

**Session 25**  
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**IOM455 April 19, 2010**

**Outline**

- Questions? Comments?
- Evaluation
- Case Presentation A&D
- Case Presentation Warner Bros.
- Negotiation
  - Some more game theory
  - Reservation values

4/26 2 cases  
Review

4/28 12:45  
Review

→ Need a volunteer!  
Schedule for balance of semester

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**Basic Problem Definition - continued**

**Reservation Prices:**

**s : minimum the seller is willing to settle for**

**b : maximum the buyer is willing to pay**

**$X^*$  : final contract value (if any)**

**$X^* - s$  : Seller's surplus**

**$b - X^*$  : Buyer's surplus**

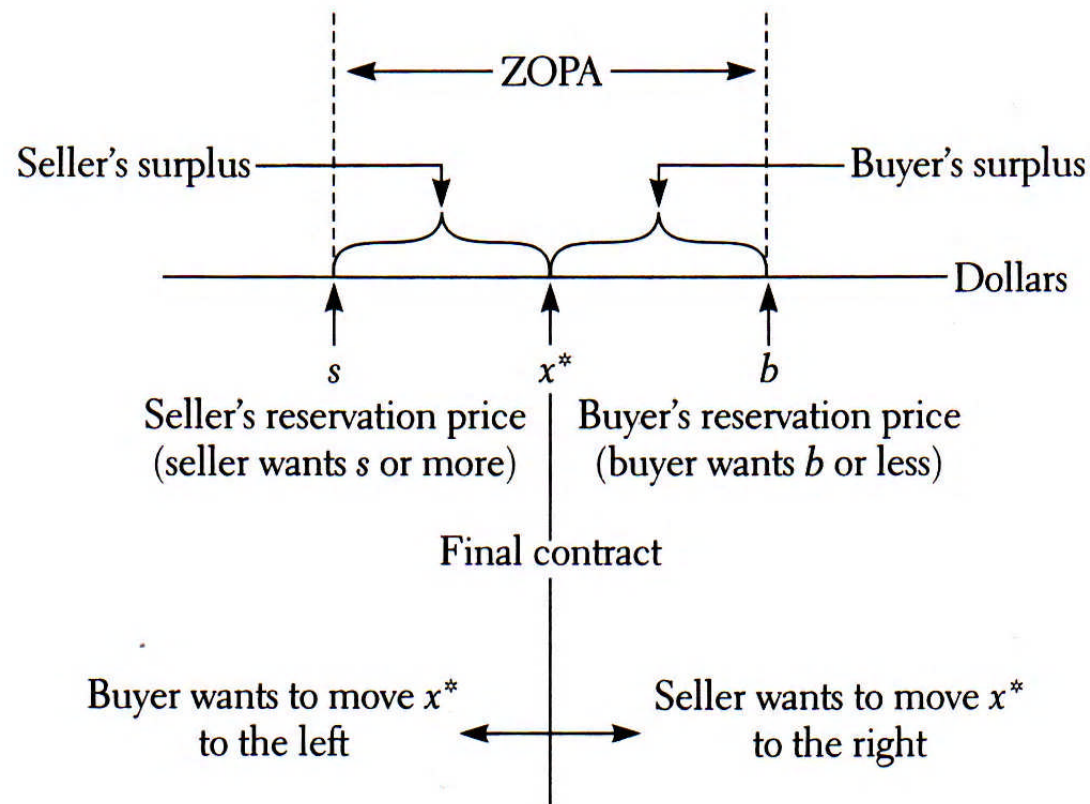
**In general these are unknown to each other (one is known – one's own, and the other is a random variable)**

**Reservation prices generally do not become public**

**The more they lie, the more it pays to be honest and vice versa**

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**Zone of Possible Agreement**



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**Class exercise – known distributions**

**This exercise involves negotiation between a buyer and a seller (e.g. the buyer is a program manager and the seller is the controller, this could also be about completion dates between customer and provider)**

