



COLUMNISTS

Hoisting the Hippopotamus

Lev Alburt &
Al Lawrence



Ross Perot Chess

Looking Under the Hood of Analysis & Evaluation

UNLESS LAST NOVEMBER'S stalemate in Florida (requiring adjudication) has erased all memories of other US presidential elections, you probably remember a fellow named Ross Perot who could afford to buy long spots on television, during which he was fond of showing us charts and graphs to illustrate his points. Occasionally he would mix statistical measurements and auto mechanics by proclaiming in his best down-home manner, "Let's just lift up the hood and take a look."

Neither Perot's graphics nor his engine-peeking-perspective can improve your chess game—and they also didn't do much for his electoral vote, for that matter. But we've always loved a good chart, and it's odd that a quantitative, visual game like chess doesn't excite more lines, bars and pies. And most of us love a good metaphor, especially a "conceit" comparing two things that seem so different, like a car engine to the millions of government workers working under contradictory guidelines and linked by 1980s computer programs, for example.

Of course it's true that we see chess charts occasionally—normally when the topic is openings, the frequency of their appearance or their results. In the early 1970s, before GM Leonid Shamkovich left the old Soviet Union for the US, he began to use graphics to show the changing evaluation of a game. Then in 1989, GM Lev Alburt, a physicist by training, refined the graphic presentation of a chess game, linking it to an expression of the ongoing evaluation of the game's positions.

Tournament players know that evaluation is a critical skill:

- We have to evaluate a position correctly to come up with the right plans.
- Before we decide on a move or a plan, we need to know if the resulting, future positions are favorable to us; to do this we must evaluate them effectively.

But before we get to evaluation, we have to go through analysis. Not *necessarily* psychoanalysis, but at times our task may seem as challenging.

Analysis in chess

Each player and every one of his chess books is concerned on some level with *analysis* and *evaluation*, the inescapable words in chess. We all talk about analysis. Sometimes we even talk about a player “out analyzing” his opponent. In the spirit of the admitted chess-duffer Albert Einstein, who encouraged us never to stop asking the “childish” questions, let’s pursue the meaning of the ubiquitous *analyze*. What does it really mean in chess? After all, since everyone talks about it as the lynchpin of good play, we’d do well to understand analysis on a basic level, as a skilled musician understands the scales and harmonics of his craft. Or, say, as an old-time master mechanic knows the knocks and pings of an internal combustion engine. So let’s pop the hood.

Obfuscating bifurcations

It turns out that chess “analysis” has two very common meanings and this double *entendre* complicates the word’s use a bit. One meaning is *calculation*—the visualization of “what ifs,” the if-I-go-there-he-goes-there and so on of our game. Sometimes someone writes that GM Nostradamus “analyzed” or “saw” ten moves ahead, (presumably in all reasonable variations). That’s analysis as calculation.

The other meaning of analysis—common whether the topic is chess, chemistry or computer systems—is the process of breaking down the object of study into its component parts and understanding how these elements relate and work together. In chess the component parts are the chessmen and chessboard squares. Understanding how these elements work together can require using nonphysical concepts such as time and weak-square complexes.

Morphing from a strict materialist to a strategist

If we play strictly to win material opportunistically—in other words, wait for our opponent to hand over pawns and pieces, or bait traps to win material—we may generally beat weak players, but will surely fall to our area’s top guns the way Morphy’s contemporaries were consistently bamboozled by the world’s first accurate analyzer and evaluator. To really get good, we need to analyze and evaluate our way through our games.

Morphy showed us how to use analysis and evaluation. We must employ the process to help us decide how each new candidate move effects our chances. In other words, we don’t make the move that promises the most CP (“cheapo potential”)—unless we’re hopelessly lost strategically. Instead we select the moves leading to

positions that are evaluated in our favor.

The elements of analysis

Without a proper set of standards, analysis and evaluation would be fruitless. But Morphy, and Steinitz, the champion of his ideas, established these criteria for us nearly 150 years ago.

The pieces

Every position of course includes pieces. Besides knowing how they move, the analyzer must know the values of each component of the armies. Traditionally, these values are based on the pawn's worth as 1 unit. Most of us learned this first list on the left. GM Lev Alburt finds the values on the right more precise.

