The Valet Score:

Principles

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1 Motivation

1.1 SCORING

Ted Turner, the U.S. media mogul, reportedly once said, "*Life is a game. Money is how we keep score.*"

Bridge is maybe not life, but in bridge we also keep score. Pairs tournaments are often scored at matchpoints. Team tournaments are often scored at IMPs converted into VP (victory points).

In a sense, the official scoring is all that matters. And yet some bridge players are analytically inclined and want to know more, whether to identify weaknesses in their own game or to have the satisfaction of seeing that it was all their teammates' fault…

There are various ways in which one can go about getting more detail. Surely one of the best ways is to conduct post-mortems with strong players who take a balanced view of things. But there are also analytical methods that can at least give pointers, the Butler score for team games being perhaps the best-known.

Any method, including the official scoring method of a given tournament, will have limitations, and it is important to be clear about these. If you bid a good slam that needs one of two finesses and you go down, you might consider yourself moderately unlucky. If you lose the tournament because of this – well, you can cry into your beer afterwards, but you still lost. At least at this level we accept that statistics and "luck" play a role.

Perhaps it is helpful to think of analytical methods as follows.

Results	▪ Official score ▪ Butler ▪ Valet	(not common, e.g. Epson tournament)
Cards	▪ Double dummy ▪ Simulations	▪ Post-mortem ▪ Single dummy
	Quantitative	**Manual**

Quantitative methods are not subject to judgment, whereas manual analysis attempts to find the "truth." Maybe it didn't cost that you missed that trump lead, but you should still have found it. So in the post-mortem your friends should charge you for this, and you should learn from it – maybe next time it *will* matter.

Result-based methods look only at the actual scores achieved at the table, without considering the actual distribution of the cards. Maybe you bid a game on a finesse for the king of trumps and went down, and others stayed out of it. Or maybe you bid the same game missing instead the ace of trumps, so the contract never had any play. You cannot tell the difference between these two distributions just by looking at the scores. For that you need card-based analysis which goes beyond the actual scores.

In this document I aim to introduce and explain the Valet score, an improvement and generalization of the Butler score. I want to be clear about what you can and cannot expect from the Valet score.

You *can* expect

- Quantitative scores for bidding, play and defense (including optionally a separate score for the opening leads). Play and leads are scored for each player separately, while the rest is scored for the pair.
- Statistical averages. If you bid to a good contract that fails, you will get a poor official score and also a poor Butler and Valet score. This is supposed to average out over a sufficiently large number of hands.
- Scores that are based on the actual results of real players.

You *cannot* expect

- Anything that relates directly to the actual distribution of the cards, except if this is visible in the results.
- Double-dummy results.
- Perfection or truth.

1.2 HISTORY

David Stevenson informs me that the Butler score was introduced by Geoffrey Butler, an English bridge administrator in the 1950's and 1960's. But if you're seriously interested in scoring (and you might not be reading this document otherwise), you should perhaps be aware that it is a bit sneaky to speak of *the* Butler score. As typically implemented, it involves a datum score which may or may not exclude outliers, and which may be an average or a median value or something else. Different scoring programs implement Butler scoring differently; for example, the current WBF program excludes the top and bottom two scores in the Bermuda Bowl. To get a flavor for the considerations, check out

http://www.bridgeguys.com/pdf/butler_scoring_stevenson.pdf

My own interest was piqued in 2004 after I played in the Istanbul Olympiad for Luxembourg, with more valor than success. I realized that the tournament offered a high-quality source of relatively homogeneous data, with many comparisons per board, and over the Christmas vacation I came up with the Valet score principles.

I then got the hand results from pdf documents at ECats, and for reasons that probably made sense to me at the time, I implemented the Valet score in VBA macros within Microsoft Excel. I wrote a short article about it and submitted it to the Bridge World. The article was not accepted – I suspect that Jeff Rubens does not share my view of the potential value of quantitative methods outside of the official scoring. After that I forgot about the Valet score.

On October 14, 2015, the issue came up on Bridge Winners:

http://bridgewinners.com/article/view/recalculating-butler-scores-to-delineate-declaring-vs-defending-proficiency/

I took the opportunity to post my description from 2004:

http://bridgewinners.com/article/view/the-valet-score/

and I was encouraged by the interest, public as well as private. So I took the leap and rewrote and generalized the code in a more practical way. With version 1.0 this document I released an open-source project in C++. It consists of a stand-alone program and a DLL / library that can be called from other programs.

This document explains the principles. A companion document explains the computer program. I hope that authors of scoring programs will incorporate the Valet score, just as they do the Butler score today.

Oh, the name? "Valet" means "jack" in French, and a valet has some similarity with a butler.

I would like to thank the people who have commented on the concept and on the documents. Thorvald Aagaard offered many helpful comments and was also the first user of the program. Michele Cammarata took a keen interest in the math behind the Valet score, and together we arrived at the "cloud" score described in the more technical part of this document towards the end. We both think this is the "best" way (or one of the nearly-equivalent best ways) to calculate the scores.

The examples in the beginning of this document are shown for the simpler calculation that I initially came up with, as these scores can still be validated reasonably well in detail by a human. There are some examples in the end that show results for some of the same hands.

The Valet score has been written up here:

- https://bridgewinners.com/article/view/valet-score-published/.
- http://blakjak.org/lwx_hen0.htm on David Stevenson's website (an earlier version from 2004).
- A very short version of this document ("doc" directory, "2015-12 Valet introductory article") suitable for e.g. bridge magazines.
- Michele's kind translation into Italian of the previously mentioned document, published in 2016 in the Italian bridge magazine.
- Thorvald's application of the Valet program to an analysis of some Danish results.

2 Definition

2.1 THE BUTLER SCORE

It is easiest to explain the Butler score is with an example. Thorvald Aagaard brought up the below hand from the 2015 Bermuda Bowl in Chennai. Nothing fancy – on the North-South hands you want to be in slam. The actual 22 results were as shown below.

East dealer NS vul.	♠ A 4 ♡ J 7 6 5 4 2 ♢ A 8 ♣ A Q 4	
♠ J 9 8 3 2 ♡ Q T ♢ J 7 2 ♣ 6 5 2	N W E S	♠ K T ♡ 9 3 ♢ 9 5 4 3 ♣ K T 8 7 3
	♠ Q 7 6 5 ♡ A K 8 ♢ K Q T 6 ♣ J 9	

http://www.worldbridge.org/repository/tourn/chennai.15/Microsite/Asp/BoardAcross.asp?qboard=002.01..1130

Contract	Count	Results (lead)
4NT, S	2	1 × 11 (♠), 1 × 12 (♣)
4♡, S	8	8 × 12 (4 × ♠, 4 × ♣)
4♡, N	3	3 × 12 (2 × ♢ , 1 × ♣)
6♡, S	7	7 × 12 (3 × ♠, 4 × ♣)
6♡, N	2	12 (♢) , 13 (♣)

The first step is to calculate the datum score. In the simplest version we just take the average of the scores, so we have 1 × 1460 + 8 × 1430 + 1 × 690 + 11 × 680 + 1 × 660 which comes out to 21730. Dividing by 22 yields 988. The second step is to convert each score into a Butler score.

Score	Difference NS	Butler score NS
1460	472	+10 IMPs
1430	442	+10 IMPs
690	-298	-7 IMPs
680	-308	-7 IMPs
660	-328	-8 IMPs

By the way, you can reproduce this result with the valet program by using the `names1.txt` and `scores1.txt` files in the distribution. Refer to the end of this section for a table of the exact input line to use. (The output looks a bit different, but it contains the same data.)

There are a number of variations on the datum calculation.

- We may leave out, for example, the highest and lowest score from the average calculation on the view that the extreme scores should not "distort" the "real" average. In the present case this only changes the datum score into 981, but the effect can of course be larger as well. My view is that bridge is about all of these scores, and at least in a strong field the large deviations are part of the overall outcome. So I am not in favor of this adjustment.
- We may round the datum score either to the closest multiple of 10, or always round it down. In the example, we could round 988 to 980 (down) or to 990 (nearest). It turns out not to matter here, but the IMP scale has gaps – what is the IMP score for a score difference of 894 against the datum?
- We may not calculate the arithmetic average, but the median value, i.e. the value "in the middle" if we order the values. As we have an even number of results, we might calculate the average of the two middle scores. In the example, both these scores are 680. This does make a big difference to the IMP scores, of course. Note that the sum of the IMP scores in the table above is -2 for NS and hence +2 for EW. This is only about +0.1 IMPs on average, but it is not zero. If the datum is 680, the average NS IMP score against the median datum is +5.3 IMPs. My view is that the sum should be close to zero (ideally zero), and I am not in favor of the median datum.

What should we think about the Butler score in this case? East-West are largely innocent bystanders – they don't have a suitable preempt, and they will just get the opposite score from the North-South pair that they happen to catch. Is this "fair"? No, but it is supposed to average out over time.

It is also possible to calculate a Butler-like score using IMPs across the field (which I sometimes abbreviate to "IAF"). It is a matter of debate whether this is then still a Butler score or not. It is more work, but it is not a problem for computers.

Let us start with the declarer who scored +1460 for bidding slam and making the overtrick. S would score +30 against the 8 declarers who made +1430 (1 IMP), +770 (13 IMPs) against the single declarer making +690, +780 against 11 declarers with +680 (also 13 IMPs), and +800 against a solitary +660 (also 13 IMPs). In total this comes to +177 IMPs in 21 comparisons, or +8.43 IMPs on average. The full set of IAF scores is shown below.

Score	**Butler score NS**
1460	+8.43 IMPs
1430	+7.95 IMPs
690	-5.14 IMPs
680	-5.52 IMPs
660	-6.14 IMPs

Note that the sum of all 22 results is now exactly 0 IMPs. Also note that the IAF values are lower than the Butler datum IMPs. This is a general phenomenon that we will come back to. The datum score first calculates a linear average and then applies the nonlinear IMP scale (a difference of 400 does not result in twice the IMP score of a 200 difference). The IAF method first applies the nonlinear IMP scale to all differences and then calculates a linear average. The IMP scale is compressive, so it can be shown mathematically that the "IAF IMPs" yield lower numbers than the "datum IMPs." It turns out that the sum of the IAF scores for the two pairs in a team is closer to the team performance than is the case if we add up the datum-IMP Butler scores.

