

Dynamics of Interorganizational Learning under the Aspects of Game Theory

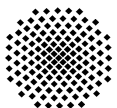
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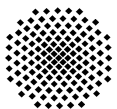
Albany, NY

October 1st and 2nd, 2003

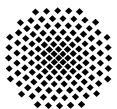


Hypothesis

A learning alliance can only be successful if both parent companies communicate honestly their aspirations.



Dynamics of Interorganizational Learning and Game Theory Literature and Background Information

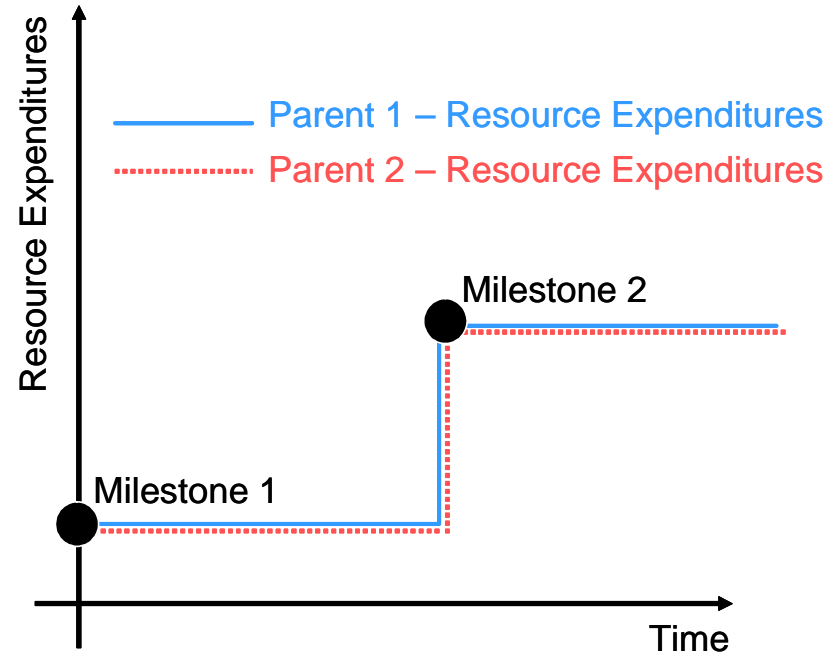


Learning Together in an Alliance - Cooperative Behavior

“Common Benefits”

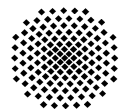
“... [are benefits that a firm can] apply ... to businesses within the scope of the alliance ...”

(Khanna et al. 1998, S. 195.)



Identical resource expenditures

Identical timing of goal attainment



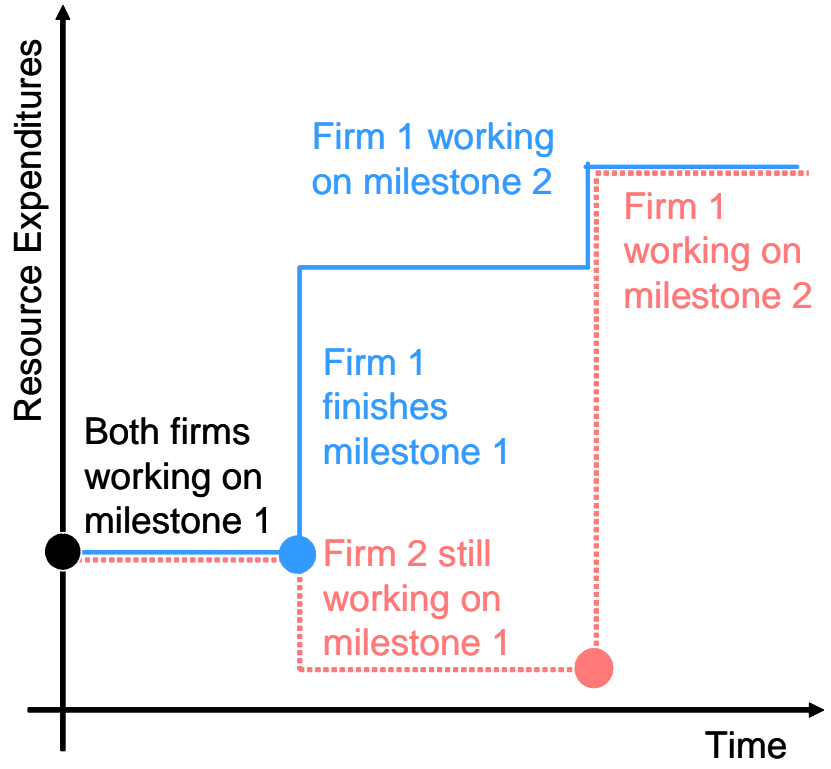
following Khanna et al., 1998.

Learning from the Alliance - Competitive Behavior

“Private Benefits”

“... magnitude of the opportunities that each partner firm has to apply what it learns in the alliance to contexts not governed by the alliance ...”