**The reservation price distributions are known to both.**

**In this case they are uniformly distributed (every value in the range has equal probability)**

**Buyer \$100 to \$200**

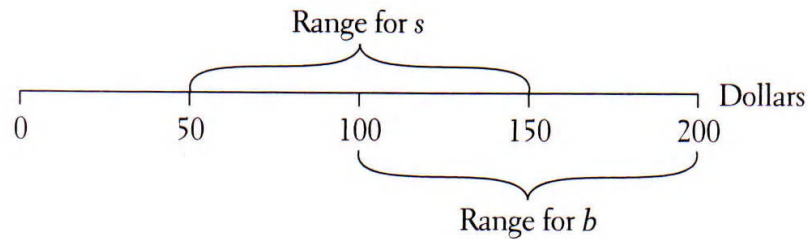
**Seller \$50 to \$150**

**This means there is a 87.5% chance of being able to come to an agreement (See next page)**

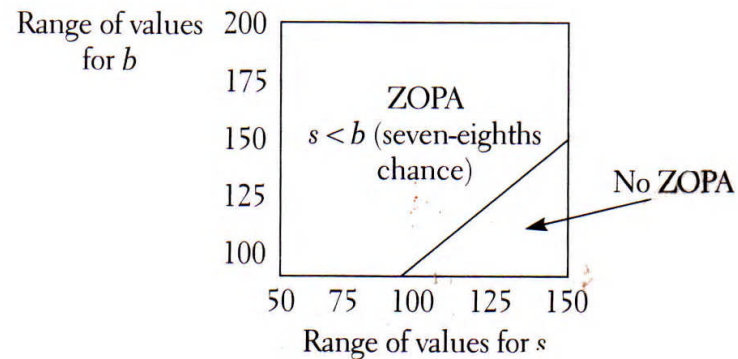
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**Class exercise – known distributions**

**ZOPA – Zone of possible agreement – overlap of the ranges of the buyer's and seller's reservation values**



Distribution of reservation prices for the canonical case.



