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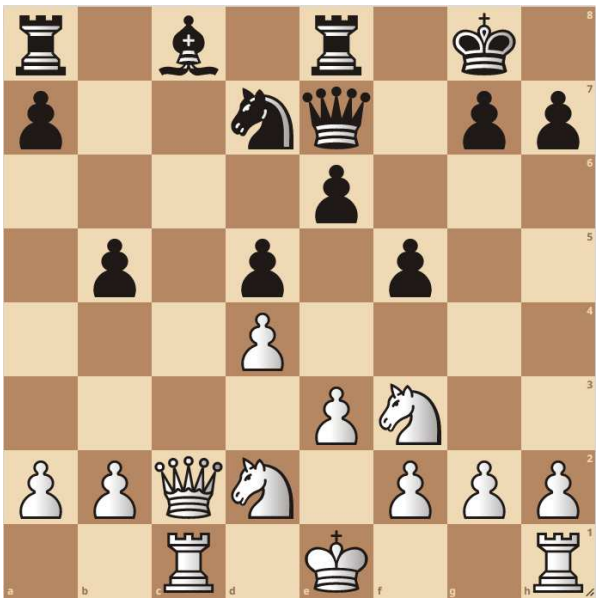

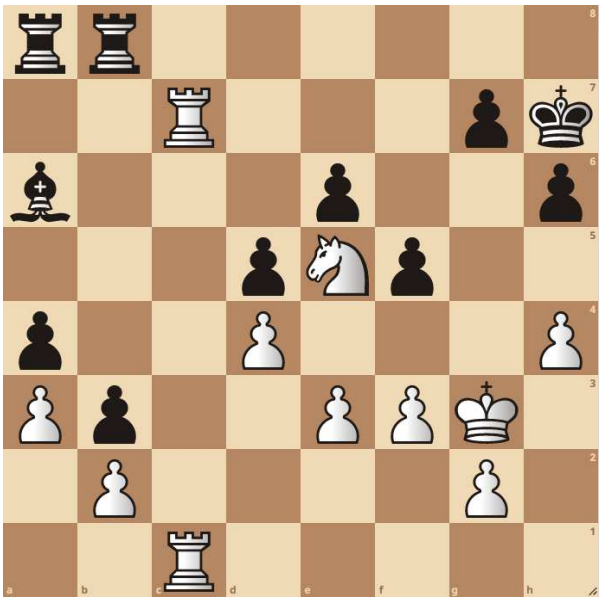

Reflections on reversed thinking in chess

Authors: Karel van Delft, Johan Hellsten, Dries Wedda

‘Reversed thinking is an element of thinking in chess that is underestimated’, says GM Artur Yusupov. ‘It is worth having a look at how it is connected with forward thinking and what we are doing basically, how we solve our problems, how we solve chess, sometimes consciously, sometimes unconsciously. We don’t have too much literature about it.’

Does reversed thinking in chess leads to better results, compared to forward thinking? If so, how and in what domains in chess? Or is bi-directional thinking the best way to go? Is reversed thinking trainable? If so, how? A research group of the Chessable science team asked 16 chess experts via a questionnaire about such questions.

It would seem that to be able to apply reversed thinking a certain level of knowledge is necessary. It is important to be familiar with patterns. Recognizing them directs your thinking. The key might be repeatedly learning and practising patterns with the same motif from simple to more complex forms. The danger with solving positions on sites and in books is that there are solutions. To prevent false assumptions a trainer could show positions which look similar but they are not. It is also interesting to take the perspective of the defender and look for one move backwards.

Since it became clear ‘solving’ is a too narrow formulation, we chose for the broader term ‘thinking’. This research is a follow-up to a 'Forward vs Reversed Solving' project that the science team did in 2021 and 2022. In that research 95 chess players via online tests solved mate patterns. In one of two

conditions participants got mate in one positions that were followed by complex puzzles with the same end positions (in the reversed condition). Participants in the other (forward) condition received random mate in one puzzles, but the same complex puzzle as in the other condition. Contrary to expectations there were no significant differences in the outcomes of the tests.
A blog and report were published on the Chessable site:
Blog Prof. Barry Hymer: https://www.chessable.com/blog/solving-puzzles-backwards
Report Karel van Delft: https://www.chessable.com/blog/wp-content/uploads/2022/04/reversed-solving-research-paper-FINAL-22-march.pdf

There were several speculations about the outcomes of the research. In a conversation GM Artur Yusupov showed to Karel van Delft a Zinar study in which reversed thinking is the best way to go. This led to follow-up research via a questionnaire for 16 chess experts. This is what Prof. A.D. de Groot in his empirical cycle called the 'evaluation phase'.

The 16 respondents were informed about the reasons for the research. They were asked to watch two short videos, read an introduction and answer questions.
1. A video presentation by Karel van Delft in June 2022 at an online chess education conference from the FIDE Education commission and the ASPU 'Chess' Research Institute from the University of Yerevan in Armenia. See https://www.youtube.com/watch?v=uWw2z7Sg4B8 (from 4:23:05 min).
2. A video with GM Artur Yusupov and Karel van Delft discussing the outcomes of the research. Yusupov thinks reversed solving is a good method when solving some endgame positions with pawns and zugzwang. See https://www.youtube.com/watch?v=uULjGv46Guo

The research group consists of GM Johan Hellsten, Dries Wedda and Chessable science project manager Karel van Delft, who coordinates the project.
The 16 respondents to the questionnaire are GM Alon Greenfeld, GM Peter Wells, GM Johan Hellsten, GM David Smerdon, GM Max Warmerdam, GM Stefan Kindermann, IM and GM of chess composition Yochanan Afek, IM Arthur van de Oudeweetering. IM Ido Ben-Artzi, IM Merijn van Delft, IM Thomas Beerdsen, FM Nate Solon, CM Can Kabadayi, CCE Alan Bester, Dries Wedda and Erick Takawira. Of these, Johan Hellsten and Dries Wedda also are involved in the research group. All respondents agreed to mention their names in the report.
GM Artur Yusupov, Prof. Barry Hymer and Prof. Roland Grabner gave feedback on the research.

Here we sum up per question remarkable responses. The full report shows the complete answers.

HABITS

Respondents mention concentrating on solving mating positions is very concrete, but just a limited aspect of what is going on in chess. In endgames, strategic middle games and studies reversed thinking can play another role.

Some respondents expected more impact in the first research from mating patterns as prompts (via pattern recognition) for more complex mates.

Possible reasons were mentioned why there were no significant differences between forward and reversed conditions in the former research. Forward thinking is the most common way of thinking in chess. Reversed thinking maybe seems artificial or is not considered at all. Even if trained in reversed thinking many players stick to old habits. In the former research the strongest participants might be strong enough to find the solution by forward thinking, while many weaker players might be too weak to make connections.

It was suggested that by training and verbal explanation in advance the relationship between simple and complex patterns might have led to higher scores. It also might have made a difference if the test positions had been based on more familiar motifs, because they are more rooted in the chess players' intuition.

Reversed thinking (which often happens unconsciously) might be a powerful tool, but only strong players can use it. They however could benefit from conscious use of it. Planning and decision making might profit when forward and reversed thinking are combined. A methodological issue was suggested: in addition to solving percentages response times in tests are also important.

ZUGZWANG

Respondents were struck by what GM Artur Yusupov had to say about pawn endgames and corresponding squares in relation to zugzwang. It is noticed that to reason reversed players need to have knowledge of theoretical endgames (strategical or tactical) to start reversed thinking. So this tool only can be used by strong players. Some respondents say the best way to go is a combination of forward and backward thinking.

Some respondents wonder how useful reversed thinking is during their own games. Others say they will give it more thought because it might be useful for them. How trainable is reversed thinking? Reversed thinking is not exclusively a weapon for the attacker – the defender can use it to find ways to obstruct the plan of the attacker. Elimination of possibilities ('branching factor') is important. Suggested are route planning exercises as in the Dutch Steps method.

APPLICATION

Some respondents apply reversed thinking in games and/or trainings. It is not always seen as efficient in practical play. A GM uses it as a demonstration during trainings with students to show what he calls 'fixing a line during calculation'. Reversed thinking implies an optimal position one should aim for. But who tells you during a game what the optimal position is? A suggestion to think about an optimal position is asking yourself which piece of the opponent should be eliminated for a variation to work. Then you can proceed via reversed thinking to the initial position. Several trainers show their students first basic tactical or strategical ideas and then more complex ones where the same motif is the kernel. A GM respondent makes an association with prophylaxis. He asks students to find the opponent's plan. Then he asks them to prevent it. So they have to think forward and then think back how to stop it. Reversed thinking is definitely used for composing endgame studies. A study is most often created by starting at the final highlight and creating the solution backward. A few respondents use the reversed thinking methodology as authors in their Chessable courses.

USEFULNESS

Several respondents say reversed thinking can be useful in pawn endgames and combinations. Also sometimes in strategy, for example when making decisions in trading pieces. In the case of strategy with long term goals there is not a concrete optimal position, but more a kind of position with certain characteristics. In openings there might be possibilities to compare superficially unrelated positions. Some respondents say they think reversed thinking is useful for every area in chess, since it is always helpful to create an image of where you would like to go and then do some sort of reversed thinking. A respondent says he thinks you could use it to figure out where your pieces are best placed to start or continue an attack. A comparison is made with how Capablanca approached positions.

LITERATURE

In his book 'Chess Recipes from the Grandmaster's Kitchen' GM Valeri Beim says 'inverse thinking' is 'frequently applied, rarely formulated'. There is a relation with pattern recognition and how reversed thinking is used in many study books. A question mark is put at Beim's definition of what he calls 'inverse thinking' as the 'ability of a player to recognise familiar…motifs in an unfamiliar position.' A respondent feels Beim's book touches more on pattern recognition and general principles than on the principle of practising the method of inverse thinking.

Also mentioned is Jon Tisdall's book 'Improve Your Chess Now', particularly the lengthy Chapter 4 'Pattern Training and other useful exercises'.

