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Improving Analysis Skills

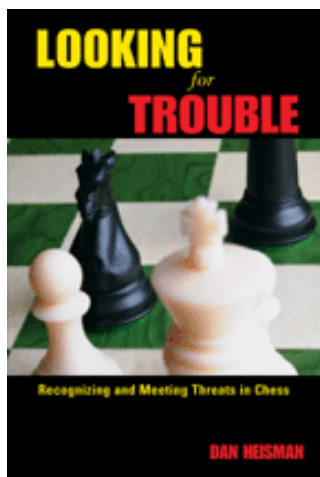
Quote of the Month: *The two most important thinking process skills are analysis and evaluation.*

Before we begin our discussion of how to improve your analysis, let's review some definitions of key terms, because chess writers use the same terms in different ways:

COLUMNISTS

Novice Nook

Dan Heisman



Analysis – The part of the thinking process that creates the mental “tree of moves.” In this process you ask yourself, “If I go there, what is my opponent’s best reply and then, if he makes a forcing move, what I am going to do in response?” Some describe the entire thinking process as analysis, while others define analysis as *calculation*, but I don’t usually use that term. If pressed for a definition, I would say that calculation is the part of analysis that involves only forced sequences or tactics. Using that definition, calculation is a subset of analysis, and involves less judgment and memory. For example, if you ask yourself, “What would be a good move here?” or “Where is the best place to develop this rook?” this is analysis and not calculation, unless as part of a forcing sequence.

Principal Variation (PV) - The sequence of moves that should occur, assuming both players make the best moves; the PV is the set of moves Fritz or ChessMaster shows at the top of its analysis window.

Evaluation – The process of looking at a position and deciding who is better, by how much, and why. *Static evaluation* is when you evaluate a position without moving the pieces. *Dynamic evaluation* is done at the end of each analysis line, after you have determined the likely sequence of best replies. Note: When someone asks you to “Evaluate this move,” they are really asking you to “Evaluate the positions that would result from this move – assuming each player is trying to make his best move.” Computers show evaluations in terms of pawns. For example, -1.34 usually means that Black is better by about one and one-third pawns. Humans often use symbols like \pm to mean “White is distinctly better.”

Previous Novice Nooks have dealt with these subjects, notably *Analysis and Evaluation* and *Evaluation Criteria* (see the [ChessCafe Archives](#)). This month we are going to minimize the evaluation aspect and focus on identifying and improving analysis skills. This is important because analysis, which often includes recognition of basic tactical patterns, is the skill that most highly correlates with chess strength, especially for players below rating level 2000. Improving your analysis skills may be the single best thing you can do to improve your chess play.

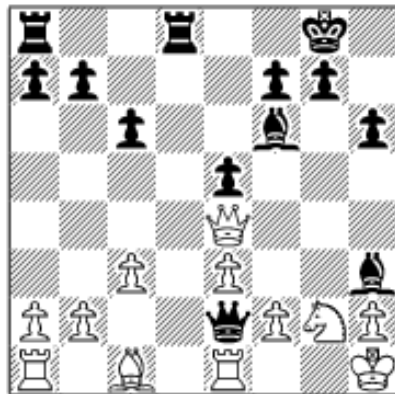
Let's start with an example from a recent tournament:

White appears to be in deep trouble. Black has the extra pawn, a lead in development, and the bishop pair. Not only that, but White's kingside light squares are a mess. Black tries for the knockout punch:



1...Qe2

OK, this move is a stunner! But now your job is to analyze and decide: brilliant, bad, good, unnecessary, terrible? – You pick the adjectives. You also have to provide the PV and any other pertinent lines to back up your decision. The answers appear after the next diagram.



Black tries for back-rank possibilities with 2.Rxe2 Rd1+.

When this type of shocking move occurs, White *should adopt a positive attitude* and think “OK, Black wants to sacrifice the queen for a back-rank mate, but since he is human *I must assume he may have erred in his analysis, so how can I play so that I can safely capture it?*” Then he should leisurely try to analyze accurately; it is

important not to miss any chances during this critical period. White did play slowly, but instead of looking for opportunity, he simply believed that Black's play was correct (a bad mistake!) and replied:

2.Bd2??

