Sipke Ernst & Karel van Delft

Find Your Next Move

Candidate Moves and Thinking Tools in Chess

Chessable 2025

Contents

Introduction

Chess is a complicated game. To gain insight and control over how to play it, World Champion Emanuel Lasker recommended using methods. In his book *Lasker's Chess Manual*, he wrote: 'You should keep in mind no names, nor numbers, nor isolated incidents, not even results, but only methods. The method is plastic. It is applicable in every situation.'

This book by grandmaster Sipke Ernst and psychologist Karel van Delft is called *Find Your Next Move: Candidate Moves and Thinking Tools*. Sipke Ernst is responsible for the chess chapters and Karel van Delft for the chapters covering Thinking Tools – but all chapters were made in close cooperation.

Candidate Moves are the moves that deserve attention when a chess player decides how to proceed in a position. It involves recognizing patterns, themes and techniques, as well as evaluating positions and calculating variations.

Thinking Tools are methods based on psychological insights to think efficiently and effectively. We have compiled a collection of these that may be helpful for the chess player.

Candidate Moves and Thinking Tools are 'building blocks' for developing methodical chess thinking. This is first done consciously and verbally, and then it moves on to a less conscious attitude and routines.

This book builds on research on candidate moves by the Chessable science team. A report on this research can be found here: https://www.chessable.com/blog/candidate-moves-look-for-better-one

Parts I-IV: Candidate Moves, by Sipke Ernst

I never thought much about the concept of candidate moves. This term, first introduced by Alexander Kotov in his groundbreaking book *Think like a Grandmaster*, seemed outdated to me, as are some of his other views on calculation. Now I believe that using candidate moves is of great help for structuring our chess thinking.

Candidate moves are moves that are worth considering in any given position. Research by the Chessable science team has proved

that finding candidate moves is a trainable skill. The choice of candidate moves is multi-faceted; it is about a concept as well as about methods – about knowledge and trainable skills. Pattern recognition plays a crucial role in recognizing possibilities and limitations when we evaluate positions.

In this book, we answer all kinds of questions regarding candidate moves, and more. Studying this book will improve your calculating abilities as we offer you practical tools that can be used in your games. The first part of the book serves as a general introduction. In the second part, we treat methods for calculation, like the comparison method, the elimination method, reversing the move order, the emergency exit, reversed thinking, and so on. In the third part, we cover methods for positional play such as prophylaxis, the drawback principle and improving the worst piece. Finally, in Part IV, we will look at psychological aspects that play a role when we try to find moves. You will find a lot of practical advice on topics such as how to deal with time trouble, playing higher-rated opponents and playing passive positions.

The relevance and usability of all these methods depend, of course, in some way on one's chess level, experience, age, personality, and other contextual aspects.

Part V: Thinking Tools, by Karel van Delft

Self-management and information-processing are key in chess performance and improvement. They are trainable via thinking tools. Thinking tools help you to perform better during training and during playing.

Self-management is the ability to regulate behaviours, thoughts and emotions in a way that better serves you and your tasks.

Information-processing concerns procedures by which data are transformed into more useful information.

Using thinking tools is based on understanding, developing routines, practice, and synthetic qualities: combining them with knowledge, plans and other tools.

Of course, you will never win a game with psychological insights only. But they can contribute to a better performance on every level. To perform better, you should become better at chess, and for that, thinking tools are most helpful.

The thinking tools in Part V are presented in alphabetical order. The reason is that there is no all-encompassing theory – just as no such comprehensive theory exists about chess either.

With his book *Think like a Grandmaster*, Alexander Kotov was the founder of systematic thinking about candidate moves. He claimed that much could be won if chess training were based more on scientific insights. But those insights are sometimes either too theoretical, or too general, or entirely absent.

There are also 'best practices' based on experience, which can provide insights that are useful for training and playing. The famous chess coach Mark Dvoretsky advised to develop more techniques based on scientific and especially psychological insights.

The Thinking Tools chapters contain insights and are helpful for developing skills and competences. Skills refer to the specific abilities a person can perform. Competences are broader concepts that encompass a combination of skills, knowledge and attitudes required to perform a task effectively. In acquiring skills and competences, verbalization plays an important role. By verbalizing, you reflect and make insights and knowledge concrete and applicable.

Instruction, practice, feedback, repetition, reflection (understanding why and how) as well as motivation play an important role in the acquisition of skills and competences. Only when you understand themes can you use insights in similar situations.

The tools are building blocks. You have to use them to put your own thinking puzzle together, time and again. It is an individual developing process.

The basis for using chess knowledge and psychological insights is pattern recognition. It gives direction to your thinking. Like strong chess players who recognize thousands of chess patterns, there are also many psychological themes we can recognize. Essential elements of chess thinking are an open mind, pattern recognition, using heuristics (rules of thumb), reasoning, calculation, evaluation and decision-making. We have put the emphasis on psychological insights. Chess techniques and themes can be compiled in databases, diaries, a JPEG collection, etcetera.

We recommend to every chess player that they get used to active learning. This is most efficient and effective. You will increase

your understanding and your memory; you will develop routines and become more skilled. Active learning involves summarizing, verbalizing, experimenting, asking questions, reflecting, and so on.

The basis format of the alphabet items is composed as follows:

1) Chess position
2) Term
3) Description
4) Practical advice
5) References

We hope you will find this book both insightful and enjoyable. Good luck, and we look forward to seeing how it helps you grow in your chess journey! We are always open for questions and comments.