An example of retrograde chess puzzles is the book 'Chess mysteries of Sherlock Holmes' by Raymond Smullyan.

Reversed thinking is one of the steps in the book 'Köningsplan' (Kingsplan) by GM Stefan Kindermann and GM of chess composition Robert K. von Weizäcker.

A respondent thinks many books related to chess strategy describe a reversed thinking concept. For example, chapter 6 in 'Endgame strategy' by Shershevsky describes schematic thinking and draws on similar things.

SUGGESTIONS

There is broad consensus that the concept 'reversed solving' is too narrow. 'Reversed thinking' better describes the broad array of cognitive processes involved.

Respondents gave several suggestions for follow-up research. A new test could include more typical patterns, for example mate images, positional goals, endgame themes, etc. Benefits of reversed thinking methods could be found via online experiments on a more massive scale by e.g., a platform like Chess.com, including the suggestions by Grabner to explore the psychological mechanisms. That would vastly increase statistical power to detect a main effect as well as heterogeneous effects by strength, age and gender (which the first study of 95 participants didn't have).

Suggested is to make training methods explicit and guide the students on what they should look for.

The two positions on the top of this introduction are from the game Alexander Alekhine vs. Fred Dewhirst Yates, London 1922. See https://www.chessgames.com/perl/chessgame?gid=1012123

About the authors:
Karel van Delft is the science project manager of Chessable. He is the author of the book 'Chess For Educators' and co-author of the book 'Developing Chess Talent'. He is running Schaakacademie Apeldoorn (Chess Academy Apeldoorn, www.chesstalent.com) in The Netherlands.
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Complete answers of respondents 'Reflections on reversed thinking in chess'

GM ALON GREENFELD

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

I liked the video. My personal taste favours a somewhat unpolished stuff with a bit of personal touch as is in the video. However, as a trainer - and all the more so when a relatively rare topic is concerned - I might have preferred a more meticulous and vivid presentation. That said, the research and the results are explained clearly.

As this video is the main introduction, I take the liberty to raise here my two main reservations about the entire research, although my remarks do not relate directly to the video itself:

- I miss the broader context and purpose of the research. Is it checking the advantages of reversed thinking in general, in problem solving, or in practical play?
I believe the methodology and results in each of the above cases should be somewhat different. As a chess trainer I am solely interested in practical play and therefore the key question is how one can know during a game what is the "optimal position" he should strive for. Giving that position in advance seems to me like a mere theoretical exercise. The immediate parallel in life I can think about is reversed engineering, but this applies to existing products the engineering of which is unknown. In chess the situation is exactly the opposite - there is no unknown data and the only important thing is the final successful outcome.

- I have a problem with the terminology in the research and its potential implications. You consistently use the term "solving", which implies there is a concrete solution based on calculation (tactics). But then you broaden the scope to other areas, like strategy where concrete calculation is not at stake (for instance in question 4 below). Because of that and since the whole cognitive process is counter-intuitive, I would prefer the term "reversed thinking". True, it is much easier to measure tests with a very concrete solution so it is understandable why you opted for mating puzzles, but it involves the risk of limiting yourselves to puzzle solving alone, rather than searching the entire thinking process.

In my opinion, there can be two main reasons for not finding significant differences between the conditions:

- The natural and by far most common way of thinking in chess (and in life) is "forward thinking". So "reversed thinking" is considered very artificial by most players. Therefore, even if they can see the benefits of it, most players intuitively ignore the process of "reversed thinking" and automatically think the way they are used to. I have often noticed this phenomenon when trying to add more thinking methods to my students' arsenal: most of them just stick to their old habits and immediately start calculating when given a position.
- The strongest participants in the research were strong enough to find the solution with "forward thinking" while many of the weakest were perhaps too weak to make the connection between the desired "optimal positions" (mate in one puzzles) and the initial ones.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

Artur is always interesting! But I feel the form of casual conversation was not the best way to communicate with him for your purposes. I feel the conversation was not planned so well and there was no full communication between Artur and Karel. As a result, we could not hear Artur's opinion about the research itself and, most importantly, whether "reversed thinking" can be used for other kind of positions apart from pawn endgames.

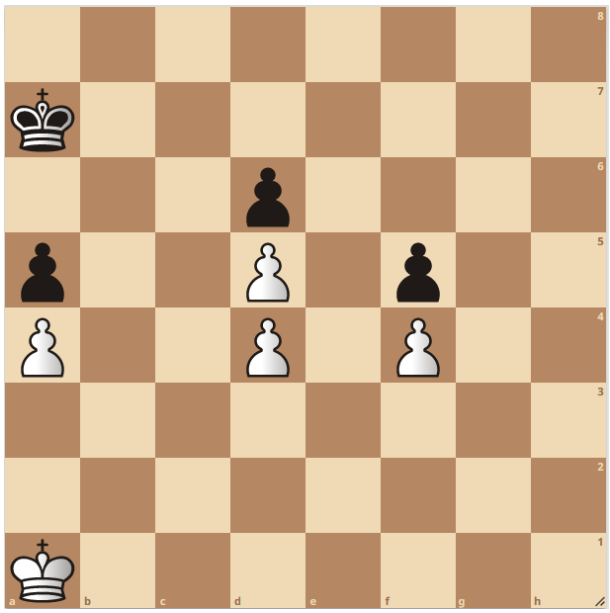
Artur looks at the "reversed thinking" process from a player's perspective, the same way I do. And for players and coaches it is known that the most common area where "reversed thinking" is applied in chess is pawn endgames with so called "corresponding squares".

A few months ago I accompanied one of my young students in a tournament abroad. One day he told me that he went to sleep quite late. I was a little angry with him but then he explained the reason: at about 11pm he showed a few of his friends (all of an IM level) a study that I gave him several weeks earlier. They thought they'd solve it quickly but it was a pawn endgame with six(!) pairs of corresponding squares. It took them an hour and a half to solve but they were so excited that they did not notice the time. Indeed such endgames are so instructive and the "reversed thinking" required to solve them is highly satisfying!

As Artur mentioned, this kind of endgames is of a great practical value. Here I want to share with you an endgame which is attributed to the second world champion, based on a game he played in a simul in the USA. The current version by Reichhelm (who in some publications is wrongly referred to as Lasker's opponent in that game) is even more instructive than the original (in which White's king was on a3).

Lasker - Version by Reichhelm

1901 *[Alon]*



White to play.

In order to win the white king has to penetrate into black's territory. There are two invasion routes: via c4 and b5 and from h4 to g5 (or h5). With forward thinking we would hurry to one of these routes, starting probably with 1.Kb2. But these direct tries will prove futile: when the white king reaches c4 the black one will stand on b6, and running to h4 will be even worse as then the black king on g6 stops the penetration and there will be no way back for white.
The winning idea lies in subtle maneuvring: white will THREATEN to penetrate via c4 while keeping the other invasion point (h4) in the background. Deep inspection will show that for most of the relevant squares which the white king can occupy black has just one place where his own king can stay in order to prevent immediate defeat. These are called "corresponding squares". White to play can force black out of reaching the proper corresponding square by some delicate maneuvring.
In order to achieve that goal the corresponding squares have to be identified first. To that end we must apply "reversed thinking", the only useful method in such positions. So let's start with the end: where should the black king go when white comes to c4? The answer is b6 and just b6! Because if he goes to a6 he won't be on time to reach g6 when the white king reaches h4 (Kd3 Kb6, Ke3 Kc7, Kf3 Kd7, Kg3 Ke7, Kh4 Kf6, Kh5 and wins). So we already have the two most important corresponding squares (sometimes called the critical squares):c4 and b6. When the two kings are there it is reciprocal zugzwang and the one to move fails to accomplish his mission. In order to win we have to get this position with black to move. But as mentioned above we cannot accomplish it with direct forward thinking. We go a bit backward then and focus on squares which threaten Kc4. The most tempting one is d3 since it is also eyeing the other penetration square on h4. Where should the black king be then (after Kd3)? It appears that the only square for him in this case is c7, as he has to be able to reach b6 in one move but also be on time to reach g6 in case white runs to h4. So the second pair of corresponding squares is d3/c7. What about the c3 square? At first glance it seems that both c7 and b7 are sufficient, since black is ready to occupy b6 in case of Kc4. But in fact, when the white king is on c3 black cannot be on c7 as this allows Kd3! and white reaches the corresponding squares (d3/c7) with black to move and therefore white wins. It means that for c3 black has just one corresponding square, which is b7. This way we go backward and backward and define all the corresponding squares. For b3 it is either a7 or c7 (b3/a7;c7). For d2 - c8 (d2/c8) - in order to have access to the two corresponding squares of d3 and c3 to which the white king can go next move. For b2 either c8 or a8 (b2/a8;c8). For c2 the corresponding square is b8! (c2/b8).
So we proceed with reversed thinking to the first rank, from which the white king threatens to reach some of the important squares on the second rank. And since black does not have another extra rank to maneuvre, he ultimately finds himself out of squares, therefore:

1.Kb1! [1.Kb2 Ka8!]

1...Kb7 [In order to reach c8 (or a8) as well as b8 after 2.Kb2 and 2.Kc2 respectively.]

2.Kc1! [Threatening both Kc2 and Kd2]

2...Kc7 [Black must have access to both b8 and c8, the corresponding squares of c2 and d2 respectively]

[2...Kb6? 3.Kd2 Kc7 4.Kd3!; 2...Kc8? 3.Kd2!; 2...Kb8? 3.Kc2!]

3.Kd1! Kd7 [3...Kd8 4.Kc2! Kc8 *(4...Kc7 5.Kd3)* 5.Kd2!; 3...Kc8 4.Kd2]

4.Kc2!! Kd8 [4...Kc7 5.Kd3; 4...Kc8 5.Kd2!]