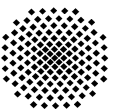
(Khanna et al., 1998, p. 196)



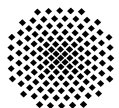
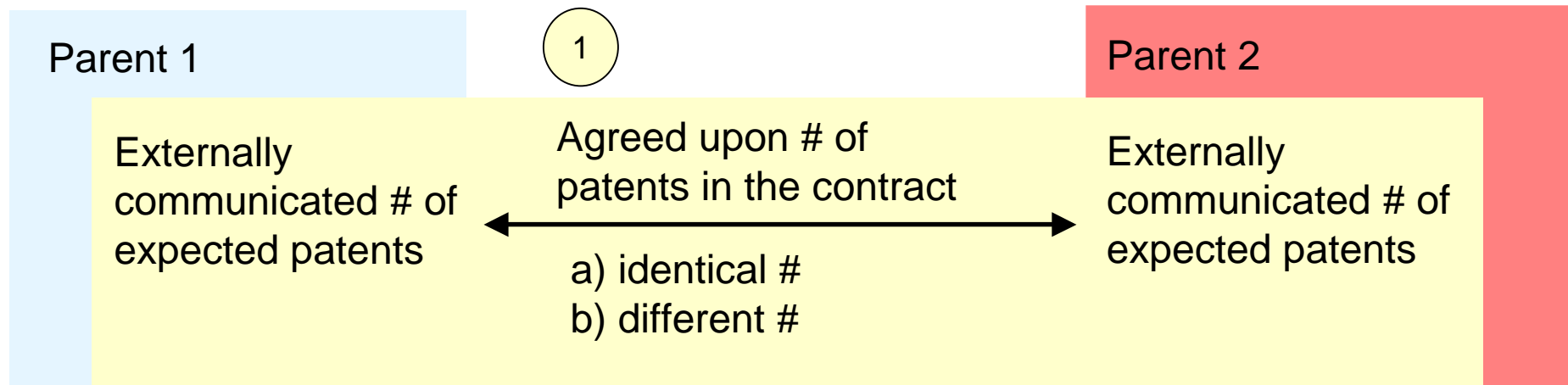
Different resource expenditures

Different timing of goal attainment

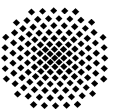
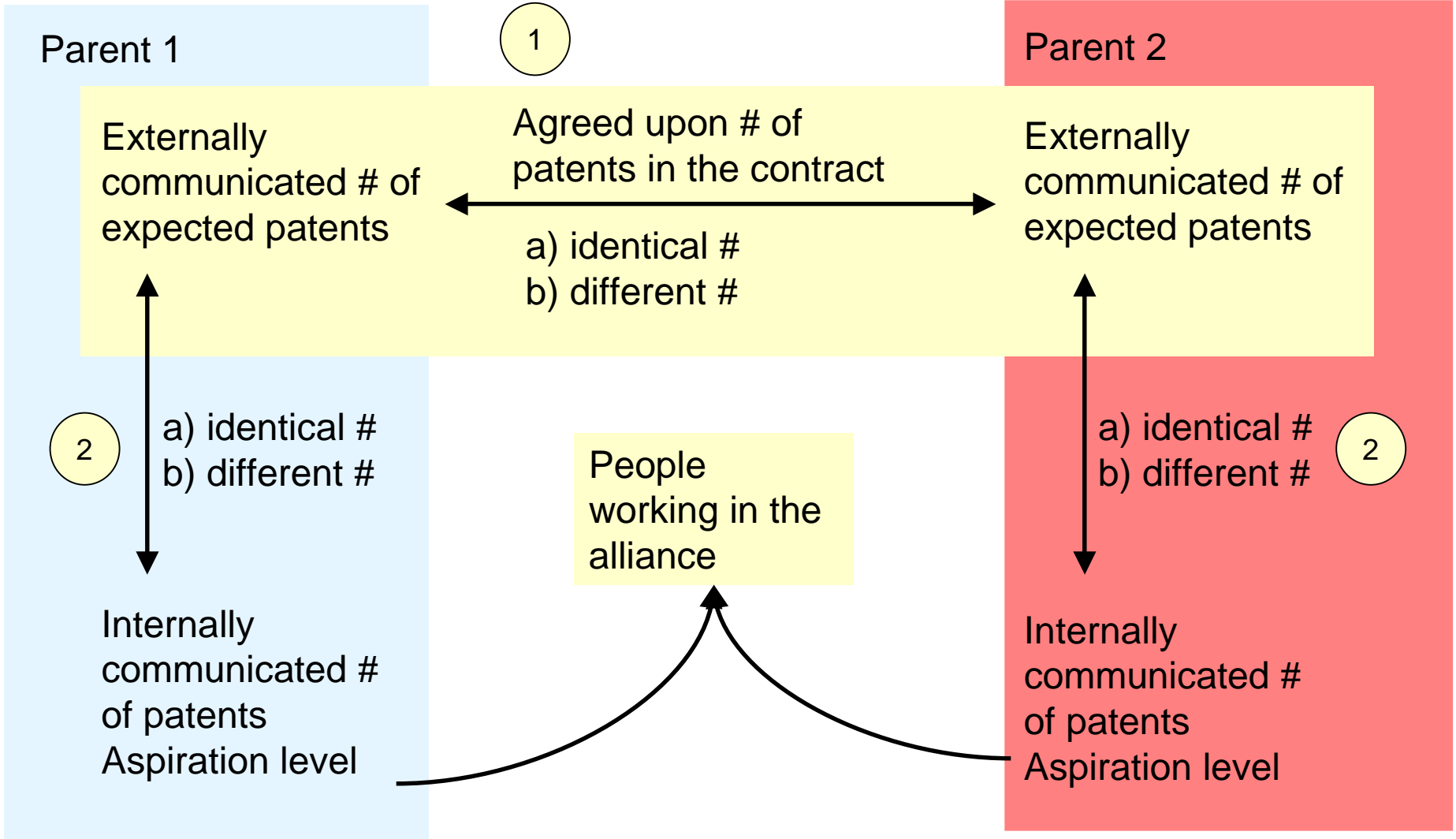
following
 Khanna et al., 1998
 Amburgey, Dacin, Singh, 2000
 Hamel, 1991
 Inkpen, 2000



