

## Report on Forward vs Reversed Solving Study

*Karel van Delft, Science Project Manager &  
Prof Barry Hymer, Chief of Science*

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This experiment takes the form of an in-house pilot study. Results will lead to publication in a Chessable science blogpost and possibly other outlets. Data will be used in our collaboration with projects led by Prof Roland Grabner, University of Graz.



*GM David Bronstein: ‘... what matters most in chess is the way you approach problems.’  
(Interview with Karel van Delft, October 1995, published in the book *Developing Chess Talent*.)*

## Abstract

There is no significant difference in outcomes between forward solving and reversed solving in checkmate puzzles – this is the finding of an in-house study by the Chessable science team. Forward solving is the traditional route to puzzle-solving: find the move in a position which results in the optimal outcome. Reversed solving requires us to find the best move to achieve a given position. This requires backwards reasoning with a known position to reach in mind.

In the study, 95 online participants completed four puzzle test series and filled in a questionnaire. Via an initial (pre)test, matched experimental and control groups were created. In a second test all participants solved the same puzzles, comprising positions from actual games. In the forward solving control group each of these puzzles was preceded by a random mate in one puzzle. In the reversed solving experimental group the > one-ply puzzles were preceded by a mate in one puzzle from the same game. The participants in this condition were expected to recognize a mate-in-one motif in the > one-ply puzzles, which could help them to solve these puzzles. Two post-tests in which all participants solved the same puzzles were meant to check for possible residual effects.

The fact this study showed no significant differences between the two conditions, doesn't mean the reversed solving method has no potential applications. Conceivably, better results could be attained if participants were to receive an explicit explanation of this search method before solving puzzles.

Via a questionnaire, participants were asked about how they think tactics should best be studied and practised. They were also asked for their opinions in an interview with the late GM David Bronstein.

## Primary and secondary research questions

### Primary:

How, if at all, does a reversed solving (RS) training format lead to different outcomes than a traditional forward solving (FS) training format in mate puzzle solving? If there are differences, can and should these be incorporated in puzzle design exercises, and in Chessable courses?

### Secondary:

- Is learning tactics via reversed solving more effective?
- If so, when should such exercises be presented during the learning process (at an intermediate stage, or terminally)?
- Is repetition with variation better than simple repetition?
- Should repetition with variation in exercises be at the same difficulty level, or at an increasing level, or in combination?
- Should such training be confined to tactics-exercises, or include other kinds of learning exercises (e.g. endgames, positional play)?

## Definitions

Forward Solving: Find the move in a position which results in the optimal outcome. (This is the traditional way of presenting tactics-solving exercises. This approach calls on such factors as focus, accuracy, visualization, pattern recognition, reasoning - e.g. rules of thumb - and calculation.)

Reversed Solving: Find the best move to achieve a given position. This approach requires backwards reasoning with this known position to reach in mind. (This is a less common way of presenting tactics training exercises. This lends itself to first solving one-ply deep positions and progressing to more complex positions with the same motif which can lead to this end position.)

## Background to the study

This project was inspired by questions posed by email to Prof Hymer by Chessable user Prof Santo D'Agostino, who, whilst recognising the benefits of spaced repetition, wondered about the learning merits of increasing difficulty-level with a reversed order learning pathway – the goal being therefore to recognize patterns and connections in increasingly complex positions.

## Research team

The experiment was coordinated and led by Karel van Delft, supported by Prof Barry Hymer.

There was intensive prior communication with a number of individuals with a wide range of expertise which led to several important improvements in the research design and choice of tools and methods. For example, we discovered a problem in relation to FEN codes (made via different methods) in combination with our ChessQuiz. Prof Roland Grabner (University of Graz, Austria) provided ongoing consultancy advice in relation to methodology and research design. He also checked results for significance and possible correlations using SPSS software. Research data have been shared with him.

By way of additional triangulation, data scientist FM Nate Solon scanned the results for significance, correlations and interpretation. Yevgueni Tenemaza of Chessable advised and helped with technical aspects. Software engineer Laszlo Moldovan converted the puzzles into test form, so that they could be solved by moving a piece/pawn on a digital board in a 'ChessQuiz'. This is based on an open-source method, which will be available via [www.schaakacademieapeldoorn.nl](http://www.schaakacademieapeldoorn.nl). Laszlo Moldovan also created a database to collect responses on questionnaires.

IM Arthur van de Oudeweetering (Chessable author of books on pattern recognition) and IM Thomas Willemze (Chessable author) did separate brainstorming with Karel van Delft about operationalizing the experiment.

The test puzzles were compiled by Chessable authors Dr Alan Bester and Raf Mesotten, who were also involved in the design of the research. Alan Bester is the author of the Chessable courses '*Forwarding and Reversing the Tactics of Mikhail Tal Part 1*' and '*Reversing Mate - World Champions Edition Vol. 1*'. This material, and material from a new course named '*Moves Ahead Course*', were used for the puzzles, alongside material compiled by Raf Mesotten, author of the bestselling Chessable course '*The Checkmate Patterns Manual*'.

A benefit of using puzzles compiled by both authors is that they could check the difficulty level of puzzles against the results of the earlier responses of Chessable users. For this they used the Chessable *Feature Tool*. Not only could the difficulty level be checked, but a spread in difficulty of puzzles could be created and controlled.

We checked via a Chessable database whether or not the participants of our research had had prior experience of these courses. Thanks to the spread of playing strength of the invited participants and confirmed by pre-test results, there was no ceiling effect. So the puzzles were not too easy for participants. Even the titled players recorded errors.

Before launching the first test there was a pilot test with seven people, who were either directly involved in the research or were Chessable staff members.

## Participants

We approached about 150 possible participants for the research, of whom 108 originally agreed to take part in the study. They all lived in or originate from the Netherlands and Belgium. The research was conducted through the language medium of Dutch. The participants were recruited via the network of Schaakacademie Apeldoorn (Chess Academy Apeldoorn, run by Karel van Delft). The idea was this would lead to higher commitment. Knowing people also helped by creating a good spread in playing strength (rating) by the participants.