Sipke Ernst and Karel van Delft
Groningen, Apeldoorn, the Netherlands
September 2025

We thank people who have contributed with feedback and documentation:
Dr. WIM Alexey Root, GM Andrey Deviatkin, GM Artur Jussupow, CM Dr. Can Kabadayi, GM Dr. David Smerdon, Dries Wedda, IM Gerard Welling, Jelle Reisinger, Dr. Jeroen Struben, Dr. Jesús Miguel Seoane Sepúlveda, GM Johan Hellsten, GM Dr. Karsten Müller, Laszlo Moldovan, IM Merijn van Delft, Michel Breij, Mikkel Nørgaard, Dr. Pablo Gusmão, ICCF-GM Peter Boll, FM Ramon Koster, Shilpa Mehra, WIM Rosa Ratsma, GM Stefan Kindermann, and IM/GM Chess Composition Yochanan Afek.

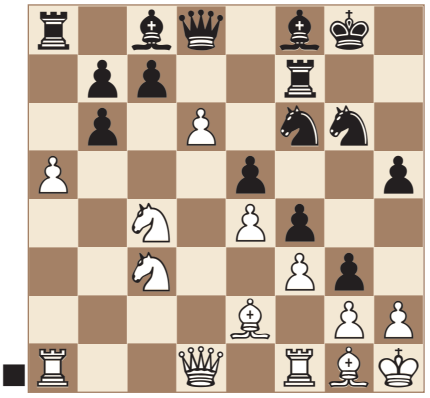
CHAPTER 7

Ignoring the Threat

Sam Shankland recently released a course on Chessable named *Strategic Calculation*, in which he discusses a method of thinking he calls '...what if I do it anyway?' In short, this method comes down to what happens if we just ignore the intentions of our opponent and just carry on with our own plan.

This is a very helpful way of thinking, and Shankland is by no means the only author who has pointed it out. We find a similar description in Ivan Sokolov's book *Sacrifice and Initiative in Chess*, which was published in 2013. According to Sokolov, ignoring a threat is the most common way to seize the initiative. All too often, I have seen my students back down when faced by threats posed by their opponents, not looking for strong counterattacking ideas. This way of thinking can especially be helpful in sharp positions like the ones discussed in this chapter.

Game 17
Boris Gelfand 2761
Hikaru Nakamura 2708
World Team Championship, Bursa 2010



Another example from the King's Indian. Nakamura played some wonderful games with Black in this opening. Here, he crushes a world-class player while his queen remains en prise for six moves straight.

It seems that Black should make some time for defensive measures on the queenside, but it is better to consider what happens if we try to carry on with the plan of mating the white king:

22...♘h4!?

22...♗xd6 23.♘xd6 cxd6 24.♗c4 bxa5 25.♕b3 ♘h8! is even, according to my engine.

23.♖e1

Making room for the bishop to retreat to f1.

Nakamura decides it's now or never:

23...♘xg2!

23...♖g7 24.♗f1 halts the attack, when White's chances are preferable.

24.dxc7?

This turns out to be the only and final mistake of the game. Black's queen is now under attack, and it will remain so for a couple of moves because Nakamura manages to create stronger threats.

After 24.♔xg2 Black has 24...♖g7 with a powerful attack.

24...♘xe1

Threatening to give mate with 25...g2.

25.♕xe1 g2+! 26.♔xg2 ♖g7+ 27.♔h1 ♗h3

Again, there is no time to take the queen because White has to deal with the threat of 28...♗g2 mate.

28.♗f1 ♕d3!

Black remains material up. The game concluded:

29.♘xe5 ♗xf1 30.♕xf1 ♕xc3 31.♖c1 ♕xe5 32.c8♕ ♖xc8 33.♖xc8 ♕e6 0-1

Game 18

Jorden van Foreest 2691

Jonas Bjerre 2550

Malmö 2021

In this example, Black could also have fought for the initiative by ignoring the threat.

Black has just sacrificed a pawn on b5 in order to open up some files against the white king.

13.e5

EXERCISE: How to respond?

ANSWER: Our knight can go to g4, h5, or e8, but none of those moves looks very attractive. Instead, Black can ignore White's threat and just carry on with his attack:

13...axb5!

13...♘e8 was played in the game, and this allowed Van Foreest to take control after 14.b6 ♕xb6 15.♘d5 ♕b7!, ignoring the threat to e7. Taking that pawn is best now, but at least Black will have

counterplay. (15...♕d8?! allows White to be better with relatively simple means: 16.♕e1! a5 17.exd6 exd6 18.♘e7+ ♔h8 19.♗c3, although I wonder how easy it would be for White to find this line.) 16.♗c3 (16.♘xe7+ ♔h8) 16...♗e6 17.exd6 ♗xc3? (17...exd6 18.♗xg7 ♔xg7 19.♕d3 ♖b8 with a balanced position) 18.♘xe7+ ♔h8 19.bxc3 ♖b8 20.♕e5+ ♘g7 21.♕xc5. As it turns out, the white king is safe. Van Foreest converted smoothly.

14.exf6 exf6!?

14...♗xf6 was also good.

As compensation for the sacrificed material Black has an easy-to-play attack. I have played out this position as White against several of my students (in the 1800-2300 rating range) and most of the time just ended up getting crushed. Maybe I am not the best defender, but I also like to think that the position is just much easier to handle for Black.

Game 19

Sergei Tiviakov 2615

Sergei Beshukov 2460

Russian Championship, Elista 1996

17.g5!

Ignoring the threat to the bishop on a7.

17...♗b4!

Black doesn't give up the fight for the initiative and leaves the knight on f6 en prise.

17...♖xa7? 18.gxf6 ♗xf6 19.♘d5 ♕d8 20.♘xf6+ gxf6 (if 20...♕xf6, then 21.♗h5 wins) 21.♕c1 leaves Black's king in mortal danger.