White believes the back-rank danger is real and that the rook on e1 needs to be guarded, so he allows Black to win a piece with 2...Qxd2.

But White should not have given his opponent so much credit. Here is how he should have analyzed the position:

“If I can take the queen and survive – even returning some material – I should be able to win, so long as I stay ahead in material and don't get mated. So I will start my analysis by assuming I can take the queen and trying to prove that I can get away with it – after all, if prove I can win the queen, then I likely win! So suppose I capture the queen with 2.Rxe2.

“Now 2...Rd1+ is the only move that I am worried about, and after that check I have two legal moves: 3.Re1 and 3.Ne1. If either move works, that's enough information for me to capture the queen. Normally I don't want to move into a pin with 3.Ne1, but here that general consideration is moot because a pin on the knight is relatively meaningless compared to being ahead a queen. So let's

try 3.Re1 first. But the “knight on g2 is attacked and guards the rook on e1,” and a *piece that is guarded by another piece is susceptible to a removal of the guard tactic*. Since the knight can be captured with check, Black will not play the innocuous 3...Rxe1 4.Nxe1 when I am ahead a queen, but rather the ‘dangerous’ 3...Bxg2+, removing the guard on the rook. Now I have two ways to capture: 4.Kxg2 and 4.Qxg2. 4.Qxg2 allows 4...Rxe1+, when I have to interpose with the queen, and after 5.Qg1 Rxg1+ 6.Kxg1 I am again behind a pawn. So therefore I have to play 4.Kxg2, and after 4...Rxe1 I am ahead a queen for a rook and a pawn. I can then break my back rank bind with an eventual b3 and Bb2. So 3.Re1 looks pretty good!”

This analysis indicates that 2.Rxe2 is safe and a quick glance shows that *no other move can possibly be better*. It is not necessary – or even good time management – to determine your best third move at this point. If I had loads of time I could decide whether I am going to play 3.Ne1 or 3.Re1, but it is more efficient to decide that on the next move. I am just trying to find the best move, and I know that 2.Rxe2 is it, so *I should stop analyzing and play it*.

Let’s assume that 2.Rxe2 is *now played* and, after 2...Rd1+, I have to determine whether 3.Re1 or 3.Ne1 is correct. First, *I must not assume my previous analysis of 3.Re1 is correct (a bad mistake)* and then either just play it (not even trying to find the best move!) or skip to 3.Ne1. Instead I should verify the previous analysis. There are three reasons not to move immediately if your opponent does what you expected:

- You now have the position in front of you and no longer have to visualize it. So you should be able to analyze it better.
- The position is reality and not supposition, so you have to give it 100% attention instead of the partial attention you had given it when it was only a possibility, and
- When you see a good move, look for a better one. Maybe your previous analysis found an adequate move, but now that it has really occurred, you should verify that it is indeed the best one.

Upon verifying my analysis from the previous move and reaching the same conclusions as above, I might now continue:

“How about 3.Ne1? At first it looks like Black’s attack is stopped dead in its tracks and I am just ahead a queen! But this line is critical; if I analyze this correctly the remainder of the game should be rather simple. (See the guidelines in the archived Novice Nook *When You’re Winning It’s a Whole Different Game*: including the important idea that *when you are winning easily, you often should **not** give the same high priority to guidelines that are important when the game is in the balance.*)

So upon careful examination of Black’s potential replies to 3.Ne1 (as always, looking for the checks, captures, and threats), we find the dangerous removal of the guard idea 3...Bf1. Now what should I do? I can move the rook and lose the knight or I can guard the rook with the queen, losing the exchange. Normally I would much rather lose the exchange, which is worth about half a piece, but since I am ahead a queen, it doesn’t make that much difference, so I am going to play the one that gives me the least problems. Let’s first look at losing the exchange: I can guard the rook with 4.Qf3, 4.Qg4, 4.Qc2, or 4.Qc4.