By the time the study started there were 98 participants and at its conclusion 95 remained. This exceptionally high retention rate can be attributed to the process of participant selection (high commitment) and the sending of personalised reminders for the duration of the study.

There were 8 women, 85 men, and two respondents did not disclose their gender.

Of the participants, fourteen were FIDE titled: 2 GM, 5 IM, 6 FM, 1 WIM. There were 62 participants with a FIDE rating, from 1100 to 2570. The average of this FIDE rating is 1983, and the median 2041.

The national ratings ranged from 1050 to 2574, and seven were unrated. The average of these national ratings was 1879, and the median 1900.

Participants were informed that the Chessable science team was doing research into chess study methods and how individuals solve puzzles. There was no explanation about the specific solving methods we were testing, or about the assignment to study conditions. Participants got personalized (individualized email address and their name in mails) information from [research@chessable.com](mailto:research@chessable.com). There were, however, occasional problems with some providers' spam filters. If participants didn't respond to the initial mailing there was a follow up contact via the private mail address of Karel van Delft.

## Feedback to participants

At the end of the research participants received the total scores of their four tests and attachments of the puzzle PGNs (via Lichess Study they can often locate the games from which the puzzles were derived). As a reward for engaging in and completing the study they received a Chessable course by Alan Bester (*'Forwarding and Reversing the Tactics of Mikhail Tal Part 1'*) or Raf Mesotten (*'The Checkmate Patterns Manual'*). The highest-scoring participants in Test 4 got the Bester course and the others the course by Mesotten.

## Research design

Participants were informed by email that they would get two questionnaires and four series of puzzles to solve. They were promised a Chessable course at the end of the research, if they

wanted one (not all participants were Chessable users). The questionnaires could be filled in via a Typeform link. Puzzles were completed in a 'ChessQuiz' where they were asked only to play the first move – i.e. by moving a piece to another square. All information was processed via a database with an output in Excel.

In the first questionnaire, participants were asked for some personal information, such as rating and Lichess account. In the second questionnaire, questions were asked about their study method routines and preferences.

The series of puzzles were sent with intervals of two or three weeks. For a variety of reasons participants reacted either almost immediately, or sometimes after about two weeks. However, all participants did the tests in the order they received them.

All puzzles in all the tests ended in mate. All the puzzles were presented from a white perspective, even when the key move was from the black pieces (and identified as such). In the second test with two conditions, the number of puzzles to solve with black to move were about equal to those with white to move.

There was no limitation regarding the time participants used to complete the tests. Indicative sampling enquiries revealed that an IM needed 10 minutes for the first test, whereas a 1770 rated player took about an hour.

Participants received no information about the goal of the research. Moreover, they received no information about the reversed solving idea behind the B-condition in the second test. [The 'reversed solving idea' here means: could you solve a mate in > one-ply moves puzzle more easily by first seeing a mate in one puzzle from the same game?] The one-ply and > one-ply positions were presented directly after each other ('back-to-back'). The researchers were interested to see if, in such a relation, the participants would discover (learn) this by themselves via an untutored 'aha' insight, and apply it as such.

### **First test**

The first test consisted of 30 puzzles compiled by Raf Mesotten. All participants received the same puzzles. The results of this test were used to create two matched-strength research groups. This was done by making a ranking of scores and putting numbers 1 and 4 in condition A, numbers 2 and 3 in condition B, etc.

### **Second test**

The second test consisted of 60 puzzles compiled by Alan Bester. Half of the puzzles were mate in one, half mate in > one-ply moves. Participants all first received a mate-in-one to solve, then a > one-ply puzzle. The > one-ply puzzles were the same for both conditions. In the A condition participants received mate in one puzzles unrelated to > one-ply puzzles – so they were expected to solve the puzzle via forward solving.

In the B condition participants received mate-in-one puzzles from the same games as the > one-ply puzzles. Here it could be possible that participants would apply a reversed solving method.

### **Third test**

The third test consisted of 30 puzzles compiled by Raf Mesotten. All participants received the





same puzzles. This was intended as a post-test, whereby the researchers intended to ascertain if a possible different result between conditions in the second test results would persist after a few weeks. Or alternatively, perhaps different results could appear after an incubation period?

**Fourth test**

The fourth test consisted of 30 puzzles compiled by Raf Mesotten. All participants received the same puzzles. Here the research had the same considerations as with the third test, only with a longer interval between this test and the second one.

After the fourth test participants were invited to take part in a Lichess blitz Arena tournament of 90 minutes (5-minute games). Since only seven participants took part, no reliable conclusions were possible.

**Results**

*Comparison of differences*

**First test**

T-tests showed the created groups were not significantly different – i.e. they were well-matched.

**Second test**

T-tests showed no significant difference in the average scores in both conditions.

**Third test**

T-tests showed no significant difference in the average scores in both conditions.

**Fourth test**

T-tests showed no significant difference in the average scores in both conditions.

**Test results Averages A (Forward) and B (Reversed)**

Test 1	20,04166667	19,85106383
Test 2	43,1875	43,9787234
Test 3	21,64583333	20,93617021
Test 4	20,9375	21,61702128

**Correlations**

The research data showed some correlations. Younger players were stronger than older ones. There was a strong relationship between rating and solving puzzles. In the appendices these correlations are shown in tables.

## Questionnaire results

The study included more qualitative investigations via a Typeform questionnaire. All responses have been exported in an Excel file. Detailed responses are to be found in the appendices. Respondents gave their name, Chessable account, email addresses. They revealed how many hours they devoted to chess and to Chessable. They revealed their favourite books (we compiled a separate list for FIDE titled players), and their views on how best to study and practise tactics (another separate list for titled players). These responses revealed a wide spread of preferences, practices and views.

Respondents received the e-book version of 'Developing Chess Talent'. They were asked to review an interview with GM David Bronstein (separate list of answers for titled players). Here admiration for the grandmaster is evident.

A minority of the respondents had questions or remarks about the research, including around the design of the research, the experimental hypotheses, the board orientation, why only the first move in a sequence was required, etc. For an extensive list see the appendices.