Pawn = 1	Pawn = 1
Knight = 3	Knight = 3¼
Bishop = 3	Bishop = 3½
Rook = 5	Rook = 5
Queen = 9	Queen = 9½
King = infinity (it's invaluable)	King = 2½ (as a fighting piece)

Of course, these are beginning, general values. Players can't be relentless chessboard accountants, or the game would be too dull to captivate the cream of human intellect that it has over the centuries. The effectiveness of a chessman varies in context. One side can be materially down but have strategic *compensation*. We've all seen a pawn on the seventh rank obviously equal to the rook that has to give itself up to stop the foot soldier from queening.

Strong elements

In addition, there are conceptual elements that tend to increase a player's overall advantage.

- Rapid development (lead in *tempi*—the number of effective moves made)
- Space advantage (greater room and freer play)
- Initiative (the ability to create threats, whether immediate or short term)
- Attack (direct assault on any of the enemy's pieces, including his king, or weak points)
- King safety (more secure king position)

- Piece activity (also called mobility, and includes coordination of the pieces)

There's a subset of strong elements here—here is a sampling:

Bishop pair, good bishop vs. bad knight, bad bishop vs. good knight, doubled rooks on the seventh, control of open or semi-open files and diagonals, flexibility, effective blockade, centralized pieces, pins, batteries, active king in the ending, owning the opposition.

- Pawn structure. Again, there is a subset of related strengths, and we offer only examples:

Preponderance of center pawns, control of the center, effective phalanxes, connected pawns, strong pawn chains or complexes, pawn steam-roller, mobile majority, minority attack, strong points, passed pawns—especially connected passed pawns or outside passed pawns, strong outpost squares.

Weak elements

Also under the hood of any chessboard position are weaknesses that have nothing to do with the material point-count. Most are the flip-side of the strengths given above:

- Lag in development
- Cramped position
- Passive position
- Defensive posture
- Exposed king
- Limited piece activity (mobility or coordination)
 - The subset: bad bishop or knight (for example, a knight on the rim), pinned pieces, trapped pieces, decentralized pieces.
- Pawn structure:
- Doubled or tripled pawns, isolated pawns, backward pawns, hanging pawn duo, split pawns, blockaded pawns, fixed pawns, multiple pawn islands, crippled pawn majority, weak pawn minority, weak squares or holes, targets, and many more.

Off-setting elements

Most positions you'll get are a combination of strengths and

weaknesses. Even the same element can have strong and weak attributes. Doubled pawns are an example. Evaluated by themselves, they are weak because they cannot protect each other. But in the context of the entire board, doubled pawns can offer advantages. They can provide an important open file, or control key squares.

So analysis and evaluation are complicated challenges.

Unsurprisingly, as a player gains more and more experience, trying his best to analyze and evaluate, he gains proficiency. *Pattern recognition*, the storehouse of similar situations in a player's recollection, is the Rosetta Stone that eventually makes the process possible. Good books on strategy are a key vitamin supplement, but the training diet must include experience.

The magic evaluation decoder ring—symbols and terminology

Once a position is analyzed, chess books the world over generally use seven different symbols to sum up the overall evaluation of a position.

+– White has a decisive advantage.
± White has a clear advantage.
± White has a slight advantage.
= Chances are equal.
± Black has a slight advantage.
± Black has a clear advantage.
–+ Black has a decisive advantage.

Individual moves can carry assessment values as well: “!” indicates a good move; “!!” signifies a very good move; “?” marks a weak move; “??” denotes a blunder; “!?” notes an interesting or provocative move; while “?! ” sets off a dubious move. These are the cheers and boos of chess. They add excitement and a dimension of understanding to game annotations.

The publishing industry is understandably fond of these space-saving and multi-language symbols. Our code saves many a word and has gained worldwide acceptance. We've all come to accept them as a matter of course. But really, how good are they?

We think they have a number of serious faults.

1. These symbols don't supply enough information.

Used without words to annotate a game, they become confusing to average players. Although the marks indicate who stands better, they do not indicate what elements of the position contribute to the assessment. It's true that Informator publications introduced some

additional symbols to help rectify this problem, but we strongly recommend using games annotated by *grandmasters using words* until you are well along in the chess hierarchy—say master strength. (Yes, we know that may come as a shock.) You may like the comfort of receiving and perusing the “latest theory,” but realize that in terms of the maximal time-efficiency of your chess studies, verbal, GM-level explanations are hard to beat.

