GUIDE IN HOW TO APPLY McMAHON SCORES IN A SWISS-McMAHON TOURNAMENT

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Introduction

This guide is concerned with the proper use of McMahon scores in a Swiss-McMahon tournament.

There are two reasons for using McMahon scores in a Swiss-McMahon tournament: (1) to pair players during a tournament (where, in each round, only players with identical McMahon scores should be paired, whenever possible); and (2) to calculate tie-breaks.

Tournament directors are familiar with the reasons for using McMahon scores both for pairing players and for performing the standard tie-break calculations of SOS (Sum of Opponents' Scores) and SDOS (Sum of Defeated Opponents' Scores); and they use the McMahon scores correctly when the tournaments they direct are "normal," that is, when there is an even number of players (therefore, no byes) and when *all* the players play *all* their games. However, tournament directors unknowingly often misapply the McMahon scores in performing the tie-break calculations when the tournaments fall outside the normal parameters just mentioned. This can lead to unfair tie-break results.

The problem stems from the failure to adjust the McMahon scores of those players who miss rounds, win or lose by default, or receive byes. These adjustments, which this guide seeks to explain, can be made either during the tournament itself or at its end.

Before going on, it's important to remember that in determining the ranking of players in each band, at the end of a tournament, the first consideration is *always* given to each player's total number of victories, including victories for byes and wins by default. The McMahon scores come into consideration as a determining factor in the ranking of players when, and *only* when, two or more players are tied in the number of their victories.[1]

I. Adjusting the McMahon Scores During a Tournament

Tournament directors familiar with the Swiss-McMahon system know the following basic rule in using the McMahon score: this score is increased by one point for each game won, including wins for byes and defaults; and it stays the same for each game lost.

This cardinal rule, however, does have one important exception. If a player enters a tournament after it has begun, or if he or she misses *n* rounds during a tournament, his or her McMahon score must be increased by ½ point for each round missed. The reason for making this adjustment *during* a tournament is simply to allow for proper pairings. (If a player leaves

[1] Of course, while it's true that each player's final McMahon score reflects (or is meant to reflect) his or her own total number of victories at the end of a tournament, these final scores can be "incorrect" when used in the tie-break calculations of tied players for the reasons given in the previous paragraph. If adjustments aren't made, using these faulty scores in determining the ranking of tied players will produce unfair tie-break results.

a tournament before its end, the tournament director need no longer make this adjustment *during* the tournament; he or she can make it at the end.)

This practice of awarding ½ point for each missed round has no bearing on the ranking of a player in his or her band, since, as was stated earlier, this ranking is based on the number of victories (including byes and wins by default), not on the final McMahon score. However, if such a player is tied in the number of victories with another player at the end of a tournament, this is when the McMahon scores and the tie-break calculations come into play.

II. Adjusting the McMahon Scores at the End of a Tournament

Adjusting Tied Player's Score

The basic procedure in determining the SOS of tied players is to add up the final McMahon scores of each player's opponents, and whichever player has the highest total score wins the tie (when positive numbers are involved, it's the number farthest from zero; when negative numbers are involved, it's the number closest to zero).

However, if one or more of the players involved in a tie has received a bye or has missed one round or more during a tournament, then an adjustment must be made to take into account the missing McMahon score(s). This is done by normalizing the SOS (dividing the sum of the opponents' McMahon scores by the actual number of rounds played by the tied player, then dividing this figure, the quotient, by the number of rounds in the tournament).

Failure to normalize the scores results in unfairly rewarding those tied players who have played less than the total number of rounds in their tournament (*see* Example I).

Example I

PLAYER A		PLAYER B	
Rounds	McMahon Scores	Rounds	McMahon Scores
Opponent 1	–3.0	Opponent 1	–3.0
Opponent 2	–3.0	Opponent 2	–3.0
Opponent 3	–3.0	Opponent 3	–3.0
Opponent 4	–3.0	Opponent 4	–3.0
No opponent	Bye	Opponent 5	–3.0
Opponent 6	–4.0	Opponent 6	–4.0
SOS:	–16.0	SOS:	–19.0
Normalized SOS:	–19.2	Normalized SOS:	–19.0

Without normalizing the SOS score, Player A would unfairly win the tie-break simply because he played one game less than Player B.

