

Supplementary File

Topology of 2x2 Games

• Symmetric games on diagonal axis, payoffs combine to make asymmetric games
 • Payoff swaps link neighboring games
 1↔2 Low swaps form tiles of 4 games
 2↔3 Middle swaps join tiles into 4 layers
 3↔4 High swaps bridge layers
 • Layers differ by alignment of best payoffs
 L4 Column L1 Discord
 L3 Win-win L2 Row
 • Layer quadrants differ in dominant strategies (D) and equilibria (E)
 • Pd scrolled to center, so layers and table are toruses, wrap side-to-side & top-to-bottom

Payoff Families	
Win-win 4,4	Stag Hunt
Biased 4,3	Battle
Second Best 3,3	
Unfair 4,2	
Sad 3,2	
Traps 3,2/2,2	Dilemma Alibi
Cyclic 0,0	Indeterminate

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Activities for 2x2 Cards

- Play.** Shuffle, pick a card and play, considering solution concepts
- Layouts.** Arrange by topology axis, differentiation, neighbors, etc.
- Story.** Pick a card and create a story where preferences transform
- Path.** Pick two cards and find cards for the pathway between them.
- Adapt games**
 - Fish.* Ask for cards by properties: ties, dominance, externalities, etc.
 - Dominos.* Add neighboring cards (half or full swap)
 - Concentration.* Pair neighbors
 - Rummy.* Sets of 3 neighbors

Options: Start with just strict games
 • Two cards make an asymmetric game
 • Work in teams • Share with #2x2atlas

see Robinson & Goforth *Topology of 2x2 Games*
 Bruns *Atlas of 2x2 Games 2x2atlas.org*
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Differentiation and Simplification

Half-swaps:
 Making ties simplifies
 Breaking ties differentiates
 also see *Neighbors*

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Symmetric Neighbors

Swaps in adjoining payoffs link neighbors
 3↔4: Prisoner's Dilemma ↔ Stag Hunt
 Games with ties lie between strict games
 Half-swap links make or break ties

■ **Faces** ■ **Edges** ● **Vertices**
 see 2x2atlas.org for more © CC-BY-SA

2x2 Symmetric Games

Cards for All the 2x2 Symmetric Ordinal Games

Bryan Bruns
 bryanbruns@bryanbruns.com
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*Dedicated to the memory of
 John Forbes Nash
 1928-2015*

*who liked to play games,
 as well as
 think about them*

Half-swaps make or break ties in the expanded topology

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Figure S1. 2 × 2 Game Cards: Maps.