Of the respondents 92 were interested in their results on the test. Of the 95 respondents 89 indicated they were willing to participate in further Chessable research. Of these, 56 were interested in the research into chess expertise being conducted by Prof Roland Grabner.

## Conclusions and suggestions for further research

In this research we found no significant differences between the two conditions. In checking for statistical significance Prof Roland Grabner concluded:

*In all four tests we do not have significant differences between the groups ( $p_s > .60$ ), which shows that there were no performance differences. This is also (again) reflected in the very similar mean scores of both groups. Since the sample sizes are quite good (47 and 48 persons in each group), there indeed seems to be no effect of the different interventions. It is also interesting that, on average, the difference goes in different directions between the tests. This also indicates random fluctuations rather than a systematic difference. The tests show inter-correlations. This means that the four tests draw on the same cognitive process. In sum, I think that the results nicely show that the tests worked quite well but there was no difference between the interventions.*

In relation to age and rating correlations between puzzle scores, Prof Grabner concluded:

*The test scores in all four tests correlate very strongly ( $r_s > .60$ ) and significantly with the participants' national and fide rating. Thus, the tests draw on the individuals' playing strength and are valid. There are also correlations with age in that younger players show better performance. Correlations are weaker but still significant.*

Data scientist FM Nate Solon came to the same conclusions as Prof Grabner. He adds: 'Somewhat surprisingly, perhaps, there is little evidence that the connected nature of the



problems in B helped the solvers perform better.’ A subsequent exploratory question (‘Did you notice anything when you solved the puzzles?’) that was put to the RS participants made clear that almost all the stronger players (rated above ELO 1800) saw a connection between one-ply and > one-ply move positions. The lower rated players didn’t.

Laszlo Moldovan and Karel van Delft checked how FIDE titled participants scored in the second test on combinations of one-ply deep and > one-ply puzzles. In the A (forward) condition they are not related, in the B (reversed) condition they are. Adjusted for rating, the participants in the B condition scored slightly better.

So on the basis of this research we cannot conclude reversed solving leads to better solving scores than forward solving. However, this doesn’t mean reversed solving has no potential benefits or applications. Maybe better results could have been attained if participants received quantitatively greater exposure to the puzzles, or more explicit explanation of this search method before solving puzzles (which could result in more awareness and a more systematic research strategy). Would this potentially influence their test results? If so, how much training is required? Would they apply it in their games over the board? Whether such gains would translate into a naturalistic chess environment – as per the prompt-free research design – however, remains moot.

As IM Thomas Willemze pointed out, besides the courses of Alan Bester and the Dutch Steps Method, he himself uses a reversed method in his books and Chessable courses. I.e. from simple to more complex, and from the end to the start. He uses as an example:

1. activity on the 7th rank
2. enter the 7th rank via an open line
3. occupy an open line
4. create an open line.

This research was explorative and fairly tentative. If we had found effects, what could have been the determining variables – differences in mindset, visualization or calculation capacities? Differences in pattern recognition, concentration, thinking structures, metacognitive processes or search strategy? Or perhaps a combination of some/all of these variables, or indeed others not listed?

Doing the research raised a lot of questions, both connected with this research as well as indirectly related, such as the origins of ‘invisible moves’ (due to cognitive biases?).

Data scientist FM Nate Solon (see appendix) suggests that for strong players it should be evident in the reversed solving condition that the one-ply deep puzzles connect with the following > one-ply puzzles. This should steer the searching strategy and lead to higher solving scores, than strong players in the forward solving condition. Actually, there is a small difference, where FIDE titled players in the reversed condition perform better than in the forward condition. However, this difference is far from significant – why? It could be interesting to explore further research and experiences with reversed solving / ‘retrograde analysis’. Prof Grabner suggests that further research could also include investigation of the psychological mechanisms underlying possible benefits of reversed solving in comparison to forward solving; it would be interesting to include further variables / assessments in future studies. Grabner proposes the integration of relevant information from his online Graz



research (e.g. numerical and figural-spatial competencies, as well as training activities) with the forward reversed solving research data, as a kind of pilot study. Graz research: <https://chess-study.uni-graz.at/en/faq>.

*A big thank you to all the participants, co-operators and consultants involved in this study!*

## **Appendices**

*(Roughly translated from the Dutch)*

1. Stats of Prof Roland Grabner
2. Findings of data scientist FM Nate Solon
3. Back-to-back scores test 2 of FIDE title holders
4. Questionnaire items related to chess and Chessable
5. Questionnaire question: What is your favourite chess book?
6. How best to study and practise tactics
7. Please describe what you think is interesting and educational in the interview with GM David Bronstein. Or maybe you have additional ideas?
8. Questions and remarks by participants about the research
9. Retrograde analysis
10. Did you notice anything when you solved the chess positions of the Chessable chess study survey?
11. ChessQuiz
12. Interview David Bronstein

## 1. Stats of Prof Roland Grabner

### GROUP COMPARISONS

#### Gruppenstatistiken

	group	N	Mittelwert	Std.- Abweichung	Standardfehler des Mittelwertes
test1	A	48	20,0417	6,76020	,97575
	B	47	19,8511	7,16264	1,04478
test2	A	48	43,1875	9,84487	1,42099
	B	47	43,9787	9,52683	1,38963
test3	A	48	21,6458	6,75558	,97508
	B	47	20,9362	6,98571	1,01897
test4	A	48	20,9375	6,66335	,96177
	B	47	21,6170	6,16989	,89997