Adjusting Opponents' Scores

Before proceeding to the SOS of tied players, the individual McMahon scores of each opponent used in calculating the SOS must be inspected to make sure that they, too, don't require some adjustment.

Although victories due to byes and defaults are given full points in determining the ranking of players in their bands, each one of these points must be reduced to ½ point when determining each opponent's final McMahon score used in calculating the SOS of tied players. Conversely, any player who loses by default or who misses *n* rounds during a tournament must be awarded ½ point for each loss by default or missed round.[2]

The following example is taken from an actual tournament. In this event, four players were tied for first place with four wins each. After using the first tie-break calculation (SOS), three of the four players were still tied for first place. In this band, two players (No. 2 and 6, marked by asterisks) each lost their last game by default, and they lost their defaulted games to players with whom the three tied players did not play, meaning that none of them could benefit from the defaulted wins.

Example II

PLAYER A			PLAYER B			PLAYER C		
Opponent ID Number	Unadjusted Scores	Adjusted Scores	Opponent ID Number	Unadjusted Scores	Adjusted Scores	Opponent ID Number	Unadjusted Scores	Adjusted Scores
8	2.0	2.0	1	4.0	4.0	2*	1.0	1.5
6*	1.0	1.5	3	4.0	4.0	6*	1.0	1.5
3	4.0	4.0	2*	1.0	1.5	4	4.0	4.0
5	4.0	4.0	6*	1.0	1.5	8	2.0	2.0
SDOS:	11.0	11.5	SDOS:	10.0	11.0	SDOS:	8.0	9.0

In this SDOS calculation, Player A wins the tie-break by ½ point against Player B, but without the adjustment, A would have won by a full point. Although this example doesn't show that the adjustment made a difference, it does make the point that Player B was unfairly handicapped in his SDOS calculation in that, through no fault of his own, he had been paired with the *two* players who lost their last games by default, games they had, presumably, a *50 percent chance of winning*. The adjusted score recognizes this possibility.

Although Example II uses the instance of defaulted games to illustrate the need to adjust opponents' scores, the same principle applies to byes and missed rounds.

Summary

Before using SOS and SDOS in performing tie-break calculations, tournament directors should review the final McMahon scores of all the players in their tournaments and make the necessary adjustments as outlined above. For the reader's convenience, these adjustments are summarized in Table I.

[2] Presumably, for the sake of proper pairings, the practice of awarding ½ point for each missed round would be followed during a tournament. In the case of defaults, the first default is usually an indication that the player has withdrawn from the tournament without informing the tournament director; consequently, the awarding of the ½ point for the defaulted round can be done at the end of the tournament.

Table I
Summary of McMahon Score Adjustments

Categories	Adjusting Tied Player's Score	Adjusting Opponents' Scores
Missed Rounds	Normalize	+½ for each missed round[1]
Byes	Normalize	–½ for each bye[2]
Wins by Default	(Not Applicable)	–½ for each win by default[2]
Losses by Default	(Not Applicable)	+½ for each loss by default[3]

[1] Adjustments made during the tournament, preferably.
[2] Adjustments made at the end of the tournament. The McMahon score increases by a full point in the tournament to indicate a legitimate victory.
[3] Adjustments made at the end of the tournament. The McMahon score stays the same in the tournament to indicate a legitimate loss.

Appendix A: Mathematical Representation

The points raised in this guide can be summarized in the following equation:

$$S = \frac{R}{r_p} \sum \left(IS_o + v_o + \tfrac{1}{2}(R - r_o) \right)$$

where S is the normalized SOS of each tied player
R is the number of rounds in the tournament
r_p is the tied player's number of rounds in which he or she was *paired*
IS_o is the opponent's *initial* McMahon score
v_o is the opponent's number of victories, excluding byes and wins by default
r_o is the opponent's number of rounds in which he or she *actually played*

The first element of the equation (R/r_p) serves to normalize a tied player's score (as in Example I), while the rest of the equation is designed to make sure that the McMahon score of each opponent of a tied player is properly adjusted (as in Example II). The way SOS is normally calculated in tournaments, it represents the sum of the final and, as suggested in this guide, adjusted McMahon scores of all the opponents with whom a tied player was *paired* (*see* Appendix C for a discussion on this point).

Adjustments to the individual McMahon scores made *during* a tournament, as suggested in this guide, need not be undone at the end of the tournament to use this equation properly and obtain each tied player's SOS.