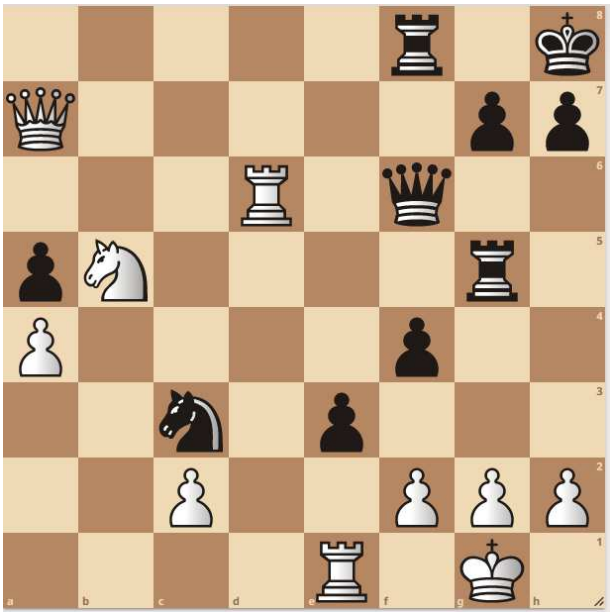
5.Kc3! Kc7 6.Kd3! [and white wins]

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Yes, I do, although applying "reversed thinking" is rarely efficient in practical play. Apart from demonstrating it in pawn endgames, as we have seen above, I use it in games and demonstrate it to my students in what I call "fixing a line during calculation".

As mentioned in my first answer, the biggest gap I see between your research and reality is that (unfortunately) no one tells us during a game what is the "optimal position" we should aim to achieve. So we have to find it on our own and that starts with "forward thinking". We calculate a potentially promising line but then we often see that it does not work for some reason (if it does work, the problem is solved and we go for it). Most players usually stop at this point and try to explore (calculate) other continuations. Usually this is a sad necessity and I have to do it as well, but if I feel that the initial try "almost works" (i.e. it looks close and there is just one defense) I ask myself what is the exact thing (move, piece) that prevents it. And then I look at my pieces and try to see if I have a piece nearby that could eliminate the defense. If there is, I move that piece in my mind to the relevant square in the critical position and this is the "optimal position" I'm striving for.
Then with "reversed thinking" I go backward from the "optimal position" till I reach the initial position (the one on the board) and try to find a position in which I can insert the desired extra move that eliminates the opponent's defense. If I manage doing so the entire idea will work!
Since the whole process sounds very theoretical and obscure, I'd like to demonstrate it with two examples.

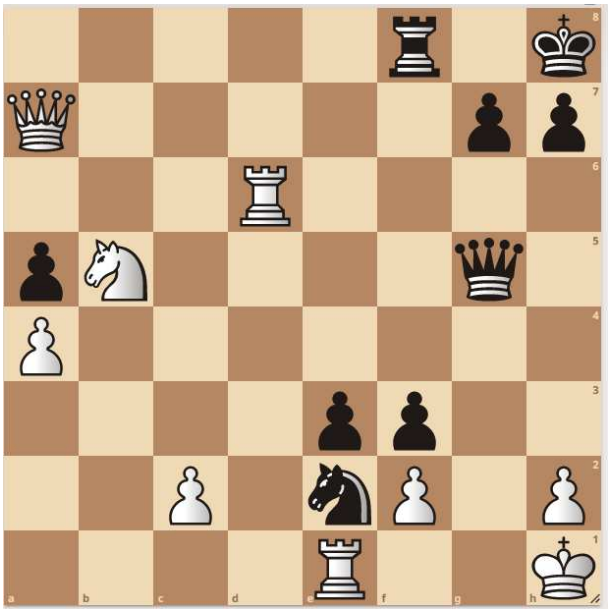
Kosashvili,Yona (2565) - Greenfeld,Alon (2521) [B59]
ISR-chT Israel (5), 26.03.1999



Black to play (after 31. Rd2-d6)

Black has a great initiative but the position is sharp (several pieces are hanging) and on top of that I was in severe time pressure (there were no increments at the time!). There were some very

promising continuations but in such cases the wide choice is often more confusing: which direction should I check first? What I chose is neither the most simple nor the "objectively best" move, but it wins by force and I calculated it clearly using systematic thinking. Let me share with you my thinking process.
In order to cut off options I looked for a forced line. This is often a useful way, instead of considering several candidate moves. Since I pined my hopes on the attack I was immediately attracted by the idea 31...R:g2+ 32.K:g2 f3+, followed by Qg5 and Qg2 mate. Alas, I saw in no time that this does not work: 33.Kh1 Qg5 34.Rg1 and White wins. But before giving up this idea, I asked myself what is the exact thing that prevents my win there and it is of course white's rook on g1. Then followed the question: which of my pieces could, in some circumstances, hinder white's defense. The answer was clear: if Nc3 could be on e2 then the whole line works! So now I had the 'optimal position' in mind:



Knowing what I have to aim for I now used "reversed thinking" and looked whether I could insert Ne2 somewhere with a tempo. There were some additional short lines to calculate as a result but since I was focused on what I was striving for, the whole calculation became easy:

31...Ne2+ [Here! This move which controls g1 comes with a tempo.]

[31...Rxg2+ 32.Kxg2 f3+ 33.Kh1 Qg5 34.Rg1;
31...Qf5 was simple and strong but I haven't even considered it]

32.Kf1 [32.Kh1 allows a simple winning attack: 32...f3 33.g3 Qf5 34.Qxe3 Rh5 with Qh3 to come]

32...Rxg2! [Black continues with his original plan. White cannot capture the queen because of R:f2#]

33.Rxe2

[33.Rxf6 Rxf2#;
33.fxe3 fxe3+ 34.Rxf6 Rf2+;
33.Kxe2 Rxf2+ 34.Kd3 Rd2+;
33.Kxg2 f3+ 34.Kh1 Qg5 would result in the "optimal position"]

33...Qa1+ [33...Qg5 was easier but I had already calculated the win]

34.Kxg2 f3+ 35.Kh3 Qf1+ 36.Kh4 fxe2 37.Qf7 Qxf2+

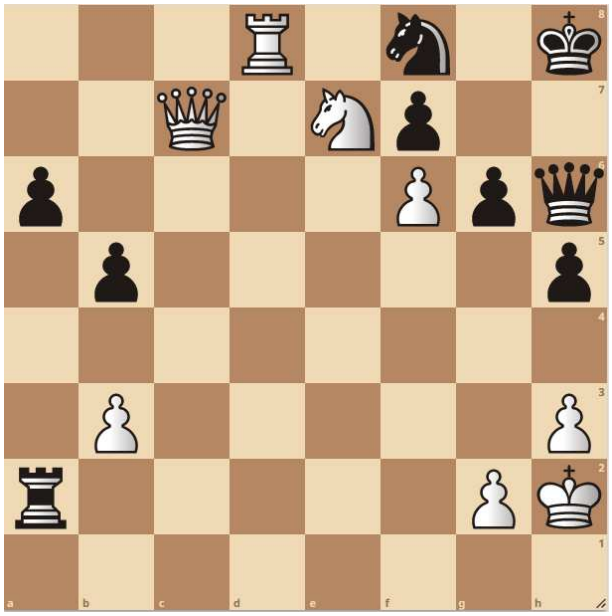
0–1

So it's not a purely "reversed thinking". It was rather a back and forth process. In order to find the "optimal position" I first used "forward thinking" and only after imagining a position which would make the idea work did I apply reversed thinking and found a way to achieve it.

The following wonderful example uses the same method.

Gopal,G.N (2525) - Howell,David W L (2685) [C96]

Gibraltar Masters 2016 Caleta ENG (6.15), 31.01.2016



Black is tied up and the position looks completely winning for White. But surprisingly there is no easy win. White has to keep controlling the h2–b8 diagonal with his queen and attempts to attack the vulnerable black N by 44.Qd6 or 44.Qb8 do not suffice on account of 44...Kh7. For instance: 44.Qb8 Kh7 45.R:f8 R:g2+! 46.K:g2 Qd2+ with perpetual.
So a new approach is required. It is clear that Nf8 is the weakest spot in the black camp and whenever direct attack is insufficient we should shift our attention from the target to its defender. How can White remove the defending queen from h6? A brilliant idea then comes to mind: what about the deflecting sacrifice 44.Qc1–? Looks tempting but when we check it further we find out that after the immediate 44.Qc1? Q:c1 45.R:f8+ Kh7 46.R:f7+ Kh6 (46...Kh8 47.N:g6+ Kg8 48.Rg7 is mate) 47.Ng8+, the black king just escapes. Such a pity but it was a close call; can we make it work?
The problem in that line was the escaping square g5 so we just need it to be covered and then the idea works! And the way to do it with our current material is to get the position after 47.Ng8 in the last line when white's pawn is already on h4. Then it will be mate and this is our "optimal position". Now we can apply "reversed thinking" and get back to the starting position.

44.h4!! [Brilliant. White takes advantage of the fact that black cannot improve his position now]

[44.Qc1 Qxc1 45.Rxf8+ Kh7 46.Rxf7+ Kh6 47.Ng8+ Kg5]

44...a5

[44...Kh7 45.Nf5; 44...Rd2 45.Nxg6+ fxg6 46.Rxd2]

45.Qc1! Qxc1 46.Rxf8+ Kh7 47.Rxf7+ Kh8 [47...Kh6 48.Ng8# leads to the "optimal position"]

48.Nxg6+ Kg8 49.Rg7#

1–0

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

Besides the above-mentioned areas of pawn endgames and combinations, I think "reversed thinking" (but not reversed solving as reads in the question) can sometimes be useful in strategy. In fact, by definition strategy deals with long term aspects of a position so long term goals are often at the essence of strategic play. The ways to achieve those goals sometimes require "reversed thinking". In contrast to the previously mentioned examples, however, "reversed strategic thinking" is not destined to achieve a concrete "optimal position" but a kind of position with certain characteristics. So in strategic thinking we are usually talking about "optimal endgame" or "optimal set-up".
One such typical case involves the endgame of bishops (usually of the same color). The reason for that is that the bishop is the only piece which controls squares of just one color and if the pawn structure is static we can foresee and evaluate long in advance the most important features of the anticipated endgame. One fine example of it can be seen in the following game between two of the greatest fighters I've ever met.