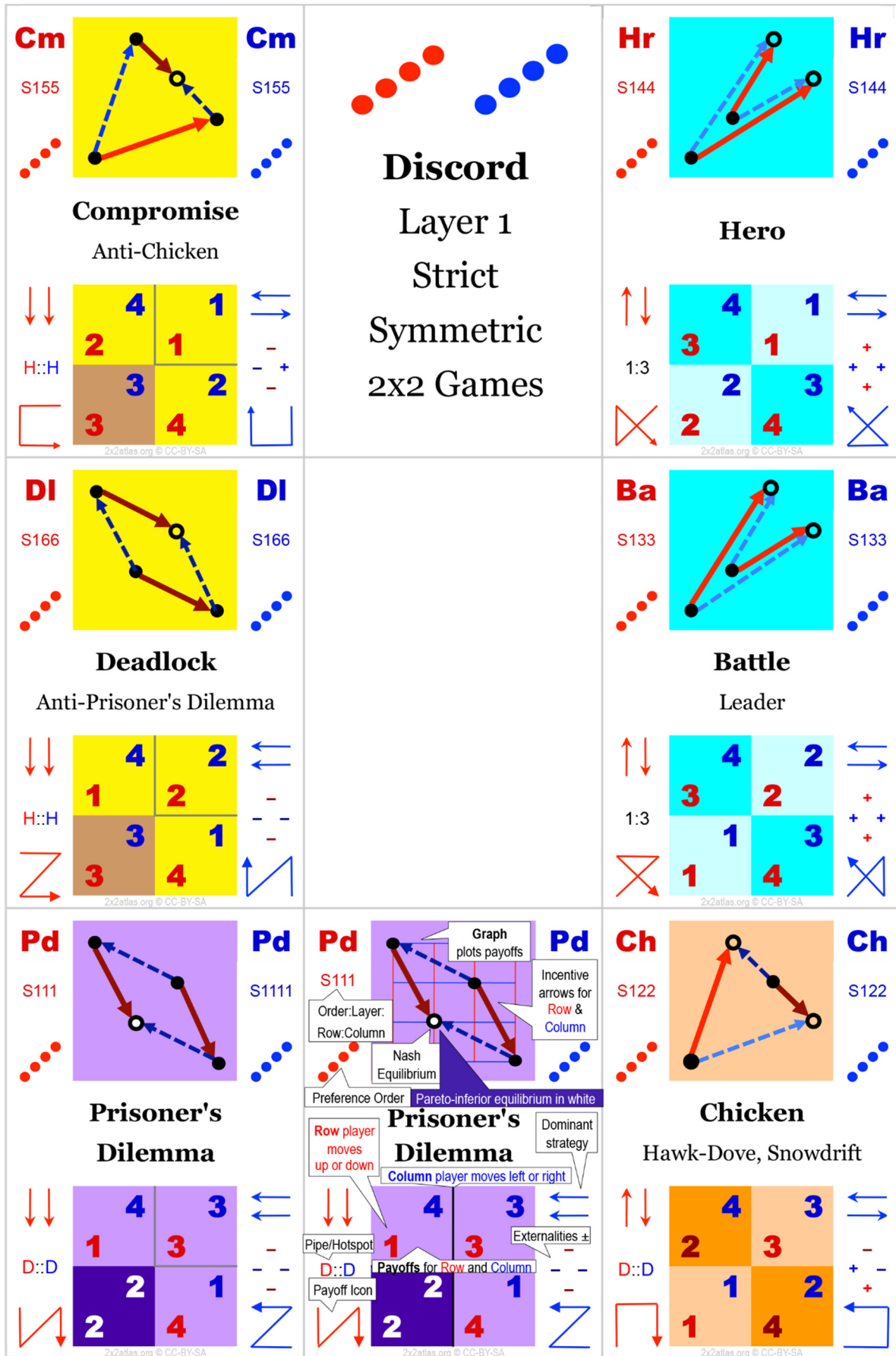


Figure S2. 2 × 2 Game Cards: Discord Layer 1.