But 4.Qc4 looks tricky because of 4...b5, attempting yet another removal of the guard, so I won't analyze that further unless I am desperate. Both 4.Qf3 and 4.Qg4 look a little "loose" since Black can try to attack me with pawns, again using the removal of the guard idea. For example 4.Qf3 e4 5.Qg4 g6 threatens 6...h5, pushing me off the diagonal. However, after 4.Qc2 neither 4...Bxe2 5.Qxe2 Rad8 nor the immediate 4...Rad8 look very dangerous because I am eventually going to play the freeing b3 and Bb2. For example 4...Bxe2 5.Qxe2 Rad8 6.b3 g6 7.Bb2?! R8d2? (Much better but insufficient is 7...R1d2) 8.Qxd1! and Black can resign in good conscience.

OK, so 4.Qc2 looks pretty safe but, unless I am in time trouble, I should check out 4.Rd2 to see if it is even easier, because that would mean that 3.Ne1 might be better than 3.Re1. But after 4.Rd2, then after 4...Rxe1 Black threatens a discovered check, leading to one of those big tactical situations you can only allow with the greatest of care; other Black threats include double check and a desperado piece. Here the discovered checks contain the dual threats of 5...Bh3# and 5...Bd3+ winning the queen, and these are very strong because I have no move that stops both! Any queen move to a dark square to avoid a bishop discovery allows the mate threat. For example 4...Rxe1 5.Qg4 Be2+ 6.Qg1 and now not 6...Rxe1?? 7.Kg1 when Black's bishop pair, pawn, and some minor factors more than make up for the exchange, but – when you see a good move, look for a better one – 6...Bf3# Therefore, I reject 4...Rd2 and my best line with 3...Ne1 appears to be 4.Bf1 Qc2 with a large advantage to White. So while either 3...Ne1 or 3...Re1 appears to win, why give him the free rook? I will play 3.Ne1."

So, not only was White winning by capturing the queen, but on the next move he could not even be mated no matter what he did, had he analyzed a little bit instead of acceding with 2.Bd2?? When opportunity knocks, you have to be there – mentally and otherwise! And, we can also conclude that instead of 1...Qe2?? almost any other safe move, like 1...Qg4, was better; the best move would have been the killer 1...Rd1.

OK, that was fun and instructive stuff. In addition to this single example, you should have experience reading and listening to how good players analyze so you know the target level of capability for which you are aiming. You might reference the archived Novice Nook *Learning from Dr. de Groot* for more on good analysis skills. Books on this subject include Kotov's classic *Think Like a Grandmaster*, Przewoznik and Soszynski's *How to Think in Chess*, and Aagaard's new one, *Inside the Chess Mind: How Players of All Levels Think About the Game*.

The following is a list of the most important skills used in analysis. The aim is to help you identify areas that need to be improved to become a better analyst.

Analysis Skills:

- Deductive Logic – For example, "If I go here, what moves would my opponent have to make?" or "If my opponent has these two threats, what moves can meet both of them?"
- Memory – What is a player supposed to do in a position like this one? What guidelines apply to this type of position? What does theory say about this opening or endgame?

- Pattern Recognition – What kind of position is this? Is it similar to something I have seen before? Is there a Seed of Tactical Destruction? If I have seen a tactic in a position similar to this, does the tactic still work here?
- Visualization – After completing your analysis, where are all the pieces? Failure to visualize correctly can result in errors such as the Retained Image, when you think a piece is still on a square but earlier in the analysis you moved it!
- Carefulness – This is a greatly underrated skill. One has to be very careful during analysis, since one mistake can result in choosing a line which is bad for you. It just takes one bad move to lose a game, and thus a single analysis error can easily lead to a loss. I am sure it has happened to you...
- Time Management – You are trying to find the best move you can, *given the time constraints*. So knowing how much analysis you can do via the criticality of the position and the time situation is an important skill. For example, taking too much time in non-critical positions; or not enough time in critical positions; or failure to recognize what is a critical position can all be fatal errors.

Some are better than others at these various “innate” skills. However, that does not mean that you cannot improve these skills greatly! For example, I could not play blindfold chess when I started to play tournament chess at age 16; yet two years later – without any practice – I could do so fairly easily. I got “better” at this visualization skill primarily just by playing many slow games and going over numerous games in chess books. Similarly, when I first started out I played “Hope Chess” (I did not attempt to find my opponent’s forcing replies to my candidate moves and how I could safely meet those replies) and finished all my games using only about 20-30 minutes on my clock out of the allotted two hours. Yet, before I had played one year, I had worked out a much better thought process and, by doing so, also learned to pace myself so that I took almost exactly all my time in every game, which is the “only” correct speed of play. So again I was able to improve crucial skills through awareness, determination, and practice.

