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Novice Nook

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$24.95

Analysis and Evaluation

Dan's saying of the month: *Your rating doesn't mean anything. Your playing strength is the only thing that matters. In the long run your rating will always follow your playing strength.*

Many players confuse the concepts of analysis and evaluation. A definition of each might be:

Analysis is the process by which a player, usually through a process of "I move here, he moves there" logic, reaches positions to evaluate in order to determine the best move. A more general definition of *analysis* is "the thinking process used to determine a best move." This contrasts to the *strategic* thinking process, which is used to arrive at a plan, although these two processes are not completely independent. Analysis makes use of many skills such as deductive logic and visualization.

Evaluation is the process of examining a position and deciding **which side is better, by how much, and why** (the "why" is usually the key to your *plan*). You can consider evaluation to happen "after" each candidate move is analyzed or, by the more general definition of analysis, evaluation is just a part of analysis. Evaluation requires experience; a talented beginner is often good at analysis but less so at

evaluation (unless one side is way ahead).

Analysis is inherently dynamic, while evaluation - and planning - are primarily static. A dynamic process involves "mental" movement of the pieces, while a static process works with a particular "unmoving" board position. For example, a combination or a knight maneuver is dynamic, while a bad pawn structure or an open file is static (not that these cannot be changed, but determining if a file is open only depends whether, in a particular position, there are any pawns on it.)

When you analyze a position, you often have to evaluate dozens of positions to compare the relative merits of each. *How you choose which moves to analyze* (candidate moves) is a big subject outside the scope of this article (but an upcoming Novice Nook called *A Generic Thought Process* will!); *when to stop analyzing and evaluate* is discussed below.

This leads to a key point: When analyzing candidate moves, how do you decide when an evaluation of a foreseen position is required and meaningful?

The answer is the concept of *quiescence*. <u>In most positions, one cannot evaluate a position until it is "quiet"</u>; that is, all the most forcing moves, such as checks, captures, and strong threats, have been resolved. As a trivial example, it would be silly to think, "I will capture his queen with my queen and that is my best move since after that I will be up a queen" when you have not analyzed his obvious recapture that restores material equality! Only a young beginner would do that in the hope his queen is not recaptured.

When should you stop your analysis because you cannot reach a positive goal? This is complicated, but for sacrificial lines *you should usually abandon your analysis as fruitless when the material sacrificed becomes greater than the potential gain*. At that point it is not likely you will attain a reasonable goal, so the sacrifice should be rejected. For example, if you are conducting a mating attack you would not stop analyzing after sacrificing a queen unless you are sure that there is no possible mate in that line. On the other hand, if you are analyzing a line where you sacrifice a queen and all you might possibly win back is a pawn, no further analysis is necessary even if there are more checks, captures, and threats – analyzing the sacrifice further is a waste of time. Of course if you find you *do* get back more than your sacrificed material by force, your goal is reached immediately and you have an excellent candidate move!

However, you may still sacrifice even if you do not see that you get all your material back and/or more. With some sacrifices, your compensation may be long term, such as your superior piece play, the opponent's unsafe King, or his badly wrecked pawn structure. You just have to make sure the potential gain is greater than the sacrifice. Since checkmate is greater than any sacrifice, a sacrifice that you think may likely lead to mate, even if you have no hope of calculating all the lines, is always worth consideration. Further, some positions have either unclear quiescence or such complexity you cannot achieve quiescence – they still have to be evaluated, even though doing so may require a "feel" or "intuition" based on your experience in similar positions.

When you analyze a position, you should select sets of candidate (reasonable) moves using deductive logic, visual perception, etc. If possible, consider and resolve the all potential checks, captures, and threats for both sides, and try for each to eventually arrive at a quiescent position. This position is then evaluated using the player's best knowledge of positional aspects: material, piece activity, king safety, pawn structure, square control, etc.

You should do much of this for all candidate moves, arriving at an evaluation of each for the purpose of selecting the move you evaluate as best. Ideally, this selection is done by performing a "minimax" of these evaluations. Minimax is an artificial intelligence term meaning you have to assume each side will choose his best moves, which in turn is that player's "highest" evaluation. In many/most cases, a conscious calculation of a minimax is not always necessary or practical – with practice the process of best move assumption and its effects becomes more intuitive (qualitative) and not very quantitative.