#### Test bei unabhängigen Stichproben

		Levene-Test der Varianzgleichheit		T-Test für die Mittelwertgleichheit					95% Konfidenzintervall der Differenz	
		F	Signifikanz	T	df	Sig. (2-seitig)	Mittlere Differenz	Standardfehler der Differenz	Untere	Obere
test1	Varianzen sind gleich	,274	,602	,133	93	,894	,19060	1,42869	-2,64648	3,02769
	Varianzen sind nicht gleich			,133	92,423	,894	,19060	1,42956	-2,64846	3,02967
test2	Varianzen sind gleich	,040	,841	-,398	93	,692	-,79122	1,98822	-4,73944	3,15699
	Varianzen sind nicht gleich			-,398	92,988	,691	-,79122	1,98753	-4,73807	3,15562
test3	Varianzen sind gleich	,008	,930	,503	93	,616	,70966	1,40985	-2,09002	3,50934
	Varianzen sind nicht gleich			,503	92,722	,616	,70966	1,41035	-2,09113	3,51045
test4	Varianzen sind gleich	,313	,577	-,515	93	,607	-,67952	1,31825	-3,29731	1,93827
	Varianzen sind nicht gleich			-,516	92,714	,607	-,67952	1,31718	-3,29528	1,93624

You can see the significance of the t-test in the column "Sig. (2-seitig)". In all four tests we do not have significant differences between the groups ( $p_s > .60$ ), which shows that there were no performance differences. This is also (again) reflected in the very similar mean scores of both groups. Since the sample sizes are quite good (47 and 48 persons in each group), there indeed seems to be no effect of the different interventions. It is also interesting that, on average, the difference goes in different directions between the tests. In test1 and test3, group A is slightly better than B, in test2 and test4 group B is slightly better than A. This also indicates random fluctuations rather than a systematic difference.

## CORRELATIONS

First, I calculated the correlations between the test scores and ratings as well as age. I collapsed both groups since there were no group differences:

		Korrelationen		
		nat_rating	fide_rating	age
test1	Korrelation nach Pearson	,727**	,745**	-,335**
	Signifikanz (2-seitig)	,000	,000	,001
	N	88	62	95
test2	Korrelation nach Pearson	,795**	,753**	-,323**
	Signifikanz (2-seitig)	,000	,000	,001
	N	88	62	95
test3	Korrelation nach Pearson	,698**	,608**	-,207*
	Signifikanz (2-seitig)	,000	,000	,044
	N	88	62	95
test4	Korrelation nach Pearson	,683**	,641**	-,225*
	Signifikanz (2-seitig)	,000	,000	,028
	N	88	62	95

\*\* . Die Korrelation ist auf dem Niveau von 0,01 (2-seitig) signifikant.

\* . Die Korrelation ist auf dem Niveau von 0,05 (2-seitig) signifikant.

As you can see, the test scores in all four tests correlate very strongly ( $r_s > .60$ ) and significantly with the participants' national and fide rating. Thus, the tests draw on the individuals' playing strength and are valid.

There are also correlations with age in that younger players show better performance. Correlations are weaker but still significant.

Then, I calculated the correlations between the tests:

		Korrelationen			
		test1	test2	test3	test4
test1	Korrelation nach Pearson	1	,856**	,850**	,816**
	Signifikanz (2-seitig)		,000	,000	,000
	N	95	95	95	95
test2	Korrelation nach Pearson	,856**	1	,870**	,833**
	Signifikanz (2-seitig)	,000		,000	,000
	N	95	95	95	95
test3	Korrelation nach Pearson	,850**	,870**	1	,864**
	Signifikanz (2-seitig)	,000	,000		,000
	N	95	95	95	95
test4	Korrelation nach Pearson	,816**	,833**	,864**	1
	Signifikanz (2-seitig)	,000	,000	,000	
	N	95	95	95	95

\*\* . Die Korrelation ist auf dem Niveau von 0,01 (2-seitig) signifikant.

The tests show inter-correlations. This means that the four tests draw on the same cognitive process.

In sum, I think that the results nicely show that the tests worked quite well but there was no difference between the interventions.

## 2. Findings of data scientist FM Nate Solon

= The overall performance was similar for Group A and Group B. Adding up all the test results, Group B had a slightly higher average score (106.4 vs. 105.8), but also a slightly higher average national rating (1881 vs. 1876). Somewhat surprisingly, perhaps, there is little evidence that the connected nature of the problems in B helped the solvers perform better.

= National rating correlated strongly with overall score.

= Age was not strongly correlated with score.

= Titled players performed very slightly better in B (137 vs. 129.7) but were also higher rated (2369.14 vs. 2336.9). This could suggest that stronger players were more able to recognize the connection between the puzzles in B and use it to their advantage, but there were a small number of titled players overall and the effect wasn't very big, so we shouldn't draw too many conclusions.

For me the most interesting question is why wasn't the connection between the problems in B more helpful?



### 3. Back-to-back scores test 2 of FIDE title holders

Calculations by Laszlo Moldovan and Karel van Delft.

In test 2 participants in both conditions solved 60 puzzles.

In both conditions a one ply mate was immediately followed by a > one-ply mate (back-to-back).

The > one-ply puzzles were the same in both conditions.

In the A (Forward) condition the one ply mate was chosen at random.

In the B (Reversed) condition the one ply mate came from the same game as the > one-ply puzzle.

There was a check (Chessable Feature Tool) the difficulty level of one ply deep moves was equal.

If both one ply move and the following > one-ply puzzle are correctly solved, there is a 1:1 score.

Between the scores of the total groups A and B there is no significant difference.

Because of being better in pattern recognition it might be FIDE titled player recognize (by comparison) better the relationship between one ply deep and > one-ply deep puzzles.

So an extra check was done with FIDE Titled players.

Checking the FIDE titled players (seven in each condition), we found

Condition A (Forward): 155 both solved well scores. With average IDE rating 2336,85.