I even improved at carefulness, and this was primarily a result of awareness. Once I learned that good chess players could always beat you if you made one bad mistake, I made the commitment to play every move as if it were to be published in every magazine in the world: I may make many mistakes, but I never purposely play a move with less than my best effort.

The above generic skills lead in turn to “chess-specific” skills. These include the ability to:

- Quickly generate reasonable candidate moves.
- Accurately identify threats and basic tactical patterns.
- Discern which aspects of the position are relevant and which are not.
- Stop the analysis without looking too far at unnecessary moves but far enough to not be surprised.

In the Novice Nook *Chess Exercises*, I suggested several exercises that can increase one’s “Board Vision” – and also analytical skills. Of special note to serious players were the “PV Exercise” and the “Stoyko Exercise.” I won’t

repeat those exercises, but practicing them is certainly a good way to improve your analysis.

Similarly, playing over well-annotated master games is good practice, partly because it provides an “osmosis” method for absorbing good analysis skills. For example, the annotations tell you which moves are relevant, so you can see if your judgment matches those of top players.

At the heart of analysis is choosing candidate moves, including yours and your opponents, eventually creating the entire analysis tree. One way to examine one’s tree-generation capability involves categorizing moves into the following types:

- Checks
- Captures
- Threats
- Moves that increase your piece’s activity or decrease the opponent’s pieces activity.
- Forced moves, like “the only legal” ones, or necessary recaptures (forced moves are almost the opposite of the forcing moves given in #1-3, although it is possible for a forced move to be a forcing move!).
- All other moves

Whenever you select candidate moves, you should consider forced (#5) and forcing (#1-#3) moves first. As a simple example, suppose your opponent puts you into check. Then, by rule, you are forced to get out of check and those are the only moves you can consider. Or suppose your opponent is attacking your queen with a piece of lesser value and you have no in-between forcing moves that would cause him not to capture it; then you are forced to save it in some way.

However, in most cases you should consider your forcing moves first, usually in the order of checks, then captures, and then threats. The reason is that even if your opponent is threatening something, you might have an even more forcing sequence that you would otherwise miss by just addressing his threat. As a simple example suppose your opponent is threatening your queen, but you can checkmate him with a series of checks (starting with a piece other than your queen). Then you should checkmate him and not save your queen. Many players miss opportunities because they concentrate too much on their opponent’s threats and overlook their own greater opportunities.

There is one major exception to the “forcing sequence” order of *checks, captures, and threats*. Threats to checkmate by force, especially *threats of mate in one*, are **more** forcing than captures, and sometimes even more forcing than checks, and so deserve higher priority in your search for reasonable moves.

In positions where there are no forcing moves (for example, early in many openings), then the primary goal should be to play a move of type #4: moves that increase what your army is doing or, similarly, moves that decrease what your opponent’s army is doing. For example, the guidelines “Find your worst piece and find a way to make it better,” “Trade off your opponent’s most

active pieces,” and “Find your opponent’s worst piece and see if you can find a way to make it permanently bad” are all aimed at this type of move.

Once you begin your analysis, you need to identify your candidate (reasonable) moves. You don’t have to identify *all* your candidate moves at the start, although for players who move too quickly doing so will help them slow down. If at any point you can prove that your move must be best, then you can immediately make your move! However, if you have adequate time and the game is close, then any good move will not do – if you see a good move, look for a better one.

The following are common analysis mistakes made by weaker players:

- They don’t try to find the best moves for each side. For example, they “assume” their opponent will make an inferior move and then are surprised when faced with a much better one.
- They don’t apply the ideas in this article to each move, but rather only to *their* candidate moves. So after the initial move they don’t next consider the opponent’s checks, captures, and threats, etc. (So they play too fast).
- They don’t stop their analysis when they have proven which move is best, but instead waste time looking deeper trying to determine “how good” the best move is. Or worse, they forget they are trying to find the best move and *waste time analyzing without comparing the positions that could occur after one move with the positions that could occur after another, to see which is preferable*. This is a very common and big error!

