Concept Source Table - Template

Scope: List all references that constitute the original sources for the VAST display:

- Isenberg, D. J. (1986). Group polarization: A critical review and meta-analysis. *Journal of Personality and Social Psychology*, *50*(6), 1141–1151. https://doi.org/10.1037/0022-3514.50.6.1141
- Burnstein, E., & Vinokur, A. (1977). Persuasive argumentation and social comparison as determinants of attitude polarization. *Journal of Experimental Social Psychology*, *13*(4), 315–332. https://doi.org/10.1016/0022-1031(77)90002-6

Construct Source Table:

Reference	**Quote**	**Extracted element** (Concept or relationship)	**Element type** (**C**oncept **or R**elationship)	**Short name / associated concept**	**ID**	**im VAST (Y/N)**
Isenberg, D. J. (1986), p. 1141	Group polarization is said to occur when an initial tendency of individual group members toward a given direction is enhanced following group discussion Thus, on decisions in which group members have, on the average, a moderate proclivity in a given direction, group discussion results in a more extreme average proclivity in the same direction.	Group polarization	Phenomenon	GP	**1**	**Y**
		Initial Tendency of group members with a moderate average proclivity	Concept	T_i^{pre}	2	Y
		Group Discussion	Higher-order concept	GD	3	Y

		Resulting Tendency of group members with a more extreme average proclivity	Concept	T_i^{post}	4	Y
Isenberg, D. J. (1986), p. 1145	PAT holds that an individual's choice or position on an issue is a function of the number and persuasiveness of pro and con arguments that that person recalls from memory when formulating his or her own position.	Individual's initial arguments that the person recalls from memory [Initial argument set]	Concept	IA_i	5	Y
		Number of arguments	Concept	n_i^{IA}	6	Y
		Persuasiveness of pro and con [direction] arguments	Concept	d_j, p_j	7	Y
		Individual's initial choice or position (tendency) on an issue is a function of the number and persuasiveness of pro and con arguments that person recalls from memory	Relationship		8	Y

Isenberg, D. J. (1986), p. 1145	Group discussion will cause an individual to shift in a given direction to the extent that the discussion exposes that individual to persuasive arguments favoring that direction.	Additional persuasive arguments [following a group discussion]	Concept	AA_i	9	Y
		[number of additional arguments person i considers after group discussion]	Concept	n_i^{AA}	10	Y
		Individual (choice) shift	Higher-order concept	CS	11	Y
		(Choice) shift is caused by exposition to persuasive arguments in a group discussion	Relationship		12	Y
Isenberg, D. J. (1986), p. 1145	Two factors determine how persuasive a given argument will be. One factor is the perceived validity of the argument. How true is the argument? Does the argument fit into the person's previous views? Does the argument logically follow from accepted facts or assumptions? The second factor determining persuasiveness is the perceived novelty of the argument. Does the argument represent a new way of	persuasiveness of a given argument	Concept	p_j	13	Y
		one factor of persuasiveness is perceived validity of argument	Concept	val_j	14	Y
		second factor of persuasiveness is perceived novelty of argument	Concept	nov_j	15	Y

	organizing information? Does the argument suggest new ideas? Does the argument increase the perceiver's access to additional information that is stored in memory?	persuasiveness of other´s arguments consists of validity and novelty of arguments	relationship		16	Y
Developed independently for completeness	At the group level, there is an initial tendency with a moderate average proclivity, followed by a polarized tendency after the group discussion	Initial Tendency of group with a moderate average proclivity	Concept	$\bar{T}^{pre}$	17	Y
		Tendency of group after group discussion	Concept	$\bar{T}^{post}$	18	Y

TASK 2:

Based on the Construct Source Table, create a VAST display. The goal is an *easily understandable* display: prioritize understandability over completeness and over a maximally truthful mapping of the original statements. Use as few concepts as possible (but as many as necessary). (Why aim for a simple model? Because we want to formalize the model mathematically in a second step, and we need a feasible model for that).