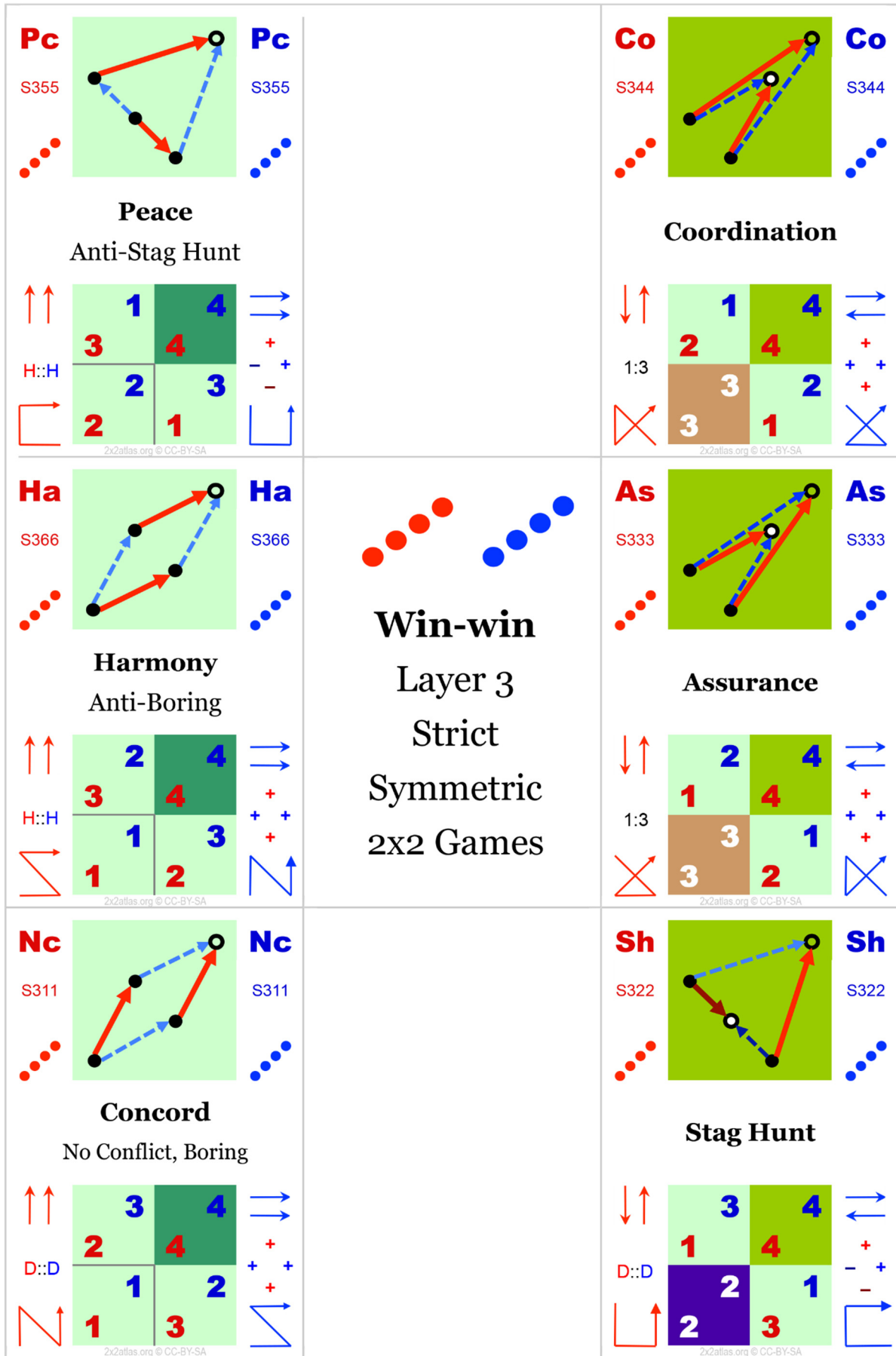


Figure S3. 2 × 2 Game Cards: Win-win Layer 3.