2.2 THE VALET SCORE

The Valet concept applies to Butler datum scoring, but also to other scoring forms. I will first explain the concept using datum scoring.

How do we separate the bidding from the play/defense, looking only at the results? The key is to imagine that you bid to your actual contract, but then you are called away and replaced by an average declarer of your chosen denomination (notrump, spades etc.) who plays on your behalf. In fact you are replaced by all the declarers playing in your denomination from your side (let's call it notrump for example), one after the other, and you get the average of their results. It turns out to be mathematically convenient to include yourself as one of these declarers, as some things that ought to come out to zero on average really do behave in this way then.

If all these notrump declarers get better results than the datum score, then you would think that you've bid to a superior contract. The difference between this average result and the datum score is your bidding score, and whatever is left between your bidding score and your Butler score is your play score.

The defenders get the opposite of your bidding score as their bidding score, and the opposite of your play score as their defense score. This may not be fair in a particular case, but it is no more unfair than the actual score or the Butler score.

In order to get enough data, we take all the notrump declarers, even the ones who played at a different level than you. If you bid game, we still include those declarers who played in one notrump. You might say that the one-notrump declarer could play differently than the three-notrump declarer, and you would be right. But we do need enough data points, and many hands are played the same way no matter what, including our slam hand above.

We only consider the declarers who played in your denomination from your side. If you sat North and protected your king, while the South players were vulnerable to a lead through that king, then rest assured that you will normally get a good bidding score.

Let us imagine that you bid to 3NT on some hand, and three declarers bid 3NT, two of them (perhaps including yourself) making 9 and 1 making 8 tricks. There were also three declarers bidding 1NT, two of them making 9 and 1 making 8 tricks. We would then give you the score for being in 3NT making 9 tricks 3 times and making 8 tricks 3 times in 3NT. Even though one declarer made 8 tricks in 1NT, we still apply his result to your 3NT contract, and you are penalized for his play – tough luck.

The above enables us to split the Butler score into two components: Bidding and play/defense. Can we go even further and grade the opening lead separately from the rest of the defense? You will be unsurprised to hear that the answer is a qualified “yes”. Maybe in a later version we’ll distinguish between spot cards and honors, at least.

We are now starting to slice the data rather finely, and we are not going to consider individual cards of a suit separately. It may be that you brilliantly led an unsupported queen, squashing declarer’s stiff jack. The pleasure will have to be its own reward.

We are going to look at all the pairs who were on lead against a contract in your denomination from your side (notrump). We already know the average score that all these opening leaders achieved against notrump, as this is the opposite of the bidding score that we assigned to you above. We are now going to use the same principle and to calculate the same type of score, but only against the opening leaders who led the suit that you were faced with (call it clubs).

Once we have this score, we are going to compare it to the total bidding score. If the average club leader did better than his bidding score, then this is considered to be due to his club lead. Whatever is left of his defense score is then his subsequent-defense score.

2.3 SCORING FORMS

If we are using datum scoring, then each comparison is made by first calculating an average score over the universe of opponents that we are considering. For example, if we let all the notrump declarers play for you, then we take their average score as the datum. We then compare each of the scores that these declarers would have achieved for you, convert it into IMPs against this notrump datum, and in the end we average over the declarers.

It is also possible to use IAF scoring. In this case we compare each of the declarers to each of the opponents separately, convert each score into IMPs, and then average these.

Personally I think that IAF scoring is the only valid choice. With datum scoring it often happens that an allocation into bidding and play produces a small, but non-zero value for a component that really “should” be zero. It’s a bit more work for the computer and for the programmer, but so be it.

It is also possible to use matchpoint scoring! This means that we can also decompose a matchpoint tournament into bidding, play, lead and defense components. Matchpoints are slightly different in that they are not additive. At IMPs it is reasonable to think of the Butler or Valet score as the sum of a number of components. At matchpoints it is an average.

For example, say that you get a 60% score on your board. You actually bid to a contract that the average declarer would have played for 70%, so your bidding score is 70%. We would like the average of your bidding and play score to be 60%, so this must mean that your play was only worth 50%. As Thorvald points out, it is easier to think of MPs as IMPs that are constrained to +1, 0 and -1.

In very extreme cases it is possible for the play score on a single hand to be less than 0% or more than 100%! This will even out over enough hands, though.

2.4 EXAMPLES

Let's go back to our slam hand and look at the declarer who scored +1430 for bidding and making the heart slam. We are only going to consider the 15 declarers who played in hearts from South. Every last one of them made exactly 12 tricks. So your average score over all declarers (including yourself) is also +1430. Some of the others played in game, but you still get +1430 for their 12 tricks as we apply their tricks to your contract.

Recall that your +1430 was worth +10 datum IMPs (and +7.95 IAF IMPs) overall.

We are now going to score this synthetic score against the datum. Of course this yields the same result as your actual +1430 score, i.e. +10 datum IMPs. So your bidding score is +10 and your play score is 0 IMPs. This makes sense. You didn't outplay anybody, but you did bid to the right contract.

It turns out to be the same for the ones staying in 4 hearts – zero play score.

Let us look at the single declarer who played in 4NT making only 11 tricks. There were 2 notrump declarers, one making 11 and one making 12. The scores against the datum were -8 and -7 IMPs, respectively, so the average score was -7.5 IMPs. This is the bidding score for both declarers. The one who made 12 tricks gets +0.5 IMPs and the one who made only 11 tricks gets -0.5 IMPs for declarer play.

You might say that the overwhelming number of declarers made 12 overall, but most of them were not in notrump, and we can't consider that. It is also clear that you want to be in hearts in this particular case.

In IAF terms it comes out slightly differently, of course. The +1460 pair gets +8.43 IMPs consisting of + 8.05 bidding IMPs and +0.38 play IMPs. In general it comes out as shown below. In my view this is maybe not perfect, but it is pretty close.

Score	Butler score NS	Bid / play
1460	+8.43 IMPs	+8.05 / +0.38
1430	+7.95 IMPs	+7.95 / 0.00 (South) +8.05 / -0.10 (North)
690	-5.14 IMPs	-5.64 / +0.50
680	-5.52 IMPs	-5.52 / 0.00 (South) -5.28 / -0.24 (North)
660	-6.14 IMPs	-5.65 / -0.50

This was a hand that was mostly about the bidding. Let's do a couple more. The first one (Example 2) is from the Polish first league in 2013/14, Round 1, Segment 1, Board 1 and is concerned with the play. The hand was played 16 times, in every single case in 3NT from North, so that makes it easier. The results were as shown below.

http://www.pzbs.pl/wyniki/liga/liga2013-14/ekstraklasa/e1314rr1b-1.html

North dealer
None vul.

North:
♠ K 6 2
♡ A K
♢ Q J 8 5 3
♣ A J 5

West:
♠ 9 5 4
♡ Q T 9 6
♢ K
♣ K 8 7 6 3

East:
♠ A Q T
♡ J 4 3 2
♢ T 9 7 4
♣ 9 4

South:
♠ J 8 7 3
♡ 8 7 5
♢ A 6 2
♣ Q T 2

Lead	Count	Results
♠	2	1 × 11, 1 × 9
♡	6	4 × 9, 2 × 7
♢	8	6 × 9, 1 × 8, 1 × 7

The datum score was (12 × 400 + 1 × (-50) + 3 × (-100)) / 16 = 278. Therefore the IMPs were as follows for North-South.

Score	Datum	IAF
+460	+5	+4.40
+400	+3	+2.73
-50	-8	-7.67
-100	-9	-8.93

The Valet score allocates the IMPs as follows, for the datum and IAF IMPs separately. In all cases the scores are given from the players' point of view, positive being good.

Score	Lead	Overall	Bid	Play
+460	♠	+5	+0.19	+4.81
+400	♠	+3	+0.19	+2.81
	♡	+3	+0.19	+2.81
	♢	+3	+0.19	+2.81
-50	♢	-8	+0.19	-8.19
-100	♡	-9	+0.19	-9.19
	♢	-9	+0.19	-9.19

Datum scoring, declarer's view

Score	Lead	Overall	Bid	Lead	Other def.
+460	♠	-5	-0.19	-3.81	-1.00
+400	♠	-3	-0.19	-3.81	+1.00
	♡	-3	-0.19	+1.19	-4.00
	♢	-3	-0.19	+0.06	-2.88
-50	♢	+8	-0.19	+0.06	+8.13
-100	♡	+9	-0.19	+1.19	+8.00
	♢	+9	-0.19	+0.06	+9.13

Datum scoring, defenders' view

Score	Lead	Overall	Bid	Play
+460	♠	+4.40	0.00	4.40
+400	♠	+2.73	0.00	+2.73
	♡	+2.73	0.00	+2.73
	♢	+2.73	0.00	+2.73
-50	♢	-7.67	0.00	-7.67
-100	♡	-8.93	0.00	-8.93
	♢	-8.93	0.00	8.93

IAF scoring, declarer's view

Score	Lead	Overall	Bid	Lead	Other def.
+460	♠	-4.40	0.00	-3.57	-0.83
+400	♠	-2.73	0.00	-3.57	+0.83
	♡	-2.73	0.00	+1.16	-3.89
	♢	-2.73	0.00	+0.03	-2.76
-50	♢	+7.67	0.00	+0.03	+7.64
-100	♡	+8.93	0.00	+1.16	+7.78
	♢	+8.93	0.00	+0.03	+8.91

IAF scoring, defenders' view

This is the first time that we see meaningful results from play, lead and defense, so we should reflect on these results. Let's start with datum scoring.

From declarer's point of view, most of the scores are allocated to the play. This makes sense. But why is there a +0.19 datum-IMP score for bidding 3NT when everybody else also bids it?

Let's take the lone declarer who made 11 tricks. We are going to replace him with each of the 16 declarers, score their results against the datum score, convert to IMPs and then add up the scores. In this way we get $1 \times 5 + 11 \times 3 + 1 \times (-8) + 3 \times (-9) = +3$ IMPs. The average bidding score is therefore 3/16 = 0.19 IMPs. You will recall that the same thing happened in Example 1 above – in general, the total number of IMPs for one side does not have to add up to 0 with datum scoring.