There are many sources of possible error in this process that can lead to selecting the wrong move. The most common sources of error are listed below. The player either:

1. Does not understand the process and stops his selection after he has found what he thinks is a reasonable move, but does not attempt to find the best move;
2. Uses bad deductive logic and erroneously thinks

a particular sequence is likely to occur, when in fact it likely would not;

3. Overlooks an opponent's move, causing a tactical error;

4. Makes a mistake in visualization and thus misses a tactic or causes a misevaluation of the position,

5. Does not analyze until quiescence and thus misses a tactic;

6. Uses bad time management and for various reasons either plays too fast or too slow, the latter resulting in time trouble where he has to play too fast;

7. Selects a bad "plan" which he thinks will lead to future good (or equal) positions but which in fact leads to less favorable positions than expected; and/or

8. Mis-evaluates the position and erroneously selects the wrong move.

These help explain which methods of study improve which aspect of the process.

Studying tactical problems helps you learn to use deductive logic and visualization to create solutions. It also increases one's pattern recognition so that future similar patterns can be recognized more quickly. However, it does not help one learn to evaluate positions, because by their nature tactical problems have a solution (evaluation: I am up a piece, rook, or have mate) and thus do not need to be "evaluated". Nevertheless, making a tactical mistake is so decisive that studying tactics is the single most important non-playing practice one can do. A few recent problem books now includes positions that do not have tactical

solutions, and that keeps the reader "on their toes."

At the other extreme, studying positional concepts helps you evaluate a quiescent position better. If you are playing good opponents and constantly misevaluating the position, then your opponent's position will constantly improve as you both allow certain variations to happen which are better and better for him, because you think they are not (at least until you realize you must have done something wrong!).

Interestingly, the mistake of missing a tactic is characteristic of almost all beginner and most intermediate games, while the latter mistake of misevaluating a position is a critical factor in many intermediate and advanced contests. The reason is that stronger players often can play without a large tactical miscalculation, but instead get "squeezed" by an opponent who is evaluating slightly better.

Of course, you can study other things that improve your chances of finding the correct move: general principles in the opening and endgame, specific opening and endgame positions, or books on *planning*.

But the player who wishes to improve his planning skills should be warned: planning is not something you consciously need to do every move based on a tabulation of the strengths and weaknesses of each side's forces. I agree with **ChessCafe.com** columnist GM Mark Dvoretsky, who wrote in his book *Attack and Defense*, "In some books you can read that the process of evaluating a position consists in isolating and weighing up all the positional factors that play a

part in it. Nonsense! In actual fact, most of this task is performed subconsciously. The art of evaluation lies in understanding the essence of a position - identifying the crucial problem (either positional or tactical) that needs solving - sensing the right direction for our investigations and detecting the desirability or otherwise of a particular operation." I think the reader can determine from the last part of this quote that Dvoretsky was discussing planning, and not just evaluating a position after analysis.

It is interesting that there are many books on tactics, fewer on planning and positional play, and almost none exclusively on evaluation". To be fair, most books on planning have a sub-focus on evaluation. For example, this type of book (like IM Jeremy Silman's excellent series) might ask, "What are both sides strengths and weaknesses, and what kind of plan does that suggest to you?"

A different way to approach this same question would be to show a series of positions and ask, "Who is better, why, and by how much?" Because this is so difficult to do objectively, this kind of question often leaves out the "…and by how much?" part. For tactical positions, you can use a computer program's estimate: have the program analyze the position in parallel with yours, and when you are finished compare your result with its. Most importantly, compare your principal variation (PV) – the one that is most likely to occur. If you chose a move that is significantly worse than its, you are also likely to have an erroneous evaluation!