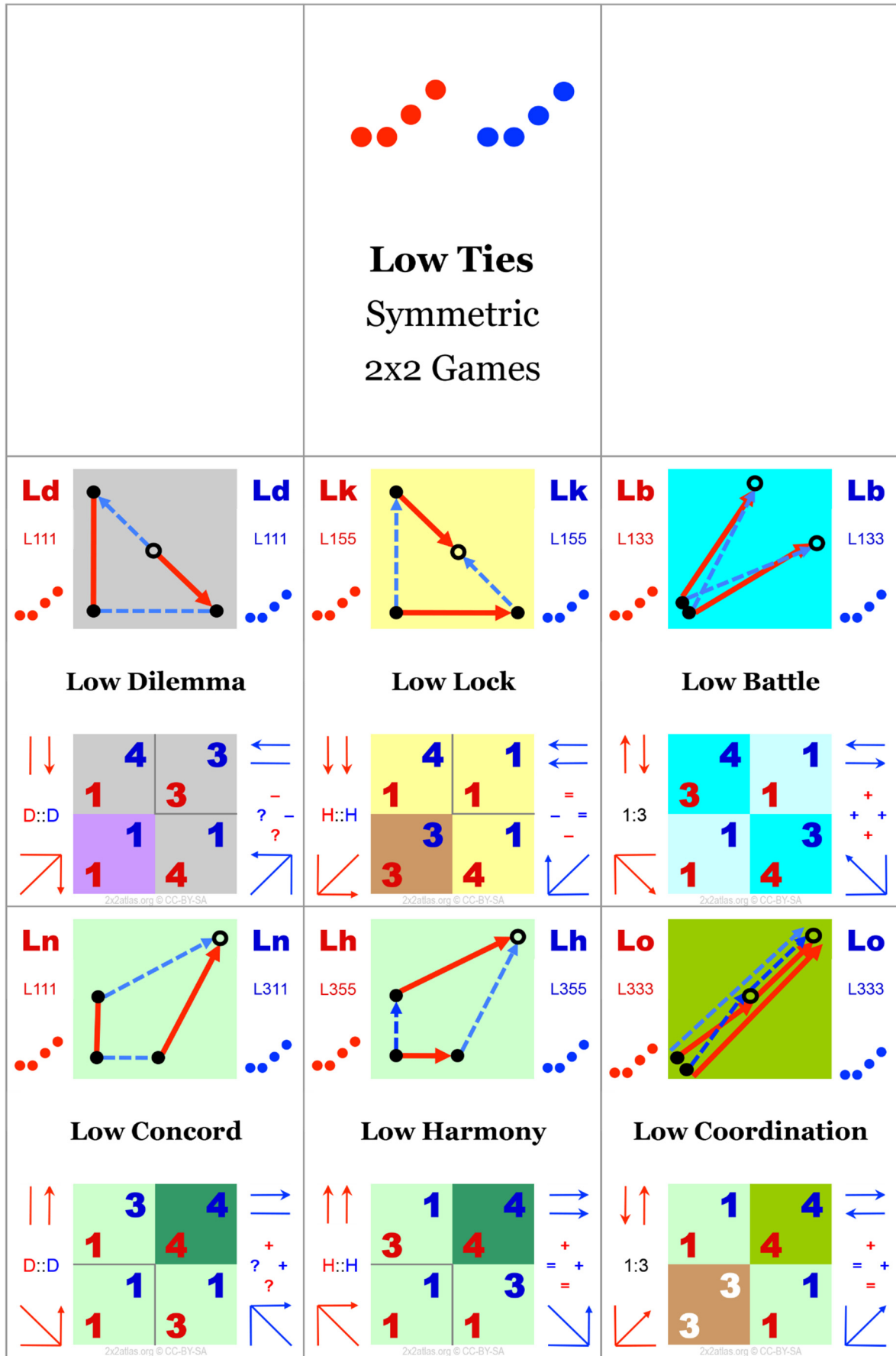


Figure S4. 2 × 2 Game Cards: Low Ties.