This problem does not occur with IAF IMP scoring, as every combination of declarer and defenders occurs exactly twice during IMPs-across-the-field: Once from the point of view of the declarer, and once from the defenders' side. Indeed we see that IAF scoring assigns 0.00 IMPs to all bids in this particular case. This is one reason that I consider IAF scoring to be superior, and I'm not going to try to justify datum scores from here on.

We also observe again that IAF IMPs are generally lower than datum IMPs.

Let's look at the scores associated with different leads. When a spade was led, one declarer made 11 and another made 9 tricks. We already know that the one whose declarer made 11 tricks got -4.40 IMPs for his trouble, while the other spade leader got away with -2.73 IMPs. The Valet score allocates the average value, -3.57 IMPs, to their lead and the difference to their other defense. That seems reasonable.

Let's look at the red-suit leaders. There were six heart leaders, and four paid out 9 tricks while two scored down two. So the defenders' IAF IMPs are $4 \times (-2.73) + 2 \times 8.93 = 6.94$ IMPs or an average of 1.16 IMPs.

Of the eight diamond leaders, six suffered 9 tricks while one obtained down one and one scored down two. The defenders' IAF IMPs are $6 \times (-2.73) + 1 \times 7.67 + 1 \times 8.93 = -0.22$ IMPs or an average of -0.03 IMPs. The diamond leaders beat the contract two out of eight times, and one of those was only down one. The heart leaders beat the contract two out of only six times, both times down two. It makes sense that the heart leaders get the better lead score.

For practice, the actual output table from the Valet program for this one hand is shown on the next page.

In this example there is only one hand. In general the averages are shown *per hand played*, not per hand declared, led or defended. Otherwise the scores would not easily add up.

Players	No.	IMPs	Bid	Play	Play		Declaring	
					Declaring	Defending	Declarer1	Declarer2
C Serek - P Busse	1	8.93	-0.00	8.93	- (0)	8.93 (1)	- (0)	- (0)
R Woliński - M Urbański	1	8.93	-0.00	8.93	- (0)	8.93 (1)	- (0)	- (0)
R Kierznowski - L Sztyrak	1	8.93	-0.00	8.93	- (0)	8.93 (1)	- (0)	- (0)
Z Papierniak - J Figlus	1	7.67	-0.00	7.67	- (0)	7.67 (1)	- (0)	- (0)
A Suwik - M Kowalski	1	4.40	0.00	4.40	4.40 (1)	- (0)	4.40 (1)	- (0)
R Jagniewski - W Gaweł	1	2.73	0.00	2.73	2.73 (1)	- (0)	2.73 (1)	- (0)
R Nowicki - R Stoliński	1	2.73	0.00	2.73	2.73 (1)	- (0)	- (0)	2.73 (1)
W Starkowski - P Gawryś	1	2.73	0.00	2.73	2.73 (1)	- (0)	2.73 (1)	- (0)
D Filipowicz - K Martens	1	2.73	0.00	2.73	2.73 (1)	- (0)	2.73 (1)	- (0)
J Ciechomski - M Leśniewski	1	2.73	0.00	2.73	2.73 (1)	- (0)	2.73 (1)	- (0)
A Jeleniewski - J Wachnowski	1	2.73	0.00	2.73	2.73 (1)	- (0)	- (0)	2.73 (1)
K Jassem - M Mazurkiewicz	1	2.73	0.00	2.73	2.73 (1)	- (0)	2.73 (1)	- (0)
K Pikus - M Cichocki	1	2.73	0.00	2.73	2.73 (1)	- (0)	- (0)	2.73 (1)
L Ohrysko - M Jeleniewski	1	2.73	0.00	2.73	2.73 (1)	- (0)	- (0)	2.73 (1)
A Guła - M Taczewski	1	2.73	0.00	2.73	2.73 (1)	- (0)	- (0)	2.73 (1)
G Bajek - M Wręczycki	1	2.73	0.00	2.73	2.73 (1)	- (0)	- (0)	2.73 (1)
P Żak - J Zaremba	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
S Gołębiowski - A Żmudziński	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
M Dembiński - M Pędziński	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
G Narkiewicz - K Buras	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
J Kalita - M Nowosadzki	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
T Wiśniewski - I Kowalczyk	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
G Głasek - M Piwowarczyk	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
T Jochymski - M Kania	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
C Komajda - J Kotorowicz	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
M Bartkowski - M Puczyński	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
R Matlak - Z Guła	1	-2.73	-0.00	-2.73	- (0)	-2.73 (1)	- (0)	- (0)
J Klukowski - A Kowalski	1	-4.40	-0.00	-4.40	- (0)	-4.40 (1)	- (0)	- (0)
S Zawiślak - E Miszewska	1	-7.67	0.00	-7.67	-7.67 (1)	- (0)	-7.67 (1)	- (0)
B Pazur - T Pilch	1	-8.93	0.00	-8.93	-8.93 (1)	- (0)	- (0)	-8.93 (1)
L Niemiec - M Białożyt	1	-8.93	0.00	-8.93	-8.93 (1)	- (0)	-8.93 (1)	- (0)
P Nawrocki - P Wiankowski	1	-8.93	0.00	-8.93	-8.93 (1)	- (0)	-8.93 (1)	- (0)

Actual Valet output for Example 2

West dealer All vul.	♠ T 3 ♡ A Q ♢ K Q 5 ♣ A K Q J 7 4	
♠ Q 9 7 6 4 2 ♡ 5 3 ♢ 8 7 6 ♣ 6 2	N W E S	♠ 8 ♡ J 7 6 ♢ J T 9 2 ♣ T 9 8 5 3
	♠ A K J 5 ♡ K T 9 8 4 2 ♢ A 4 3 ♣ -	

The next hand (Example 3) is from the Polish first league in 2013/14, Round 1, Segment 1, Board 4. The hand was played 16 times and the results are shown in the table below.

http://www.pzbs.pl/wyniki/liga/liga2013-14/ekstraklasa/e1314rr1b-4.html

Contract	Declarer	Count	Lead	Tricks
7NT	S	4	2 × ♠, 1 × ♡, 1 × ♣	13
7NT	N	3	1 × ♠, 2 × ♢, 1 × ♣	13
6NT	N	1	1 × ♢	13
5NT	N	1	1 × ♢	13
7♡	S	3	1 × ♡, 2 × ♢	13
6♡	N	2	2 × ♠	12, 13
7♣	N	1	1 × ♡	12
6♣	N	1	1 × ♣	12

We would expect there to be nothing to the play. Indeed we get the IAF-IMP tables shown on the next page. The two pairs who played in clubs both made 12 tricks. One single heart declarer made only 12 tricks, but in play terms this didn't cost very much, as he was only in 6 and there were 10 pairs in grand slam and one pair only in game, where the missing trick made no difference in IMPs.

Score	Lead	Overall	Bid	Play
+2220	♠, ♡, ♣	+5.93	+5.93	0.00
+2210	♡, ♢	+5.80	+5.80	0.00
+1470	♢	-6.20	-6.20	0.00
+1460	♠	-6.47	-6.60	+0.13
+1430	♠	-6.73	-6.60	-0.13
+1370	♣	-7.33	-7.33	0.00
+720	♢	-13.53	-13.53	0.00
-100	♡	-18.67	-18.67	0.00

IAF scoring, declarer's view in Example 3

Score	Lead	Overall	Bid	Lead	Other def.
+2220	♠, ♡, ♣	-5.93	5.93	0.00	0.00
+2210	♡, ♢	-5.80	-5.80	0.00	0.00
+1470	♢	+6.20	+6.20	0.00	0.00
+1460	♠	+6.47	+6.60	0.00	-0.13
+1430	♠	+6.73	6.60	0.00	+0.13
+1370	♣	+7.33	+7.33	0.00	0.00
+720	♢	+13.53	+13.53	0.00	0.00
-100	♡	+18.67	+18.67	0.00	0.00

IAF scoring, defenders' view in Example 3

North dealer NS vul.	♠ K J 9 2 ♡ K J T 7 5 3 ♢ 9 3 ♣ 3	
♠ T 4 3 ♡ 6 ♢ Q 7 5 ♣ K Q 9 7 6 4	N W E S	♠ A 8 7 6 ♡ 9 8 4 2 ♢ T ♣ A J 8 5
	♠ Q 5 ♡ A Q ♢ A K J 8 6 4 2 ♣ T 2	

The next hand (Example 4) is from the Polish first league in 2013/14, Round 1, Segment 1, Board 5. The results are all over the place, including a sacrifice, so here we see what the Valet score does about that.

http://www.pzbs.pl/wyniki/liga/liga2013-14/ekstraklasa/e1314rr1b-5.html

Contract	Declarer	Count	Lead	Tricks
6♢	S	1	1 × ♣	10
5♢	N	1	1 × ♣	10
5♢	S	4	1 × ♣	10
3♢	S	1	1 × ♡	9
5♣×	E	1	1 × ♢	9
4♡	N	7	2 × ♠, 2 × ♡, 3 × ♣	12 (1 × ♣) 11 (other)
4♡	S	1	1 × ♣	12

The overall IAF IMPs are as follows.

Score	IAF
+680	+6.93
+650	+6.33
+300	+0.33
+110	-4.07
-100	-7.67
-200	-9.13

The Valet tables are shown on the next page. The format is different as the lead is now more relevant. By the way, this is almost the exact format generated with the `-t` option of the Valet program.

Contract	Lead	Tricks	Count	Overall	Bid	Play
4♡, N	♠	11	2	+6.33	+6.42	-0.09
	♡	11	2	+6.33	+6.42	-0.09
	♣	12	1	+6.93	+6.42	+0.51
		11	2	+6.33	+6.42	-0.09
4♡, S	♣	12	1	+6.93	+6.93	0.00
5♣×, E	♢	9	1	+0.33	+0.33	0.00
6♢, S	♣	10	1	-9.13	-9.29	+0.15
5♢, S	♣	10	4	-7.67	-7.91	+0.24
3♢, S	♡	9	1	-4.07	-3.49	-0.58
5♢, N	♣	10	1	-7.67	-7.67	0.00

IAF scoring, declarer's view in Example 4

Contract	Lead	Tricks	Count	Overall	Bid	Lead	Other def.
4♡, N	♠	11	2	-6.33	-6.42	+0.09	0.00
	♡	11	2	-6.33	-6.42	+0.09	0.00
	♣	12	1	-6.93	-6.42	-0.11	-0.40
		11	2	-6.33	-6.42	-0.11	+0.20
4♡, S	♣	12	1	-6.93	-6.93	0.00	0.00
5♣×, E	♢	9	1	-0.33	-0.33	0.00	0.00
6♢, S	♣	10	1	+9.13	+9.29	-0.15	0.00
5♢, S	♣	10	4	+7.67	+7.91	-0.24	0.00
3♢, S	♡	9	1	+4.07	+3.49	+0.58	0.00
5♢, N	♣	10	1	+7.67	+7.67	0.00	0.00

IAF scoring, defenders' view in Example 4

The play differences are small. All declarers but one made 10 tricks in diamonds, so the odd one out got -0.58 IMPs for his play (or for the opponents' heart lead). The total IAF IMPs for this result are -3.49 IMPs and the play score is the balance of -0.49 IMPs.