Examples of Analysis and (Overall) Evaluation

The following examples give (summary) analysis and evaluation for each position. Of course, the actual process of performing the analysis and evaluation may be somewhat lengthy!
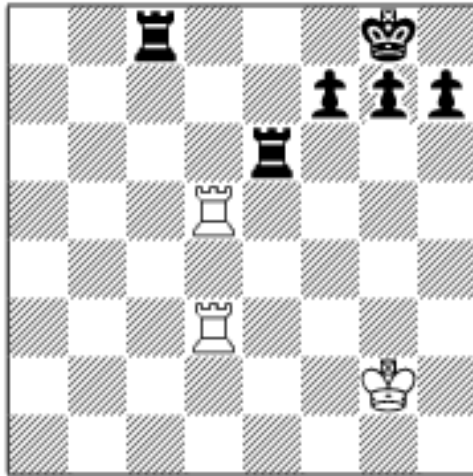
In this well known "Is it a back-rank mate?" position it is White to play.

Analysis: White is down material so needs to look for ways to get back in the game. If he does nothing he will surely lose, so he looks for a back-rank mate, which is a reasonable hope given the three pawns blocking in the king in the classical back-rank mate setup. If **1.Rd8+** Rxd8?? 2.Rxd8+ Re8 3.Rxe8 is mate, so **1…Re8!** is forced and White has nothing since the Black rooks guard each other through the White rook – a good pattern to remember!

Evaluation: Count the material at the end of the critical line 1…Re8!: Black has three extra pawns – this is such a large lead that smaller positional considerations, if any, don't matter too much. Since 1.Rd8+ is the only line to worry about and after 1…Re8 White has no mate, Black has an easy win.

The following position occurred in a recent club game where I was Black against a 1900 player. After **1.d4 Nf6 2.c4 g6 3.Nc3 Bg7 4.e4 d6 5.f3 O-O 6.Be3 c5!? 7.Nge2 Nc6 8.dxc6 dxc6 9.Qc2** what is Black's

best move?
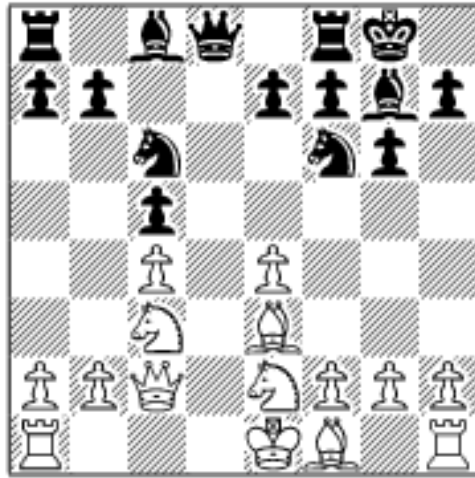
Analysis: Black has no reasonable checks and the capture 9…Nxe4 leads to little after either recapture, so he should look for a reasonable threat and, if he does not find one, he should just develop. The most interesting threats are 9…Nb4 and 9…Nd4. But notice that 9…Nb4 has the additional follow-up that after the queen moves, 10…Nd3+ may lead to a discovered check if White does not play 10.Qd2. But then after **9…Nb4 10.Qd2 Nd3+ 11.Kd1 Nxb2+** When looking ahead, did you see that the queen was pinned and that this was possible? **12.Kc2**, Black wins yet another pawn after 12…Nxc4 or **12…Qxd2+** followed by **13…Nxc4** as played in the game.

Evaluation: Count material at the end of the forced line: After 13…Nxc4 Black is up two pawns and has no noticeable weaknesses; White's exposed king, which would be a big detriment should the queens still be on the board, may actually be somewhat a benefit in the upcoming endgame, but is not nearly enough to compensate for the loss of two pawns. Therefore, Black is winning easily.

After **1.Nf3 d5 2.g3 Nc6 3.Bg2 e5 4.d3 Be6 5.O-O Qd7 6.e4 d4 7.Nbd2 Bh3** who is better and why?