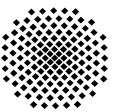
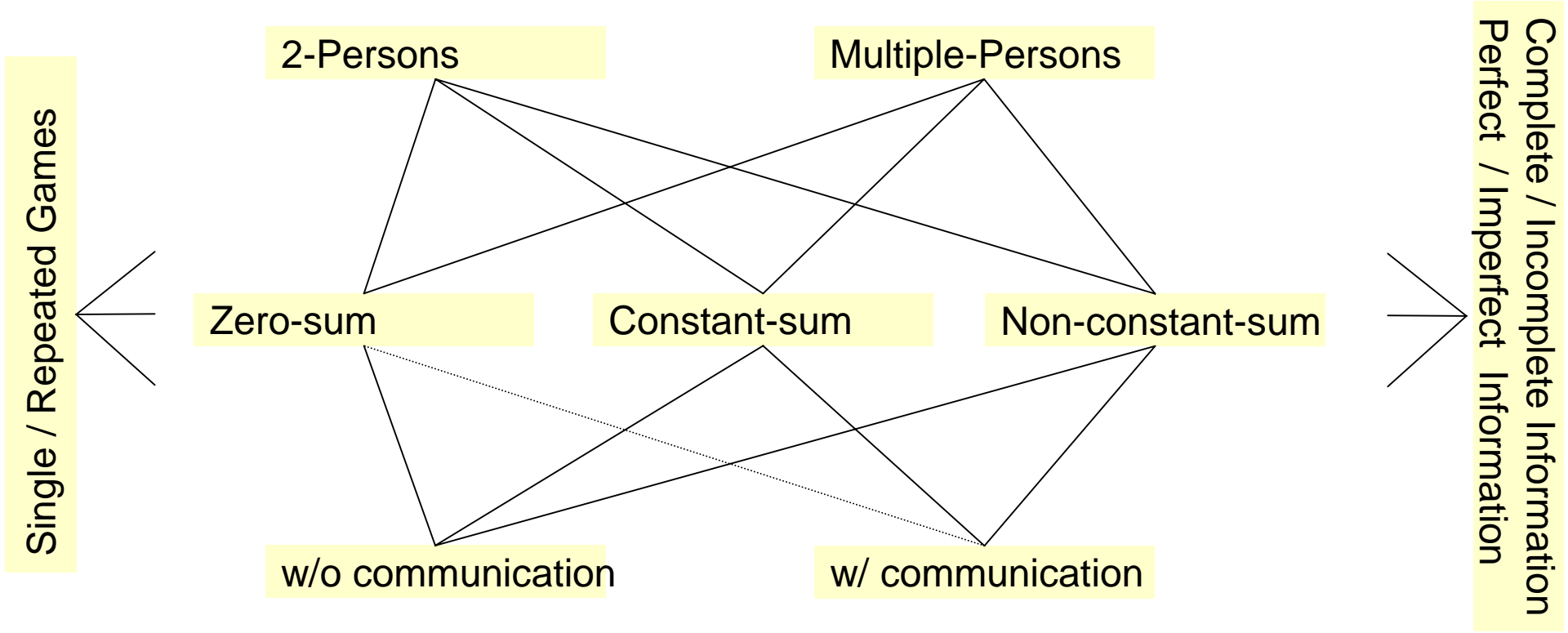
Communicated “Expected Patents” and “Aspiration Level”



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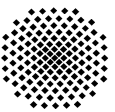
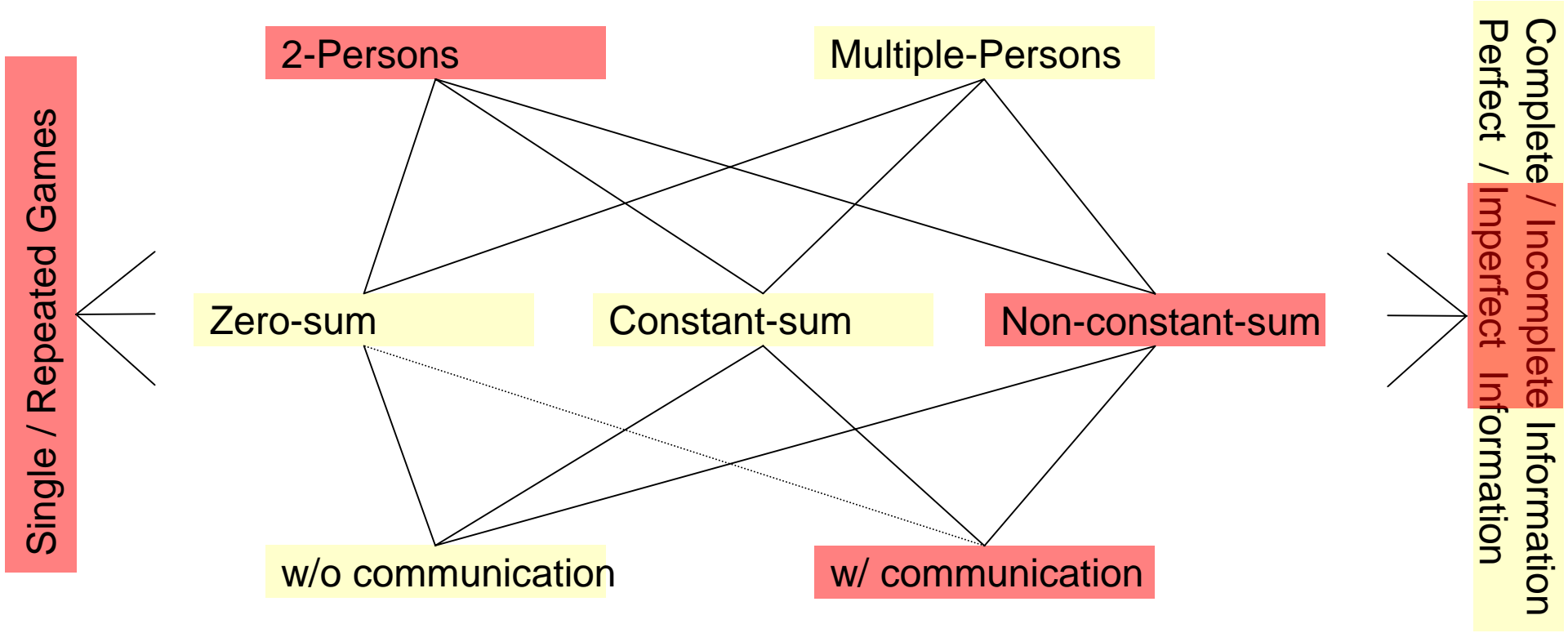


Classification of Strategic Games



Source: Höfer 1997, p.147.