The same equation can also be applied in calculating SDOS. As with SOS, SDOS could also require the need to normalize the McMahon score (i.e., to use R/r_p).

Appendix B: Example Application

The following example demonstrates the application of the principles suggested in this guide. It is based on the results of a recent tournament (*see* Appendix E for the complete record of the tournament for the concerned players).

In Example III, three players (Nos. 11, 15, and 16) are tied for first place in their band, each having won three games.

Example III

PLAYER 11			PLAYER 15			PLAYER 16		
Opponent ID Number	Unadjusted Scores	Adjusted Scores	Opponent ID Number	Unadjusted Scores	Adjusted Scores	Opponent ID Number	Unadjusted Scores	Adjusted Scores
14	–4.0	–2.0	13	–3.0	–3.0	12	1.0	0.5
12	1.0	0.5	14	–4.0	–2.0	13	–3.0	–3.0
MR			12	1.0	0.5	18	–3.0	–2.0
7	–2.0	–0.5	8	2.0	1.5	9	1.0	1.0
19	3.0	–3.0	MR			10	1.0	1.0
15	–1.0	–1.0	MR			11	–1.0	0.0
SOS:	–9.0	–6.0	SOS:	–4.0	–3.0	SOS:	–4.0	–3.0
R/r_p:		$6/5$	R/r_p:		$6/4$	R/r_p:		$6/6$
Normalized SOS:		–7.2	Normalized SOS:		–4.5	Normalized SOS:		–3.0

MR = Missed Round

Before obtaining the normalized SOS of the three tied players, the final, adjusted McMahon scores of each player's opponents must first be determined. This is done by applying this part of the above mathematical equation to each opponent at the end of a tournament:[3]

$$IS_o + v_o + \tfrac{1}{2}(R - r_o)$$

If we select Player 12, for example, this means:

$$-4 + 4 + \tfrac{1}{2}(6 - 5)$$

Thus, the final, adjusted McMahon score for Player 12 is 0.5.

Appendix C: Paired Games vs. Played Games

A legitimate issue of debate is whether or not r_p should stand for *(a)* the number of rounds in which a tied player was *paired* (but did not play) or *(b)* the number in which he or she *actually played*.

In Example III, this issue is of concern to Player 11 (because of Opponent 7) and Player 15 (because of Opponent 8). If r_p stands for the number of rounds in which a tied player actually played, then, in the case of Player 11, the McMahon score for Opponent 7 would be excluded from the SOS calculation, and r_p would now be equal to 4. This means that he or she would

[3] Many tournament directors may feel more comfortable in applying the system of adding or subtracting ½ points at the end of each round as suggested in Table I. The equation is used here simply to demonstrate its application.

obtain a final, normalized SOS of –9 and would come in third place among the three tied players. In the case of Player 15, the McMahon score of Opponent 8 would be excluded from the SOS calculations, and r_p would now be equal to 3. This means that he or she would obtain a final, normalized SOS of –8¼ and would now come in second place.

Aside from the intrinsic argument of which option is more "fair," which is far from clear, there is the side issue of the additional burden placed on tournament directors: if r_p stands for the number of rounds is which a tied player *actually played*, then this factor becomes one more element for tournament directors to keep track of in making tie-break calculations.

Appendix D: How Valid is SDOS?

The traditional argument in defense of SDOS is that it measures the strength of the opponents that were defeated by a tied player. If Player X defeats stronger opponents than those defeated by his or her tie-breaking rival, so the reasoning goes, then this accomplishment should count as an additional element in measuring X's superior performance. Yet there seems to be a logical flaw in this argument, for if X does defeat stronger opponents than those defeated by his or her tie-breaking rival, then it must also mean that X lost games to weaker opponents than those that his or her rival lost to!