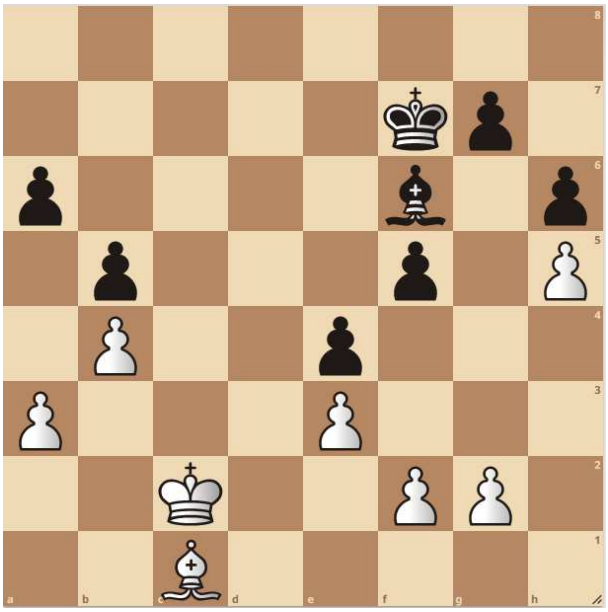
Kozul,Zdenko (2609) - Efimenko,Zahar (2624) [E12]

EU-Cup 23rd Kemer (4), 06.10.2007 *[Alon]*

Black to play (after 19-b2-b4)

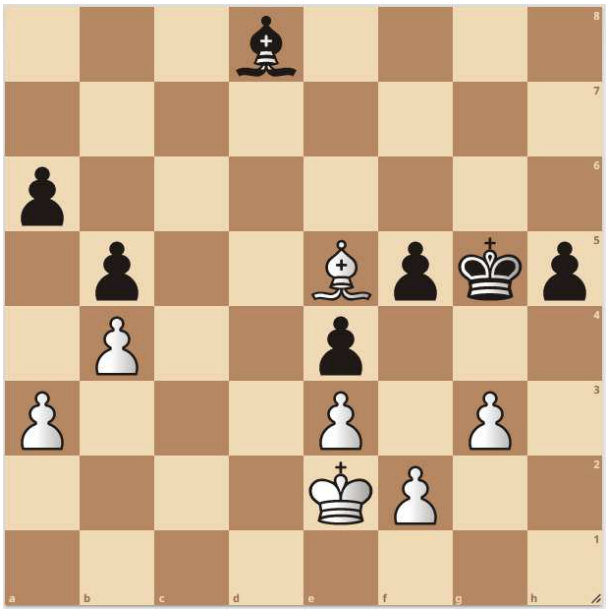
[White's last move (19.b4?) was a serious positional mistake, which severely weakened the queen-side. The main target now seems to be the c4 square, where black can try to plant an awesome Knight. Yet, Efimenko understands the position much more deeply and realizes that after fixing White's queen-side pawns on dark squares his real advantage lies in the potential endgame of dark-squared bishops. This is the "optimal endgame" he is striving for and the means to achieve it is by gradually exchanging all the other pieces, without letting "background noises"' such as a strong N on c4 distracting him.]

19...b5 20.Rc6 Rxc6 21.Nxc6 Rc8 22.Rc1 N5b6 23.Rc2 Nc4 24.Na5 Ndb6 25.Nxc4 Rxc4! [The black rook may be more active than his counterpart, but Black does not forget his strategic goal.]
26.Rxc4 Nxc4 27.Bc1 e5 28.Nd2 Nxd2! 29.Kxd2 e4 30.Kc2



This is the "optimal endgame". Black did not foresee this exact position but he did imagine and strived for the pawn structures which mean that White has permanent weaknesses on b4 and a3, while White's pawns are completely safe on the light squares. In such cases one cannot be completely certain about the win, but he has all the reasons to believe that his advantage will suffice. The immediate target on white's structure seems to be the h5 pawn. However if Black goes for it White gets enough counter-play on the queenside, e.g. 30...Be5 31.Bb2 B:b2 32.K:b2 Kf6 33.a4!! etc. So instead, Black creates one more weakness in his opponent's pawn structure, which will soon be entirely on dark squares - vulnerable to the attack of the bishop.

30...Bh4! 31.g3 [31.f3 exf3 32.gxf3 g6 33.hxg6+ Kxg6 and the past h pawn will decide the game.]
31...Bf6 32.Bd2 g6! [32...Be5 33.Bc3]
33.hxg6+ Kxg6 34.Bc3 Bd8 35.Be5 Kg5 36.Kd2 h5 37.Ke2

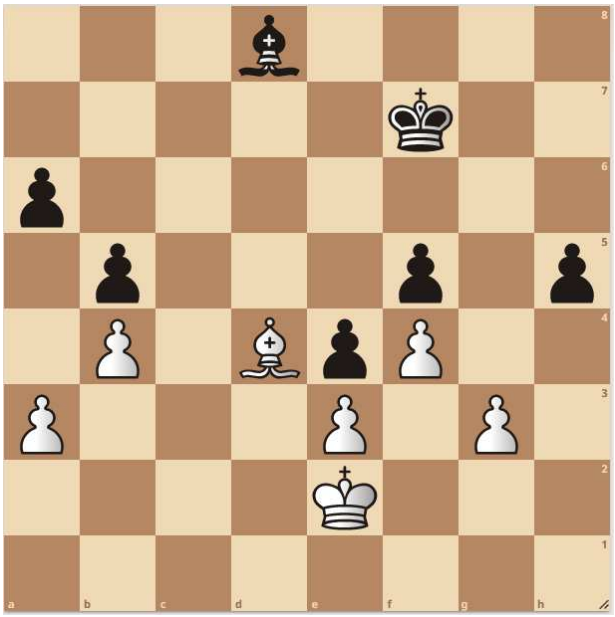


It looks like White managed to defend after all, as the black king cannot penetrate from the king-side. But black finds a beautiful winning plan: his king and bishop swap roles, the former will attack on the queenside while the latter will do so from the kingside.]

37...Kg6! 38.Bd4

[After 38.Bc3 Kf7 39.Kd1 Ke6 40.Kc2 Kd5 41.Kb3 h4! 42.gxh4 Bxh4 43.Be1,the poor bishop can only protect f2 from this square and now 43...f4 44.exf4 e3 decides the battle]

38...Kf7 39.f4



39...exf3+! [The last finesse - the white backward pawn must remain exposed.]

40.Kxf3 Bc7 41.Bc3 Ke6 42.Be1 Kd5 43.Bf2 Kc4 44.e4 fxe4+ 45.Kxe4 Kb3 46.Kd5 Kxa3 47.Kc6 Bxg3 48.Bxg3 Kxb4 49.Kd5 Kb3 50.Kd4

0–1

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

Not really

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

Unfortunately I'm not familiar with this book (I am with the author though).

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes, as I wrote explicitly in my answer to question 1, I think the term should be "reversed thinking". I believe the term "solving" is both very restricting and not accurate. It implies a technique of dealing with puzzles rather than a method we can use in actual games; and it doesn't represent the real nature of the process, which is first and foremost a cognitive one. In my previous answers I gave some explanations and examples which show that the definition could and should be extended to "reversed thinking".

8= Do you miss any questions? Do you have suggestions for further research?

-

GM PETER WELLS

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

The accumulated material presented on the subject of reverse solving convinces me that this is an important topic which well merits the research *Chessable* is devoting to it. I am less certain as to whether this is best deployed in solving tactics or whether its role in strategic decision-making/endgames may prove more significant.

I thought this video could have expanded a bit more on what should guide us *in general* as to the motifs/patterns with which we should start when producing a reverse analysis. Just mentioning an 'optimal final position' begs a lot of questions. Clearly in the case of the particular research here, the starting point is the simple mate and the end-point a more complex mate. However, I thought Santo d'Agostino's vision in Barry's blog of the process of learning a basic pattern and gradually adding layers of complexity so that the basic motif was increasingly 'latent,' was a useful one which helped me to get a better handle on what is going on.

In common with the researchers, I am somewhat surprised that the impact of the reversed solving - using simple mating patterns as prompts to the more complex mates - (and the accompanying levels of pattern recognition) was so low. A few thoughts flow from this:

i) Were the complex positions hard enough for the stronger players to actually *need* the simpler positions? In other words, might reversed analysis have enabled them to solve them somewhat more quickly/easily, but this didn't significantly affect the outcomes since the solutions would have been well within their grasp anyhow?
ii) I am not at all surprised that the pattern recognition between the simple and complex mates varied significantly according to rating. However, I would really not expect there to be anything like the clear-cut 'cut-off' point at 1800 as implied in the video. I would also have expected any cut-off to be well below 1800 (assuming the example of simple and complex mate given in the video was representative of the overall level).
iii) I guess that the players who would have really required the simple mating patterns in order to succeed in tackling the more complex positions were precisely the ones who struggled to recognise the patterns. You speculate on whether they would have scored better had the relationship between the simple mates and the complex ones been made more explicit. I strongly assume that they would. However, it might be more interesting to see whether some other method of improving their engagement with the simple positions would have had beneficial effects. Some verbal explanation of what is going on in the simple patterns, for example, might help in linking them to more complex examples?

One difference between d'Agostino's initial suggestion and the experiment would seem to be a question of familiarity. Yes, we might expect the simple position which can arise from a sequence of moves from the more complex position to prompt the respondent to find this sequence starting from the end. However, I suspect that the key is not seeing the position once, but a truly familiar motif (as with the smothered mate which d'Agostino cites) and that, consequently, repeated learning of/ familiarisation with the simpler pattern might be the key.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo Do you have any further comments or suggestions?