2. The symbols’ definitions are inconsistent.

Take “+/-” for example—what exactly is a “decisive advantage”? The plus that Kasparov needs to force a win is significantly smaller than the plus you need. This annotation alone has caused a lot of frustration among amateurs. Indeed, many times, average players will not have the first idea of how to proceed to win in a book position marked “+/-”. Clearly there is a wide range within the scope of this symbol. We can be a rook up, or Bobby Fischer could be practically anywhere in a Sozin Sicilian!

3. The symbol “!?” is frequently misunderstood.

This annotation can mean “deserving consideration,” “double-edged,” “enterprising,” “risky,” or “provocative.” It can designate a move that is unsound, or an interesting move. So what is a student to make of this hodgepodge? Is a move so annotated good, bad or just obscure? Sometimes only the annotator knows what he means, and sometimes one has to wonder if the symbol is a fudge to cover a move that the writer simply hasn’t taken the time to figure out.

4. The “=” symbol can be misleading.

Perhaps the most common sign, this one also covers a wide range of possibilities. Perhaps the position is evenly and dynamically balanced, or perhaps it’s drawish—two very different things! Does the game offer “practical equality,” so clear that it offers little chance for either side to go seriously wrong? Is it a “theoretical equality,” in which the defender must play accurately to get his half-point? If a position is in dynamic equilibrium, both sides could actually enjoy winning chances! The equal sign doesn’t give us much guidance.

5. The traditional symbols do not offer the varying degrees of advantage or disadvantage.

When we read the *words* of a GM-annotator, we frequently run across phrases such as “White stands only a little better,” or “White has a small edge,” or “White’s advantage is clear.” Although these three phrases are meant to distinguish between progressively increasing, slight advantages for White, they would all receive the same “+/=” sign in publications. One could dream up a model with an increasing number of parallel lines beneath the equal sign, but such a system would be hard-to-read and otherwise impractical.

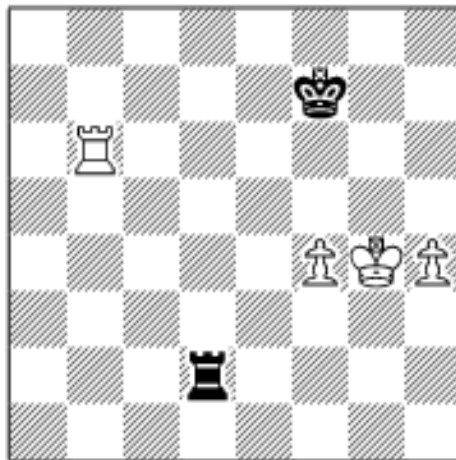
The System of Predicted Results—statistic confirmations

We advocate a system that assigns a numerical value based upon the estimated number of points that White is predicted to score (or has scored) out of ten games played from the specific position between grandmasters of equal strength. An absolute winning position would have the evaluation of 10. A totally lost position for White is a 0. A dead draw is 5. Decimal points offer many distinctions.

Amateurs can contribute to important research!

Interesting, SOPR (System of Predicted Results) allows for *statistically based* confirmations of both hypothesized evaluations and research to establish evaluations. After all, modern game databases allow speedy searches on precise positions! This is an area where amateurs can do very important, quantitative and objective work. Keep in mind that you should consider only GMs within 50 FIDE points of each other, eliminating lesser players and mismatches from the list of games your database puts together for you based on the position you've asked it to search for. A comparison to astronomy comes to mind. Professional astronomers can't watch for every previously unobserved comet to appear. It's a big sky, and they have more important tasks to accomplish with their high-powered equipment. But amateurs can and do pick up the slack, and once in a while wind up with their names on a recurring astronomical event!

In general, statistics show that for every 10 GM games played nowadays, White wins scores $5\frac{1}{2}$ out of 10. Thus we can conclude that the initial position in chess should be evaluated at $5\frac{1}{2}$. Our theory is already bolstered by statistics and general knowledge. Authorities agree that White has a slight but meaningful opening edge.



Our SOPR approach shows that many positions traditionally considered to be “theoretical draws” don’t stand up as such in GM play.

Take the following example, a position from Browne-Shamkovich, US Championship, 1981. Position after 60. h4. Black to move.