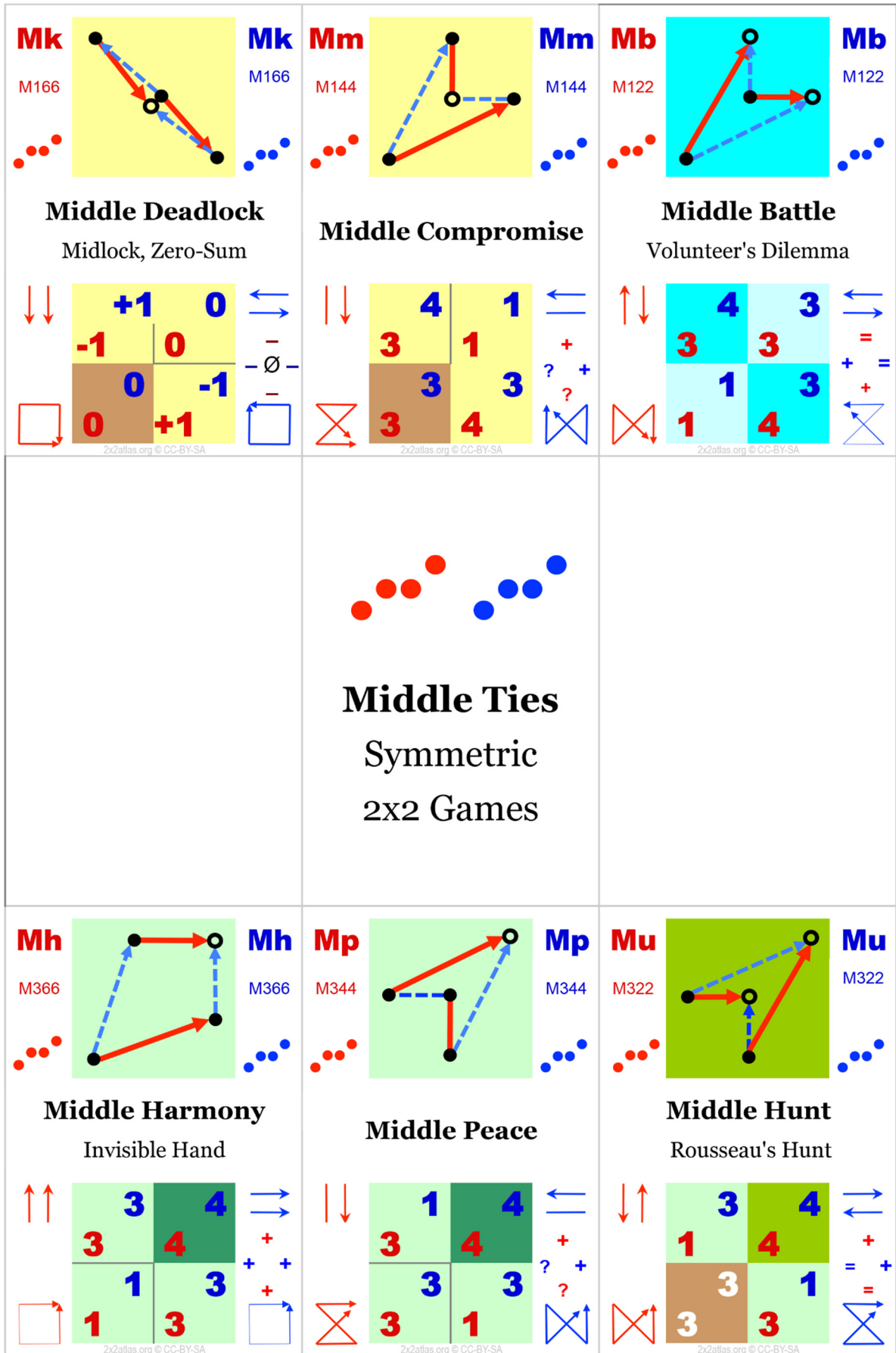


Figure S5. 2 × 2 Game Cards: Middle Ties.