18.gxf6

Black would have been OK after 18.♘a2 ♖xa7 19.gxf6 (or 19.♘xb4) 19...a5.

18...♗xc3 19.♕c1!?

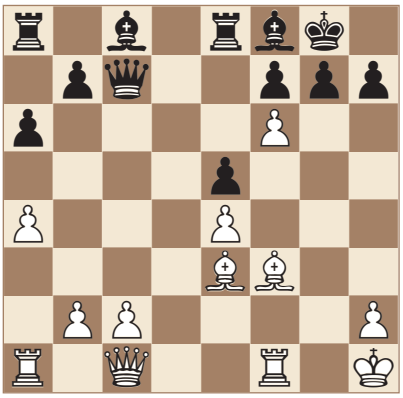
Objectively it was better to play 19.bxc3 ♖xa7 20.♕d2, but the text move is very tempting as well. It ignores the bishop on a7 for the moment in favour of threatening 20.♕g5.

19...♗b4!

19...♖xa7?? leads to an unstoppable mate after 20.♕g5 g6 21.♕h6.

20.♗e3 ♗f8?!

20...g6 21.♗h6 ♗h3 22.♖g1 ♕c6 is level.



21.♗h6! ♕c6

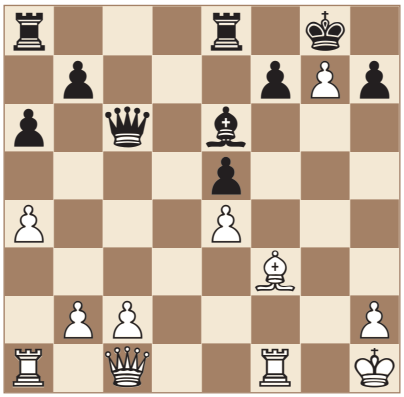
21...gxh6 22.♕d2 ♗h3 23.♖g1+ ♔h8 24.♖g3 ♕d6 and yet again we ignore the threat to our queen with a strong intermediate move: 25.♖ag1! ♗e7 (the only move) 26.♕xd6 ♗xd6 27.♖xh3 ♖e6 28.♖xh6 ♗f8 and Black holds.

22.♗xg7?!

22.♕g5 g6! (22...♕xf6 allows 23.♗h5! ♕xg5 24.♗xf7+ ♔h8 25.♗xg5) 23.♗xf8 ♖xf8 24.♖ad1. This position looks very scary, but still, the engine insists that Black is OK.

22...♗xg7 23.fxg7 ♗e6

Black is fine now. Still, Tiviakov won quickly by carrying out a very nice tactic, which is one of the main reasons why I wanted to include this example.



24.♖f2 a5?!

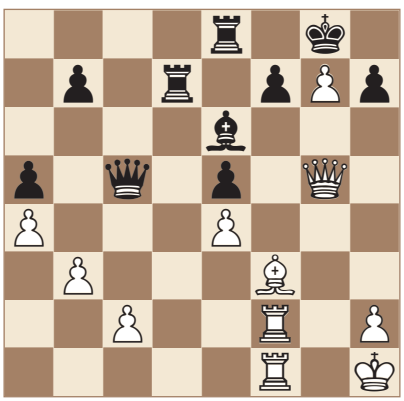
Black starts to make moves which improve his pawn structure, but there is no time for that yet. 24...♕b6 would have disturbed White's plans somewhat. After 25.♖g2 ♖ad8 the chances remain balanced.

25.♕g5 ♖ad8 26.b3!

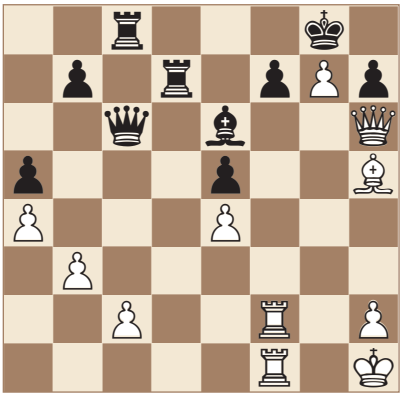
Taking away the c4-square from the black bishop is very useful.

26...♕c5? 27.♖af1 ♖d7

It was time to give up a pawn and hope for the best with 27...♕e7 28.♕xe5, but Black probably didn't realize yet what was coming.

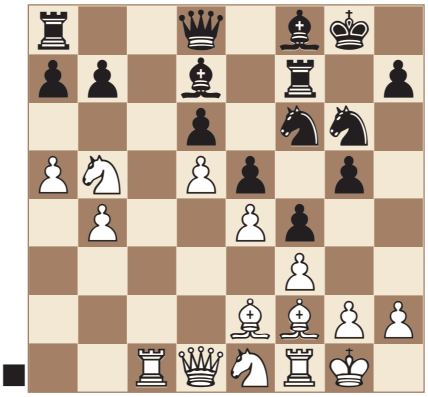


28.♗h5! ♖c8 29.♕h6 ♕c6



30.♗g6!! 1-0
A wonderful finish!

Game 20
Jeroen Piket 2540
Garry Kasparov 2775
Tilburg 1989



White has just played 19.♘b5 with the idea to either take on a7 or play 20.♘c7, threatening to take the black rook or trying to go 21.♘e6, which would lead to a very favourable exchange of the knight versus Black's light-squared bishop.

EXERCISE: How should Kasparov 'defend'?