Classification of Strategic Games



Source: Höfer 1997, p.147.

1 Bargaining Game

Special Case: Ultimatum Game

Bargaining About the Distribution of a Surplus

Partner 2

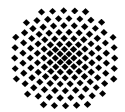
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Höfer, S. (1997), Strategische Allianzen und Spieltheorie
“Jede Spielperiode entscheiden die beiden Allianzpartner, ob sie mit der Aufteilungen in den kommenden Perioden einverstanden sind.” (p. 192)

Strong importance of relative payoffs !

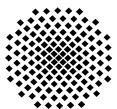
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Question 1:
How can I model such a bargaining situation ?



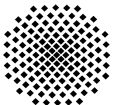
Source: Sally 2003, p.585.

Dynamics of Interorganizational Learning SD-Model



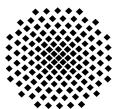
Different Types of Learning Alliances and Their Different Set-up Possibilities

	Alliance is designed for ...	
Type of Learning Occurring in the Learning Alliance	a) ...unique interaction (non-repeated game)	b) ...repeated interaction (n-stage repeated game)
1) Common Learning	1a) 1-Milestone Alliance	1b) n-Milestone Alliance
2) Private Learning	2a) 1-Milestone Alliance	2b) n-Milestone Alliance
3) Common & Private Learning	3a) 1-Milestone Alliance	3b) n-Milestone Alliance