Hold on, you say – why -3.49 IMPs? That is not in the table of IAF IMPs for actual scores on the previous page. That's true. But we have to imagine the other five declarers in diamonds from South. They all made 10 tricks, effectively scoring +130 for our declarer, and this is a score we haven't seen yet. We then have to calculate the IAF IMPs for +130 vs. the field.

Which field? When we do a normal IAF calculation, we drop the player whom we're scoring. But here the +130 result comes from one player's contract and another player's declarer play. It turns out that we get more intuitively pleasing results in some cases (and it's easier in my computer implementation) if we drop one player with the score that we’re using. In this case there is nobody with a +130 score, so we drop nobody, and we compare with the full field of 16 players. There is no right or wrong here, I think.

So this comes to 2 × (-11) + 6 × (-11) + 1 × (-5) + 1 × 1 + 5 × 6 + 1 × 8 = -54 IMPs for the scores +680, +650, +300, +20, -100, -200, and the average of these 16 results is -3.38 IMPs. So we get 1 × (-4.07) + 5 × (-3.38) = +20.94 IMPs divided by 6 declarers, which comes to -3.49 IMPs.

Well, that was exciting – you can see why we need a computer for this. Looking at the defenders, their only chance to make a difference after the lead was in the case of a club lead against four hearts by North. The remaining variation was due to the lead, which makes sense.

North dealer None vul.	♠ K J T 6 ♡ K 8 7 5 ♢ 8 3 2 ♣ Q 2	
♠ 9 8 5 ♡ A Q 9 3 ♢ J T 7 ♣ 9 8 3	N W E S	♠ A 4 3 ♡ J T 4 2 ♢ A K Q 9 ♣ A J
	♠ Q 7 2 ♡ 6 ♢ 6 5 4 ♣ K T 7 6 5 4	

http://www.worldbridge.org/repository/tourn/chennai.15/Microsite/Asp/BoardAcross.asp?qboard=001.01..1130

As our penultimate example, let's take another hand (Example 5) brought up by Thorvald Aagaard from the 2015 Bermuda Bowl (Round 1, Board 1). Thorvald says that East-West should be in four hearts as it mainly depends on the heart finesse. Ideally he would like the score to reflect this, whether or not the king is in place. In any event he would like most of the variation to be in the play and defense, not in the bidding.

As discussed in the introduction, the Valet score cannot take into account a specific king, as it has no way to incorporate actual distributions, only the results from actual play. But it's a hand where the defense can slip up. Against 3NT the defense has to lead a club. Against four hearts the defenders have to avoid some pitfalls, including a club ruff in East. So let's see what happens (next page).

First of all, 3 out of 14 declarers make four hearts and 2 out of 8 declarers make three notrump.

Score	IAF
+420	+8.57
+400	+8.33
-50	-1.62
-100	-3.48

Contract	Lead	Tricks	Count	Overall	Bid	Play
4♡, E	♢	8	1	-3.48	+0.44	-3.92
		9	4	-1.62	+0.44	-2.06
		10	2	+8.57	+0.44	+8.13
	♠	9	2	-1.62	+0.44	-2.06
4♡, W	♠	9	3	-1.62	+0.05	-1.67
	♣	10	1	+8.57	+0.05	+8.52
		8	1	-3.48	+0.05	-3.52
3NT, E	♣	9	1	+8.33	-0.52	+8.86
		7	6	-3.48	-0.52	-2.95
	♠	9	1	+8.33	-0.52	+8.86

IAF scoring, declarer's view in Example 5

Contract	Lead	Tricks	Count	Overall	Bid	Lead	Other def.
4♡, E	♢	8	1	+3.48	-0.44	-0.59	+4.50
		9	4	+1.62	-0.44	-0.59	+2.65
		10	2	-8.57	-0.44	-0.59	-7.54
	♠	9	2	+1.62	-0.44	+2.06	0.00
4♡, W	♠	9	3	+1.62	-0.05	+1.67	0.00
	♣	10	1	-8.57	-0.05	-2.50	-6.02
		8	1	+3.48	-0.05	-2.50	+6.02
3NT, E	♣	9	1	-8.33	+0.52	+1.27	-10.12
		7	6	+3.48	+0.52	+1.27	+1.69
	♠	9	1	-8.33	+0.52	-8.86	0.00

IAF scoring, defenders' view in Example 5

We see that very little of the variation is assigned to the bidding. The table format makes clear that there is a single bidding score for the same contract played from the same side. The Valet score also likes the spade lead against four hearts from either side, which makes sense as no declarer had any chance after that.

Against four hearts by East, it was better to lead a spade (which always beat the contract) than to lead a diamond (which sometimes let declarer make). The lead scores correctly reflect this. When the defenders did subsequently beat the contract on a diamond lead, their defense scored benefits.

Similarly, a spade lead against three notrump let the contract make, so that causes a terrible lead score.

So even this supposedly dull hand actually had some interesting aspects. To be sure, we could construct a hand that really did only depend on a single finesse. We could make it so that exactly one half of the declarers bid game and the other half didn't.

If the finesse is onside, we would then find that the game bidders would get a plus score for their bidding, and non-game bidders would get a negative score. There would be no variation in the play or defense. For a non-vulnerable three notrump, it would of course be +400 vs. +150. If there are a lot of pairs, then the game bidders would get approximately +3.00 IAF IMPs (as 250 corresponds to 6 IMPs) and the non-game bidders would get -3.00 IAF IMPs.

If we change the same hand by moving the finesseable card, then the plus-minus relations would change. The game bidders would get -50 and the non-game bidders would get +120. The IAF IMP scores would be -2.50 IMPs for the game bidders (as -170 is -5 IMPs) and 2.50 IMPs, respectively.

If all the pairs played a tournament consisting only of these two hands, and the same pairs bid game on both hands, then the game bidders would get a positive score of 0.25 IMPs per board (3.00 – 2.50 divided by 2), and the others would get -0.25 IMPs per board. This is as it should be. Luck evens out and skill remains in the long run. We might have wait a while, though.

North dealer
EW vul.

	North	
	♠ K 9 7 ♡ 9 8 2 ♢ A K 8 4 3 ♣ 9 6	
West ♠ J T 3 ♡ T ♢ Q T 6 5 ♣ A K J 5 2	N W E S	**East** ♠ A Q 8 6 4 2 ♡ Q 6 3 ♢ 9 ♣ Q T 3
	♠ 5 ♡ A K J 7 5 4 ♢ J 7 2 ♣ 8 7 4	

Our final example (Examples 6) is from the 2015 Danish First Division. This one is interesting because declarers bid to different levels in the same denomination.

Contract	Declarer	Count	Tricks
5♢×	N	1	7
5♡×	S	1	8
4♡	S	1	8
5♠	E	1	11
4♠×	E	1	11
4♠	E	4 1	10 12
3♠	E	2	12

The overall IAF IMPs for North-South are as follows.

Score	IAF
-100	9.82
-230	7.45
-500	1.36
-620	-1.36
-650	-2.18
-680	-3.18
-800	-5.73
-990	-9.55

Contract	Tricks	Count	Overall	Bid	Play
5♢×, N	7	1	-5.73	-5.73	0.00
5♡×, N	8	1	+1.36	+1.36	0.00
4♡, S	8	1	+9.82	+9.82	0.00
5♠, E	11	1	+2.18	-3.45	+5.64
4♠×, E	11	1	+9.55	+8.18	+1.37
4♠, E	10 12	4 1	+1.36 +3.18	+2.15 +2.15	-0.79 +1.03
3♠, E	12	2	-7.45	-7.65	+0.20

IAF scoring, declarer's view in Example 6

Contract	Tricks	Count	Overall	Bid	Def.
5♢×, N	7	1	+5.73	+5.73	0.00
5♡×, N	8	1	-1.36	-1.36	0.00
4♡, S	8	1	-9.82	-9.82	0.00
5♠, E	11	1	-2.18	+3.45	-5.64
4♠×, E	11	1	-9.55	-8.18	-1.37
4♠, E	10 12	4 1	-1.36 -3.18	-2.15 -2.15	-+0.79 -1.03
3♠, E	12	2	+7.45	+7.65	-0.20

IAF scoring, defenders' view in Example 6

The solitary North declarer in diamonds gets his penalty in the bidding column. Similarly for the two declarers in hearts, as they played from different sides, so there is no comparison available.

The real interest is in the spade declarers. Thorvald was in 4♠ making 12 tricks. Why did he get +1.03 for his declarer play, while the declarer in 5♠ making 11 tricks got +5.64?

The reason is that the Valet score measures declarer play *relative to the actual contract*. Thorvald was only in 4♠, and his good play (or his benefit from the soft defense) didn't benefit his team a lot, as it was only the second overtrick. When we replace Thorvald by each of the spade declarers, we get somewhat lower IAF scores, but not a lot.

In contrast, the declarer in 5♠ really did have to take at least 11 tricks. In fact he did. If we replace him with each of the spade declarers, his team would have gone down five times out of nine, and each time it would cost a lot of IAF IMPs. Relative to this, his declarer play was very valuable. So he gets a much better play score for taking 11 tricks than Thorvald gets for taking 12. (He does get a poor bidding score though, and that is as it should be.)

You can reproduce the examples using the Valet program and the following input switches. In addition to these you must also add "-d path", where path is the path to the directory with the examples. For instance if you run Valet in the src directory, the path is "-d ../data/examples". You must also add "-t tab.txt" which outputs the tableau for the hand into the local file tab.txt. Note that the early tables in this document are simplified versions of the tableau.