ANSWER: 19...g4!
Kasparov decides to ignore what is going on at the queenside and just carries on with the attack. 19...♘e8 defends against the main threat, but then White is much better after 20.♘xa7.
20.♘c7?
Attacking the rook, but should Black really care?
Better was 20.♘xa7 g3 21.♗b6 ♕e8 when the position is equal according to my engine – I will just leave it at that.

EXERCISE: Try to find the strongest move for Black.

ANSWER: 20...g3!
This is actually a very typical idea in the King's Indian.

21.♘xa8?! ♘h5!

But this move might have surprised Piket.
After 21...gxf2+ 22.♖xf2 ♕xa8 White is still in the game.
22.♔h1
22.♗xa7 ♕h4 23.h3 ♗xh3 quickly leads to mate.
22...gxf2 23.♖xf2 ♘g3+?!
This turns out to be inaccurate, as the knight was better kept on h5 for now: 23...♕xa8 24.b5 ♕d8.
24.♔g1 ♕xa8 25.♗c4?
25.b5! was the best defence, as it allows White to close the a7-g1 diagonal when necessary.
25.hxg3 fxg3 26.♖f1 ♘f4 leads to a quick mate.

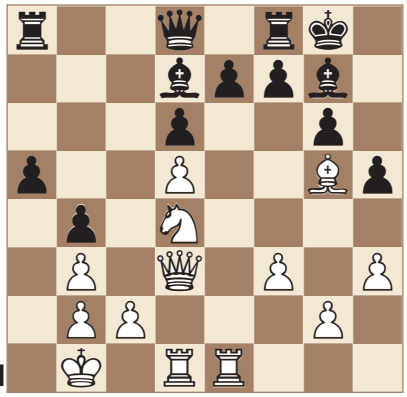
EXERCISE: How to bring more pieces to the attack?

ANSWER: 25...a6!
Now White is too weak on the dark squares, which can be exploited by the black queen from a7.

26.♕d3
Black's attack is unstoppable after 26.hxg3 fxg3 27.♖fc2 ♕a7+ 28.♔f1 ♖f4.
26...♕a7 27.b5 axb5 28.♗xb5

28...♘h1!
And White resigned.

Game 21
Vasyl Ivanchuk 2635
Daniil Dubov 2693
Jerusalem rapid 2024



EXERCISE: How would you continue?

ANSWER: The threat is 19.♗xe7, so most players would first consider 18...♖e8. However, Dubov looked at a much sharper alternative here which ignores White's threat:

18...a4!

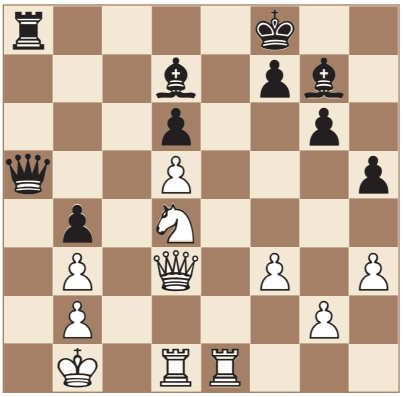
Excellent judgment!

18...♖e8 would have allowed 19.♘e6! ♗xe6 (19...fxe6? 20.♕xg6 wins for White) 20.dxe6 f5 with an unclear position.

19.♖xe7?

Based on a miscalculation. It turns out that the rook on e7 is badly placed.

The point is that 19.♗xe7 ♕a5 20.♗xf8 axb3 21.cxb3 ♔xf8 offers Black fantastic compensation:

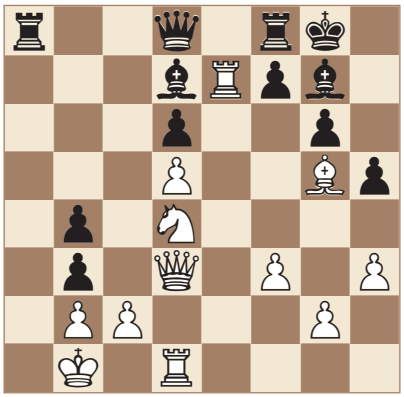


analysis diagram

White's king is weak for a very long time to come.

19...axb3

It would have been bad to try to win material with 19...f6? due to 20.♖de1 fxg5 21.♕xg6.

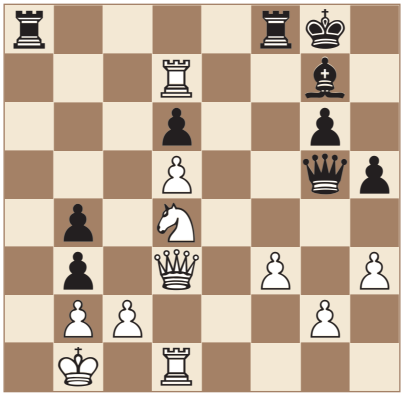


20.♖xf7?

This just loses a piece.

20.♘xb3 was a better try, but White's position looks very bad after 20...♗a4, threatening 21...f6; for example, 21.♖de1 ♗xb3 22.♕xb3 ♕a5 23.♔c1 ♖fc8.

20...♕xg5 21.♖xd7



White resigned in view of 21...♗xd4 22.♕xd4 bxc2+ 23.♔xc2 ♕f5+.

CHAPTER 21

Too Many Candidates

Sometimes, we are playing a game, and a position arises in which we have many candidate moves. Hellsten wrote an interesting article about this phenomenon (https://www.chess.com/blog/jhellsten/candidate-moves-ii).

Hellsten concludes that, in general, three candidate moves is an excellent number. However, there are cases where there are many more candidate moves to consider.

Game 89
Sipke Ernst 2562
Rick Duijker 2242
Groningen 2012

White has a promising position, but is there an easy way to finish the game?

19.♗f4!