Analysis: Again, start by looking at checks, captures, and threats and, if there are none, look for a way to develop the pieces, for example by planning the thematic "break" move f4. There are no checks and the two captures are 8.Nxe5 and 8.Bxh3. 8.Bxh3 looks questionable as the g2 square is weak, but it is always worth looking to see if, say, 8…Qxh3 9.Ng5 traps the queen, which it does not, so there is nothing to recommend it. And **8.Nxe5** does not look too promising, but you always have to check these things out, and not stop just because **8…Nxe5** seems to win a piece because the position is not yet quiescent: **9.Qh5** double attacks, and the knight cannot guard the bishop nor the bishop the knight, so 9…Nxd3 or 9…Bxg2 looks forced. But 9…Nxd3 10.Bxh3 attacks the queen (followed by cxd3), and the main line **9…Bxg2** allows **10.Qxe5+** and then 10…Qe7 11. Qxe7+ Bxe7 12.Kxg2 or other Black moves allow **11.Kxg2**, so the surprising 8.Nxe5 is best, winning a pawn.

Evaluation: Count material: after the principal variation starting with 8.Nxe5 White sneaks away with a pawn and is left with a better position as well, including an imposing kingside pawn majority that will get rolling after a later f2-f4. <u>The general rule is that an evaluation of +one pawn is about the dividing line between a theoretical win and a draw.</u>

If the opponent has compensation for the pawn you are not likely winning yet, but if he has no compensation (or you have some!) then you are winning.

How far do you need to see ahead?:
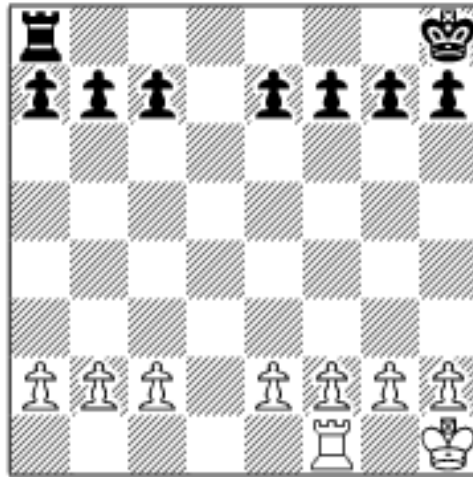
Analysis: Hmm. Whoever gets to the open file first has a big advantage. *Since the goal is almost always to find the best move, and not necessarily to tell the future* (although sometimes that is necessary to find the best move), here **1.Rd1** grabs the file and threatens to penetrate to the 7th rank, so I can make this move with no other calculation at all. This type of position reminds me of the memorable answer a famous player gave when asked how far he looks ahead: "Only one move – the best one." (Actually, I prefer, "As far ahead as necessary!").

Evaluation: Count material: even so far, but with the prospect of possibly winning a pawn once the rook gets to the 7th rank. Since the best move is obvious, a detailed evaluation is not necessary since I don't have to compare this line with any other. However, after I get to the 7th rank the Black pawns are weak, but capturing them too soon gives Black the d-file and the threat of a back-rank mate, so I am likely winning but some care is required. I will figure out

what to play and whether it is a forced win when I get there…

Funsy Finish:

In case you have not seen it, the shortest possible stalemate: **1.e3 a5 2.Qh5 Ra6 3.Qxa5 h5 4.h4 Rah6 5.Qxc7 f6 6.Qxd7+ Kf7 7.Qxb7 Qd3 8.Qxb8 Qh7 9.Qxc8 Kg6 10.Qe6**. Black never gets to make his 10th move!

Reader Question: "You recommend playing at least 2 "slow" games per week for improvement. But, for purposes of this advice, how slow is slow? G/30? G/120? I realize, of course, that playing as slowly as possible is best, but where's the dividing line (or dividing grey area) you are thinking of?"

Answer: Good question. Most internet players think that 30 5 is slow, but that is unlikely slow enough to play "real" chess. You need a game slow enough so that for most of the game you have time to consider all your candidate moves as well as your opponent's possible replies that at least include his checks, captures, and serious threats, to make sure you can meet all of them. For the average OTB player G/90 is about the fastest, which might be roughly 60 10 on-line, where there is some delay. But there is no absolute; some people think faster than others and

others can play real chess faster because of experience. Many internet players are reluctant to play slower than 30 5 so you might have to settle for that as a "slow" game.

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