Consider the following fictitious example where the McMahon scores of Players A and B are displayed after a six-round tournament in which both players won their first four games.[4]

Example IV

PLAYER A		PLAYER B	
Rounds	McMahon Scores	Rounds	McMahon Scores
Opponent 1 (won)	1.0	Opponent 1 (won)	1.0
Opponent 2 (won)	2.0	Opponent 2 (won)	2.0
Opponent 3 (won)	2.0	Opponent 3 (won)	2.0
Opponent 4 (won)	3.0	Opponent 4 (won)	1.0
Opponent 5 (lost)	1.0	Opponent 5 (lost)	3.0
Opponent 6 (lost)	2.0	Opponent 6 (lost)	2.0
SOS:	11.0	SOS:	11.0
SDOS:	8.0	SDOS:	6.0

In looking at the SDOS results, Player A gets 8 points while Player B gets 6 points; consequently, Player A would deserve to win the tie because of the stronger opponents he or she defeated. Yet, the sum of the opponents' scores who have defeated Player A is 3, while the sum of those who have defeated Player B is 5. In other words, although Player A has defeated stronger opponents that has Player B, he or she has also lost games against weaker ones. So, what does SDOS measure?

[4] Placing the won games at the beginning is arbitrary and is done simply to make the example clearer to follow.

In *The Official AGA Tournament Guide*, the American Go Association mentions that a possible alternative to the traditional tie-breaking calculations discussed in this guide (i.e., SOS and SDOS) is the Median, or Harkness, Score, where, in tournaments from six to eight rounds, the highest and lowest scores are excluded in determining the sum of opponents scores.[5] The idea, basically, is to reduce the element of chance that can sometimes generate "unfair" pairings, especially in small tournaments where gaps in the strength of players is not an uncommon occurrence.

Still another possibility, though far from practical in tournaments that do not benefit from computerized pairings, is to replace the traditional SDOS by the sun of opponent's SOS.

Despite the doubts that can be raised regarding the validity of SDOS, the tradition of using it as it is presently constituted is so strongly anchored in usage among tournament directors that it is doubtful that any meaningful reforms can be expected. Besides, any system of tie-break calculations is bound to represent a trade-off between competing sets of "inequities." Of course, it's worth remembering that whatever built-in inequities are found among competing systems, these tend to melt away in proportion as the number of participants in a tournament becomes larger, as the number of rounds becomes higher, and as the distribution in the strength of players becomes more even.

Appendix E: Example Tournament

The partial tournament grid below is taken from the 18th Quebec Open (May 18-19, 1996). Only those players of concern in the tie-break calculations of Players 11, 15, and 16 are shown. The shaded rounds indicate games that were lost or won by default.

Table II

Player ID No.	Initial Score	Round 1		Round 2		Round 3		Round 4		Round 5		Round 6		Unadjusted SOS	Adjusted SOS
7	–2	9	W	10	–1	6	+2	11	–3					–2	–½
		–2		–2		–2		–2							
8	–2	10	–1	9	B	1	+3	16	–4	5	+2	4	+2	2	1½
		–1		0		0		1		1		2			
9	–2	7	B	8	W	10	–1	15	–5	2	+3	3	+3	1	1
		–1		–1		–1		0		1		1			
10	–2	8	+1	7	+1	9	+1	12	–1	15	–3	2	+5	1	½
		–2		–1		0		0		0		1			
11	–4	14	W	12	W			7	+3	19	–8	15	–1	–1	0
		–3		–3		–3		–3		–2		–1			

[5] The *Guide* is unclear whether the Median Score is suggested as a possible replacement for both the SOS and SDOS or only for SDOS. For further discussion on the Harkness Score, the reader is referred to Harkness' *Official Chess Handbook.*

12	–4	15	–1	11	B	16	–1	10	+1	20	–9	6	+6	1	½
		–3		–2		–2		–1		0		1			
13	–4	16	W	15	B	19	–7	20	–9	22	–9	21	9	–3	–3
		–4		–4		–4		–4		–3		–3			
14	–4	11	B	16	W									–4	–2
		–4		–4											
15	–4	12	+1	13	W	18	–3	9	+5	10	+3	11	+1	–1	–1
		–4		–3		–2		–2		–1		–1			
16	–4	13	B	14	B	12	+1	8	+4					–1	0
		–3		–2		–1		–1							
18	–6	21	–6	17	W	15	+3	19	–2					–3	–2
		–5		–4		–4		–3							
19	–6	22	–4	21	–3	13	+7	18	+2	11	+8	20	–2	–3	–3
		–5		–5		–4		–4		–4		–3			

Note: Player 11 informed the tournament director of his absence from the tournament for Round 3; consequently, he wasn't paired. In Round 4, the player was paired but he failed to show up. Normally, as suggested in this guide, ½ point would have been added to his McMahon score for each missed round. This wasn't done here for the sake of maintaining consistency with the normal practice of most tournament directors.

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