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**Uncertainty**

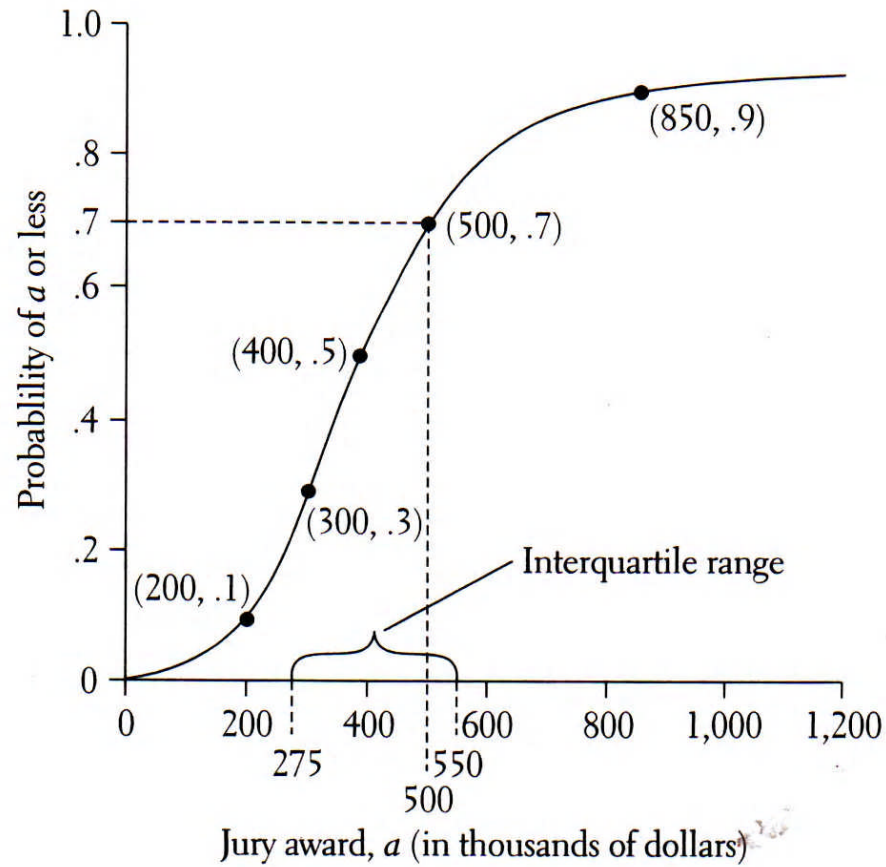
**Tree diagrams**

**Cumulative probability distributions**

**Utility Curves**

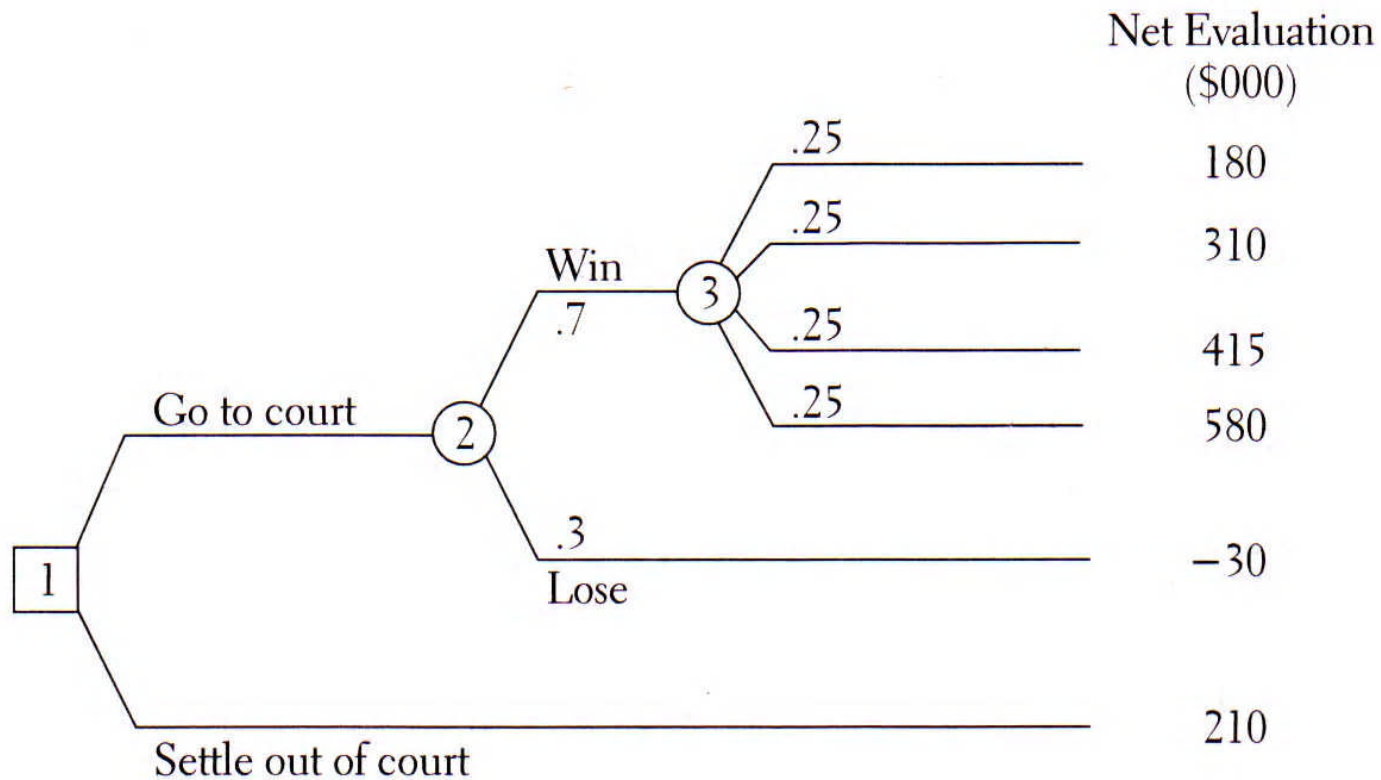
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**Cumulative Distribution**



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**Tree Diagram**



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**The effects of time**

**We must choose when to come to an agreement**

**It requires patience**

**Sometimes there are deadlines**

**Self-imposed penalties**

**Real penalties**

**Most people are too impatient**

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**Auctions**

**Distributive negotiation with 3 or more parties**

**It is distributive between the auctioneer and an individual bidder**

**It is competitive among bidders – it gets in the way of the distributive aspect**

- 1. Open, ascending, outcry (English)**
- 2. Open, descending, outcry (Dutch)**
- 3. Sealed bids**
- 4. High bidders wins, pays second price (Philatelic)**
- 5. Reciprocal (buy, sell)**