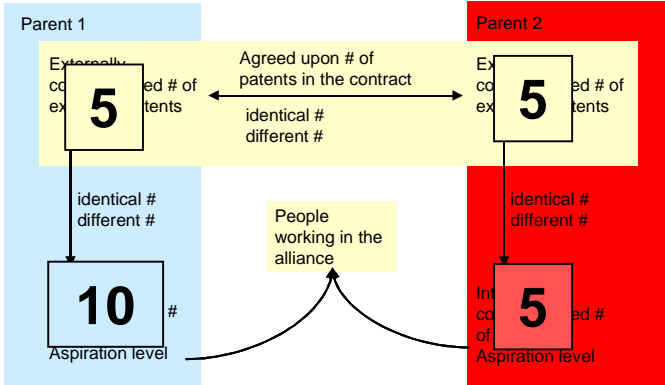


Dynamics of Interorganizational Learning

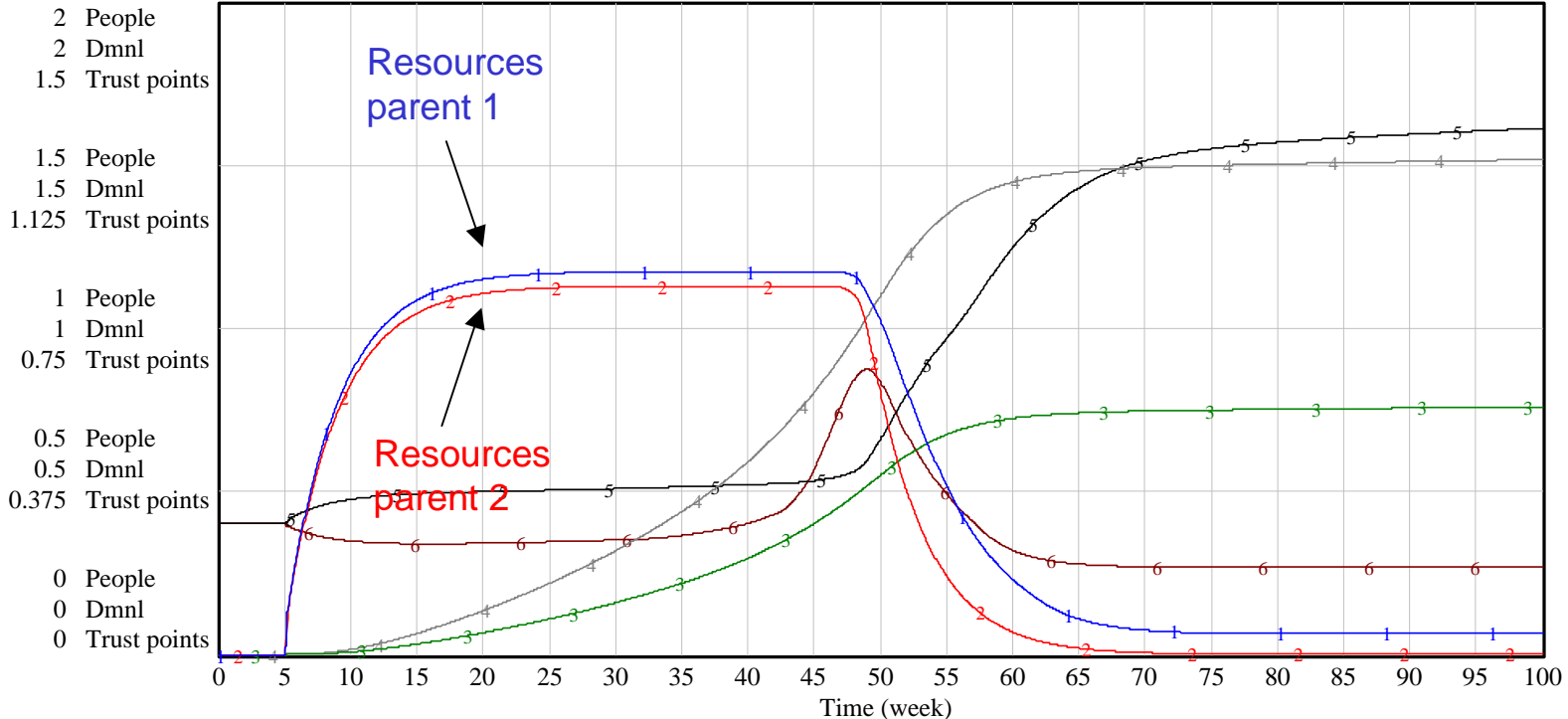
1-Milestone Learning Alliance



1st Scenario: Parent 1 has Higher Aspirations Than it Admits.



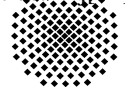
Resources parents 1 and 2



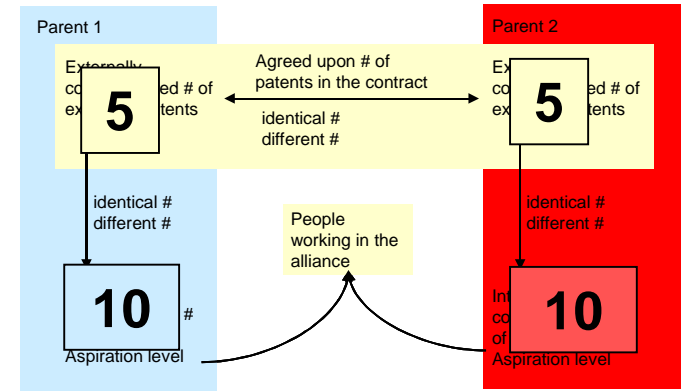
Payoff 1: 1.5
Payoff 2: 0.75

Only parent 1 is satisfied with the alliance outcome.

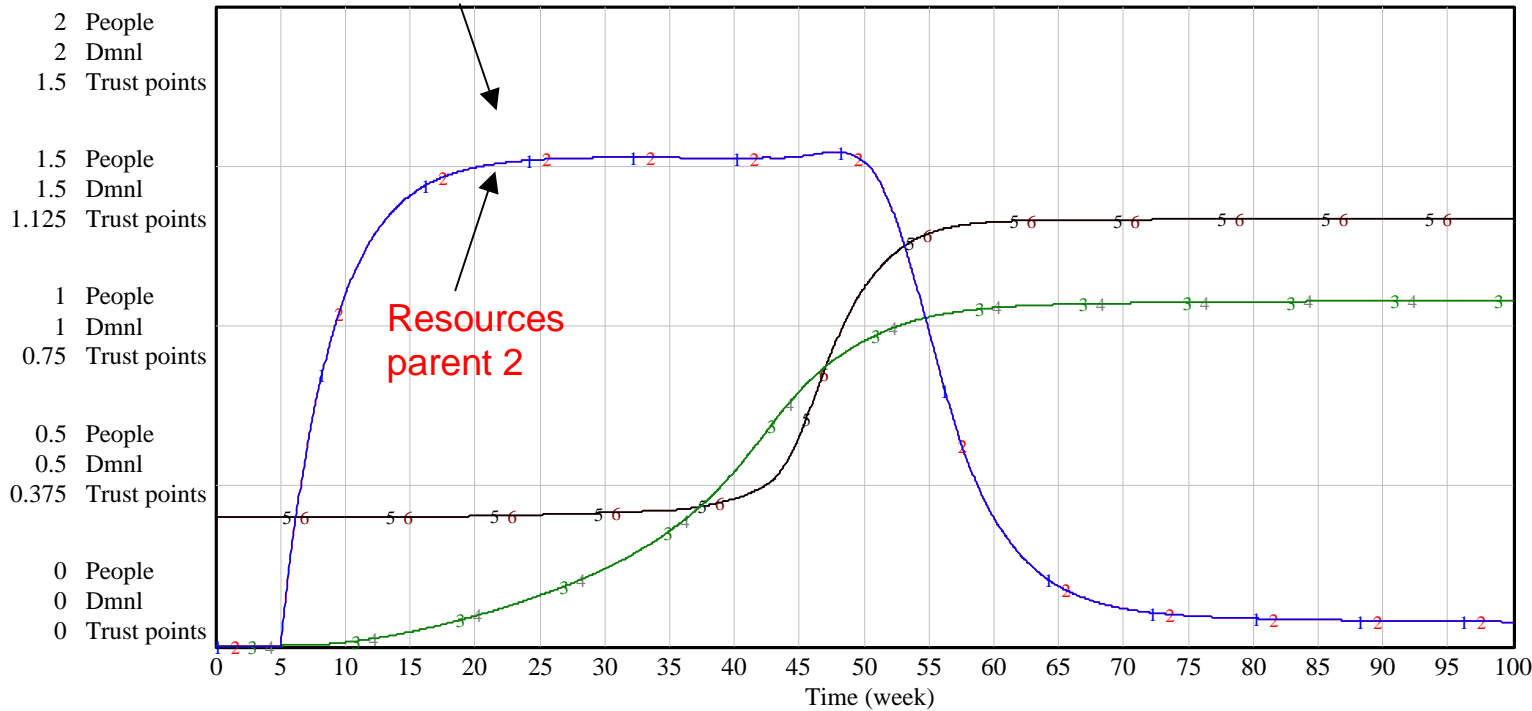
- "Resources active on alliance - parent i"[P1] : all 1st higher hidden exp 1.5
- "Resources active on alliance - parent i"[P2] : all 1st higher hidden exp 0.75
- Degree of aspiration level attainment i[P1] : all 1st higher hidden exp 0.5
- Degree of aspiration level attainment i[P2] : all 1st higher hidden exp 0.5
- Parent i trust in j[P1] : all 1st higher hidden exp 5
- Parent i trust in j[P2] : all 1st higher hidden exp 6



nth Scenario: Parent 1 and 2 have Higher Aspirations Than They Admit.