I totally agree with Yusupov that pawn endings (especially, as he makes clear, those featuring mutual zugzwangs and consequently sets of corresponding squares) are a very clear example of situations in which reversed analysis is not only useful, but perhaps indispensable. Endgames are clearly the area of the game in which more positions are 'calculable' than in any other phase, but in cases such as the Zinar position cited, it would be very difficult to work through the alternatives in the initial position without a clear picture of the end goal.
However, I find myself – especially after reading Beim's chapter – wondering how distinct 'inverse thinking'/'reverse analysis' is from the more general directive to learn simple theoretical endgames as the indispensable starting point for analysing more complex ones? So many endgame books and so many coaches concentrate on 'theoretical endings' on the basis that a thorough knowledge of these is essential to guide players through more complex ones. What is the relationship of this much more general thought to both 'reverse solving' in general and Yusupov's very specific examples in particular?

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Interestingly I presented a class during a summer camp just 2-3 months ago which tried to examine how familiar patterns could guide students towards the solution of slightly more complex positions,

but also how they might sometimes mislead if the familiar patterns contained hitches/flaws which deviated from the 'pure case'.

The group I was coaching in the summer was large (30+ children), with quite a range of ability. It was also remote rather than face-to-face, which made it harder to get an idea of the full range of responses. There was definitely a correlation between rating level and ability to solve this, but it was hard to gauge how much my prompt about 'familiar mating patterns' may have assisted different levels.

The players I mentioned whom I was surprised didn't manage to solve this (based on the ability they showed in discussion and solving other exercises) were, I guess somewhere in the 1750-2000 rating band. A few were successful, but several seemed to have a block pushing the line further after 3...Qh6.

For example, I wanted to see whether a knowledge of Anastasia's mate (I think that's the right one – I am better on the patterns than the names!) might assist players to find the solution in the diagram below from Toth-Szigeti (Reggio Emilia, 1946)

White wins by 1.Bxh7+ Kxh7 2.Rh3+ Kg8 3.Qh5 Qh6 4.Nf5! Qxh5 5.Ne7+ Kh7 6.Rxh5#

In this case, I didn't explicitly direct them to the particular mating pattern, but asked them to think about mating patterns which they were familiar and whether any of these might help to guide them towards the solution. To my surprise, only a small number found the full solution, with a number being immediately drawn to the 'Greek gift' motif, but several giving up at the point where Black has the …Qh6 resource. I concluded that the taboo on permitting the exchange of queens as an element in a mating attack was just too strong (even in a position in which the queen could be recaptured with immediate mate)!

I'm not entirely clear how you would want to describe this using the 'reverse solving' paradigm. You could, I guess see it as a mix of two familiar themes (Greek gift and Anastasia's mate) which together guide towards the solution. Or the position up until 3…Qh6 might just be the one most anticipated using 'forward analysis' and at that point familiarity with a mating motif could render the remainder very straightforward using a reversed approach.

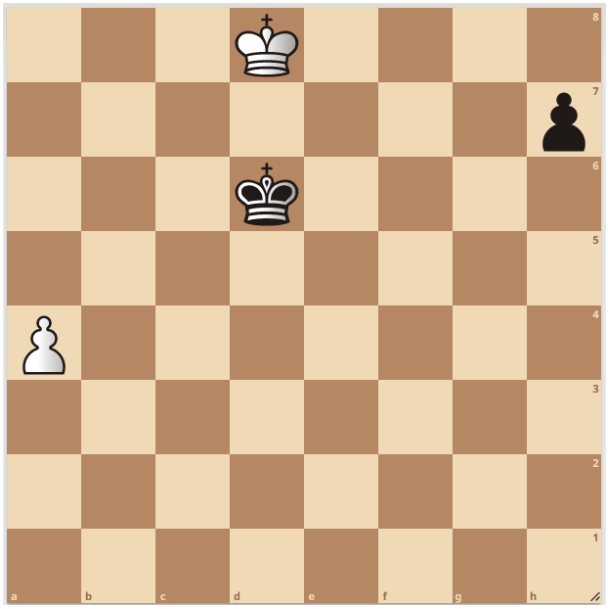
Another very interesting instance would be Kuzmin – Sveshnikov – USSR (ch) 1973.

This position is justly famous for White prefacing the 'familiar' double bishop sacrifice with the move **16.Nb6!** on the grounds that the apparently promising 16.Bxh7+ Kxh7 17.Qh5+ Kg8 18.Bxg7 Kxg7 19.Qg4+ Kh6 20.Rf3 is greatly complicated by the resource 20…Nxf4! interfering effectively with White's mating plans. This raises an interesting question. Should this be seen as a clear case of 'forward analysis' in which case it is necessary to go through the full variation in order to come up with the idea of first deflecting the black knight? Or might it make sense to have an image in the mind of a 'pure' double bishop sacrifice and then to intuit that this will be most easily set-up in the absence of the black knight, enabling White to find that **16...Nxb6 17.Bxh7+ Kxh7 18.Qh5+ Kg8 19.Bxg7 Kxg7 20.Qg4+ Kh7 21.Rf3** leaves Black helpless. In other words, not explicitly discovering that the knight seriously impedes the attack, but working with an 'ideal type' in which the black knight is absent and simply analysing back from that?

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

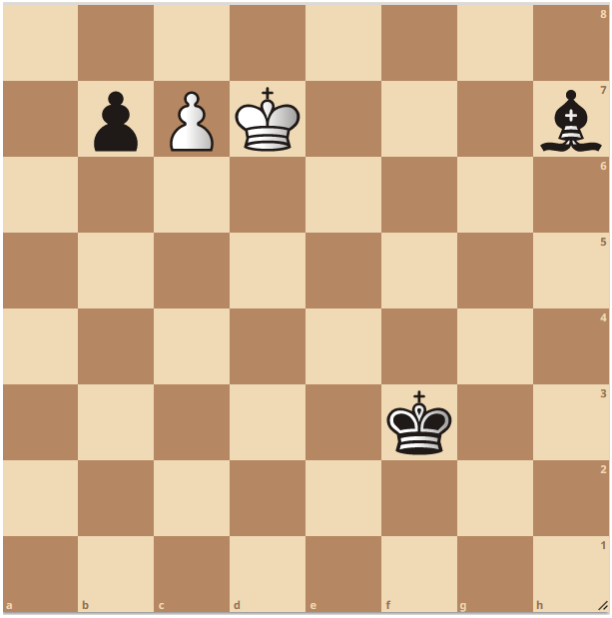
I haven't given much thought to their applicability in the opening, although in general I am very sympathetic to approaches which make comparisons between openings, seek thematic links between superficially unrelated positions etc, so I suspect the approach can be usefully deployed in opening work. I have given some instances above of where the approach can be valuable in seeking tactical solutions.

In the endgame, I have, for example, used a knowledge of Reti's famous pawn ending in which the White king travels at miraculous speed as the prompt for solving related problems. Beim himself mentions one of these - Prokes 1947 in which White draws by using the threat to support the a-pawn to gain a tempo to approach the h-pawn by a paradoxical route



1.Kc8! Kc6 2.Kb8 Kb5 3.Kb7! Kxa5 4.Kc6 h5 5.Kd5 =

Perhaps a more interesting comparison is with the wonderful Sarychev study (one which I already made in *Chess Improvement: It's All in the Mindset*).



White's extremely paradoxical decision to jettison two tempi in the diagram position with **1.Kc8!** [1.Ke6 Ke4] **1...b5 2.Kd7!** [2.Kb7 Bf5–+] might perhaps be calculable simply by gradual exclusion of the alternatives. However, it could be much more efficiently found by employing the lesson of Reti's familiar study (that the king can cover ground very fast if he can save tempi by threatening to act in two directions simultaneously) by foreseeing that the route via d6-d5-d4 will be accelerated for exactly this reason.

2...b4 3.Kd6! Bf5 4.Ke5 Bc8 5.Kd4 b3 6.Kc3 Be6 7.c8Q Bxc8 8.Kxb3 =

I also think that there is real scope for strategic decision-making to be made in this way. Minor piece exchanges is one example. I have frequently asked students to imagine what would be the optimal minor piece battle in any given structure and then *work back* from that to work out the plausibility that such exchanges can be engineered, starting with any immediate exchange decisions which might appear much less clear-cut when considered in isolation.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

In general I tend to agree with Valeri Beim that such 'inverse thinking' is "frequently applied, rarely formulated". However, as I will explain in the next section, I think much hangs on whether Beim's vision of 'inverse thinking' as the "ability of a player to recognise familiar…motifs in an unfamiliar position" is a fair reflection of how you are conceiving of it, or somehow an extension of it. If his definition reflects yours, then it is implicitly handled in a great deal of literature (most endgame literature, as I mentioned above) including anything which grapples with the ubiquitous topic of 'pattern recognition'. Jon Tisdall's excellent book *Improve Your Chess Now,* particularly the lengthy Chapter 4 'Pattern Training and other useful exercises' is a good place to start.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

Yes. I read this a while ago and re-read it for this purpose, finding it much more appealing in the context of the current discussion. As I suggested above, my main issue is whether Beim is extending the concept too far. We know that pattern recognition is important and some of his examples look to me to be just this – cases in which a tactical or positional motif may have been inspired by some related precedent – rather than necessarily convincing me that these familiar patterns were used as a the start-point for some 'reverse analysis'. However, I like his chapter and am convinced that the use of familiar motifs (recognising patterns) to provide a start-point which can guide a player in a position in which candidate moves would otherwise be hard to come by has great potential. If this extends the concept somewhat beyond what d'Agostino and you intended, that is not necessarily a problem for me.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes, for all the reasons I have outlined in previous questions, I think the topic as a whole has a lot of potential and extending it into the endgame/strategic middle-games can help to unleash this.

8= Do you miss any questions? Do you have suggestions for further research?