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**Two party negotiations – win/win Phase II Template  
Analysis**

**Efficient contracts**

**Joint ordinal rankings**

**Dominance, elimination of non-contenders**

**Extreme efficiency**

**Fair division**

**The problem**

**Proposed solutions**

**FOTE analysis**

**What is fair?**

**Mathematical approaches**

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**Two party negotiations – win/win Phase II Template  
Analysis**

**The Fair Division Problem**

**n items**

**2 parties**

**all n items to allocated to the two parties**

**no item may be split**

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**Two party negotiations – win/win Phase II Template  
Analysis**

**Proposed solutions**

**Sequential Choice**

**Toss a coin**

**Decide and choose**

**Allocation of points**

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**Allocation**

**See spreadsheet**

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**Efficiency**

**When you compare two items that each have two dimensions,  
such as:**

$$C_1 (A, B) = (6,8)$$

$$C_2 (A, B) = (5,4)$$

**We say that  $C_1$  is more efficient or dominates  $C_2$  if:**

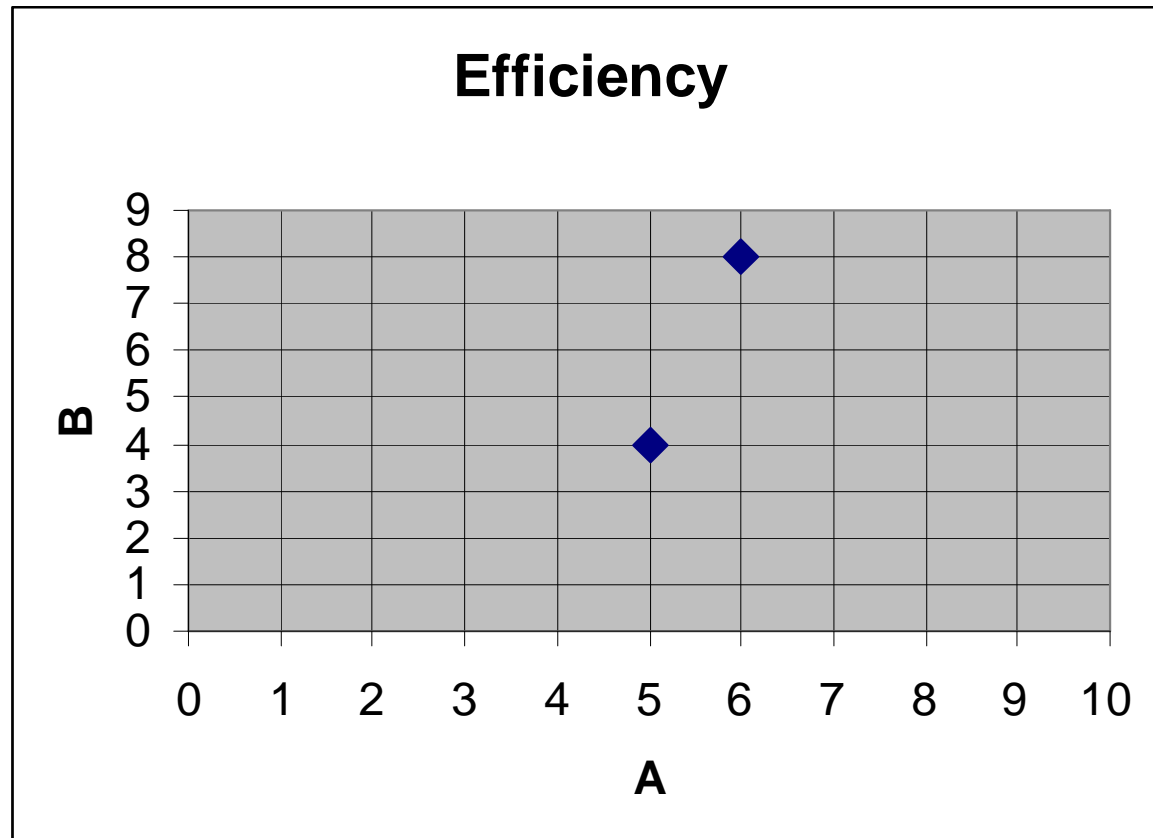
**Either**  $C_{1A} > C_{2A}$  and  $C_{1B} \geq C_{2B}$