Resources parent 1 Resources parents 1 and 2



Payoff 1: 1.1
Payoff 2: 1.1

Both parents are finally satisfied with the alliance outcome, but it takes 10 weeks longer to get to the goal as if they had communicated the 10 patents to each other.

- "Resources active on alliance - parent i"[P1]: all both higher
- "Resources active on alliance - parent i"[P2]: all both higher
- Degree of aspiration level attainment i[P1]: all both higher
- Degree of aspiration level attainment i[P2]: all both higher
- Parent i trust in j[P1]: all both higher
- Parent i trust in j[P2]: all both higher



Example: Payoffs

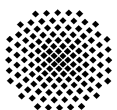
Common Learning 1-Milestone Alliance

		Partner 2 ...	
		a) cooperates	b) defects
Partner 1...	a) cooperates	1.25	1.5
	b) defects	0.75	1.1
		1.25 ←	0.75
		1.5 ←	1.1

Counterintuitive Behavior

Whereas one would think that it is better for one company to **drag its partner into spending more resources** on the alliance to speed up the process via understating its goals, there is **no additional** payoff for it.

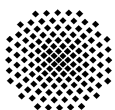
However, the partner receives an additional payoff that he even might not be interested in. So, the partner's real payoff might be even smaller (rather 1.0 than 1.5).



Dynamics of Interorganizational Learning n-Milestone Learning Alliance

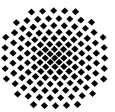
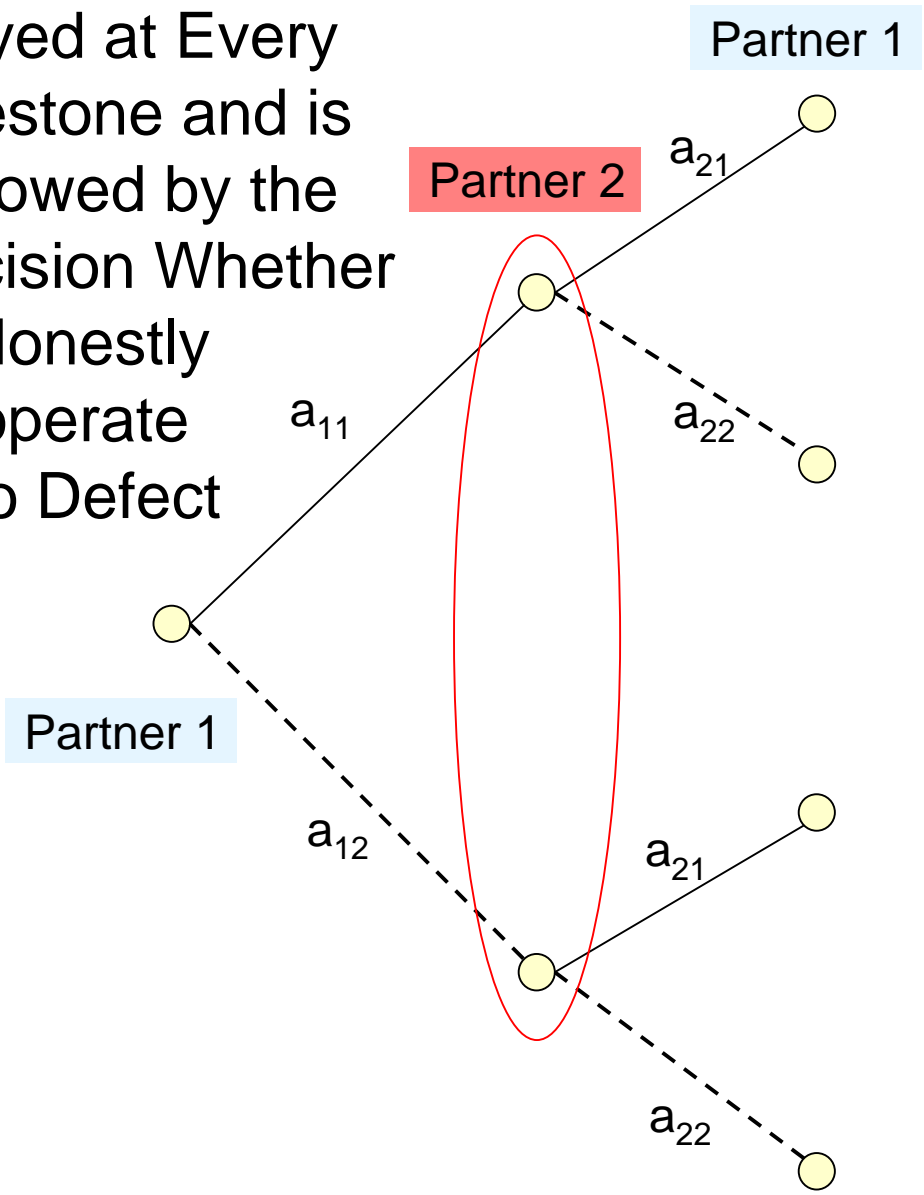
Axelrod, R. (1984), The Evolution of Cooperation

“As long as interaction is not iterated, cooperation is very difficult. That is why an important way to promote cooperation is to arrange that the same two individuals will meet each other again, be able to recognize each other from the past, and to recall how the other has behaved until now.” (p. 125)