Variable Table:

List all concepts that are not higher-order concepts (because higher-order concepts typically are not reducible to a single metric):

Construct	**Short Name**	**Scale level**	**Range/Values**	**Anchors**	**VAST vs R-Code**
Initial Tendency of group with a moderate average proclivity	$\bar{T}^{pre}$	continuous	[-1;+1]	-1 = extremely negative opinion on a certain topic +1 = extremely affirmative opinion on a certain topic	
Tendency of group after group discussion	$\bar{T}^{post}$	continuous	[-1;+1]	-1 = extremely negative opinion on a certain topic +1 = extremely affirmative opinion on a certain topic	
Initial Tendency of group members with a moderate average proclivity	T_i^{pre}	continuous	[-1;+1]	-1 = extremely negative opinion on a certain topic +1 = extremely affirmative opinion on a certain topic	
Resulting Tendency of group members with a more extreme average proclivity	T_i^{post}	continuous	[-1;+1]	-1 = extremely negative opinion on a certain topic +1 = extremely affirmative opinion on a certain topic	

Number of arguments	n_i^{AA}, n_i^{IA}	continuous / integer	0;1;2;... (discrete) x $\in \mathbb{N}0$		**in R:** finite argument pool (size defined by user), distribution of arguments in pool based on group´s bias (bias defined by user)
persuasiveness	p_j	continuous	[0;1]	0 = argument not persuasive at all, 1 = argument maximally convincing	**in R:** implicit novelty and validity; only a general persuasiveness value per argument is implemented
direction	d_j	dichotomous	+1/-1	-1 = Contra Argument +1 = Pro Argument	

Relationships Table:

Every variable in the VAST to which a one-sided arrow is pointing is a dependent (endogenous) variable. Provide a mathematical function for each endogenous variable, that takes all incoming arrows as input variables.

Output variable	**Function to compute the output variable**	**Comment**	**To what extent derived from theory?[a]**	**To what extent empirically backed?**
IA_i	$IA_i = (a_1, a_2, \ldots, a_n)$ mit $a_j = (d_j, p_j) \quad$ fuer $j = 1, 2 \ldots, n$		Derived from theory	ID 8
AA_i	$AA_i = (a_{n+1}, a_{n+2}, \ldots, a_{n+m})$ $a_k = (d_k, p_k) \quad$ fuer $k = n+1, n+2, \ldots, n+$	parallel to IA_i	Loosely inspired by theory	ID 9
T_i^{post}	$T_i^{\text{post}} = \frac{1}{n_i^{IA} + n_i^{AA}} \times \underbrace{\sum_{j \in IA_i} p_j d_j}_{n_i^{IA} \text{ Terme}} + \underbrace{\sum_{j \in AA_i} p_j d_j}_{n_i^{AA} \text{ Terme}}$		Loosely inspired by theory	ID 4

T_i^{pre}	$T_i^{\text{pre}} = \frac{1}{n} \sum_{j \in IA_i} p_j d_j$		Loosely inspired by theory	ID 2
$\bar{T}^{pre}$	$\bar{T}^{\text{pre}} = \frac{1}{N} \sum_{i=1}^{N} T_i^{\text{pre}}$		Derived from theory	ID 17
$\bar{T}^{post}$	$\bar{T}^{\text{post}} = \bar{T}^{\text{pre}} + \frac{1}{N} \sum_{i=1}^{N} \sum_{j \in AA_i} p_j d_j$		Derived from theory	ID 18

[a] Response scale:

- Dictated by theory (add IDs from the Construct Source Table as reference)
- Derived from theory
- Loosely inspired by theory
- Not based on focal theory, but rather on common sense or other theories
- Not at all.

Deviations of the simulation from the Variable Table:

- **Deviation in Calculation (Aggregation Logic)**: The variable table defines the tendency (T) strictly as the arithmetic mean. The simulation code deviates from this by introducing the uncertainty factor C into the denominator. This modification is necessary to mathematically model the theoretical assumption of 'uncertainty-dependent stability', ensuring that low information volume results in moderate rather than extreme tendencies.

- **Deviation in Data Origin (Generative Approach)** The variable table treats argument sets (IA_i, AA_i) as static input vectors containing fixed values. In contrast, the simulation employs a generative approach: instead of defining specific arguments manually, it constructs a finite argument pool of a user-defined size (pool_size). From this restricted pool, argument values are dynamically sampled based on a probability distribution defined by the group's pool_bias parameter, effectively simulating the homophilic selection process.