**Or**  $C_{1A} \geq C_{2A}$  and  $C_{1B} > C_{2B}$

**We will plot the  $C_i$  as points in a two dimensional plane, with A  
as one Axis and B as another**

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**Efficiency - continued**

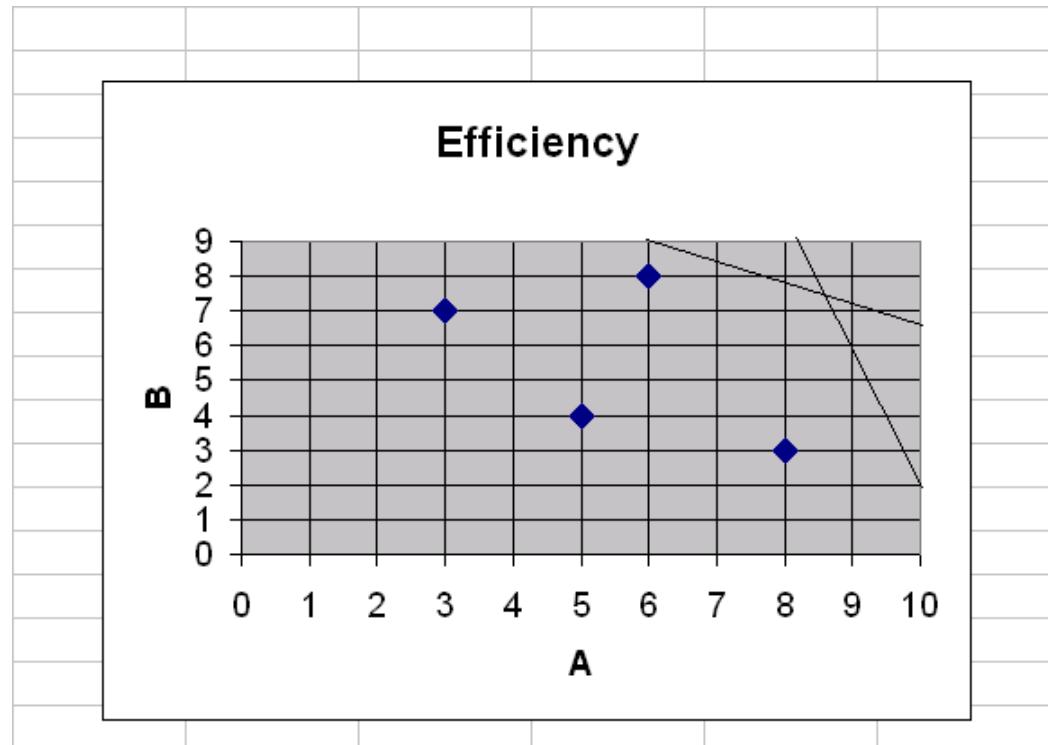


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**Efficiency – extreme efficiency**