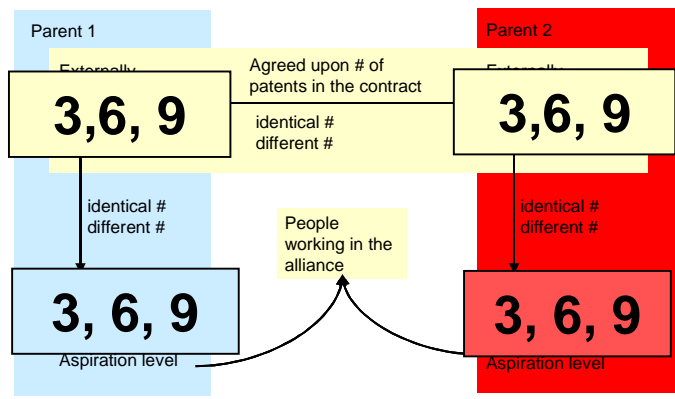


2 The Bargaining Game is

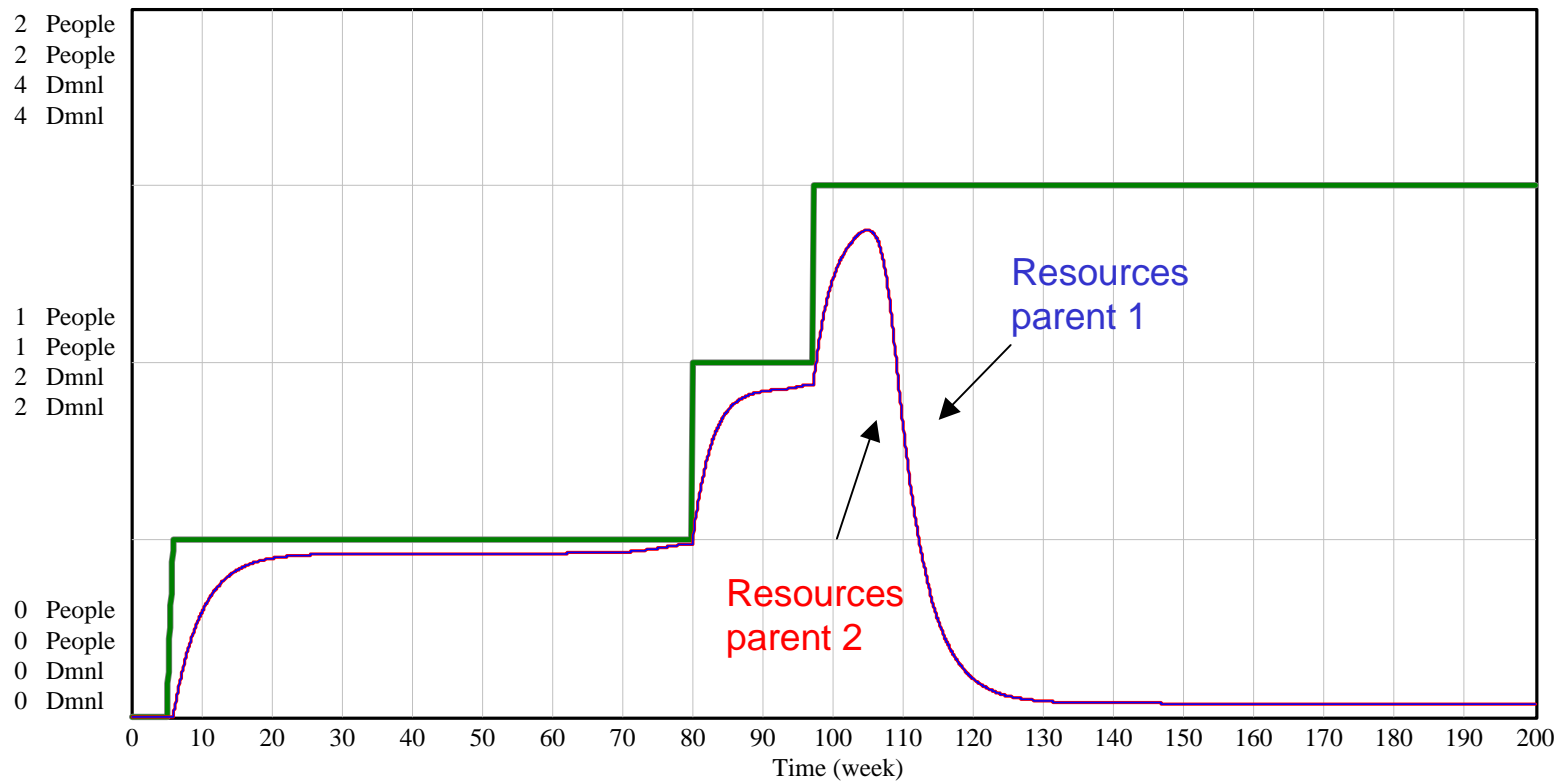
Played at Every Milestone and is Followed by the Decision Whether to Honestly Cooperate or to Defect



Baserun: Both Parents Have the Same (Hidden) Aspirations and Also Communicate Them to the Partner



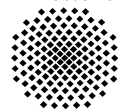
Resources and Milestones



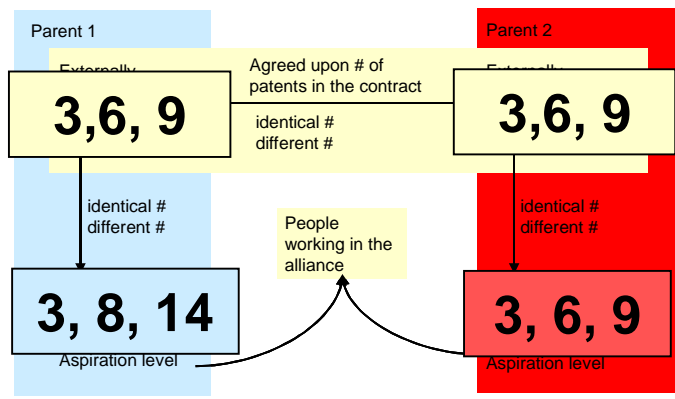
Payoff 1: 1.2
 Payoff 2: 1.2

Both parents are satisfied.

