:

♦ **Male Holstein calves**
  – <u>Study 1</u>: 150 calves housed in groups
  – <u>Study 2</u>: 22 calves housed in individual pens

Independent variable I:

♦ Approach phase

♦ **Scale of Measurement:**
 – **Quantitative (with drawl or no with drawl)**
 – **Nominal Scale**

♦ **Levels of Independent Variable I:**
 – **ZERO**

Independent variable II:

◆ Touch phase

◆ <u>**Scale of Measurement:**</u>
  – **Qualitative** (1-4 scale)
  – **Ratio scale**

◆ <u>**Levels of Independent Variable II:**</u>
  – **ZERO**

Independent variable III:

♦ Arena test

– comparing independent variables I and II with independent variable III

♦ **Scale of Measurement:**

– **Quantitative** (with drawl of no with drawl)

♦ **Levels of Independent variable:**

– **ZERO**

Dependent variable:

♦ Responsiveness of calves when in an arena and/or in an individual pen

♦ **Scale of Measurement**:
  – **Ratio scale**

Data Analysis: Study 1

♦ <u>Approach phase</u>: calculated probability of observing same response for calves over repetitions

♦ <u>Touch phase</u>: conditional probability calculated, denoting the probability for initial reaction scores to reappear during second test

Table 1

Repeatability of the reactivity of veal calves to a person for study 1

Observation 1	Observation 2			
	1	2	3	4
1	**0.57**	0.34	0.20	0.07
2	0.17	**0.19**	0.16	0.08
3	0.19	0.30	**0.34**	0.26
4	0.07	0.17	0.30	**0.59**

Data Analysis: Study 2

◆ <u>Arena test</u>: Analysis of co-variance (ANOVA's) performed with latency, frequency, time of interaction with unknown person and stockperson in the arena as dependent variants

Table 2

Comparison between calves' responses to humans test in their crate and in an arena using ANOVA for study 2

Covariate/ factor	Latency		Frequency		Time Interacting	
	F	P	F	P	F	P
Approach phase	9.94	<.01	5.53	0.03	5.74	0.03
Touch phase	13.02	<.01	7.72	0.01	7.18	0.01

Results:

♦ **Main Effect**: Found a relationship between arena and individual pens in the animals responsiveness to unknown person

♦ From the approach test, they categorized the scores and did a F-test and related it to the arena scores

Results Cont…

♦ <u>Approach phase</u>: The average probability for an equal score on 2 observations was .84 (S.E.= .03) with a 95% lower confidence bound of .79

♦ <u>Touch phase</u>: Responses on observation 1 and 2 were significantly correlated, r =.62, p< .001

Results Cont…

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Results Cont…

♦ <u>Approach VS. Arena test:</u> Responsiveness in approach test were shown to be similarly consistent with the arena test

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Discussion:

- <u>Advantage of approach test</u>: quick, easy, and able to do on large quantities of animals (commercial conditions)

- *Approach test* showed consistency among repetitions

- *Arena test* showed that the calves that with drew from the unknown person in the approach test interacted less with the unknown person in the arena and vice versa

Discussion Cont…

♦ *Did the Operational definitions correspond well to the Theoretical Constructs??*

   – **NO**, there were many confounding variables along with no strong relationship among arena and individual pens using the approach and touch tests

   – <u>Possible confounding variables</u>:

      • Didn't do study on female calves

      • Can't generalize to all animals… only male Holstein calves

      • The arena test was in a square room which could have increased animal stress

Discussion Cont…

♦ *If the results were significant, did they have a big effect??*

   – NO!!

   – From Table 1, **r** = .62 but it should be closer to .80 to be significantly correlated

   – From Table 2, they should have calculated a **r** value. They show a relationship but not a strong relationship

Discussion Cont...

◆ *What are the Potential Confounds??*

– Like I said before:

• They only looked at male Holstein calves , not female or any other types of calves.

• The arena test was in a square area which could cause an increase in animals stress due to the corners whereas a circular room isn't as stressful because there are no corners

Discussion Cont…

♦ *Do you agree with the authors??*

– NO!! They misused reliability and repeatability

– They said the approach test can be considered repeatable…. SHOULD HAVE USED **RELIABLE** and they said it was reliable when they MEANT TO SAY **VALID**

– **I do however think that if the study was repeated and done correctly, it could be useful information to find**

Discussion Cont…

♦ *How would you have done the study different??*

- – Use female calves and of different groups
- – Calculate **r** value for Table 2
- – Use arena test in circular room to decrease animals stress
- – Find more secure way to measure touch test so more consistent results can be shown among entire scale (not just extremes)

Discussion Cont…

◆ *What to do next??*

◆ Repeat the study considering the multiple confounding variables, include needed information in data analysis (r value), and use correct terms (validity and reliability) in proper context

THE END!