Example	Parameters
1	-n names1.txt -s scores1.txt -v datum -x -n names1.txt -s scores1.txt -x
2	-n names2.txt -s scores2.txt -v datum -l -x -n names2.txt -s scores2.txt -l -x
3	-n names3.txt -s scores3.txt -l -x
4	-n names4.txt -s scores4.txt -l -x
5	-n names5.txt -s scores5.txt -l -x
6	-n names6.txt -s scores6.txt -x
7	-n names7.txt -s scores7.txt -n names7.txt -s scores7.txt -v datum

2.5 ADJUSTMENT

Some people will never be content… Not satisfied with the false accuracy of all these Valet calculations, they also want to compensate for the strengths of the opponents faced by different pairs.

Since I was at it, I implemented such an optional adjustment in the Valet program. The adjustment calculates a weighted average of the overall Valet score of all the opponents faced. Furthermore, following an idea by Paul Gipson, the opponents' Valet scores are recalculated by excluding the boards played against the specific pair in question, on the theory that these boards would otherwise count "double". Of course it's not really double, as the boards generally have a small effect on the opponents' scores, at least in a big tournament.

In any case, the feature is there. I don't personally recommend using it except in rare cases where there are not so many different opponents, but then there will also not be so many comparisons, and the Valet score (and the Butler score) is of questionable utility. It doesn't work for matchpoints currently.

2.6 INDIVIDUAL RESULTS

Some scoring programs output the Butler score for individuals, so if a player has played with multiple partners, a composite score arises. I don't think this is very appropriate except perhaps for declarer play and leads, so the Valet program does not offer this feature. It wouldn't be hard to implement, though.

3 Results

3.1 STRONG TOURNAMENTS

I've applied the Valet score to some strong tournaments whose results I could screen-scrape from Internet sites. If there were qualifying and final rounds, I only took the qualifying round-robin rounds.

- 2004 Olympiad (this was was done more or less manually from pdf files, though).
- The 2008 and 2012 World Mind Games, both for men and women. These tournaments replaced the Olympiad.
- The Bermuda Bowl and Venice Cup for 2005, 2007, 2009, 2011, 2013 and 2015.
- The European Championship for 2006, 2008, 2010, 2012 and 2014, both for men and women.
- The Polish first league for 2012, 2013, 2014 and 2015.

It was a fair amount of work, and in some cases there were small issues with data quality, but overall I think the data is quite good. From my own experience I would say that the pairs may well not have sat the way they were entered on the Bridgemates, so it's not a good idea to rely too much on individual as opposed to pair scores.

Due to the variations in Butler implementations, don't expect my results to be identical to the "official" ones.

The results are distributed together with the Valet program, including in pdf format. I have not attempted any statistical analysis on the number of hands needed for some kind of relevance, but I have often drawn the line at either 100 or 200 hands for a given pair.

I mentioned earlier that datum IMPs give rise to larger numbers than do IAF IMPs. I've quantified this, and the effect is 10%. So 10 datum IMPs are statistically similar to 9 IAF IMPs.

I've also quantified the relative effects of bidding, play and defense on results. This is a quick-and-dirty approach: I took the standard deviation of each of these three components across all pairs with enough hands played in a given tournament (regardless of how many hands each pair played). If there is more variation in the bidding results than in the defense results, that means that the bidding varies more and so plays a larger role.

Across all the tournaments, it turns out that the bidding counts for about as much as the play and defense together. This is calculated per hand, so if you play 100 hands, you might be expected to bid 100, declare 50 (25 for each of you and partner), and defend 50 hands. The stated results apply when dividing the IMP swings by 100 for each component (and not by 100 for bidding, 50 for play and 50 for defense). In other words, it is indeed a bidders' game.

3.2 CHEATING

I thought it might be possible to get indications of cheating by looking at some statistics across tournaments. In the Valet distribution I also include spreadsheets that cover all of the tournaments (except the Polish league games).

Some of the pairs that are reported to have been cheating do indeed score well on the Valet score, including on bidding, opening leads and defense (where cheating might be expected to help). But I think the signal-to-noise ratio in the data is not good enough to be helpful in this regard. Perhaps someone has a better idea for using this data.

4 Appendix: The Full Truth

4.1 MOTIVATION

Michele Cammarata brought up an example that caused both of us to think more deeply about the Valet score, and in the end we both arrived at a similar result. I didn't complete the work in late 2015, and as I think about it now, I see more aspects. To explain it all, I have modified Michele's example slightly (with IMPs-across-the-field scoring and declarer vulnerable):

Player	Contract	Points	Butler	Bid	Play
1	3NT+1	+630	+3.00	+4.50	-1.50
2	3NT+4	+720	+6.00	+4.50	+1.50
3	5♣+2	+640	+3.33	+2.67	+0.67
4	7♣-1	-100	-12.33	+2.46	-14.79

The standard IAF decomposition of Example 7.

Player 1 scores -3 IMPs against player 2, 0 against player 3, and +12 IMPs against player 4 for a Butler score of +3.00 IMPs.

Player 1 could apparently have made 10 or 13 tricks, but she made 10. Let us consider that she made 10 tricks half the time and 13 tricks the other half. With 10 tricks she scored the same +9 IMPs against the other players (excluding herself) as before. With 13 tricks she would have scored +18 IMPs against the four actual players, so on average she scored ((9 + 18)/2) / 3 = +4.50 IMPs in the bidding.

Note that all players get a solidly positive bidding score, including both declarers in clubs. This somehow feels wrong. We are not in Lake Wobegon, "where all the women are strong, all the men are good looking, and all the children are above average."

The issue is that the 5♣ declarer is considered to make either 12 or 13 tricks, both of which generate a good bidding score against the 7♣ declarer's actual score of down one. The 7♣ declarer is considered to make either 12 or 13 tricks, which also generates a positive average against the 5♣ actual declarer's score of two overtricks. But we are not considering that the 7♣ declarer might apparently have made as well, but didn't, so the 5♣ bidder should somehow be penalized for this.

Broadly speaking, the solution is to compare the 5♣ declarer's two possible scores not just against the single, actual 7♣ result of down one, but against two 7♣ results: Down one and making. After all, the 7♣ declarer is also in a sense called away and his replacements take 12 and 13 tricks, respectively. The issue is whether and how this can be done in a general and consistent way.

If we just compare the two club declarers, the 5♣ declarer gets 12 tricks half the time for +620, and this is compared to -100 and to +2140, yielding +12 and -17 IMPs respectively. The other half of the time he gets 13 tricks for +640, yielding the same IMP numbers. His bidding average is -2.50 IMP against the grand-slam bidder.

The 7 declarer gets 12 tricks half the time for -100, and this is compared to +620 and +640 yielding -12 IMPs in both cases. The other half of the time, he gets +2140 which is compared to +620 and +640, yielding +17 IMPs. His bidding average is +2.50 IMPs against the 5♣ bidder.

I think of this as a "cloud" solution where all declarers have not just a single result, but a cloud of results. When comparing bidding results, we compare the current declarer's cloud of results not just with the actual results at the other tables, but with the clouds of results at these other tables.

How to generalize this to a Valet score decomposition, and what properties do the decomposition then have? We will go through possible definitions and their advantages and disadvantages in some details, using the above example. This gets a bit technical. If you're mathematically inclined, you may also enjoy Michele's article in the "doc/others" directory.

4.2 MATH

Let us define r_j as the actual result of the jth player in total points,. As usual, in the Valet score we will only compare this declarer's play against others in the same denomination from the same side (including oneself). In our example

$$(r_1, r_2, r_3, r_4) = (+630, +720, +640, -100).$$

Let us also define e_{jn} as the modified result of the jth player in total points when he takes the same number of tricks as the nth player (in the same denomination from the same side). For example e_{33} would be +640, as the first player in clubs would take 13 tricks if replaced by himself, and e_{34} would be +620, as the first player in clubs would take only 12 tricks if replaced by the grand-slam declarer. In our example

$$(e_{11}, e_{12}) = (+630, +720),$$
$$(e_{21}, e_{22}) = (+630, +720),$$
$$(e_{33}, e_{34}) = (+640, +620),$$
$$(e_{43}, e_{44}) = (+2140, -100).$$

Let us also define d_j as the "expected" or datum result of the jth player in total points when this player is successively replaced with all other declarers in the same denomination from the same side. We simply average the total points over the different outcomes. In our example

$$(d_1, d_2, d_3, d_4) = (+675, +675, +630, +1020).$$

We write

$$d_j = \text{average of the total points of player } j \text{ with hypothetical declarers, or}$$

$$d_j = \text{avg}_n\, e_{jn},$$

where n ranges over all declarers playing in the same denomination from the same side (including oneself). The notation "avg$_n$" means "the average overall result of all players, including oneself, playing in the same denomination from the same side."

4.2.1 Overall Butler-Like Score

The usual Butler-like score of the jth player can be written

$$\text{overall1}_j = \text{average of the IMP score of } r_j \text{ against other results, or}$$

$$\text{o1}_j = \text{avg}_k\, \text{IMP}(r_j, r_k),$$

where k ranges over all declarers (excluding oneself), whether or not they play in the same denomination from the same side.

The first notation is a bit verbose, so in the second notation "avg$_k$" means "the average over all other declarers, as k counts through these declarers," and o1 is short for "overall1", the first possible definition of the overall score.

"IMP" is a function with two arguments, and it generates the IMP value of those results. For example IMP(-100, +620) equals -12 IMPs, the result of going down one in the grand slam vs. making an overtrick in 5♣. The IMP scale is nonlinear: IMP(-300, +620) equals -14 IMPs, whereas IMP(-300, -100) equals -5 IMPs and IMP(-100, +620) equals -12 IMPs. -14 is not the sum of -5 and -12. The IMP scale is symmetric (technically anti-symmetric), so IMP(-300, +620) = -IMP(+620, -300).

In our example

$$(\text{o1}_1, \text{o1}_2, \text{o1}_3, \text{o1}_4) = (3.00, +6.00, +3.33, -12.33).$$

The first player scores -3 IMPs against the second player, 0 IMPs against the third player, and +12 IMPs against player 3, for an average of +3.00 IMPs as before.