Condition B (Reversed): 167 both solved well scores. with average FIDE rating 2369,14

Although puzzle scores are on a rational scale and ratings on a ordinal scale comparing the numbers gives an indication:

Solved well puzzle combinations:  $167/155 = 1,077$

FIDE ratings:  $2369,14/2336,85 = 1,014$

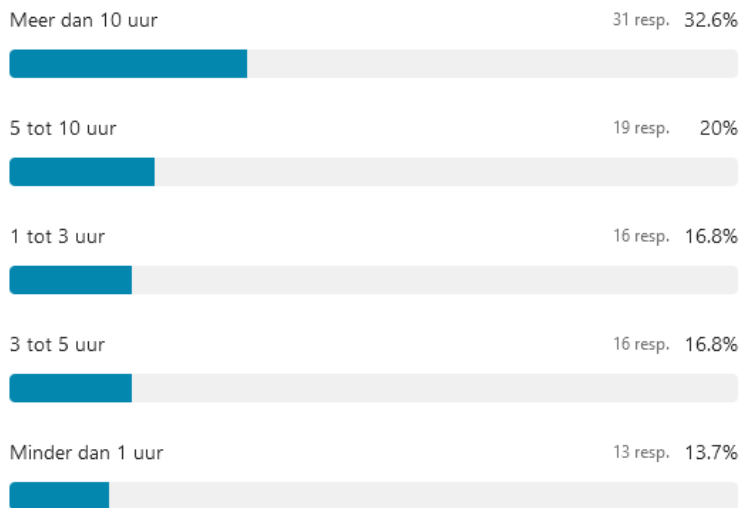
So puzzle ratio divided by rating ratio is 1,062

## 4. Questionnaire items related to chess and Chessable

### = How many hours a week do you devote to chess?

✓ 4 Hoeveel uur per week ben je gemiddeld met schaken bezig?

95 out of 95 people answered this question



### = How many hours a week do you devote to Chessable?

✓ 5 Hoeveel uur per week ben je gemiddeld met Chessable bezig?

95 out of 95 people answered this question



## 5. Questionnaire question: What is your favourite chess book?

### = Favourite books of FIDE titled players

**GM** = The positional manual of chess gives a good representation of the positional aspect in chess that is important and interesting to improve

**GM** = Silman's complete endgame course. A very accessible method to learn endgames

**IM** = The Anand Files, you really get a good insight into a World Cup match and the preparation for it

**IM** = Dvoretsky's Endgame + Analytical Gelfand Positional Decision Making in Chess

**IM** = Mastering positional sacrifices

**IM** = Life and Games of Mikhail Tal. Phenomenal chess player and good writer

**IM** = Chess Structures, it makes complex matter a lot easier based on pawn structures

**FM** = Sherlock Holmes. Retrograd problems

**FM** = Endgame manual, Dvoretsky

**FM** = 100 endgames you should know

**FM** = Recent Discovery: King's Indian Warfare (Smirin). Emphasizes inspiration rather than hard theory in an opening I've rediscovered for a while. And a classic: The King. Donner remains the best chess writer for me

**FM** = Chess Buccaneer (my own project with Merijn, a milestone) From London to Elista - Bareev/Levitov (beautifully written unique document) Move First, Think Later - Hendriks (nicely cross) Nimzowitsch: A Reappraisal - Keene: deep insights about a old favourite The Games of Robert James Fischer - Wade/O'Connell (nostalgia)

**FM** = No answer

**WIM** = Step method series, Grandmaster Preparation series by Aagaard. With both you are very active and structured learning

### = Favourite books of un(FIDE) titled players

- *Mental Toughness in Chess*; is a strong book that contains many psychological tips!
- *Mastering Positional Sacrifices*; cool book from one of my good friends!
- I don't have a chess book
- I don't play chess anymore
- *Rios, M: Chess Structures*, clear explanation, strategic
- *Timman-Chesswork*, *Tim Krabbe-Chesscuriosa*
- *The Anand files*, you get a good insight into what it's like to play a World Cup match
- *100 endgames you must know*, because I think it is a well-arranged book and like to study endgames
- *My System, Nimzowitsch*. It contains clear examples with interesting example games
- *Pal Benko: My Life, Games, and Compositions* This is my favourite book because it contains both board chess and problem chess. It is also interesting because Benko's life was not everyday
- The Chess Bible
- Uncle Jan teaches nephew to play chess
- *Bobby Fischer goes to war*. Once received from a colleague. Offers a nice insight into the world of top chess grandmasters
- *Judgment and plan of Max Euwe*. Did I become a much better chess player?
- I have a lot of chess books, I can't say which one
- A lot of chess books

- *360 brilliant endgame studies Troitzky*
- *Nimzowitsch: Mein System* Received in my youth from my chess-playing father (even problem composer), now I see in it: interesting arrangement of strategic points
- Books by Genna Sosonko: important role of chess culture, especially in the Soviet Union
- *How to reassess your chess* I'm not that far in the book yet because every topic that is broached prompts me to delve further but each time I return to the book to pick up the next topic
- *How to reassess your chess*, very instructive
- *"Understand what you do"* by Herman Grooten
- Series 'I learn to play chess' nice and simple the basics of chess explained
- *Advanced Chess Tactics*, Tactics at an advanced level
- I do not have
- *100 Endgames You Must Know Visualize 1 and 2*
- *Woodpecker method* because you can practice on interesting positions
- Not a favourite, don't do much with chess books
- *Pirc alert*
- *The test of time - Kasparov Polgar teaches chess My 60 memorable games*
- *Chess Tactics - Martin Weteschnik from Scratch De Koning - Jan Hein Donner Chess – Polgar*
- *Chess for Zebras- J. Rowson It's only me (Tony Miles biography) Mayhem in the Morra- M. Esserman ..d6, Move by move- C. Lakdawala*
- *The Middlegame (1 to 4) by Euwe and Kramer*
- *Wiener Geniales Schach im Wiener Kaffeehaus 1750-1918*. Because it's about the history of chess associated with Vienna
- *Judgment and plan*, the strategy of chess, Max Euwe. Teaches you to look at the characteristics of the game of chess
- *Chess For Zebras: Original Book Written From A Philosophical Point of View*
- *Yusupov series*, combination of entertainment and lessons
- *My Great Predecessors by Kasparov*. Has everything in it: analyzed games of the greatest chess players, overview of chess history, etc
- *Series Grandmaster preparation by Jacob Aagaard*
- *Judgment and plan (Euwe)* - Has brought me the most because I started to reason differently during my matches
- *chess course Lev Alburt* They are all fun assignments
- no chess books
- No
- *Shereshevsky - Endgame play*
- I do not have
- *The Woodpecker Method* > for a complete tactical training book Applying Logic in Chess > for valuing and assessing positions Dynamic Chess Strategy > for practical modern chess vision
- move first think later
- *Chess for zebras and 7 sins*. Let you look at it in a different way
- I do not have
- *The king*
- *100 Endgames you should know*; instructive and understandable book, one of the few that I have read from front to back
- *Visualize series and Kingscruchers*
- *books by Karel van Delft*