Each time you identify a forcing sequence, make sure it is as forcing as you think it is, and try to analyze to quiescence. Quiescence means “quiet,” or that no more checks, captures, or threats are relevant. Of course, *it is not always possible to analyze to quiescence*. For example, suppose you are contemplating the “classical bishop sacrifice” 1.Bxh7+ and you analyze that Black must play 1...Kxh7 (else he will just be down a pawn for nothing with his king somewhat exposed), and that after 2.Ng5+ he must play 2...Kg6 (the normal move) when you then have 3.Qg4. It may not be possible to calculate all the possible defenses for Black from that point. So you have to use your evaluation skill – your judgment of how good the position is for you, which in turn determines how good you feel the move 1.Bxh7+ is. If you evaluate the move as unclear and otherwise think you can play a move that leaves you better, then 1.Bxh7+ is likely not best and should not be played. However, if you find that 1.Bxh7+ is unclear, but otherwise your other “best” moves lead to an equal position, then *if you are trying to learn, play the unclear lines over the equal one*. That way you will improve your judgment and next time you will have a better feel as to whether the sacrifice in similar positions is good or bad.

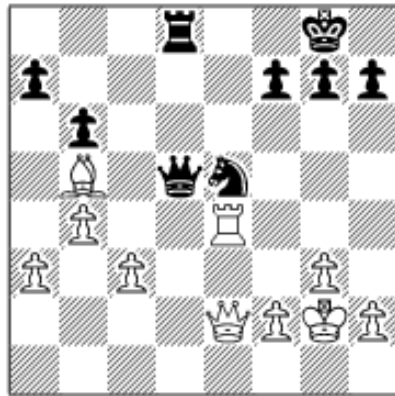
Here are additional tips for analyzing:

- *Small considerations rarely overcome big considerations*. For example, wrecking your pawn structure is often a small price to pay for winning a lot of material – certainly whenever you can win a piece or more, or possibly even the exchange. And you don’t have to spend time analyzing how to defend your weak pawn after you win a rook,

because it is usually not that important. Better to stay out of time trouble.

- *General considerations rarely overcome specific considerations* – You can do anything you want to ruin your position if you get a checkmate. Or you would not worry about not having a position without further immediate attacking chances (or a bad bishop or...) if it is part of a line where you can win a piece by force. Another common mistake is to not win a pawn because that extra pawn would be weak. Of course, refraining from doing so is often silly because even if you lose that pawn material will still be equal!

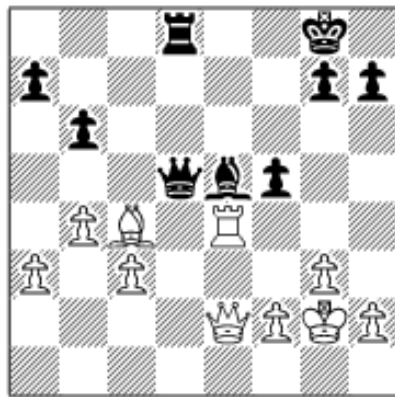
Let's apply some of what we have learned to analyze another position. Black is to play. What is the correct analysis of this position? Can you generate all the pertinent lines?



First, negative credit if you said Black is losing the knight because he cannot save it because of a line like 1...Ng4 2.Re8+ Rxe8 3.Qe8#, since the white rook is pinned to the king! So the knight is in no immediate danger – it is not attacked at all.

Secondly, since the Seed of Tactical Destruction for White is the pinned rook, Black should consider attacking it again – especially with something worth less than

a rook. In this case **1...f5** becomes a major candidate move. If you stopped there and said you were winning a rook, then you did not look far enough because you must investigate whether the new Seed of Tactical Destruction for Black, the queen and king on the newly opened a2-g8 diagonal, would be a problem; perhaps White can counter-pin and win with a move like 2.Bc4. For example, if we replace the knight with a bishop, it certainly can:



In this position, with a bishop on e5, it would be White who would come out ahead after a line like 2...fxe4 3.Bxd5+ Rxd5? 4.Qxe4 Rb5 5.c4 (removing the guard).