Here we only compare the player's result with the other actual results. We can also define a cloud Butler score as

$$\text{o2}_j = \text{avg}_k\, \text{IMP}(r_j, d_k),$$

Here we compare the actual result against the *datum* results that other players, excluding oneself, would have obtained on average in their respective result clouds. This includes all denominations and declarers. We might say that some of the randomness or "luck" of the play at these other tables is evened out, and we might consider this second, possible definition of the overall Butler score to be in a sense "better." It yields different results.

In our example

$$(o2_1, o2_2, o2_3, o2_4) = (-3.67, -0.67, -3.67, -12.67).$$

For example the grand-slam declarer with -100 loses 13 IMPs (for a score difference of 775) to the first player, 13 IMPs to the second player, and 12 IMPs to the third player. The average is -12.67 IMPs.

In a sense this is a disturbing result. Our intent was to make the play scores come out closer to a zero average, but we have made the overall Butler scores (for the declarers) all negative in the process. Of course the Butler scores for the defenders average out this effect, but have the defenders all deserved positive scores?

The answer is that we have introduced a number of "shadow" pairs, for example the declarer who bid and made 7♣. In the particular set of declarers who happened to play this hand he was not present, but he could have been, and he would have got a very positive Butler score. The average over all the real and shadow declarers is still zero. It's just that by the luck of the draw, we had real declarers at the table who all got negative Butler scores.

The example is constructed on purpose to combine good or lucky bidding with bad or unlucky declarer play. Before we pass judgment, let us see how the play scores come out as well. We could actually say that the difference between o1 and o2 (or between o1 and o3 below) is the "luck" in the particular combinations that happened between the individual bidding results and the individual number of tricks taken. In addition to "luck," the particular bidding sequences and the levels of the different contracts surely enter into it as well. We will come back to this.

We can also define an even more cloud-like overall score as:

$$o3_j = \text{avg}_k \, \text{avg}_n \, \text{IMP}(r_j, e_{kn}),$$

where (for a given opponent k) the index n ranges over those players that could have replaced opponent k in the same denomination from the same side. As the IMP scale is nonlinear, o2 and o3 are not the same. In our example

$$(o3_1, o3_2, o3_{3,}, o3_4) = (-1.33, +0.83, -1.50, -12.33).$$

The third player loses 12 IMPs to the first player, 12 IMPs to the second player (whether or not he makes 13 tricks), and loses 8.5 IMPs on average to "himself", i.e. 0 IMPs if his shadow also goes down and 17 IMPs if his shadow makes.

Here the sum of the scores is still significantly negative, but it is not quite as bad as in o2. In o2 we averaged raw total scores, i.e. before applying the nonlinear IMP scale, and in a sense this introduced additional distortion.

Other things being equal, we would like the average Butler score of all North-South pairs to average to zero. This applies to o1, but not to o2 nor to o3. I will call this "Rule 1 (overall)".

4.2.2 Bidding Score

So far in the Valet score we have averaged the different hypothetical declarer outcomes against the actual results of all declarers in the same denomination from the same side:

$$b1_j = \text{avg}_n \text{ avg}_k \text{ IMP}(e_{jn}, r_k),$$

which means: For a given player j, consider all the players n who bid to the same denomination from the same side. For each such player n, take the score (e_{jn}) that player j would have obtained if he had taken the same number of tricks that player n took. Calculate the average IMP result that player j would have obtained in this way against all other players k (excluding oneself).

This is a mathematical way of saying the same thing that was calculated below the table at the beginning of this section. As shown there, the result is

$$(b1_1, b1_2, b1_{3,}, b1_4) = (+4.50, +4.50, +2.67, +2.46).$$

Let's consider some alternatives. We could just use the datum score and average this against all other players:

$$b2_j = \text{avg}_k \text{ IMP}(d_j, r_k).$$

In our example

$$(b2_1, b2_2, b2_{3,}, b2_4) = (+4.67, +5.00, +3.00, +8.33).$$

The first player loses 2 IMP to player 2 (we count a difference of 45 as 2 IMPs, rounding down), gains 1 IMP over player 3, and gains 13 IMPs over player 4 for an average of 13 / 3 = +4.67. That didn't really help.

Or we could simplify even further to

$$b3_j = \text{avg}_k \text{ IMP}(d_j, d_k).$$

In our example

$$(b3_1, b3_2, b3_{3,}, b3_4) = (-2.00, -2.00, -4.33, +8.33).$$

The fourth player gains 8 IMPs against players 1 and 2, and 9 IMPs against player 3 for an average of +8.33. This always averages to 0, and the results are somewhat intuitive.

A final attempt goes in the direction of more cloud rather than less, as outlined in the introduction to this section:

$$b4_j = \text{avg}_n\ \text{avg}_k\ \text{avg}_q\ \text{IMP}(e_{jn}, e_{kq}),$$

which is starting to look at bit complicated. It means: For a given player *j*, consider all the players *n* who bid to the same denomination from the same side. For each such player *n*, take the score (m_{jn}) that player *j* would have obtained if he had taken the same number of tricks that player *n* took. Then consider all opponents *k* (no matter the denomination and side), and take each score that player *k* would have obtained if he had been replaced successively in his contract by other declarers *q* who played in the same denomination from the same side that he did.

In our example

$$(b4_1, b4_2, b4_3, b4_4) = (-0.25, -0.25, -1.67, +2.17).$$

As this looks so complicated, let us do all four players by hand. For the first player (j = 1) there were two players n = 1 and 2 who bid to the same denomination (NT) from the same side. Player 1 would have scored e_{11} = +630 with player 1's trick number and e_{12} = +720 with player 2's trick number. Player 1's opponents for a comparison were players 2, 3 and 4. These players would have obtained the scores shown at the beginning of section 4.2 if they were replaced successively with different declarers *q*. To repeat:

(e_{11}, e_{12}) = (+630, +720) – our intrepid declarer,
(e_{21}, e_{22}) = (+630, +720) – his first opponent,
(e_{33}, e_{34}) = (+640, +620) – his second opponent,
(e_{43}, e_{44}) = (+2140, -100) – his third opponent.

Going from the inside out in the formula, we must first average over *q*. So we pick e_{11} and we compare it to the possible results of player 2, which gains an average of (0 - 3)/ 2 = -1.50 IMPs. Similarly the average against player 3's possible results is 0.00 IMPs on average, and the average against player 4's possible results is (-17 + 12) / 2= -2.50 IMPs. The average of -1.50, 0.00 and -2.50 is -1.33 IMPs.

Next we pick e_{12} and we go through the same calculation. This time we gain (3 + 0) / 2 = +1.50 IMPs against player 2, (2 + 3) / 2 = +2.50 IMPs against player 3, and (-16 + 13) / 2 = -1.50 IMPs against player 4. The average of these three is +0.83 IMPs.

Finally we average the results of e_{11} and e_{12}, yielding -0.25 IMPs.

For player 2 there were also two players who played in the same denomination from the same side, players 1 and 2. Player 2 would have scored +630 with player 1's trick number and +720 with player 2's (own) trick number. Player 2's opponents were players 1, 3 and 4. The calculation from here on will be the same as for player 1, which is not surprising, as they bid to the same contract from the same side.

For player 3, players 3 and 4 played in the same denomination from the same side. Player 3 would have scored +640 or +620, respectively. Starting with +640, player 3 would have gained (0 – 2) / 2 = -1.00 IMPs against player 1's possible results, -1.00 IMPs against player 2's possible results, and (-17 + 12) / 2 = -2.50 IMPs against player 4's possible results. The average of these three numbers is -1.50 IMPs.

Continuing with +620, player 3 would have gained (0 – 3) / 2 = -1.50 IMPs against each of players 1 and 2, and (-17 + 12) / 2 = -2.50 IMPs against player 4. The average of these three numbers is -1.83 IMPs. Therefore player 3's overall bidding score is the average of -1.50 and -1.83 which is -1.67 IMPs.

Finally, player 4 would have scored either +2140 or -100. Starting with +2140, he would have gained (17 + 16) / 2 = +16.50 IMPs against players 1 and 2, and (17 + 17) / 2 = +17.00 IMPs against player 3. The average of these three numbers is +16.67 IMPs.

With -100, he would have gained (-12 – 13) / 2 = -12.50 IMPs against players 1 and 2, and (-12 – 12) / 2 = -12.00 IMPs against player 3. The average of these three numbers is -12.33 IMPs. Therefore player 4's overall bidding score is the average of +16.67 and -12.33 which is +2.17 IMPs.

We note with some satisfaction after all this work that the bidding scores average to zero again. I will call this "Rule 2 (bidding)", and it is satisfied for b3 and b4, but not for b1 and b2.

4.2.3 Play Score

The play score is in a sense whatever is left when we take out the bidding score from the Butler score. As we have three candidates for the overall Butler score and four candidates for the bidding score, this gives us twelve combinations.

If both the overall score and the bidding score chosen average to zero, then the play score will, too.

If only one of them average to zero, then the play score will not.

If none of them average to zero, it is still possible for the play score to average to zero, but this would have to be shown mathematically and it would in general be a bit of a coincidence.

Rule 3 (play) is satisfied when the play scores for a given side average to zero.

4.2.4 Further Rules

Rule 4 (sum): It is desirable that the overall score be the sum of the bidding score and the play score. This might be considered trivially true, as the play score is always the difference between some overall score and some bidding score. But we could theoretically define the play score as the difference between two quantities and yet choose some other quantities as definitions of the overall score and the bidding score…

Rule 5 (contract): If all tables bid to the identical contract (including declarer, denomination, level and doubling status), then it is desirable that the bidding score be zero.

Rule 6 (tricks): If the tables bid to a number of different contracts, but every table in the identical contracts takes the same number of tricks, then it is desirable that the play score be zero.

Rule 7 (zero): If there is only one player in a specific contract, then it may be desirable to some people that the play score be zero. This is related to, but not the same as Rule 6.

4.3 PUTTING IT TOGETHER

4.3.1 IMPs Across the Field

Using the building blocks defined above, we can define a number of potential Valet score decompositions.

My favorite is o3 together with b4: In addition to delivering good results in the example as shown below, these measures are symmetrical and mathematically pleasing. They satisfy all rules except Rule 1 (overall), but this is actually as it should be.