- *Chesscamp 1-7 by Igor Sukhin*: best for beginner chess players, teaching method in America. Then *Step Method*
- *Viena game - A. Konstantinopolsky*
- *Uncle Jan teaches his little nephew to play chess*. Classic, started it yourself
- I hardly dare to say it, but I don't have/know no chess books
- *Learn from the Legends*
- Don't have a favourite book
- Don't have chess books
- *Silman books*, funny and educational and I don't do that many books
- *Mastering positional sacrifices by Merijn van Delft*. Opened my eyes to possible sacrifices and then has great matches. Analyzes relatively concise, which improves readability
- *Bobby Fischer- My 60 Memorable Games* That's what I'm reading right now
- *Fundamental Chess Endings* (endgame matters)
- *Silman*, amateurs mind Goes into thinking patterns
- *How to reassess your chess*
- *Zweispringerspiel by Jakob Estrin* (from around 1980). I had a lot of fun playing with that
- *The Killer Sicilian*, Tony Rotella, for special openings
- *I think something of Krabbé*
- *The King*, by JH Donner. Beautiful literature that gives a beautiful picture of the era Karpov-Korchnoi, from Bent Larsen everything from Euwe, that's how I learned to play chess
- I don't read
- *How you reassess your chess*
- *My Best Games with White and My Best Games with Black by Viktor Korchnoi*, because he is my favourite chess player.
- *Opening books of Taimanov*. Very good and with a good explanation, perhaps a bit dated. Enjoy reading stories and/or doing puzzles: *Kings of the chessboard* (Paul v/d Sterren), *We present...* (series Böhm & Afek), *Tactical targets in chess 1 + 2* (Istvan Pongo) *Mein System (Nimzowitch) - First discovery of positional play Step method (van Wijgerden - Brunia)* - Incredible learning gains made in tactical terms *Gewinning mit Französisch - Ein Leben lang Französisch (Uhlmann)* - A good book to learn how to play the French defense *Gewinning mit Nimzo -Indian (Keene, Taulbut)* - A good book to learn how to play the Nimzo-Indian defense *Principles fondamentaux de la stratégie (Quenehen) Karpov - Kortsnoy 1978*. Very compassionate at the time *Grandmaster preparation by Jacob Aagaard*. Clear statement with many assignments *Mastering chess strategy The King by Jan Hein Donner Max Euwe judgment and plan*
- *Betoverend*

## 6. How best to study and practise tactics

**= Answers FIDE titled players on question about how to study and practice best tactics**

**GM** = Chesstempo. Better recognize and practice motifs and patterns

**GM** = The Steps Method

**IM** = Start young with Steps Method, later calculation positions from e.g. the Aagaard series

**IM** = In the past the Steps Method was very helpful for practice and repetition, nowadays there are enough sites for tactics (Lichess, Chess.com)

**IM** = Step method to learn it, then practice the themes in a mixed fashion online

**IM** = Online tactics with an iron discipline to solve every problem (and have your answer as complete as possible)

**IM** = Solve many puzzles (without computer)

**FM** = Solving puzzles

**FM** = From book complicated puzzles, online easy puzzles

**FM** = Keep playing

**FM** = Chesstempo on level difficult I like very much

**FM** = Probably via online programs, I do it mainly through sections in magazines - and blitz chess

**FM** = Chesstempo.com

**WIM** = I think very active: by solving puzzles. Ideally with an element of repetition, as with the Woodpecker method.

**= Answers not FIDE titled players on question about how to study and practice best tactics**

= I think by repeatedly doing x number of puzzles (per day) that you develop a certain pattern recognition through automation. Online is my preference

= With literature from others

= First theory, then try it out on club night

= Many repetitive exercises, always per theme (such as step method)

= Playing a lot

= Trying to solve many puzzles on the different websites (puzzle rush, chesstempo)

= By doing tactics exercises on a daily basis

= Chess puzzles (lichess), live commentary at GM games follow

= Making puzzles

= By the "Woodpecker method" - regularly review a permanent collection of various exercises.

= By playing matches

= Don't know

= Gotham Chess. Educational and fun to watch, without taking a lot of time.

= Do a lot of exercises, preferably on theme

= Do a lot of tactical tasks, so that you can recognize those situations in competitions

= Partly based on re-enacted games of grandmasters.

= Step method

= Learning structured patterns (a la step method), as well as regularly practicing puzzles with few hints

= Online

= I think through a systematic study, accompanied by daily puzzles.

= Puzzling every day



- = Step method
- = Reading book / theory in combination with matching puzzles or watching video games and then matching puzzles
- = Practice
- = First learn the different themes separately. Then repeat a lot in various exercises with limited stretches. Repetitions are easy via chessable: e.g. Common Chess Patterns Via Visualization exercises Then in game problems
- = By someone better than yourself pointing out your mistakes and explaining your mistakes
- = Via an app on phone or tablet
- = Digital
- = Through a structural approach, such as the step-by-step method, in combination with a lot of practicing practical statements (e.g. online). Repetition is part of that, because you also have to learn to see tactical turns at a glance. Learning from the computer, which shows missed moments, is now certainly part of it.
- = Studying Chess Tactics from Scratch and trying to apply that knowledge in games
- = (Many) tasks, via tactic programs or from, for example, Forcing chess moves
- = By making meters
- = By playing, by doing exercises, by looking at positions together
- = I have benefited most from the CT-Art 3.0 program. about 1000 positions with all motifs.
- = Solving varied puzzles, so a mix of methods. For example, the structure of the step method, classics, spaced repetition by Woodpecker, own parts, books aimed at math skills (e.g. Aagaard's 'Calculation')
- = Practice structured per theme. Random repeat
- = A lot of training by means of solve problems
- = Solving puzzles
- = Solve chess diagrams
- = How do you think you can best study and practice tactics?
- = Play many games and then analyze
- = Chess
- = With book by Laszlo Polgar
- = Troubleshooting
- = Own games
- = as in The Woodpecker Method and playing games
- = Making puzzles
- = I think from book/from screen/paper without board (visualizing). But online puzzles where you have to make one move and then the next if all goes well are more accessible. But the tendency to answer too quickly is great.
- = Many exercises with specific themes
- = Solving puzzles
- = Do a lot of assignments, preferably every day
- = Just practice a lot
- = No idea
- = Make and repeat many puzzles on the same topic!
- = Lichess
- = In groups
- = Hard to say. Seeing examples, imitating and practicing with variants is my first instinct
- = Thematic exercise in response to own (serious) parties
- = Specific chess puzzles, analyzing games, playing a lot of chess
- = Create diagrams, follow method steps