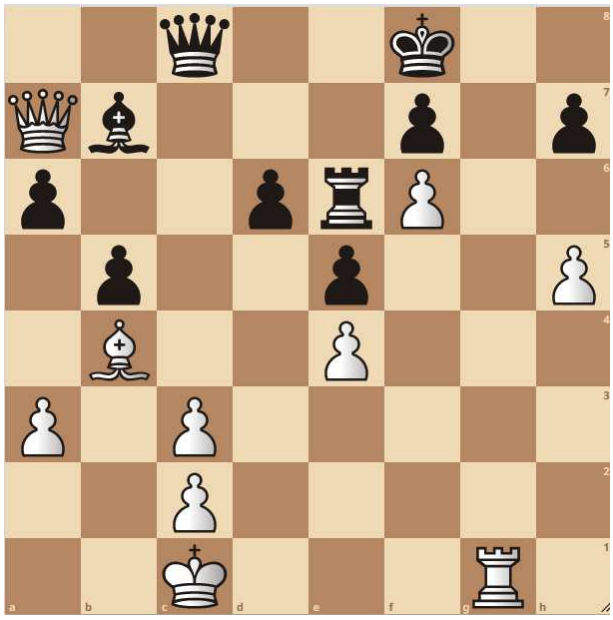
Two further thoughts:

Anytime that a knowledge of familiar patterns is used to guide decision-making, it is incumbent on the player to ensure that the patterns really are as she understands them and not subtly different. This is a topic we explored in *Chess Improvement*, but it seems of fundamental importance to me. I think this can probably be as easily addressed by *accurate* reverse analysis from the 'familiar' position as by conventional forward analysis, but there is the psychological danger that familiarity will breed assumption. One example which I discovered recently:

A. Ghasi, - G. Flear,
Hastings Online 2021

I suspect that White should spot that the tempting 25.Rxe6 fxe6 26.Nxe6 is met by the neat riposte 26…Nf4! (relying not just on the e2 fork, but also the fact that after 27 Qxc5 Nxe6 defends the queen on c7.). However, I think that the very familiarity of the motif renders it harder to appreciate that the detail will not work in White's favour here. I am not sure how to work this into a research idea, but there may be scope for examining whether the familiarity of a motif actually makes it harder to spot inconvenient details?

Lastly, I think it would also be possible to examine positions in which a player clearly spots a familiar pattern which almost works, which motivates him to find a way to hone the idea so that it conforms to an ideal type. I am not sure how many such positions there are, but I think they represent a clear example of highly effective reversed solving. One example I love (notwithstanding that White has an excellent position and already several routes to success) is Vallejo Pons - Topalov**,** Leon Masters 2012.



White is clearly working with the beautiful (but familiar) motif Rg8+, followed by Qg1+-g7. However, at the moment, this would be refuted by the king's ability to run via d7 to c6. So White hones the position to create an ideal type by means of 31.Qb6! after which anyway Black chooses to defend the d6 pawn, the motif will then be successful – 31…Bc6 32.Rg8+ in the game, with the beautiful variation 32…Kxg8 33 Qg1+ Kf8 34 Qg7+ Ke8 35 Qg8+ Kd7 36 Qxf7+ Kd8 37 Ba5 mating, then a very simple calculation.

1–0

GM JOHAN HELLSTEN

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

A very interesting experiment. However, I think the difference would be bigger if the test positions were based on more traditional (typical) mating patterns, such as the back rank mate, smothered mate etc. These are more rooted in the chess player's intuition, than something they just came across at this very moment. However, the ability to use something that we saw somewhere else (for example, a tactical detail spotted in a specific variation) when working out the solution to a problem at the board, is definitely greater among professional players, who have been into this process countless times, than among club players.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

It was very interesting to see the video. It is clear that reversed solving can be very useful in pawn endgames featuring corresponding squares and zugzwang.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Yes, for example when working on basic tactical ideas, I like to show a simple image first (for example, a knight forking two pieces) and then hand out exercises which will lead into such a situation (for example, attract an enemy piece to a square where it will be submitted to a fork). Also when working on strategy, I use a similar approach, for example first an image of a good knight vs a bad bishop and then a few exercises where we try to reach such a scenario. The same goes for endgame training, for example first a position involving opposition and then some exercises where a correct usage of waiting moves will lead into such a situation.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

Please see the previous answer.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

Very little. I could only mention Beim's great book 'Chess Recipes from the Grandmaster's Kitchen'.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

I think it is a very interesting chapter, with a high practical value.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Definitely. There are many established patterns within strategy and endgame play, for example isolated pawns, pawn majorities, bad bishops, outside passed pawns, domination, which can be studied using reversed solving. In contrast, calculation-based challenges often involve uncertainty regarding what we are actually looking for, so there it is more difficult to use reversed solving.

8= Do you miss any questions? Do you have suggestions for further research?

Perhaps a new test including more typical patterns, for example mate images, positional goals, endgame themes etc.

GM DAVID SMERDON

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

I could not find enough details about the experimental design and implementation to make a good judgement about study, including those in the Final Report. One alternative design to testing your

hypothesis would be to instigate a reverse-solving training program for the treatment group, compared to the control group, and then test whether the RS training led to higher scores on traditional chess studies and puzzles, as well as on long-term strategic problems in closed positions. This RS training approach seems logical to me.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

I don't have any useful comments about this video.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

I don't use RS methods in my games or training.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

I believe it makes most sense in endgames and in closed positions where long-term strategy is important. The way that Yusupov explains it with the mutual zugzwang example seems logical to me.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

I don't know of any, besides retrograde chess puzzles (you may know the book "Chess mysteries of Sherlock Holmes" by Raymond Smullyan).

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

I'm not familiar with this book.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

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8= Do you miss any questions? Do you have suggestions for further research?

I think there would be ways to better test the benefits of RS methods, including the suggestions by Grabner to explore the psychological mechanisms. An RS-based training experiment could in theory be automated and set up online on a play platform like chess.com, which would vastly increase your statistical power to detect a main effect as well as heterogeneous effects by strength, age and gender (for which you didn't have sufficient power in this study).

GM MAX WARMERDAM

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ

Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

Perhaps no real difference was found between the two conditions because the participants are not trained to link the positions with reversed solving. It is quite difficult for me to say. As a player or coach I am not used to Reversed solving. I have sometimes used it myself to solve endgame positions with corresponding squares.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

Reversed solving can be quite important in certain positions. However, to me, it seems questionable how useful it is during your own games.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

It is something that I may have used in the past, but I find it hard to recall. The subject does remind me of prophylaxis. I have given positions to students where they would need to find the opponent's plan. After having found it they can then think about how to prevent it. So they look into the future and then think back on how to stop it.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

As mentioned in my answer to question 3, I would think for prophylaxis. It could also be quite useful for the endgame. I don't really see yet how it could impact the opening.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

Before this research, it has not really been a topic I have given much thought too. Perhaps I have encountered it in the past but definitely very little. It could be something that needs to be studied more.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

No I am not familiar with this book, did not hear about it before.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

For some situations it could certainly be useful, but for the most part I don't think so. We already have quite a lot to think about during a game, and to also try to apply reversed thinking would be too much. Perhaps training it could be useful, but I find it hard to see how useful it is going to be in practice.

8= Do you miss any questions? Do you have suggestions for further research?

Nothing that comes to my mind right now.

GM STEFAN KINDERMANN

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

I believe that Backward Thinking is a powerful tool, that anyway is used most of the time by strong players, this process however being mostly subconscious. To make it work, the precondition is, that a clear goal/vision exists and we can go backward from there. This goal/vision in chess is linked with patterns (strategical or tactical) with stronger players obviously having much more of them stored in their (intuitive) knowledge. In Jusupows example the final vision is the mutual Zugzwang which can be understood also by much weaker players. The corresponding squares as in between goals on the way there are much more complex and the concepts stored only by rather strong players.

I believe that it can be very useful for stronger players to put the focus on a more conscious use of the backward thinking (as in Jussupows example) and would expect some improvement in the longer run, when the approach is more integrated. For weaker players it can be only useful, when they enlarge their patterns, which are necessary to create the goals to start from in the backward thinking.

The most crucial point however is to use forward and backward thinking in combination, which at a subconscious level in my opinion stronger players do to some extent without realizing it: We start from candidate moves to search forward, while at the same time we are striving to reach some kind of goals and come to the question about the obstacles along the way which leads to the question "what has to happen before these obstacles can be removed" Used in the right way the combination of backward and forward is the most powerful thinking tool, as pointed out in the "Königsplan", an approach that can be used for planning and decision making in general!

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: h https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

See above

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

We use the backward/reversed thinking as an integral part of our strategy model "Königsplan" in our lectures and trainings for managers, but also as an educational tool for kids in elementary schools. For more details please take a look at https://www.koenigsplan.com/the-model/?lang=en step 6 "back along the timeline"

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

Can be used for any area where a clear goal can be defined – should be combined with the forward approach for maximum results – see above

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

See also above

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

I knew the book and used some of the examples given to highlight critical ideas

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

See above

8= Do you miss any questions? Do you have suggestions for further research?

It would be highly interesting to do research about using the full Königsplan concept for solving, where forward and backward solving are two of seven parts only. (step 5

IM AND GRANDMASTER OF CHESS COMPOSITION YOCHANAN AFEK

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions?

Answer: Interesting, training chess thinking on both directions might Improve calculating and tactical skills as well as endgame understanding.

Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

Perhaps because both processes are occasionally involved in the solving process.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

I agree with Artur that reversed solving is essential mainly when facing pawn studies with reciprocal zugzwangs and corresponding squares. I would suggest that certain types of combination might be solved in reverse.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Not really, but I definitely use it for composing endgame studies. A study is most often created by starting at the final highlight and building the solution backward.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

Tactics and endgame.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

Not in chess: https://theinvisiblementor.com/reverse-problem-solving-when-you-must-have-a-certain-outcome/

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?
No.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes. Reversed thinking is involved in endgame play and endgame studies.

8= Do you miss any questions? Do you have suggestions for further research?