For these reasons, this combination is the choice for IMPs-across-the-field in the Valet program, assuming that the cloud option is turned on (which it is by default). But we will get there in two steps. The following table shows the IAF cloud decomposition of Example 7 in to o1 and b4.

Player	Contract	Points	Butler	Bid	Play
1	3NT+1	+630	+3.00	-0.25	+3.25
2	3NT+4	+720	+6.00	-0.25	+6.25
3	5♣+2	+640	+3.33	-1.67	+5.00
4	7♣-1	-100	-12.33	+2.17	-14.50

The new cloud IAF decomposition of Example 7.

We see that all the component scores now average to zero as expected. But players 1, 2 and 3 derive way too much of their score from the play. This is because the Butler score in itself is skewed by the effect that I alluded to above: There are “shadow” pairs that should be influencing the Butler score, but aren’t. The bidding scores are fine, but the Butler effect flows through to the play scores.

So let us do this example one last time, but let us include the o3 decomposition as well. I will call this the “fair Butler,” and the difference between the real and the fair Butler is the “luck” in pairing up end contracts with numbers of tricks taken that happened in this particular case. If we derive the play scores from the fair Butlers, then the play scores make more sense. The price we pay in this Faustian bargain is that they no longer average to zero – the luck component has effectively been allocated to the play. In my opinion this is as it should be.

Player	Contract	Points	Butler	Fair Butler	Luck	Bid	Play
1	3NT+1	+630	+3.00	-1.33	+4.33	-0.25	-1.08
2	3NT+4	+720	+6.00	+0.83	+5.17	-0.25	+1.08
3	5♣+2	+640	+3.33	-1.50	+4.83	-1.67	+0.17
4	7♣-1	-100	-12.33	-12.33	0.00	+2.17	-14.50

The new cloud IAF decomposition of Example 7, including "luck".

Now all the scores make sense, at least to this observer. The grand-slam bidder did somewhat well in the bidding, albeit with high volatility, and did terribly in the play. The others did nothing much good or bad, though of course taking more tricks in a given contract was rewarded. Players 1, 2 and 3 got sizable presents in the Butler. If the 5♣ and 7♣ bidders had instead taken 13 and 12 tricks, respectively, these same players would have had negative "luck."

When the Valet program reports cloud IAF scores, it only shows the Fair Butler and not the luck component.

4.3.2 Datum Scoring

We're not quite done yet. The scoring versions that use a datum score, o2 and b3, are closer in spirit to the datum Butler score. We start again from the standard decomposition of Example 7, but this time we use datum scoring.

Player	Contract	Points	Butler	Bid	Play
1	3NT+1	+630	+4.00	+5.00	-1.00
2	3NT+4	+720	+6.00	+5.00	+1.00
3	5♣+2	+640	+5.00	+4.50	+0.50
4	7♣-1	-100	-11.00	+3.00	-14.00

The standard datum decomposition of Example 7.

This does not differ greatly from the IAF composition above, but we do see that the Butler scores do not add up to zero anymore. The bidding scores are still all strongly positive.

As before we will start from the usual Butler score, and we will consider the o2 decomposition to be the fair Butler and b3 to be the bidding score. Both these are close to the datum-score thinking in their definitions.

Player	Contract	Points	Butler	Fair Butler	Luck	Bid	Play
1	3NT+1	+630	+4.00	-3.67	+7.67	-2.00	-1.67
2	3NT+4	+720	+6.00	-0.67	+6.67	-2.00	+1.33
3	5♣+2	+640	+5.00	-3.67	+8.67	-4.33	+0.67
4	7♣-1	-100	-11.00	-12.67	+1.67	+8.33	-21.00

The new cloud datum decomposition of Example 7, including "luck".

In this example the bidding score for 7♣ feels too high, and this skews the entire picture. The 7♣ declarer does not deserve a bidding-datum score of +1020, beating all pairs in game by a huge margin even though he goes down half the time. As I've said previously, I recommend IMPs-across-the-field over datum scoring. The datum composition does have the same characteristics as the IAF decomposition, i.e. it satisfies all rules except Rule 1 (overall).

To an extent these considerations are for the purist. At the very end of this document I show some aggregate results from the second European Winter Games in 2018. I include the 5 top, 5 middle and 5 bottom players for IAF and datum scoring (among those players with at least 50 hands), both with the original Valet version and with the recommended cloud version.

As expected the order of the players is quite similar, and the IAF scores are about 10% lower than the datum scores.

4.4 MATHEMATICAL PROOFS

You're still not satisfied? For this last part we will unfortunately have to use some real math notation as introduced by Michele. The basic idea is that there is a number (5,881 in fact) of scoring outcomes of a hand:

5 levels × 5 denominations × 4 declarers ×
3 doubled scenarios (undoubled, doubled, redoubled) ×
14 different numbers of tricks +
1 (for a pass-out).

We arrange these in some order into a long vector **v**. A specific result it coded as a "1" in the corresponding location of the vector, with zeros elsewhere. A set of possible outcomes in a given contract is coded as some probabilities in the corresponding locations, for example in a "cloud" vector **e**. The probabilities must add to 1.

We also define an IMP matrix **M** containing all the IMP scores of each of the 5,881 results at one table against each of the 5,881 results at the other table. This is a pretty big matrix with almost 35 mio. entries, and in practice we wouldn't store the results in this way. But in principle we can match up the results of two vector $\mathbf{v}_j$ and $\mathbf{v}_k$ as follows:

$$\mathrm{IMP}(\mathbf{v}_j, \mathbf{v}_k) = \mathbf{v}_j^{\mathrm{T}}\, \mathbf{M}\, \mathbf{v}_k.$$

Our hypothetical outcomes e_{11}, e_{12} and so on are organized into probability vectors as well, one per player, here $\mathbf{e}_1$. In this notation

$$\mathrm{o1j} = \mathrm{avg}_k\, \mathbf{r}_j\, \mathbf{M}\, \mathbf{r}_k = \mathbf{r}_j\, \mathbf{M}\, (\mathrm{avg}_k\, \mathbf{r}_k),$$

$$\mathrm{o3}_j = \mathbf{r}_j\, \mathbf{M}\, \mathrm{avg}\, \mathbf{e}_k,$$

$$\mathrm{b1}_j = \mathbf{e}_j\, \mathbf{M}\, \mathbf{r}_k,$$

$$\mathrm{b4}_j = \mathbf{e}_j\, \mathbf{M}\, \mathrm{avg}\, \mathbf{e}_k.$$

We’re not going to bother here with the datum-like versions o2, b2 and b3.

The decomposition of an IAF score that I recommend can be written

$$\mathrm{o1}_j\ (\text{Butler}) = \mathrm{o3}_j\ (\text{fair Butler}) + \text{luck, or}$$

$$\mathbf{r}_j\, \mathbf{M}\, (\mathrm{avg}_k\, \mathbf{r}_k) = \mathbf{r}_j\, \mathbf{M}\, \mathrm{avg}\, \mathbf{e}_k + \mathbf{r}_j\, \mathbf{M}\, (\mathbf{r}_k - \mathbf{e}_k).$$

Also

$$\mathrm{o3}_j\ (\text{fair Butler}) = \mathrm{b4}_j + p_j\ (\text{the play score}), \text{ or}$$

$$\mathbf{r}_j\, \mathbf{M}\, \mathrm{avg}\, \mathbf{e}_k = \mathbf{e}_j\, \mathbf{M}\, \mathrm{avg}\, \mathbf{e}_k + (\mathbf{r}_j - \mathbf{e}_j)\, \mathbf{M}\, \mathrm{avg}\, \mathbf{e}_k.$$

In words, your luck component is your actual score vs. the differences at all other tables between the actual and cloud (“expected”) results. Your play component is the difference between your own actual and cloud results, scored against the expected results at the other tables.

There are other ways to slice the Butler score, and Michele has a different preference.

Now we can explain Table A:

1. As seen in Example 7, o1 averages to 0 whereas o3 doesn’t.
2. As seen in Example 7, the bidding score b1 does not average to zero. The bidding score b4 does average to zero.
3. The play score defined as o1 – b4 averages to zero, as both components of the difference have this property. This is not the case for o1 – b1, o3 – b1 or o3 – b4.
4. All the reasonable decompositions are sums of components.
5. By symmetry b1, b3 and b4 average to zero under the assumptions of Rule 5, but b2 does not.
6. Under the assumptions of Rule 6, note that $\mathrm{b1}_j$ and $\mathrm{b2}_j$ both simplify to $\mathrm{o1}_j$. Also $\mathrm{b4}_j$ simplifies to $\mathrm{o3}_j$. Therefore the play score is zero when using o1 – b1 or o3 – b4.
7. Under the assumptions of Rule 7, b1 and b2 equal o1, while b4 equals o3. Therefore the play scores defined as o1 – b1 or o3 – b4 are both zero.

					Play		Declaring	
Players	No.	IMPs	Bid	Play	Declaring	Defending	Declarer1	Declarer2
MAUBERQUEZ Eric - OURSEL Christophe	80	1.33	0.69	0.64	1.33 (45)	-0.24 (35)	1.49 (24)	1.14 (21)
LAURIA Lorenzo - VERSACE Alfredo	110	1.07	0.27	0.80	1.04 (50)	0.60 (60)	1.51 (21)	0.70 (29)
LORENZINI Cedric - QUANTIN Jean-Christophe	80	1.06	0.47	0.59	0.53 (47)	0.67 (33)	0.76 (21)	0.34 (26)
KORDOV Mehmet Ali - BILGEN Salih	80	1.00	0.82	0.18	0.18 (27)	0.18 (52)	0.49 (14)	-0.17 (13)
NANEV Ivan - STEFANOV Julian	140	0.98	0.53	0.45	0.98 (76)	-0.18 (64)	1.20 (49)	0.57 (27)
...								
OYMEN Can - YILMAZBAYHAN Can	60	0.02	0.06	-0.04	-0.17 (35)	0.14 (25)	0.18 (22)	-0.76 (13)
HOUMOLLER Jonas - SCHAFFER Lauge	130	0.01	-0.08	0.08	-0.23 (55)	0.31 (75)	-0.21 (30)	-0.25 (25)
FONTENEAU Dominique - DESAGES Olivier	100	0.00	-0.08	0.08	0.17 (51)	-0.01 (48)	1.11 (19)	-0.39 (32)
FRANCESCHETTI Pierre - ROBERT Quentin	80	-0.01	-0.14	0.13	0.02 (45)	0.27 (35)	-0.20 (22)	0.23 (23)
BARETY Michel - MARCHANDISE Michel	70	-0.01	-0.08	0.07	-0.51 (32)	0.56 (38)	-0.24 (14)	-0.73 (18)
...								
LORENZINI Cedric - WARD-PLATT Kiki	70	-1.00	-0.58	-0.42	-0.19 (31)	-0.60 (39)	-0.39 (17)	0.06 (14)
PORKHUN Volodymyr - DRAGAN Volodymyr	90	-1.09	-1.02	-0.07	-0.00 (41)	-0.12 (49)	-0.02 (20)	0.02 (21)
MARTENS Krzysztof - MILLENS Joan	70	-1.21	-0.57	-0.64	-0.89 (25)	-0.50 (45)	-0.30 (14)	-1.64 (11)
ARLOVICH Andrei - VAINIKONIS Erikas	70	-1.22	-0.90	-0.32	-0.65 (41)	0.17 (28)	-0.64 (20)	-0.66 (21)
FRANCESCHETTI Pierre - SETTON Hilda	70	-1.23	-0.87	-0.36	-0.65 (39)	-0.00 (31)	-0.65 (26)	-0.66 (13)
JELENIEWSKI Marek - KOLUDA Piotr	50	-1.37	-0.53	-0.83	-0.37 (24)	-1.27 (26)	-1.44 (10)	0.40 (14)

Some results from the 2nd European Winter Games with IAF scoring, without cloud calculations.