- = Exercises on chess.com puzzles. I also follow step 4 through self-study.
- = Tactical exercises
- = By studying theorems from practice, such as in Hort/Jansa 230 Propositions from the Grandmaster Practice
- = Solve puzzles
- = Repeat exercises a number of times, where incorrectly answered questions are repeated a few more times
- = Doing exercises, studying mistakes, practicing a lot
- = Chestempo respect but with positions in between that don't contain tactics
- = Practice, practice and play a lot
- = Play games with another chess player
- = Practice, practice and practice. Step method
- = By doing
- = Making exercises
- = Via the Woodpecker method (solve a selection of exercises seven times faster each time).
- = Step method?
- = By making puzzles
- = Practice, practice, practice. First through simple thematic exercises, then through exercises involving multiple themes
- = Doing exercises
- = Practice pattern recognition by solving many problems in succession as quickly as possible. Take more time to calculate
- = Review many positions, practice mating images and pattern recognition
- = Playing and analyzing a lot with opponents
- = Chessable
- = Youtube chess sites and textbooks

## 7. Please describe what you think is interesting and educational in the interview with GM David Bronstein. Or maybe you have additional ideas?

### = Reviews of FIDE titled players of the Bronstein interview

**IM** = He chooses a different mindset, different perspectives, that remains inspiring.

**FM** = Nice to read back, I was also there at the time. Nice that a near-world champion actually prioritizes playing fun. If you dare to play uncompromisingly without worrying about the result, you will eventually come the farthest. I would definitely pass this on to every youth player. In practice, this remains difficult, because in many matches (particularly in a team) the result / not losing is paramount. It is also striking that at the time he was already agitating against the obsession with ratings. This development seems to have only gotten worse since then.

**FM** = I was at that interview myself and wrote a report about it at the time. What stands out to me the most was Bronstein's inexhaustible creativity and energy despite his relatively advanced age.

**WIM** = Inspiring how he focuses 100% on the content instead of the result

### = Reviews of not FIDE titled players of the Bronstein interview

= I'm confused that he phrases it so strongly, but I do share his vision (it's also my personal approach). As usual, though, I think the truth is somewhere in the middle: creativity alone won't get you there (or I'll bump into it anyway). A minimum of preparation/opening knowledge is necessary (I lack that), but most players indeed know too much theory. And if you've established that for decades; then I understand his sharpness.

= Interesting about this interview is Bronstein's approach to chess, namely that creativity should be central, results are of secondary importance. In line with this, it is instructive that it is precisely by gaining new ideas and experimenting that one becomes a better player, although this does not necessarily translate directly into better results. Although Bronstein says he likes to play against computers - at least they don't complain about defeat - the aspect of how to use computers to come up with new ideas (creativity) is (rightly?) not discussed.

= Great interview!

= Creating problems for your opponent is something I don't think about consciously enough during a game. Interview is somewhat dated I think because of the current generation of top chess players. Interesting insights about how to train!

= Chess is especially fun and losing is necessary to learn. I prefer to play nice games, with as many combinations as possible. I don't feel like learning 24 hours a day, especially having fun, the top is tough, but being able to play fun game with always feeling that you have some chance is fun and keeps you busy.

= Be creative, present opponent problems. If the opponent has to make choices, the chance of mistakes is greater. In forced play/prepared openings, the opponent has limited choices and may not make any mistakes. Playing your own game, pursuing an idea, despite SF

saying you're understated. Behind the board you don't play against SF, so if your opponent doesn't understand why you're playing something, they can offer good counter play with accidental moves, but eventually get problems strategically/in the endgame because the idea only comes out then.

= In any case, Bronstein was a very interesting and inspiring chess player and person; this is also apparent from the training session described. He's right, of course, or at least I don't pretend to know better than him. Bronstein is talking about chess players who want to achieve the highest possible level. But in my previous answers, I was thinking more about people who want to get better, but don't have exceptional talent. I often notice that they cannot get a grip on positions at all; and then it is useful to use the knowledge of others.

= What appeals to me is that he thought the result was secondary to creativity and imagination.

= I find his ideas about creativity and researching theorems interesting and useful. In my opinion, he somewhat underestimates the value and pleasure of good preparation for a game. But this is of course very personal...

= Interesting interview. Developing ideas, enjoying the game, playing fun games is more important than the result and ELO rating. I fully agree with that and also propagate that, but I also find myself regularly looking at the ELO rating lists and thinking about them during the game. I'll just say a contradiction.

= I have yet to read it and will definitely do so soon. I had the privilege of playing against Bronstein and spent hours analyzing with him after the game. Fascinating person.

= Best tournament book Zurich 1953

= Create problems yourself!

= Nice to read what Bronstein wants to convey. I take his emphasis on creativity and thus creating problems for your opponent. What I would also like to hear from him is how he would practically design a chess study: how much time do you spend on which type of study? And is blitz chess useful/not useful to improve your level?

= Creativity is using your imagination. Being afraid only paralyzes your imagination. Only when you look in all directions (an 'open mind'), you see a lot. That sometimes things go wrong (one point less) is a price you are willing to pay for beautiful ideas. => I find that very difficult, not to think about the result during the game.

