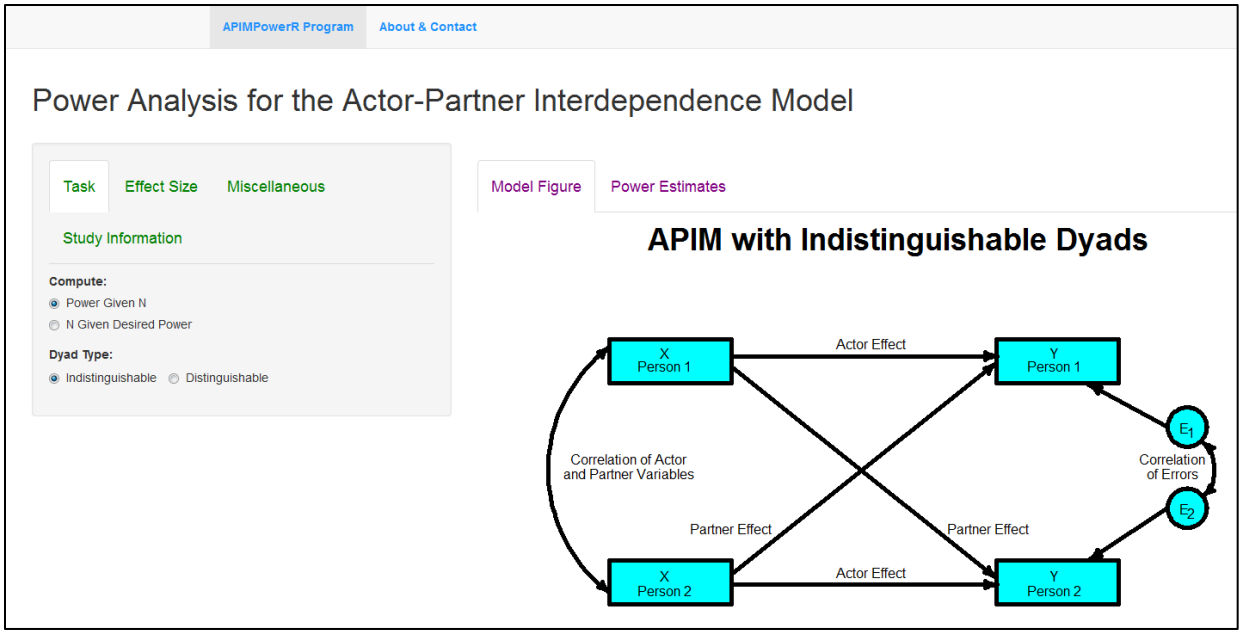
APIMPowerR Documentation

APIMPowerR (available at https://robert-a-ackerman.shinyapps.io/APIMPowerRdis/) estimates power for the Actor-Partner Interdependence Model (APIM) with indistinguishable or distinguishable dyads. Power can be determined for a given sample size or sample size can be determined given a desired level of power.



The app consists of an input panel to the left and an output panel to the right. The input panel contains four green tabs (i.e., **Task, Effect Size, Miscellaneous, and Study Information**) that permit the user to specify different features of the analysis (e.g., alpha level, effect size measure). To facilitate the specification of different parameters in the Study Information tab (e.g., Correlation of the Errors), a depiction of the Actor-Partner Interdependence Model with the corresponding parameters labeled is provided in the purple **Model Figure** tab in the output panel. The user is advised to click the four green tabs sequentially and choose the appropriate options. Once the analysis is completed, results are presented in the purple **Power Estimates** tab in the output panel. If Distinguishable is chosen, the user is given an option to name the two members (e.g., Boss & Employee).

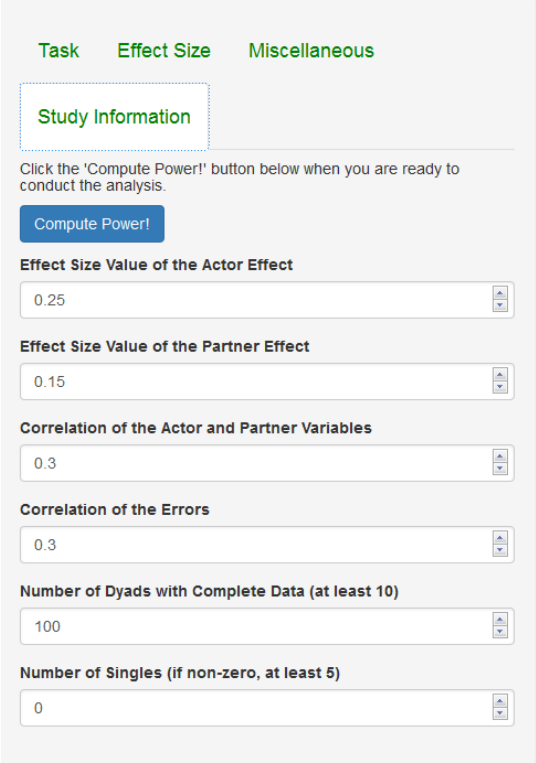
Effect Size Tab

Effect Size Measure: Users can specify their effect size measure to be the standardized regression coefficient (i.e., Beta), Cohen's *d* (i.e., d), or partial *r.* The program defaults to using Beta as the effect size measure.