- "Resources active on alliance - parent i"[P1] : MM1-11 all
- "Resources active on alliance - parent i"[P2] : MM1-11 all
- Which Milestone externally communicated i[P1] : MM1-11 all
- Which Milestone externally communicated i[P2] : MM1-11 all

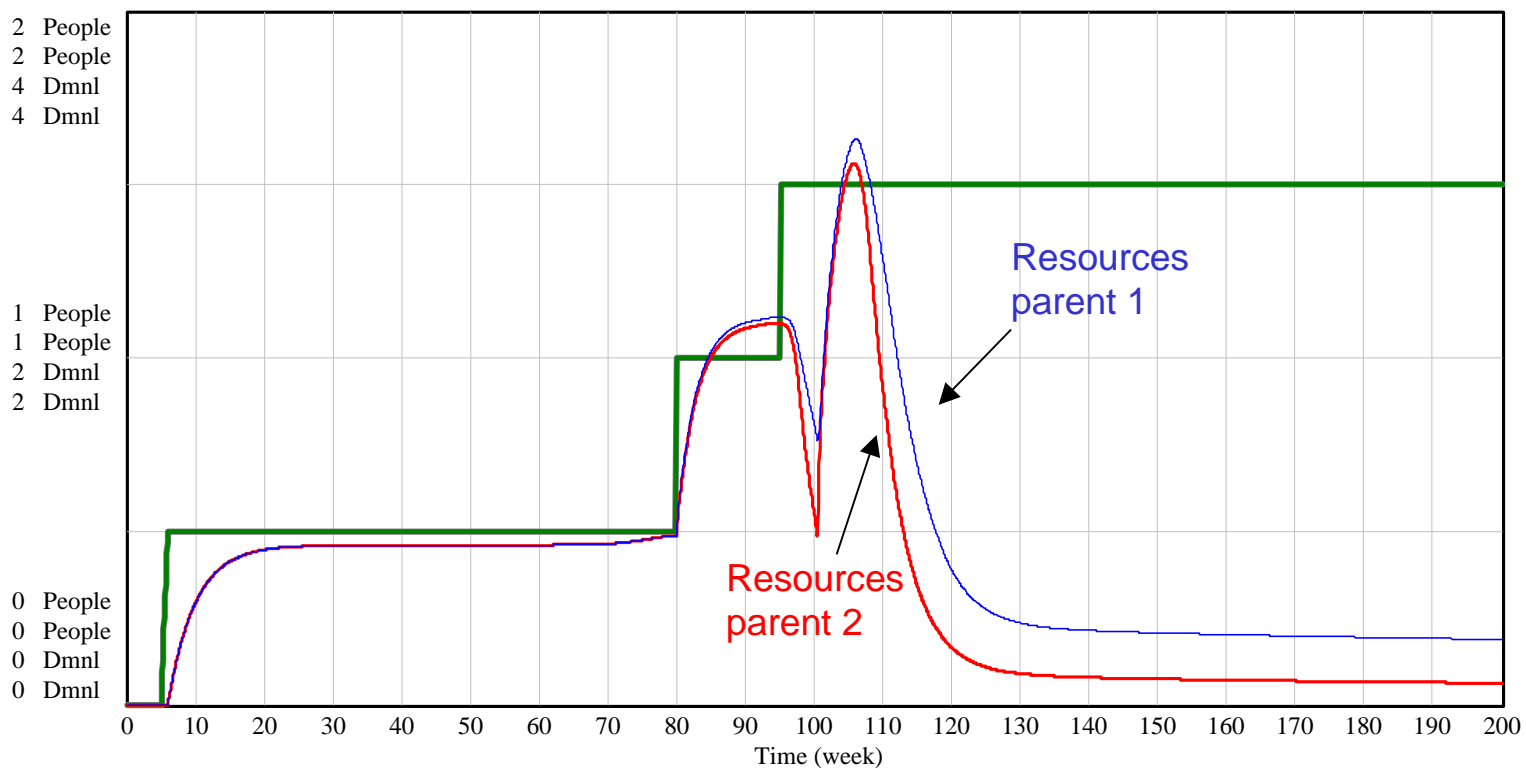


1st Scenario: Parent 1 has Higher Aspirations Than it Admits.

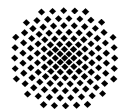


Payoff 1: 0.75
Payoff 2: 1.2

Resources and Milestones



"Resources active on alliance - parent i"[P1] : MM1-11 1 higher hidden expect — People
 "Resources active on alliance - parent i"[P2] : MM1-11 1 higher hidden expect — People
 Which Milestone externally communicated i[P1] : MM1-11 1 higher hidden expect — Dmnl
 Which Milestone externally communicated i[P2] : MM1-11 1 higher hidden expect — Dmnl



Dynamics of Interorganizational Learning

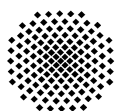
Research Questions

General

1. What do you think about the **combination** of Learning Alliance Theory and Game Theory ?
2. What do you think about the **structure** of my approach, first let the alliance partners bargain and second decide if they cheat or not ?
3. Have you heard from anybody **applying** Game Theory to System Dynamics models ?

Modeling

1. How can I model a **bargaining situation** in terms of the Ultimatum Game ?
2. Game theory models often include **variables** like
 - Bargaining Costs and
 - Discounting Factors.



How relevant do you think are they for the dynamics ?