Yes. I haven't noticed the term endgame studies in the discussion while it is a leading tool in chess training at all levels, certainly reversed solving.

IM ARTHUR VAN DE OUDEWEETERING

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions?

I didn't quite get the forward/inverse version statistics of Test 1 – thought this was an equal test for all. Otherwise fine summary of the research. Some more explanation on the numbers of the outcome might be useful – when is it significant

Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?

Varying strength of participants within one group might even out the results? No idea.

Do you have any further comments or suggestions?

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

Clear practical example - the idea will not be confined to pawn endings. You could also aim for a theoretically drawn position in a rook ending or strive for a position where our opponent has a bishop of the wrong color.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

I often let a theme/pattern return un-announced in the next exercise, with reversed colours or mirrored. Provoking deja-vu reactions when the solutions had to be told.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

Tactics as used in the tests, strategical patterns – how do get that knight on d6 (octopus) – several preliminary steps are possible - like open file example of Thomas Willemze – first exchange of relevant bishop, advance supporting pawn.

Endgames – like Yusupov's example, but as said can be applied in all endgames were theoretical knowledge can be used to aim for a particular resulting position.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

Not aware of any yet I own the one in the next question. Perhaps something like 'small plan' in the Steps method may sometimes come close to the subject of inverse thinking.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

I read it again but I felt it touched more on pattern recognition, general principles than on the principle of practising the method of inverse thinking

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Perhaps, but what would be the difference between solving, analysing and thinking? The goals can be concrete, also in the middlegame endgame. In practical play players will first have to determine that goal before they can think reversely to get there.

8= Do you miss any questions? Do you have suggestions for further research?

Endgame tests would require (theoretical) knowledge of the resulting position beforehand – difficult to compare forward/inverse. You could try about the same test with strategic patterns as you did with the tactical mate problems if you suspect a difference between tactical en strategic solving.

Compare the results in groups of players within a limited range of range/all about the same level (though I think you already did so)

IM IDO BEN-ARTZI

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?

Do you have any further comments or suggestions?

I think that accuracy measures (solved%) may be a too rough measure. Therefore, I suggest looking at response times for the reversed solving condition. The point being that the final position acts as a priming for the solver, and thus could direct his thinking. However, not necessarily improve the silver's visualisation abilities.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

I think that Arthur's point is very useful. Moreover, I think that reversed solving should be gradual to ease the visualisation process. This is to say that not only the final position should appear, but also intermideate positions.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this? Would you like to show examples of positions or games?

I think that pawn endgames as mentioned are a good example. Furthermore, this concept also appears in positional battles during the middlegame where a strategic plan is tried to being implemented.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

As mentioned before.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

I think that many books related to chess strategy describe a similar concept. For example, chapter 6 in "endgame strategy" by Shershevsky describes schematic thinking and draws on similar things.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

No.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes I do. I think that the middlegame concept is similar in nature, where one abstractly imagines the resulting position.

8= Do you miss any questions? Do you have suggestions for further research?

Looking for improvement in response times and not just accuracy levels. Other than that, I think that training methods should be explicit and guide the students on what they should look for.

IM MERIJN VAN DELFT

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ

Good summary of what you did. One question: what exactly were the numbers you presented? The amount of exercises solved correctly? Now I see this is explained in the second video.

Why do you think there were no significant differences found between the two conditions? Do you have any further comments or suggestions?

I honestly have no idea. I guess there are several factors influencing the process and I fail to see how exactly they interact. Calculation in chess is a complex matter, it is not easy to pinpoint exactly what is going on.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

The pawn endgame he talks about is extremely difficult. The concept is clear, but the solution is difficult for professsionals and impossible for amateurs.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Regularly I ask the question: what would we like to achieve from the current position and with this final goal in mind, how could we get there? So as a way of thinking yes, but I don't have concrete examples in mind.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

I think for every area in chess, since it is always helpful to create an image of where you would like to go and then do some sort of reversed solving. Of course in different situations, different ways of thinking could be most effective. You never know what way of thinking is most effective, which is what makes chess so interesting and never boring.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

I don't know, I'm not very familiar with the subject.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess'?

I don't know the book, but it sounds interesting.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it

in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes, that is basically what I meant when answering question 3. But I'm not an expert on this subject.

8= Do you miss any questions? Do you have suggestions for further research?

Nothing comes to mind, I'm sorry that I can't be of more use.

IM THOMAS BEERDSEN

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

I can't really come up with a good explanation for this.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

I had never really thought about it, but Artur's comments definitely made me realize reversed solving could be useful for myself. Not just in pawn endings but in any type of position, I think it might be useful to do in my games.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

I don't think I have yet, at least not actively. You never really know what you think about unconsciously during a game while making decisions :)

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

I think it could be useful in any area. Artur already pointed out the usefulness in (pawn) endgames, but the same could go for a strategic closed position. For example you see a nice square where you'd like to put a knight, then you start figuring out how to get there. But I think you could also use it to figure out where your pieces are best placed to start or continue an attack.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

I don't think I had really heard about it before this research.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

Not familiar.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it

in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Definitely, as for this research only tactical puzzles were used. But I think it could be interesting to study reversed solving for other parts of chess as well.

8= Do you miss any questions? Do you have suggestions for further research?

I can't think of any.

FM NATE SOLON

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

I was surprised there wasn't a difference, because in some cases it seems like you can mechanically solve the puzzle by working backwards from the end. I think weaker players didn't realise the connection between the forward and backward puzzles, but I would have expected a bigger difference at least among the strong players. Not sure of the reason.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

It was interesting that GM Yusupov immediately connected the technique to a practical chess situation. I would like to hear if he has any further thoughts about training this skill or if it can be applicable outside of pawn endgames.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

I don't think I've ever used reversed solving exactly as it's presented in the study. I will modulate the difficulty of problems to fit the student by starting earlier or later in the line, or perhaps giving a hint about where a piece needs to go.

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

The idea of a "dream position" from a given opening has some similarities to reversed solving, in the sense of, "Where do I want my pieces to end up?"

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

The closest thing I can think of is The Chess Mysteries of Sherlock Holmes, which has retrograde puzzles. These are fun, but I don't think they're very relevant for practical chess.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

No

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes, I've shared some ideas about this in the previous answers: aiming for a "dream position" in an opening; similar to GM Yusupov's suggestion, I heard a story about Capablanca analyzing endgames where he simply rearranged all the pieces and said this is where they need to be, then worked backwards.

8= Do you miss any questions? Do you have suggestions for further research?

Noting that weaker players didn't spot the connection between the related positions, I think the idea of comparison and connection is quite interested, and perhaps a differentiator between strong and weak players. Maybe asking players to compare similar positions and point out differences could be an effective technique.

CM CAN KABADAYI

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

It is a very interesting study, and I was a little surprised that no difference was found between two conditions, despite stronger players have reported that they noticed a link between the two positions. Perhaps the reversed solving helps more with strategic/endgame positions. Or perhaps the effect would be more visible if the positions followed each other after a certain delay? This delay would allow some consolidation which would later translate to better solving for the forward positions? These are all speculations of course.

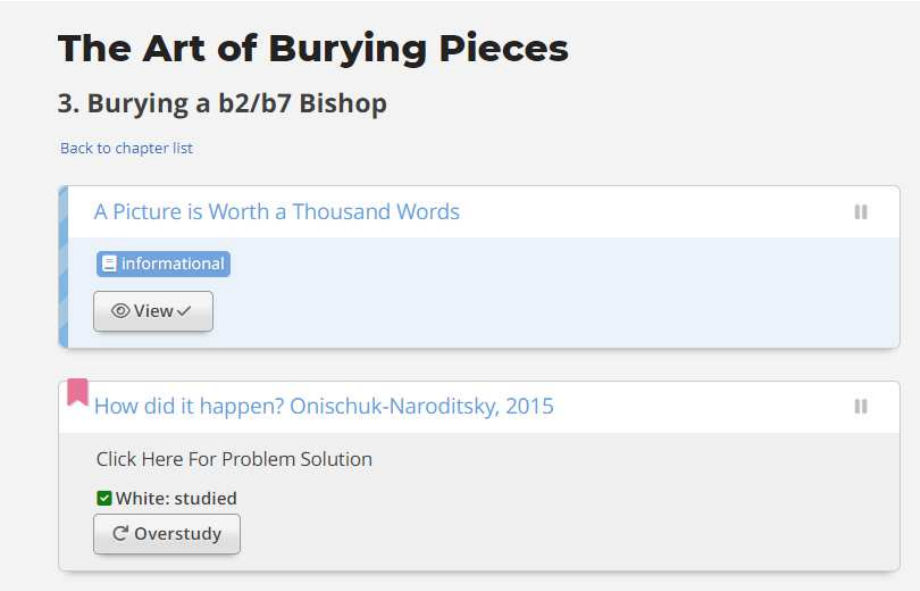
2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

I found it very instructive! I think as GM Yusupov says, the reversed solving can be an effective method for such theoretical endgame positions where you have a clear 'end goal' with known evaluation. Then you want to reverse engineer the game to that desired outcome. Pawn endgames are definitely one such avenue, but I can also think of different endgame scenarios, e.g. when a bishop + a rook pawn cannot win, due to the 'wrong-color bishop' issue. The defending side can take that 'end goal' as a starting point and find a drawing idea to reach that end goal.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

I have made a Chessable course that is titled “The Art of Burying Pieces”, which feature such reversed learning methodology. I start each chapter with a desired ‘end goal’, where an opponent piece is buried and shut down from the game. Later comes a puzzle, and the goal is to achieve that end goal that was just studied. This ‘reversed-engineering’ methodology got good reviews from the students, and I think it applies nicely to such positional/strategic concepts as burying an enemy piece.