I had many good moves, but I just wanted to win in the simplest possible way. Whether that means having a +3 advantage instead of +5 doesn't matter. The lines following the move I played were easy to calculate. Keep it simple!

I considered 19.♘xh8 ♖xh8, but it seemed to me that there was no need to take the rook on h8 straight away.

For a long time, I considered 19.♖b1+ ♔a6, but I didn't see what this would lead to. It could turn out that only Black benefits from the check on b1.

I also considered 19.♗e4 to attempt a mating attack against the black king. This is a strong move, but I had difficulties overseeing the complicated lines. Black also has a lot of options now, and that was why I didn't like this move.

19.♗a3 can also be considered. I think that the move I played in the game is similar, but has some benefits over 19.♗a3.

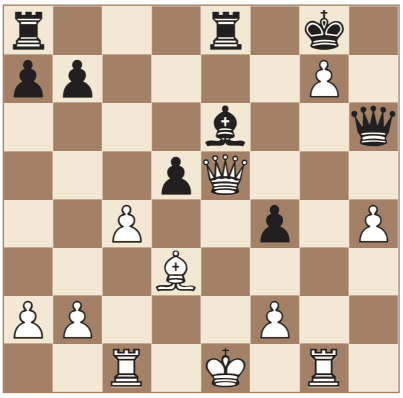
19...e5

19...♖hd8 20.♘xd8 ♖xd8 21.♗g5 wins easily for White.

20.♖xd7 exf4 21.♘xh8 ♖xh8 22.gxf4

This is the position I saw in advance and I evaluated this endgame as a trivial win. White is currently a pawn up with superior pieces, and his majority on the kingside can advance easily.
22...g6 23.e3 a5 24.a4 h6 25.h4 ♖b8 26.♖d6 ♔c5 27.♖d5+ ♔b4 28.♖b5+ ♔xa4 29.♗xc6 ♖c8 30.♗d7 ♖c1+ 31.♔g2 1-0

Game 90
Sipke Ernst 2606
Pentala Harikrishna 2665
Wijk aan Zee 2012



EXERCISE: A very complex position in which there are many moves to consider. What are your candidate moves? Which move would you eventually play?

First of all, we should calculate forcing moves. 24.♗g6 loses to 24...♗f7, so that move is quickly eliminated.
24.♖g6 looks very attractive. This clearly needs to be calculated first, as it could potentially win on the spot.
Also, 24.♕g5 comes to mind. Black will give a discovered check, and then we have to decide where to put the king.

ANSWER: 24.♔d2!
After some time, I noticed this move. ♔e1-d2 has to be played in all lines anyway, so why not start with it? Black has no effective discovered attack. Only 24...♗f7 makes sense, but the line to calculate is straightforward.
24.♖g6! was equally good as it leads to a winning endgame. Also, the lines are straightforward here, but I misevaluated the resulting endgame. I thought that the double rook endgame would give Black some chances to hold: 24...♗f7 (24...♕xg6 25.♗xg6 ♗f7 26.♗xf7+ ♔xf7 27.♕xe8+ ♖xe8+ 28.♔d2) 25.♖xh6 ♖xe5+ 26.♔d2 ♔xg7 27.♖d6 dxc4 28.♗xc4 ♗xc4 29.♖xc4 ♖ae8. According to the engine, this is winning for White, but I wasn't sure.
24...♗f7
After 24...dxc4 simplest is 25.♖g6 ♕xh4 26.♖xe6 ♕xf2+ 27.♔c3.
25.♕g5 ♕b6
The ending after 25...♕xg5 26.♖xg5 dxc4 27.♖xc4 looks hopeless.
26.♕f5 ♕xb2+

26...♕h6 27.cxd5.

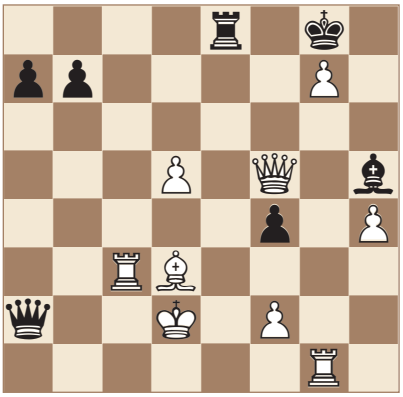
27.♔d1

It is good to note that White has an emergency exit here with 27.♖c2, when Black has nothing better than repeating moves with 27...♕b4+ 28.♔d1 ♕b1+ 29.♔d2 ♕b4+. It is always nice to know you have an escape in case you miss something.

27...♖e4

The only move to prolong the game, but Black cannot create enough threats.

28.cxd5 ♖ae8 29.♗xe4 ♕d4+ 30.♗d3 ♗h5+ 31.♔c2 ♕a4+ 32.♔b2 ♕b4+ 33.♔c2 ♕a4+ 34.♔d2! ♕a5+ 35.♖c3 ♕xa2+ 36.♖c2 ♕a5+ 37.♖c3 ♕a2+



EXERCISE: Does White have more than a draw? Calculate!

ANSWER: 38.♗c2!

38...♖e2+

This looks scary, but it is possible to calculate that the white king escapes the checks.