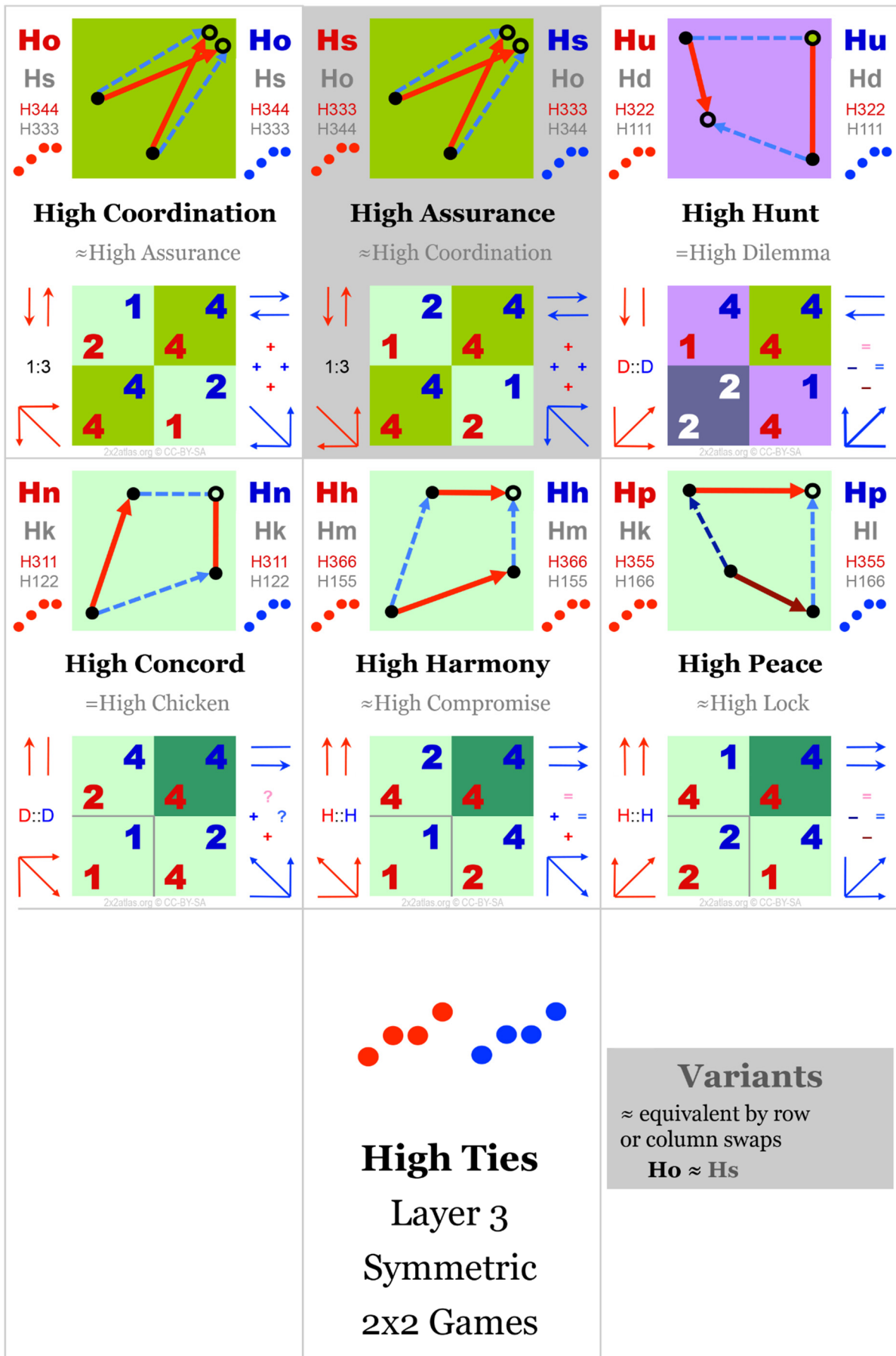


Figure S6. 2 × 2 Game Cards: High Ties Layer 3.