Below, I am attaching some positions from that course:



4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

See above. I think it is mostly strategy and endgame. As Willemze said, another positional application would be to show the strength of a rook on the 7th rank first, and later show the steps to get there. Or perhaps we show the strength of a centralized king in the endgame first, and then later show how to activate the piece etc. Or we can show how effective a knight can be on a blockading square first, and then later show the steps to create such a blockade. Another example would be to learn the 'Philidor defence' in the rook ending, and then try to steer the game towards achieving a Philidor position.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

As I mentioned above, my course The Art of Burying Pieces shows several such patterns of reversed solving. In my other Chessable course "The Art of Awakening Pieces", I also used a reversed solving method when explaining the concept "Undermining Squares". The idea is to show a very simple example first, e.g., a pawn play in order to undermine a specific square for one of our pieces. Later, you show a very similar idea in a complex setting. Again, I think such strategic positions fit nicely to reversed solving methods.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess'?

I have not read that book.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example, speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

As I described above, I think the method is most suited to strategic/endgame positions. You have a desirable outcome (burying an enemy piece or activating your own pieces or achieving a theoretically winning endgame etc.) and the goal is to reduce the current position to your goal position. Even in AlphaZero's games, one can see the execution of such 'mini plans': with the h-pawn rolling up the

board, it often reaches all the way to h6. That h6-pawn not only restricts the enemy fianchetto bishop, but also buries the enemy king, creating all sorts of back rank problems. In this context, the play with the h-pawn could be considered as 'reversed solving', e.g. By achieving my mini plan of inserting the pawn on h6, I am reaching my desired goal of long-term restriction of the enemy pieces.

8= Do you miss any questions? Do you have suggestions for further research?

The 'goal setting' is a very important thought process for a chess player. And it is very understudied so far. How do we set goals in a given position? This is a very relevant position both in sharp, tactical positions but also in quiet ones. Reversed solving could nicely connect to this subject. Perhaps reversed solving method would make certain types of decision-making processes much more efficient. And reversed solving method could be studied together with this broader concept of goal-setting in chess.

CCE ALAN BESTER

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

A good report of the study.
For the Reverse Solving between the two conditions it is necessary that instruction/explanation is given on the method. Without the explanation it becomes a series of exercises without working with. or measuring the effectiveness of, a specific method of solving.
I would have preferred a follow up study in which the explanation of the method was given before the completion of the exercise and to compare the results.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

The content is good, and especially found Artur's example helpful.
Some editing to delete unnecessary sections would improve the video, eg. between 5:20 and 5:43
At times I struggled to hear Artur - maybe subtitles would be helpful.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Yes, in my Chessable training courses – in both checkmate exercises, and strategic/tactical positions.
Accessible through my Reverse Solving courses in Chessable (AlanB)
For my brief overview of the Reversing Method see:
1. Checkmates https://www.chessable.com/variation/1518601/ The examples are from https://www.chessable.com/variation/1555591 onwards
2. Tactics/Strategy https://www.chessable.com/variation/2342663/ The examples are from https://www.chessable.com/variation/1978717
Also, the video on the homepage here https://www.chessable.com/reversing-and-forwarding-the-tactics-of-bobby-fischer/course/17025/
For the terms Vision and Calculation see the definitions I've used here (albeit, not a Reversing method Course):

https://www.chessable.com/variation/6594039/ and
https://www.chessable.com/variation/6754421

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

There is value to apply the Reversed Solving method in every area of the chess game, but less so for the opening, as so much of opening play is dictated by chess theory and repetition of prepared moves. In general, especially so of strategy, tactics, and the endgame, Reverse Solving is to both develop chess vision and exercise chess calculation. Vision is being able to see a future position and keep it in mind. Calculation is the analysis moves to achieve that envisioned position from the current position.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

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6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

Unfortunately, I don't have the book in my chess library.

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

I don't think there is a need to extend the concept of Reversed Solving, as the concepts of Reversed Analysis or Reversed Thinking, and probably other terms as well, are already part of the Reversed Solving method.

8= Do you miss any questions? Do you have suggestions for further research?

As mentioned above, "I would have preferred a follow up study in which the explanation of the method was given before the completion of the exercise and to compare the results."

DRIES WEDDA

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

As indicated in the video, higher rated players were more likely to spot the connection that the experiment was about reversed solving. Higher rated players are generally more skilled at drawing these connections and using these tools to their advantage. Therefore, it does not come to me as a surprise that for lower rated players there was an insignificant difference between the two conditions, and it may be a good idea to draw this connection explicitly for them. As for the higher rated players, since the exercises are trivial (mate-in-N puzzles), the difficulty may not be inviting to apply this 'reversed solving', since their default 'forward solving' is already a sufficient tool for this task. For this category it may be more interesting to give different types of puzzles.

2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

Artur's explanation makes sense to me. His remark about reversed solving being useful in pawn endgames reminds me a bit of when you are trying to solve a maze puzzle and it can be a good idea to solve the maze from both the start and the end ('bidirectional search'). This requires that you know what goal you are headed for. Artur showed this goal as the position with mutual Zugzwang. Also, it is important that there are not that many possible moves to consider in each position (small 'branching factor'). This occurs especially in pawn endgames with limited options.

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

This would be only in training sessions, as I am not aware of using these methods myself. During training sessions, I am using it a bit more explicitly, as I am now more aware of the concept. This could for example be suggesting ideas like 'look for possible mating patterns' or 'what would be the optimal square for this piece' (like route planner exercises in the Steps Method).

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

One case would be when there is a clear strategical goal available (e.g., finding a good square for a piece or some piece configuration) and the position is not too complex. Also, when there is a clear tactical goal available (mating pattern, Zugzwang (trebuchet position), …) and the position is not too complex.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

Backward induction is a more general term for 'reversed solving' with a lot of information about it available: https://en.wikipedia.org/wiki/Backward_induction. This Wikipedia page also mentions retrograde analysis in chess. In AI this idea of backward induction is also used https://en.wikipedia.org/wiki/Backward_chaining, for example with logical inference engines (example: I want to prove B, I know if A then B, so I need to prove A; you continue until you reach something you know is true 'for sure'.

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

No

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes, I would say there is an argument for this. Of course, in research it can be desirable to use mate-in-N puzzles since they have a well-defined solution. In practice, however, there is are usually no well-defined solutions/answers, so there it can be useful to speak about certain 'ways of thinking' or

'approaches' to the position.

8= Do you miss any questions? Do you have suggestions for further research?

(See comments at question 1 for further research). This boils down to distinguishing more between different strengths, using different tasks, and certainly giving instructions beforehand as some sort of training phase. It is possible that a large part of the 'reversed solving' condition participants did not actually apply reversed solving. This can cause your measurements to be not something you actually intended to measure.

ERICK TAKAWIRA

1= What are your impressions of the video about the research into 'Forward versus Reversed solving' with mating positions? Video: https://www.youtube.com/watch?v=VedGTL6X2kQ
Why do you think there were no significant differences found between the two conditions?
Do you have any further comments or suggestions?

My impression is it clear and well thought out.
I do believe with players above 1800 there was already significant pattern recognition.
Can you give same puzzles based on level of school say primary school vs high school.

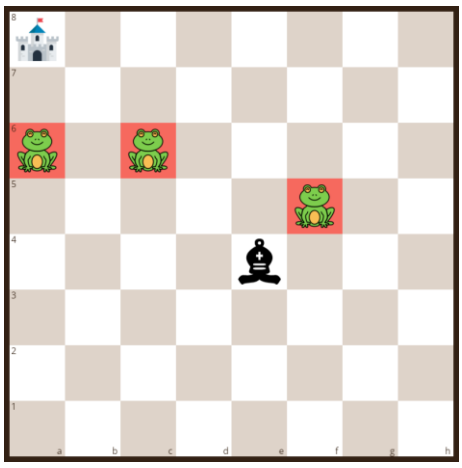
2= What are your impressions of the video in which GM Artur Yusupov gives his vision?
Video: https://www.youtube.com/watch?v=uULjGv46Guo
Do you have any further comments or suggestions?

Brilliant. It reminded me of 3rd World Champion Jose Raul Capablanca when he spoke about scheming in endings and shows importance of elimination in solving. I suggest at looking positions in route planning which can be given to kids to solve. Step method also has these puzzles

3= Do you apply methods that involve reversed solving yourself in games and/or training sessions with students or self-study? If so, can you tell more about this?
Would you like to show examples of positions or games?

Yes I do mainly in Chess in Education where final position is known.

This a Bishop Maze found in Winning Chess puzzles Vol 2 by Jeff Coakley. The Bishop must give a check in 8 moves without going to a square where its under attack and must not capture anything. The only safe square is g4 and you can work backwards to f1. Only square to g4 is f3 ...e4....b1...a2...b3..a4...b5 then f1.



I always s talk about from home to school with my Grade 1 -3 learners and its part of route planning when teaching how pieces move. The Bishop only is at home and wants to go to school and avoid trouble along the way. The only square available is b7 since c6 is trouble , from there he has 2 options, one with a frog (bully) and this is part of solving by eliminating so he has to go to c8 then to e6 because there is another obstacle on f5 so it has to be d5 and e4

4= For which areas of chess do you think reversed solving is useful?
Think in terms of tactics, strategy, opening and endgame. Feel free to give concrete examples.

Pawn Endings, Tactics when one knows the pattern and strategy an example is wanting a piece to occupy a weak square. A piece can maneuverer itself to this weak square, but one must work it in reverse.

5= Do you know books, literature, sites or other information about reversed solving? If so, can you mention these? Please tell us your opinion about them.

theinvisiblementor.com. It's not very concise but more to sell other products

6= Are you familiar with the book 'Chess Recipes from the Grandmaster's Kitchen' by GM Valeri Beim? If so, what is your opinion of chapter 2 'Inverse thinking in chess' ?

No

7= Do you think there is an argument for extending the concept of 'reversed solving' in the way we defined it in the first research? For example speaking about 'reversed analysis' or 'reversed thinking' in the context of middle game strategy and endgame play where the best choice is of a more abstract nature.

Yes there is an argument for it especially on liquidation

8= Do you miss any questions? Do you have suggestions for further research?

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