					Play		Declaring	
Players	No.	IMPs	Bid	Play	Declaring	Defending	Declarer1	Declarer2
MAUBERQUEZ Eric - OURSEL Christophe	80	1.30	0.67	0.63	1.31 (45)	-0.24 (35)	1.47 (24)	1.12 (21)
LAURIA Lorenzo - VERSACE Alfredo	110	1.08	0.28	0.79	1.03 (50)	0.60 (60)	1.49 (21)	0.69 (29)
LORENZINI Cedric - QUANTIN Jean-Christophe	80	1.07	0.49	0.58	0.52 (47)	0.67 (33)	0.74 (21)	0.34 (26)
KORDOV Mehmet Ali - BILGEN Salih	80	1.02	0.84	0.18	0.18 (27)	0.18 (52)	0.48 (14)	-0.16 (13)
HOYOS Carlos - BERNAL Francisco	100	0.99	0.46	0.53	0.79 (59)	0.14 (41)	0.95 (52)	-0.39 (7)
...								
OYMEN Can - YILMAZBAYHAN Can	60	0.02	0.06	-0.04	-0.17 (35)	0.14 (25)	0.17 (22)	-0.75 (13)
HOUMOLLER Jonas - SCHAFFER Lauge	130	0.01	-0.07	0.08	-0.22 (55)	0.31 (75)	-0.21 (30)	-0.25 (25)
SCHNEIDER Michael - SMYKALLA Gisela	150	-0.01	-0.11	0.10	-0.01 (74)	0.21 (75)	-0.05 (33)	0.02 (41)
FONTENEAU Dominique - DESAGES Olivier	100	-0.01	-0.09	0.08	0.17 (51)	-0.01 (48)	1.10 (19)	-0.38 (32)
MARINA Bogdan - COLDEA Ionut	150	-0.02	0.18	-0.20	-0.19 (70)	-0.21 (80)	0.33 (38)	-0.80 (32)
...								
PORKHUN Volodymyr - DRAGAN Volodymyr	90	-1.07	-1.01	-0.07	-0.00 (41)	-0.12 (49)	-0.02 (20)	0.02 (21)
ARLOVICH Andrei - VAINIKONIS Erikas	70	-1.19	-0.88	-0.31	-0.64 (41)	0.16 (28)	-0.63 (20)	-0.66 (21)
MARTENS Krzysztof - MILLENS Joan	70	-1.20	-0.57	-0.63	-0.88 (25)	-0.50 (45)	-0.29 (14)	-1.62 (11)
FRANCESCHETTI Pierre - SETTON Hilda	70	-1.21	-0.84	-0.36	-0.64 (39)	-0.02 (31)	-0.64 (26)	-0.64 (13)
JELENIEWSKI Marek - KOLUDA Piotr	50	-1.41	-0.58	-0.83	-0.37 (24)	-1.25 (26)	-1.43 (10)	0.39 (14)

Some results from the 2nd European Winter Games with IAF scoring, with cloud calculations.

Players	No.	Butler	Bid	Play	Play		Declaring	
					Declaring	Defending	Declarer1	Declarer2
LORENZINI Cedric - QUANTIN Jean-Christophe	80	1.49	0.88	0.61	0.58 (47)	0.65 (33)	0.85 (21)	0.35 (26)
MAUBERQUEZ Eric - OURSEL Christophe	80	1.44	0.74	0.70	1.52 (45)	-0.35 (35)	1.76 (24)	1.25 (21)
LAURIA Lorenzo - VERSACE Alfredo	110	1.32	0.46	0.86	1.12 (50)	0.65 (60)	1.64 (21)	0.74 (29)
HOYOS Carlos - BERNAL Francisco	100	1.14	0.55	0.59	0.92 (59)	0.12 (41)	1.09 (52)	-0.34 (7)
KORDOV Mehmet Ali - BILGEN Salih	80	1.13	0.94	0.18	0.19 (27)	0.19 (52)	0.46 (14)	-0.10 (13)
...								
FRANCESCHETTI Pierre - ROBERT Quentin	80	0.04	-0.12	0.16	-0.05 (45)	0.43 (35)	-0.39 (22)	0.28 (23)
CRONIER Benedicte - CRONIER Philippe	160	0.01	-0.00	0.01	0.28 (84)	-0.29 (75)	-0.17 (42)	0.74 (42)
OYMEN Can - YILMAZBAYHAN Can	60	0.00	0.01	-0.01	-0.14 (35)	0.16 (25)	0.34 (22)	-0.95 (13)
PALMA Antonio - VENTIN CAMPRUBI Juan Carlos	50	-0.02	0.72	-0.74	-1.47 (27)	0.12 (23)	-1.15 (14)	-1.83 (13)
SCHNEIDER Michael - SMYKALLA Gisela	150	-0.02	-0.13	0.11	-0.02 (74)	0.25 (75)	-0.05 (33)	-0.00 (41)
...								
GLOYER Andreas - KRIFTNER Georg	90	-1.20	-0.68	-0.52	0.15 (45)	-1.19 (45)	-0.21 (21)	0.46 (24)
FRANCESCHETTI Pierre - SETTON Hilda	70	-1.33	-0.88	-0.45	-0.75 (39)	-0.08 (31)	-0.79 (26)	-0.67 (13)
MARTENS Krzysztof - MILLENS Joan	70	-1.49	-0.77	-0.72	-0.91 (25)	-0.61 (45)	-0.21 (14)	-1.80 (11)
ARLOVICH Andrei - VAINIKONIS Erikas	70	-1.49	-1.07	-0.42	-0.81 (41)	0.13 (28)	-0.76 (20)	-0.86 (21)
JELENIEWSKI Marek - KOLUDA Piotr	50	-1.52	-0.60	-0.92	-0.37 (24)	-1.42 (26)	-1.54 (10)	0.46 (14)

Some results from the 2nd European Winter Games with datum scoring, without cloud calculations.

Players	No.	Butler	Bid	Play	Play		Declaring	
					Declaring	Defending	Declarer1	Declarer2
MAUBERQUEZ Eric - OURSEL Christophe	80	1.45	0.75	0.70	1.58 (45)	-0.44 (35)	1.85 (24)	1.27 (21)
LORENZINI Cedric - QUANTIN Jean-Christophe	80	1.18	0.49	0.69	0.61 (47)	0.81 (33)	0.85 (21)	0.42 (26)
LAURIA Lorenzo - VERSACE Alfredo	110	1.17	0.33	0.84	1.18 (50)	0.55 (60)	1.67 (21)	0.83 (29)
HOYOS Carlos - BERNAL Francisco	100	1.07	0.47	0.60	0.94 (59)	0.11 (41)	1.14 (52)	-0.54 (7)
KORDOV Mehmet Ali - BILGEN Salih	80	1.05	0.88	0.17	0.19 (27)	0.16 (52)	0.51 (14)	-0.16 (13)
...								
FONTENEAU Dominique - DESAGES Olivier	100	0.03	-0.08	0.11	0.22 (51)	-0.00 (48)	1.21 (19)	-0.36 (32)
NAWROCKI Piotr - WIANKOWSKI Piotr	110	0.03	-0.23	0.26	0.63 (65)	-0.28 (44)	0.41 (36)	0.91 (29)
SCHNEIDER Michael - SMYKALLA Gisela	150	-0.00	-0.13	0.13	0.05 (74)	0.20 (75)	0.03 (33)	0.08 (41)
HALLBERG Gunnar - BERTHEAU Peter	100	-0.00	0.05	-0.05	0.37 (40)	-0.34 (59)	-0.02 (19)	0.72 (21)
PALMA Antonio - VENTIN CAMPRUBI Juan Carlos	50	-0.02	0.76	-0.78	-1.47 (27)	0.02 (23)	-1.13 (14)	-1.84 (13)
...								
LORENZINI Cedric - WARD-PLATT Kiki	70	-1.13	-0.60	-0.53	-0.18 (31)	-0.81 (39)	-0.41 (17)	0.11 (14)
MARTENS Krzysztof - MILLENS Joan	70	-1.27	-0.59	-0.68	-0.84 (25)	-0.59 (45)	-0.33 (14)	-1.50 (11)
ARLOVICH Andrei - VAINIKONIS Erikas	70	-1.32	-0.97	-0.35	-0.74 (41)	0.20 (28)	-0.75 (20)	-0.73 (21)
FRANCESCHETTI Pierre - SETTON Hilda	70	-1.34	-0.89	-0.44	-0.73 (39)	-0.07 (31)	-0.78 (26)	-0.65 (13)
JELENIEWSKI Marek - KOLUDA Piotr	50	-1.51	-0.68	-0.83	-0.28 (24)	-1.34 (26)	-1.18 (10)	0.36 (14)

Some results from the 2nd European Winter Games tournament with datum scoring, with cloud calculations.