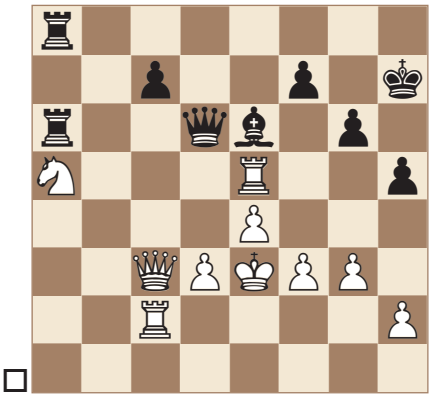
39.♔d3 ♕a6+ 40.♖c4 ♕a3+ 41.♖c3 ♕a6+ 42.♔d4 ♖d2+ 43.♔e5 ♕e2+ 44.♔f6! 1-0

Game 91

Sipke Ernst 2523

Koen Leenhouts 2400

Maastricht 2015

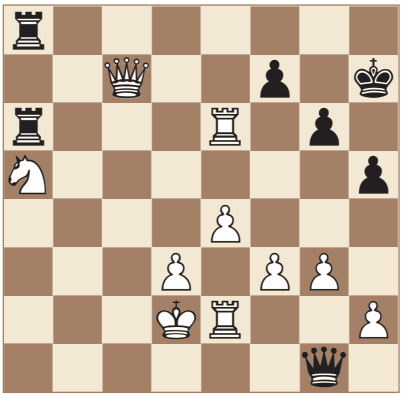


EXERCISE: Which moves would you consider here for White? What would you finally choose?

White is firmly in control with an extra pawn and well-placed pieces. Only the king on e3 could be a matter of slight concern. White has many candidates, so I spent a lot of time here.

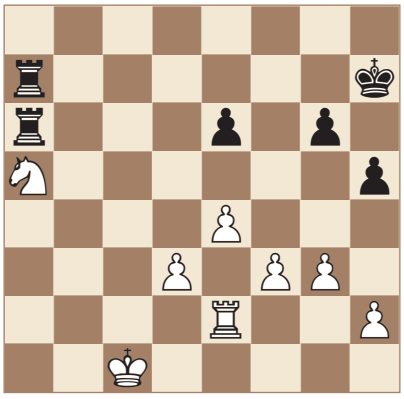
ANSWER: 35.♖c5! is a very solid choice. There's no need to calculate much, and White can continue by slowly advancing the d-pawn. This is by far the most practical decision, and it also follows the advice to keep things simple.

35.♕xc7?
I decided to go for a long variation which I thought was winning by force. Remember, 'long variation, bad variation'. This is a risky approach as it is easy to miss resources for the opponent. And that is exactly what happened in this game.
I considered 35.♘b7 ♕b6+ 36.♘c5 as the knight looks nice on c5. However, after 36...♖a2 Black has counterplay. Also, I am not sure if my rook is good on e5.
I also considered 35.♖b2 with the idea of 36.♖b7 next, but I didn't like it because of 35...♖b6.
35...♕b4!
The only reasonable move. After a queen exchange, White's task is easy: 35...♕xc7 36.♖xc7 ♖xa5 37.♖xe6.
36.♖xe6
This was the plan.
36...♕e1+ 37.♖e2 ♕g1+ 38.♔d2



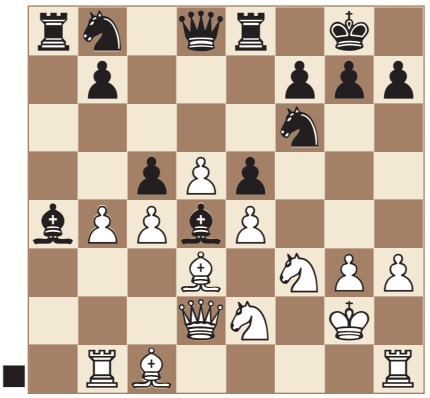
Frankly, I expected resignation here. But my opponent had different plans.

38...♖8a7!
This move turns the tables entirely. White is not lost now, but this is a difficult blow to recover from. White loses the exchange and suddenly has to defend a tricky endgame.
39.♕c1 ♕xc1+ 40.♔xc1 fxe6



41.♘b3?
Clearly, I hadn't yet recovered from the turn of events just before the time control.
41.♘c4 ♖a1+ 42.♔d2 ♖7a2+ 43.♔e3 ♖xe2+ 44.♔xe2 g5, and while Black can still harbour some small hopes here, White should hold this endgame reasonably comfortably.
41...♖c7+ 42.♔b2 e5! 43.f4
Also after 43.d4 exd4 44.♘xd4 ♖d6 Black has the advantage.
43...♖b6 44.d4? exd4 0-1
Clearly, I totally collapsed in the end. It is important to be able to deal with setbacks during a game. This time, I was not in a mental state to give it my best after spoiling a great position.

Game 92
Sipke Ernst 2435
John van der Wiel 2493
Dutch Championship, Leeuwarden 2001



23...b5!
This move was accompanied by a draw offer! I decided to continue, but there are a lot of possibilities here. It makes sense to first look at all the possible captures.

A) 24.bxc5? bxc4 25.♗c2 ♘bd7. I still don't understand what is going on here, but apparently White is much worse;

B) I didn't bother too long with 24.♘fxd4? either. It just makes way more sense to take with the other knight. 24...exd4 25.bxc5 bxc4 26.♗xc4 ♘bd7;

C) 24.cxb5 c4 25.♗c2 c3 26.♕d3 (26.♘xc3 ♗xc2 27.♕xc2 ♗xc3 28.♕xc3 ♘xe4) 26...♗xc2 27.♕xc2 looks interesting too. The engine gives as 0.00, but I like Black's position.

24.♘exd4 bxc4
24...exd4 25.bxc5 bxc4 26.♗xc4 ♘xe4 27.♕xd4 looks good for White.

25.♘f5!
In the end, this was the line I went for. White has the initiative here, and I also saw that there was a repetition, so I could safely go for this position and then see whether it was possible to continue or take the draw.

25...cxd3 26.♕g5 g6 27.♘h6+ ♔g7
27...♔f8? 28.♕h4 ♗c2 29.♗g5 looks crushing.

