

## Typos Theory of Backgammon

Page 35: in diagram 3.7 pip counts are too low (92-93 instead of **94-95**)

Page 38: it has to say ... **one** of the scenarios.....

Page 41: . instead of ,.

Page 48: in definition 4.2 it has to say: ...that was **a** take.....

Page 56: it says postion instead of **position**

Page 56: **14** shots instead of 16

Page 66: The index "P" stands for "Pass". In section 5.2.1, however, I used it for "Player". In the corrected version I simply took the index out.

### 5.2.1 The Relation Between MWC and DMP Probabilities

The match winning chances are the probabilities of winning the match for each side, and they behave exactly like probabilities in a DMP game. When we know the winning probabilities in a DMP position, we can apply the formula  $E_p = 2 \cdot p - 1$  from definition 2.1 on page 20 to calculate the fair price one player should pay to the other if the game were stopped at that moment. When we stop a match at any given point where we know the player's MWC, we just need to substitute  $M_p$  for  $p_p$  in the formula to determine the fair price:  $2 \cdot M_p - 1$ .

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Page 68: in diagram 5.1 it should be **34.7%** instead of 37.7%

Page 80: **MWC** instead of MCW

Page 84: Ratio column: **24/10= 2.4** instead of 26/10=2.6

Page 87: figure 6.4 a): **24** instead of 24.5 at 4 away/ 8 away

Page 90: figure 6.5 a): **28** instead of 27 at 7 away/ 4 away

Page 93: figure 6.8 c): **0.69** instead of 0.67 at 9 away 6 away

Page 94: an index got lost somewhere in the calculation: it has to say **p<sub>w</sub>** instead of just p.

$$p^* \cdot M_w + (1 - p^*) \cdot M_l = (p - p_{gw}) \cdot M_w + p_{gw} \cdot M_{gw} + (1 - p) \cdot M_l$$

Solving the equation for  $p^*$  results in:

$$p^* = p + p_{gw} \frac{M_{gw} - M_w}{M_w - M_l} = p + p_{gw} \cdot \frac{s}{t} = p + p_{gw} \cdot GV$$

In the same fashion we can adjust for our opponent's gammons and thus reduce a position with gammons to one that has the same equity, but without gammons. ♣

We can now define gammon-adjusted wins for match play.

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Page 105: It has to be **10** numbers instead of 9

Page 132: **winning** instead of wining

Page 134: **-0.303** and not -303.

Page 147: **your** opponent and not you opponent

Page 162: **section 2.2.1** instead of section 2.4

Page 167: Screenshot wrong color. White is the favorite. Corrected now

Page 174: one "numbers" too much

Page 175: figure 11.1: it has to say **of** and not or

Page 177: one "also" too much

Page 186: Diagram subtext **53** instead of 54

Page 189: **your** take/pass decision instead of you take/pass decision

Page 224: **19** shots instead of 18 shots

Page 255: **just a little** instead of just little

Page 269: **show** instead of shows

- Page 284: In Figure 5.1 it has to say **336** instead of 239 at 4away 2away
- Page 285: **get** it instead of it get
- Page 290: **White** instead of Black in the text
- Page 309: remove **a**
- Page 331: **too** instead of to
- Page 337: **prize** instead of price

Two more mistakes that are not the author's fault:

Page 163: in the script it says correctly "10.4" but in the book it says only "10". Same happened on page 195.

## Free Pass corrected: In new version it is only free at PC/2away

### The Pass Is only Free at PC/2-Away

There is the widespread belief that there is little difference between PC/2-away and other PC/even-away scores regarding the free pass. However, applying the concept in the same fashion at PC/4-away, for example, can lead to sizable mistakes, as happened to me in position 8.3. I knew that I was a substantial underdog so I decided to use my "free pass", especially since it was perhaps my last opportunity to do so. My assessment was correct but not my conclusion: with only 47.7% winning chances the position is still a fairly comfortable take at PC/4-away and of course a big pass at PC/2-away.

Calculations regarding the cube at PC/even-away are the same as when we are 2-away: the cube is dead and only our opponent's gammon wins count. This means that we should pass when our gammon adjusted wins are lower than our take point. The only difference from the 2-away situation is that our take points at PC/even-away are all very high, so that we indeed have to pass frequently after a bad opening sequence, but they are still much lower than 50%. Let us do the calculation for position 8.3 where our take point is 33.9% and our opponent's gammon value is 1.05 (see figures 8.1 and 8.2):

$$GAW = 47.7\% - 11.9\% \cdot 1.05 \approx 35.2\% > 33.9\%$$

Naturally, it is very difficult to estimate wins and gammons with enough precision to find the correct decision over the board. We need some heuristics, but apparently it is not sufficient to realize that we are clearly the underdog

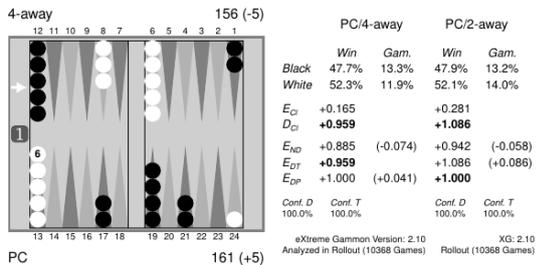


Diagram 8.3: Being the underdog, Black should use his free pass at PC/2-away. At PC/4-away, however, the position is a clear take because of White's decreased gammon rate.

and therefore should use the "free" pass. Additionally, we need to take into account whether our opponent's gammon rate has increased or decreased after the opening sequence. In position 8.3 my thought process over the board should have been something like: "The bad news is that I am the underdog. The good news, however, is that my opponent's best game plan appears to be racing. This means that her gammon wins should be significantly lower than in the starting position, which is why I better play *this* game until the end. After a pass I will have to take the cube, no matter how badly I start the next game."

It is important to note that, unlike in position 8.3, our opponent's gammon rate normally increases when she becomes the favorite after the opening sequence. And when this is the case, we should always pass at PC/4-away. In position 8.4 taking at the score would be a blunder. White is more likely to attack than in 8.3 because she already has a deep inner board point and Black's home board is much weaker. Over the board you can argue as follows: "I lose more gammons than in the starting position and I am not even the favorite to win the game. That's why I should let this one go and hope for a better start in the next game." This argument doesn't hold anymore when Black is at PC/6-away: White's gammon value (0.57) is much lower than at PC/4-away, so that a gammon loss is less of a disaster for Black. As a result, his GAW are slightly higher than his take point. Playing this game until the end has the advantage that if Black loses, he still has the option of passing after a bad start in the next game where the cost of losing a gammon is much higher. And after a gammon loss Black has at least his free pass left.

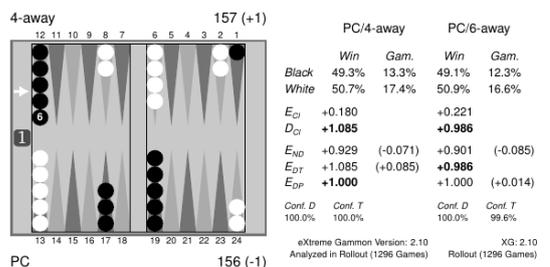


Diagram 8.4: Taking is a blunder at PC/4-away because of White's increased gammon rate. At PC/6-away her gammon value is much smaller.