If Cohen's *d* or partial *r* is chosen by the user, the program converts the value for the effect size measure to the corresponding Beta value before conducting the power analysis.

Study Information Tab from Input Panel

Study Information Tab when Dyad Type is Indistinguishable and Task is to Compute Power n



Power Estimates Tab When Dyad Type Is Indistinguishable

Model Figure | Power Estimates

	Size	Power	N	Beta	r	partial r	ncp
Actor	.250	.959	100	.250	.295	.245	3.714
Partner	.150	.602	100	.150	.225	.150	2.229

The task is to determine the levels of power available to detect the actor and partner effects for an Actor-Partner Interdependence Model analysis with indistinguishable dyads given a particular sample size and alpha.

Alpha is set to .050. N refers to the number of dyads. There are 100 dyads (and 0 singles).

The measure of effect size is beta, the standardized regression coefficient. The correlation between the two members' scores on X is .300, and the correlation of the errors is .300. The term "ncp" is the non-centrality parameter or the regression coefficient divided by its standard error.

There is .959 power to detect an actor effect of size .250 (i.e., a beta of .250 or a partial r of .245).

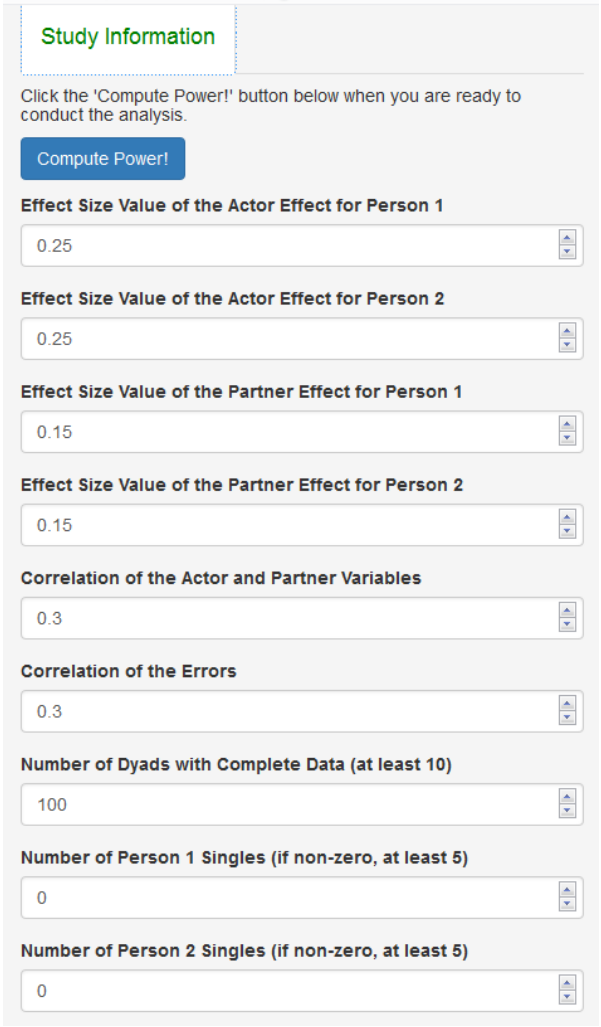
There is .602 power to detect a partner effect of size .150 (i.e., a beta of .150 or a partial r of .150).

Surprising Fact

For a fixed actor-partner correlation:

Power increases as that correlation of the errors increases in absolute value and has the same sign. Power decreases as that correlation of the errors increases in absolute value but has the opposite sign.

Study Information Tab When Dyad Type Is Distinguishable



Power Estimates Tab when Dyad Type Is Distinguishable

Model Figure | Power Estimates

	Effect	Power	N	df	Beta	r	partial r	ncp
Actor Effect for Person 1	.250	.692	100	97	.250	.295	.245	2.486
Actor Effect for Person 2	.250	.692	100	97	.250	.295	.245	2.486
Partner Effect for Person 1	.150	.315	100	97	.150	.225	.150	1.492
Partner Effect for Person 2	.150	.315	100	97	.150	.225	.150	1.492
Difference in Actor Effects	.000	.050	100					0.000
Difference in Partner Effects	.000	.050	100					0.000

The task is to determine the levels of power available to detect the actor and partner effects for an Actor-Partner Interdependence Model analysis with distinguishable dyads given a particular sample size and alpha.

Alpha is set to .050. N refers to the number of dyads. There are 100 dyads (and 0 Person 1 singles and 0 Person 2 singles).

The measure of effect size is beta, the standardized regression coefficient. The correlation between the two members' scores on X is .300, and the correlation of the errors is .300. The term "ncp" is the non-centrality parameter or the regression coefficient divided by its standard error.

There is .692 power to detect an actor effect for Person 1 of size .250 (i.e., a beta of .250 or a partial r of .245).

There is .692 power to detect an actor effect for Person 2 of size .250 (i.e., a beta of .250 or a partial r of .245).

There is .315 power to detect a partner effect for Person 1 of size .150 (i.e., a beta of .150 or a partial r of .150).

There is .315 power to detect a partner effect for Person 2 of size .150 (i.e., a beta of .150 or a partial r of .150).