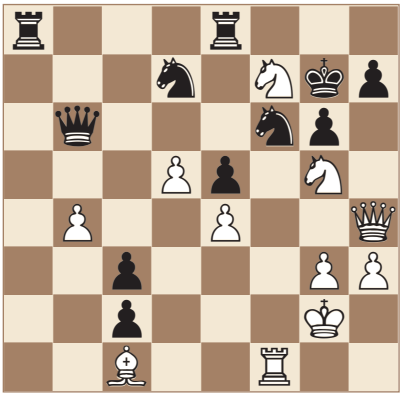
28.♕h4
I decided to continue. I liked my chances, but I underestimated Black's resources in this position. 28.♘f5+ ♔h8 29.♘h6 ♔g7 is a draw.

28...♗c2?
I never considered 28...d2! when 29.♗xd2 ♗c2 30.♖be1 ♘bd7 leads to unclear play.

EXERCISE: White's rook on b1 is now under attack. How would you react?

ANSWER: 29.♗g5!. Ignoring the threat! Black is forced to take the rook with 29...♗xb1, when there could follow 30.♘f5+ gxf5 31.♕h6+ ♔g8 32.♗xf6 ♖a2+ 33.♔g1 ♕xf6 34.♕xf6, with a promising position for White.

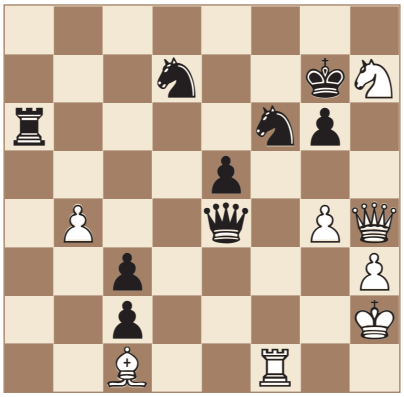
29.♖b2? c4 30.♘g5 ♘bd7 31.♘hxf7 ♕b6 32.♖f1 c3?
32...h5.
33.♖xc2 dxc2



This was another moment where I spent a great deal of time. White has many candidate moves, and I just didn't see the win.

EXERCISE: This is a tough one! Try to find the winning idea.

34.♘e6+??
The win seems to me to be incredibly hard to find: 34.♘xh7! ♘xh7 35.♘d6!! ♕xd6 (Black also gets mated after 35...♖f8 36.♕e7+ ♔g8 37.♗h6) 36.♖f7+ ♔xf7 37.♕xh7+ ♔f6 (37...♔f8 38.♗h6#) 38.♗g5+!. The cherry on top! 38...♔xg5 39.♕h4#.
34.♕h6+? would be the wrong move order: 34...♔g8 35.♘xh7 ♘xh7 36.♘d6 ♖e7! 37.♕xg6+ ♖g7 and Black defends.
34...♖xe6 35.dxe6 ♕xe6 36.♘g5 ♕c4 37.g4 ♖a6?!
We were both in time trouble here, so the quality of the play dropped quite a bit.
Black is winning after 37...♖a1 38.♘xh7 ♕xf1+ 39.♔xf1 ♖xc1+ 40.♔e2 ♖d1.
38.♘xh7 ♕xe4+ 39.♔h2



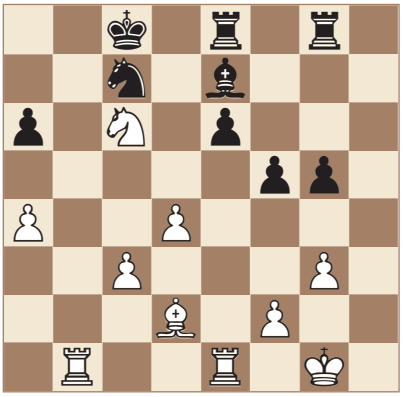
And here my draw offer was accepted. I thought my position was reasonable, but it turns out that after 39...♕d3 or 39...♖d6 White is lost.

CHAPTER 32

Active Learning

Henk Burg
Karel van Delft

Arnhem 2007 (analysis)



After the game, the engine found a forced mate here with three silent moves: **1.♖b8+ ♔d7 2.♘e5+ ♔d6 3.♖b6+ ♔d5 4.♗e3 f4 5.f3 fxe3 6.♖d1 ♗d6 7.c4#**

Active learning is an effective and efficient study approach. It involves variation, fascination and participation. Variation means different training methods, fascination is about intrinsic motivation, and participation is about active involvement.

In active learning, students actively participate in the learning process by interactive exercises, discussions, problem-solving, reflection, critical thinking tasks as well as hands-on experiences. It is the opposite of passive learning methods such as lectures where students listen and take notes. In active learning, students are personally involved, and learning by doing is essential.

Via active learning you verbalize thoughts, get better understanding, remember better what you learn, develop communication skills and critical thinking skills (analyse, evaluate, synthesize), you develop routines by which you can apply insights and skills better. Also, learning is more fun and more motivating.

There are various methods, techniques and tools to implement active learning, such as puzzle solving (pattern recognition), blitz games (decision-making) and game analysis. A good method is also to create your own database with thematic positions (see Chapter 48 on the JPEG-method).

Several websites offer interactive learning tools and online courses. Working with a coach and a training partner can be very beneficial.

In the book *Foundations of Cognitive Psychology*, IM Fernand Gobet, professor of cognitive psychology, has this to say about active learning: 'Research has shown that being active during learning leads to better understanding and retention of the material, and cognitive psychology has developed methods for studying efficiently.'

Although active learning can be very stimulating and productive, there is also a place for passive learning in training; for example, when a new topic is introduced.