White won on move 107. This type of ending, with king, rook

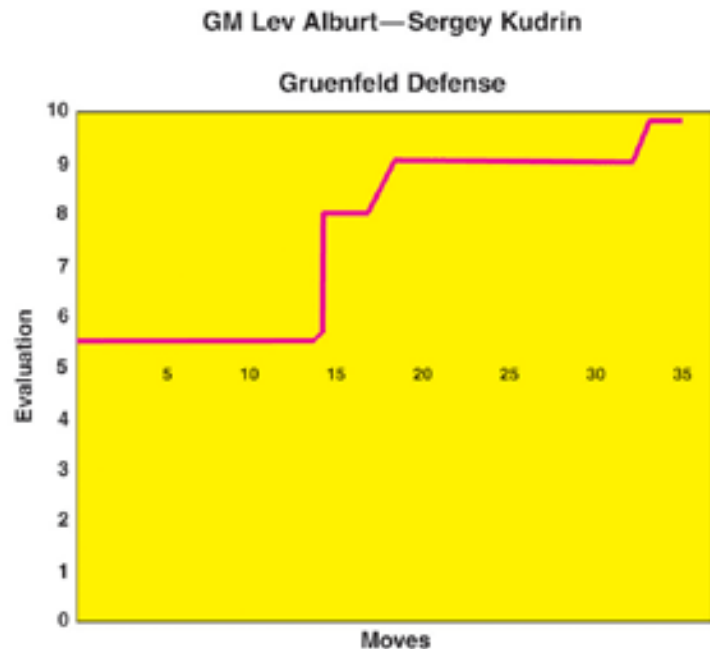
and f- and h-pawns, or a- and c-pawns, still on the fourth rank is regarded as a theoretical draw in all the endgame texts. But in actual praxis, it is frequently won by White.

No stats?—use extrapolation

Of course, there are some positions for which we won't find GM examples, or locate enough games between similarly rated GMs. In that case, we can use extrapolation, estimating the numerical values from the essential elements turned up in our analysis of the position. This process requires practice and developed insight. Going carefully over GM notes to games will give you a sense of the evaluations that go with various kinds of positional factors.

Chess graphs

It seems we've certainly been looking under the hood, but what about those charts? Using the SOPR system, we can chart the progress of a game, tracking its changing evaluation—even the up-and-down swings in an exciting back-and-forth game. In the game from the 1986 US Championship we've charted below, you can see that the vertical axis tracks the evaluation while the horizontal axis plots the move.



The graph shows us that in this game, White maintained his initial advantage through 14 moves, when White got a clear advantage. Then, at 18, White achieved a winning position. Here are the bare-bone moves.

1.d4 Nf6 2.c4 g6 3.Nc3 d5 4.Nf3 Bg7 5.cxd5 Nxd5 6.e4 Nxc3 7.bxc3 c5! 8.Bb5+ Nc6 9.00 cxd4 10.cxd400 11.Be3 Bg4 12.Bxc6 bxc6 13.Rc1 Qa5 14.Qe2 f5? 15.Qc4+ Kh8 16.Ne5 Bxe5 17.dxe5 f4? 18.Bc5! Rae8 19.f3 Bc8 20.Rf2 Ba6 21.Qe6 Qc7 22.Ba3? Bb5 23.Bc5 Ba6 24.Ba3 Bb5 25.h3 Kg7 26.Kh2 Rf7 27.Qb3 e6 28.Rd2 Qc8 29.Bc5 h5 30.h4 Kh6 31.Rd6 g5 32.a4 gxh4?! 33.axb5 Rg7 34.Bf2 1-0

We'll cover this game in some detail next time, as we talk more about graphing evaluations.

SOPR-testing

If you'd like to use the SOPR system to research some favorite positions, please let us know what you found out and what you thought of the system. Likewise, why not try charting one of your favorite games, whether it's yours or Paul Morphy's? Fax (248-927-0598) or send it to us as an Email attachment—and let us know what you thought of the process.

Please Email suggestions for future columns and other comments to AlForChess@aol.com. We enjoy your comments and learn from your criticism.

Copyright 2001 Lev Alburt and Al Lawrence. All rights reserved.

All seven volumes of Lev Alburt's *Comprehensive Chess Course* are available in [The Chess Cafe Online Store](#).



[\[The Chess Cafe Home Page\]](#) [\[Book Reviews\]](#) [\[Bulletin Board\]](#) [\[Columnists\]](#)
[\[Endgame Studies\]](#) [\[The Skittles Room\]](#) [\[Archives\]](#)
[\[Links\]](#) [\[Online Bookstore\]](#) [\[About The Chess Cafe\]](#) [\[Contact Us\]](#)

Copyright 2001 CyberCafes, LLC. All Rights Reserved.
"The Chess Cafe®" is a registered trademark of Russell Enterprises, Inc.