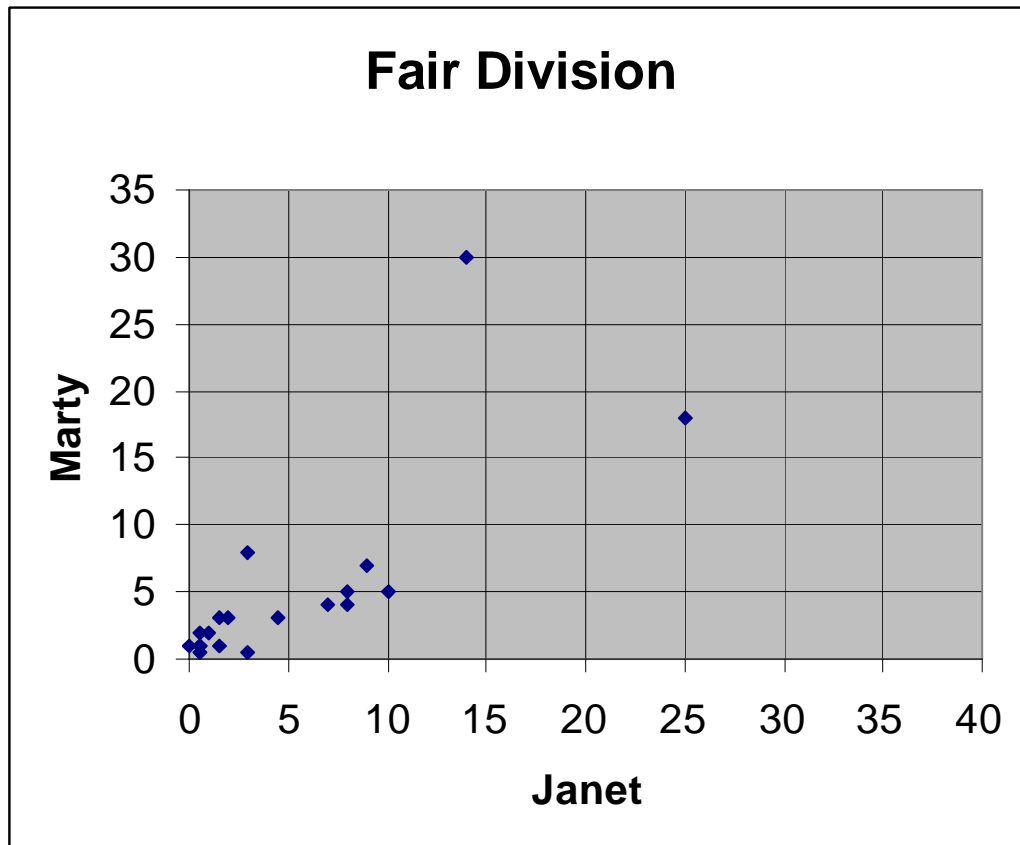
**The concept of extreme efficiency is necessary to decide among several efficient points**

**In order to do this, we have to have a relationship (linear) between A and B**



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**Fair Division**



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**Case Study – Electronic Manufacturing Working Group**

**As Xerox expanded around the world in the 60's and 70's its resources were severely strained and they formed alliances. The first major one was with Rank Corporation in the UK. This joint venture (50-50) became known as Rank Xerox and operated independently in Europe and the Middle East.**

**Later, Fuji corporation in Japan and Rank Xerox formed a joint venture (again 50-50) called Fuji Xerox which operated in the Far East.**

**By the late 80's Xerox, Rank Xerox and Fuji Xerox each had design and manufacturing centers in their respective territories and operated relatively independently of each other.**

**Senior managements decided that more cooperation was needed.**

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**Behavioral Realities**

**Most negotiators do not prepare in anywhere the detail we have proposed**

**Most negotiators do not follow the FOTE approach**

**After completion, most negotiators think they have done well and blame the other party for any difficulties**

**Simulations are instructive and enjoyable. Outcomes tend to vary widely**

**In the real world negotiators are evaluated on achieving feasible results**

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**Behavioral Realities – Styles of negotiating**

**The Dance of Packages**

**Each party proposes a complete contract**

**Followed by successive complete counterproposals, by one or the other or both**

**Joint construction of a compromise**

**Build a package based on a succession of compromises on individual issues – nothing is settled until everything is settled**

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**Behavioral Realities – Biases, Anomalies and Errors**

**Zero sum bias**

assuming a zero sum game when it is not

**Social Utility**

Evaluating one's own outcome relative to the outcomes of the other negotiators

**Reactive Devaluation**

If the other guy thinks this is a good idea, I'm suspicious

**Negative attribution**

Overemphasize stable traits in the opponent

Overemphasize situational factors in oneself

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**Behavioral Realities – Cultural Differences**

**Differences within and between**

**In subgroups, within differences swamp between differences  
most of the time**

**An individual belongs to many “cultures” simultaneously**

**The more people differ, the larger the potential for joint gains**

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**Question**

**In Ch. 15 of Raiffa, he states that most negotiations don't follow FOTE, but instead dissemble and spend more time cutting up the pie instead of trying to make the pie bigger for both sides. Why do you suppose that is? Is it because the parties don't trust that they are truly doing FOTE, or is it because it consumes too much time?**

**I think the major reason is distrust. The second one is probably that most people don't realize that both parties have much to gain from FOTE.**