Connected to active learning are learning strategies, The Learning Scientists, a collective of cognitive psychologists who describe six learning strategies, claim that students are more productive using the following six principles:

- Spaced practice (spread study schedule over time)
- Interleaving (switching between topics)
- Elaboration (asking and explaining how and why things work)
- Concrete examples (when studying abstract concepts, illustrate with concrete examples);
- Dual coding (combine words with visuals)
- Retrieval practice (bring learned information to mind from long-term memory)

References:

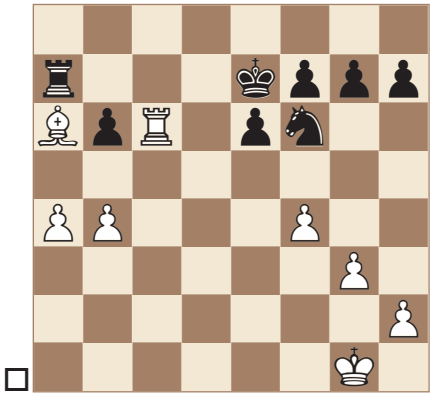
Gobet, F., Chassy, P., & Bilalić, M. (2011). *Foundations of cognitive psychology*. McGraw-Hill Education. mheducation.co.uk

Sumeracki, M. (2020). *Six strategies for effective distance learning: A summary for teachers*. The Learning Scientists. https://www.learningscientists.org/blog/2020/5/7-1

CHAPTER 46

Heuristics

Paul van der Sterren 2520
Jan Timman 2590
Dutch Championship, Hilversum 1987



White blundered with **32.♖xb6**, completely overseeing **32...♘d7**. Van der Sterren didn't expect this move because on move 30 Timman had played ...♘d7-f6.

When selecting candidate moves, relying solely on calculation is often insufficient. Heuristics are rules of thumb, general principles that often apply in specific situations. They focus on the most critical features in a scenario and help to quickly make evaluations, decisions and solve problems, especially when the position on the board is complex and time is limited. Heuristics make use of pattern recognition and are used consciously and unconsciously. Evaluating limited information by using heuristics often leads to better results: less is more.

The economist and cognitive psychologist Herbert A. Simon highlighted the limitations of rational decision-making. Simon developed the concept of 'satisfice' (a contraction of 'satisfy' and 'suffice'). This is a strategy where one chooses an option that is adequate rather than optimal. The underlying idea is that a full

analysis is sometimes impossible or too expensive, or that people do not have the cognitive abilities to weigh all the variants.

There are many heuristics in chess in relation to information-processing. They range from simple principles to more complex strategies:

- Move selection: prioritize moves that improve activity of pieces. Play moves that ensure a sound pawn structure. Attack where your opponent is weak.
- Position evaluation: check material, king safety, pawn structure, activity.
- Strategic planning: quickly develop pieces in the opening. Fight for the initiative. Let pieces cooperate well.
- Endgame techniques: activate the king in the endgame. When you are material up, exchange pieces instead of pawns.
- Tactics: be aware of undefended material. Anticipate threats and counterplay.

There are also many heuristics in chess in relation to mental aspects and self-management. For example:

- Play on in a lost position; the opponent can become overconfident.
- Mark Dvoretsky regularly mentions psychological rules of thumb in his books. They are mostly derived from practice, but that doesn't make them less true.
- To quote Albert Einstein: 'Logic brings us from A to B, and imagination everywhere.'
- You can formulate your own rules of thumb.
- Why should you limit yourself? In a scientific study (Palmer, Rosch, Chase, 1981) people were asked to draw a coffee cup. Everyone chose a perspective from the side. No one drew the cup from above.

A heuristic gives a general approach to solving a problem. But be aware, there can be exceptions.

Heuristics guide the search for a solution, whereas algorithms offer fixed methods (for example, checkmate with king and rook versus king).

Famous chess authors have written about heuristics. For example:

Siegbert Tarrasch emphasized principles of piece activity, pawn structure, and development.

Aron Nimzowitsch introduced key concepts like prophylaxis, overprotection, and blockade.

Emanuel Lasker wrote about practical play and psychological factors.

John Nunn gave practical advice for improving decision-making and analysing positions.

Mark Dvoretsky explained analytical techniques and heuristic methods in endgames.

Some quotes of these authors have become famous:

Aron Nimzowitsch: 'The passed pawn is a criminal who should be kept under lock and key.'

Emanuel Lasker: 'When you see a good move, look for a better one.'

Mikhail Tal: 'You must take your opponent into a deep dark forest where 2+2=5, and the path leading out is only wide enough for one.'

Heuristics are important thinking tools. Using heuristics effectively is a skill that can be developed by analysing your games and documenting heuristics you encounter. You can maintain a rules-of-thumb list, JPEG-diagrams, a diary, or another database. The best is to document them in concise, active and concrete language combined with a diagram. And review them regularly.

Be aware – heuristics should be used as guidelines, not as strict principles to follow always. Many times, heuristics conflict with each other. Chess is a very concrete game and there are many exceptions to the rule.

References:

de Groot, A. (1965). *Thought and Choice in Chess*. Mouton.

Dvoretsky, M. (2003). *Dvoretsky's Endgame Manual*. Russell Enterprises.

Fine, R. (1976). *Thirty rules of chess*. *Chess.com*. https://www.chess.com/forum/view/general/reuben-fines-thirty-rules-of-chess

Gigerenzer, G., & Gaissmaier, W. (2011). *Heuristic decision-making.* Annual Review of Psychology, 62, 451-482. https://doi.org/10.1146/annurev-psych-120709-145346