However, in the previous position having a knight on e5 comes in handy, and the critical line is **2.Bc4 Nxc4 3.Qxc4 fxe4** leaving Black safely ahead a rook since the queen on d5 is still safely guarded by the rook. So Black need not play the

disastrous 3...Qxc4?? 4.Rxc4 when White is ahead in the endgame, nor the illegal 3...Qxe4+ since Black would be putting his own king into check (players do make these kind of visual mistakes when looking ahead in analysis!).

In the root game Black saw all of this *but overlooked that the rook was*

guarding the queen at the end and thought that 3...Qxc4?? was forced because of the pin of his queen to his king. So he missed 3...fxe4 and concluded that this line was just a bad simplification. Instead he played 1...Ng6 and lost. In his defense, he was somewhat short of time and could not leisurely work out all the details.

Managing your time so that you spend most of it when the position is critical is an important skill. Of course, when the time limit for the game is shorter, all analysis suffers. This leads to an important point: *a significant way to get better at analytical skills is to play a great many games at time limits long enough to practice and improve those skills*. That way when you do play shorter games it is much easier to “shortcut” a good analytical practice than it would be if you never played those long games and do not have good analytical practices. This is one reason that the best blitz players are, for the most part, the best players at slower time controls – they know how to shortcut their analysis efficiently in shorter time controls (and also learned from long games how to play many types of positions, and thus can quickly apply this knowledge to faster games). With regard to analysis, practice will not make perfect, but it sure can make for dramatic improvement, even in visualization!

Outside of playing, other types of analysis practice are a great way to improve. For example, after a game, analyzing the positions with stronger players is a surefire way to improve your skills. This great advice applies not just for analysis, but for most any chess skill, evaluation being the primary one that leaps to mind. Playing correspondence (e-mail or snail mail) allows you to move the pieces, and thus can also help develop analysis skills (except for visualization!). Self analysis of your game – preferably before you give it to a computer program – is yet another common and effective practice.

Another big issue is being able to see the entire board as accurately and as quickly as possible (“board vision”) so that you can analyze better. Improving your board vision is outside the scope of this column (and covered in other Novice Nooks), but suffice it to say the better you “chunk” the entire board, the easier it is to analyze and the fewer mistakes you make.

According to Albur and Lawrence’s handy little book, *Chess Rules of Thumb*, there are five characteristics of a critical position:

- When the game changes from known theory into unknown territory, from opening to middlegame, or from middlegame to endgame.
- When any pieces are exchanged, especially queens.
- When there is any change, or possible change in the pawn structure – especially in the center.
- When you have a tactical (short-lived) advantage which will disappear if not exploited now.
- When you see a move which seems to win.

Their next rule is, “a critical position is one about which you should think long and hard.” For example, suppose after your game you analyze the moves with a software program. If, early in the game in a quiet position, the program rated your best move as giving you a +0.21 pawn advantage, the second best +0.18, and the third best +0.16, then that move was likely not too critical. But

later, in a position where the pieces were flying around the board and you find out that your best move was +3.26, the second best +0.60, and the third best - 2.13, then finding the best move at that point was the difference between winning, drawing, or even losing.

I agree with both of Albur's guidelines. So *if you can at least allocate most of your time to the moves that need it most, then even if your overall analytical skills don't improve much, your results will*, since you will be spending your time at the appropriate critical moment and thus analyzing more thoroughly.

Question What are the major causes of "Hope Chess"?

Answer Some primary causes are:

- Bad time management - you play too fast and don't consider possible replies to your moves.
- Lack of board vision - you try to consider all forcing replies but you do not "see" some despite your attempts (this may be partly because of lack of experience and deficient pattern recognition).
- Making a move "by default" – you see that other moves are bad, so you play a move without fully considering the consequences, just because you don't like the other moves. Of course the default move can therefore be even worse!
- Not being careful - not considering your opponent's forcing moves before you make a move.
- Lack of sense of danger - you think your opponent doesn't have forcing moves, but he really does. You should always assume your opponent's position contains hidden dangers, especially when you are winning! Assume he does and try to prove he doesn't, rather than the reverse.

Dan welcomes readers' questions; he is a full-time instructor on the ICC as Phillytutor.

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