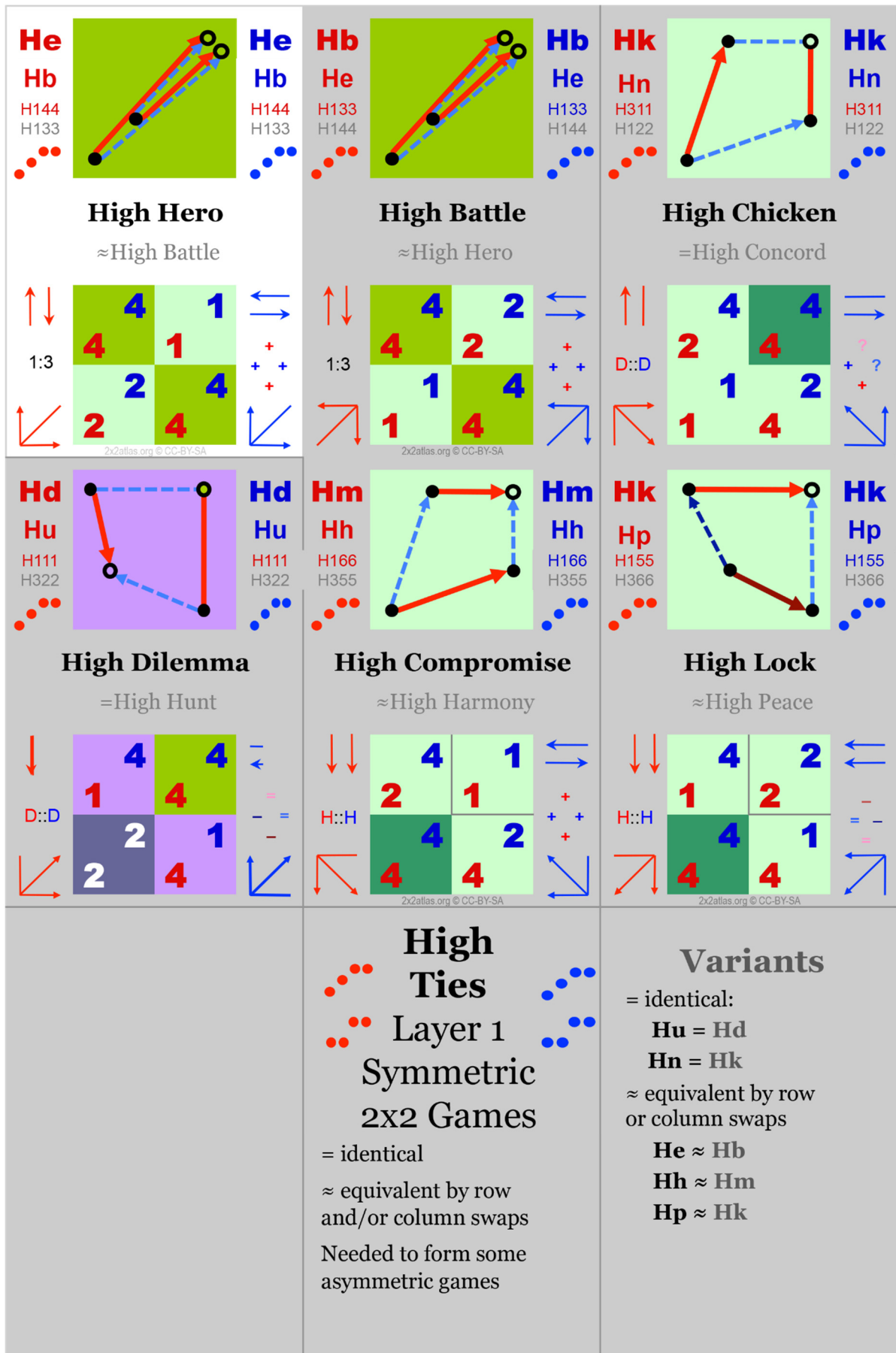


Figure S7. 2 × 2 Game Cards: High Ties Layer 1.

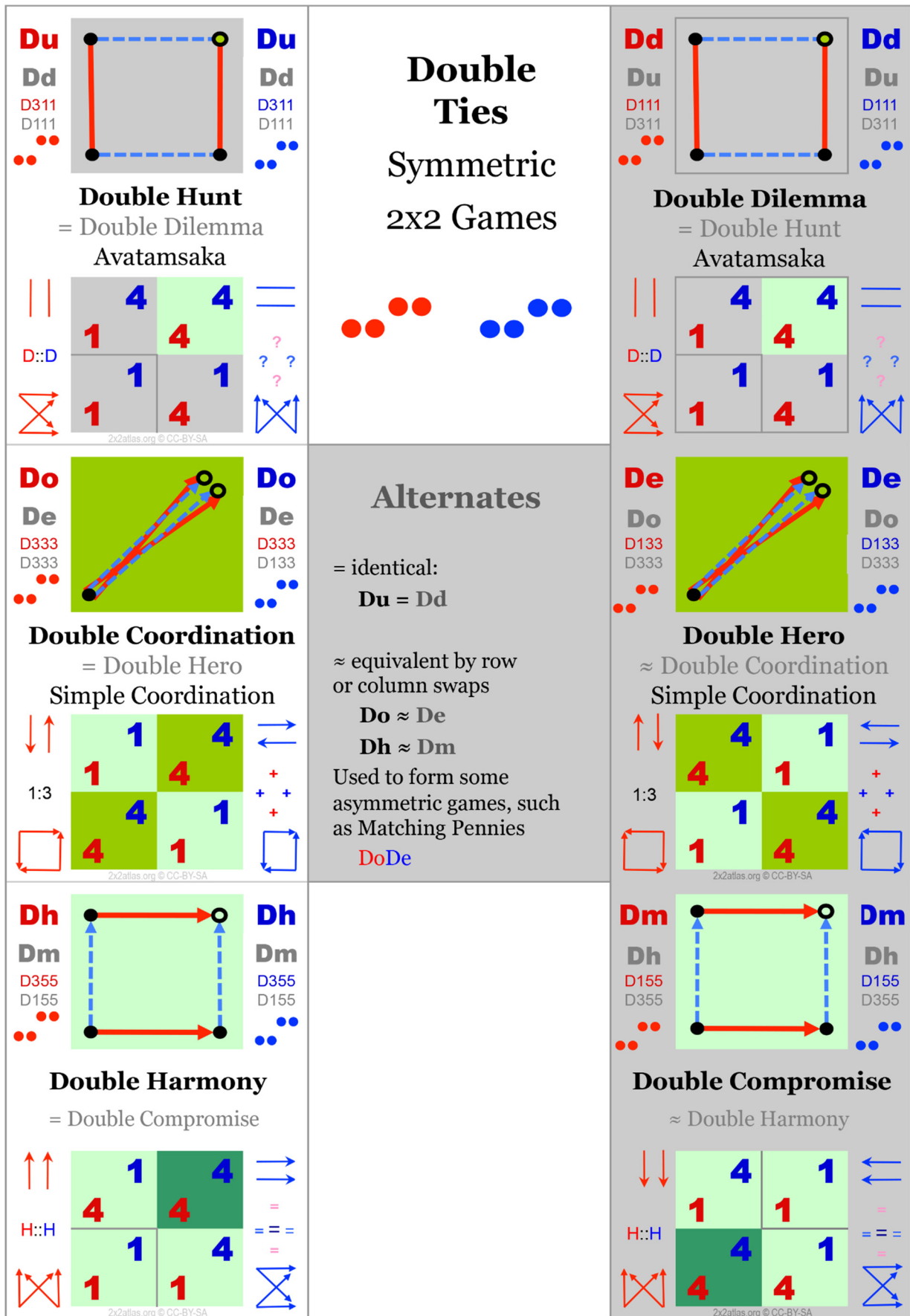


Figure S8. 2 × 2 Game Cards: Double Ties.

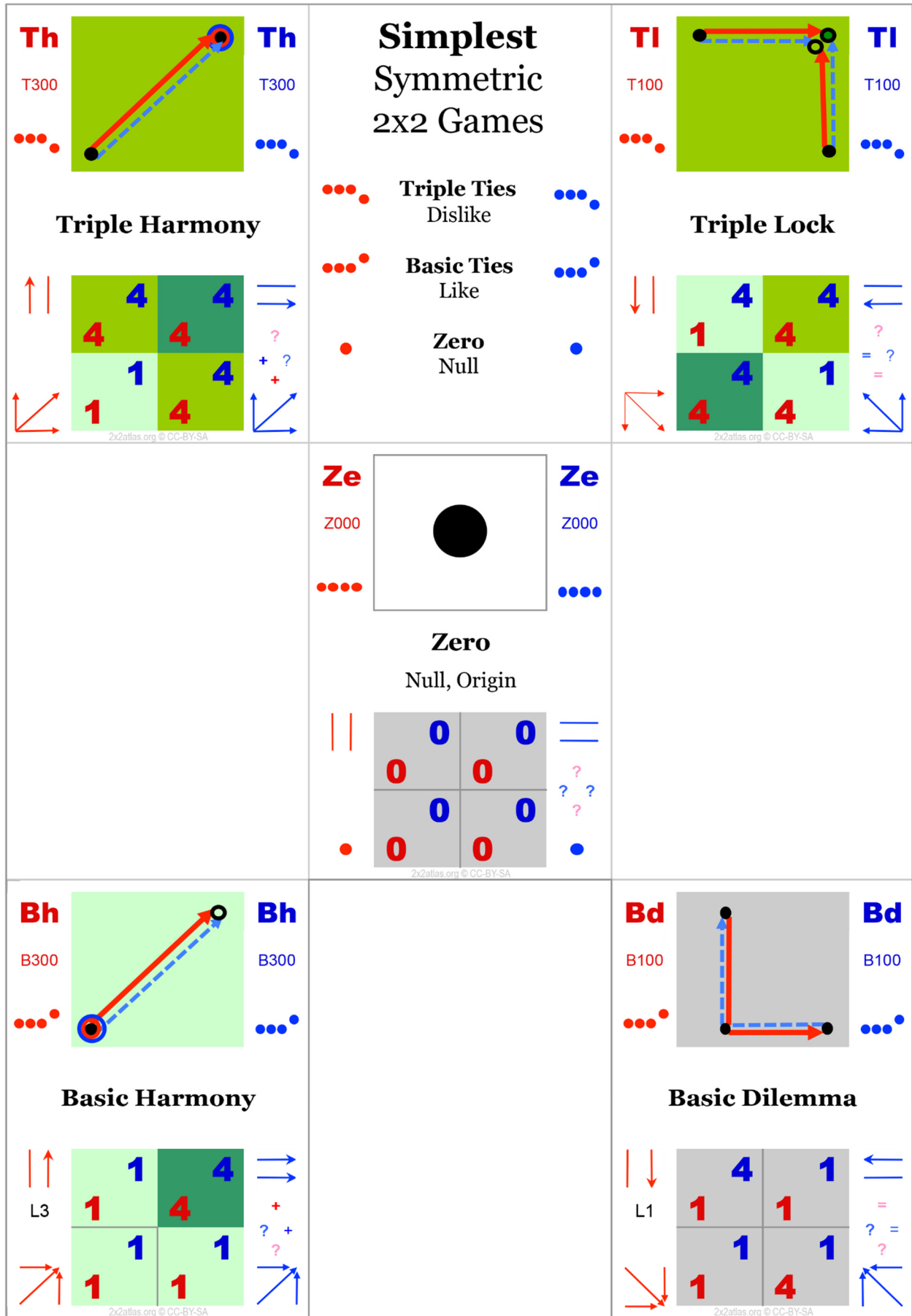


Figure S9. 2 × 2 Game Cards: Simplest.