= Causing problems instead of solving them

= The push to especially try new ideas is very appealing. Play freely.

= Nice interview. Bronstein describes how he functions best and what his preferences are. What is underexposed in my eyes is that not everyone learns and experiences in the same way. You should also pay attention to that.

= He claims that you should create problems, not solve them. My attitude has always been to simplify and work clearly, and that is one of my mistakes.

= 'You do not beat your opponent. He makes wrong appraisals and that makes your statement better. "

= In summary: only if you look in all directions you see a lot, and have the guts to follow your own ideas

= I find it very interesting that before the 1980s and 1990s, grandmasters seemed to attach much less importance to opening theory, and much more to finding their own ideas. I myself spend quite a lot of time studying opening theory, but it's statements like Bronstein's that remind me that this is not the most important thing in chess training. I also didn't think that an ex-vice World Champion gave so little importance to losing, I was always under the impression that top players hated that, and what Bronstein says about not being afraid of losing is very inspiring.

= I like his heuristic approach and it is true that there is too much play for points (and money). The lower time controls on the net seem interesting to me on the one hand for 'more creative' chess, but on the other hand you risk going less in-depth (because those games are no longer analyzed and many serious mistakes are made)

## 8. Questions and remarks by participants about the research

- =I am interested in the results of the research
- =Interesting and thanks for participating
- =It was all very clear
- =Why all moves from white perspective?
- =Is the time used for solving part of the research?
- =Happy to participate in new research
- =Success processing the data
- =Nice not to know what are the answers
- =Thanks
- =Curious about the scientific design
- =How are puzzle chosen (personalized, adaptive to earlier answers of mine?) and what is measured?
- =I like solving tactics, pity only first move had to be solved
- =Many questions per test
- =What was the hypothesis?
- =Doing much courses at Chessable I recognized much patterns
- =Can we see the scores?
- =Chessable is a good method for repetition
- =Solving was a lot of fun and I guess the research is about developing better training tools for which I contribute with pleasure because I think chess thinking is important for society by learning to think flexible
- =It was not clear from the beginning you could solve the puzzles with breaks in between
- =I would like to see results immediately after a test
- =With only to solve first move you can be lucky
- =How will the results be shared?
- =I would like to know what are my weaknesses and how to solve my weaknesses
- =Second test strange mix of easy and complex puzzles
- =This is important research but I am happy myself if I can just play a nice game based on some simple principles and it should not become a kind of work
- =Some of the puzzles seemed artificial
- =Why are participants not paid?
- =What is the research about?
- =It was fun and because I am a teacher myself I would like to get the puzzles with answers to use in my lessons
- =Excellent research
- =I am very much interested in exercises with an end position followed by a position a few moves earlier from the same game.



## 9. Retrograde analysis

Alan Bester is one of the authors who created puzzles for this research. Several of his Chessable courses are built on the principle of reversed solving. He refers to internet links about 'solving backwards' (reversed).

Bester mentions an article (with a TED video) '*What a Chess Grandmaster Can Teach You About Solving Problems*' about ideas of GM Maurice Ashley. See: <https://www.inc.com/justin-bariso/a-chess-grandmaster-shares-an-effective-trick-for-solving-a-ny-problembr-.html>

Ashley refers to the problem-solving technique retrograde analysis, whereby you start with possible end goal in mind. Then you try to find ways to reach such end positions.

Other links to retrograde analysis:

- <https://www.chess.com/blog/ForwardChess/getting-better-at-problem-solving-thinking-backwards>
- [https://www.chessprogramming.org/Retrograde\\_Analysis](https://www.chessprogramming.org/Retrograde_Analysis)

Retrograde analysis has similarities with a reverse engineering process. This is an analysis to deduce design features from certain products with little or no additional knowledge about procedures involved in their original creation of production. See: [https://en.wikipedia.org/wiki/Reverse\\_engineering](https://en.wikipedia.org/wiki/Reverse_engineering)

See Daniel Magen - Chess Reverse Engineering technique: <https://www.youtube.com/watch?v=0Ye6MbXdChk>

## **10. Did you notice anything when you solved the chess positions of the Chessable chess study survey?**

*Answers on question to participants in the Reversed condition, in order of national rating.*

2469 IM = Often two positions from the same variant/game.

2420 IM = In some studies I noticed that positions came in pairs of two, with one dealing with a later phase than the other.

2393 IM = Yes, in some parts of the research the problems formed pairs, with solving the first statement helping to solve the second statement. Once you've seen the ending, it's easier to work towards it and find the solution.

2360 FM = Many problems built on each other and with both white and black the same/similar problems.

2268 WIM = I thought that sometimes mate positions were first practiced with an easy problem and then tested with a difficult one.

2198 = Mating images of easy and more difficult problems often matched. Almost all exercises had mate as their goal.

2132 = Yes I have become very bad at tactics.

2107 = Often mate.

2087 = Continuation of positions sometimes came back.

2040 = The 'retrograde' analysis turned out to be much more difficult than expected.

2033 = Yes, the first position was often mate in 1 and the second position was the set-up.

2019 = Some time ago, but saw the same motifs regularly. Also great variety in difficulty.

2005 = Some positions came from the same game, so a fragment from the same game reappeared a little later.

1921 = Pattern repeated.

1900 = Exercises were mainly tactical positions.

1816 = No.

1801 = Yes, an easier problem was followed by a more difficult problem with the same theme and essentially the same position.

1794 = I seem to remember that some positions came back with a small adjustment. I also found some positions significantly easier than others.

1781 = Test 2: was suddenly very much and I started it very late at night. This is also reflected in the solution percentage.

1760 = You only had to enter one move and some were difficult.

1710 = Alternately simpler and difficult.

1700 = I think the exercises had to do with mate in 3 or 4 moves. And maybe that easy tasks alternated with difficult ones.

1647 = Alternating level between easy and hard.

1647 = No, I didn't notice anything.

1647 = I found that some of the positions were very similar, and that sometimes a pattern developed in the order of the exercises where an easy exercise was followed by a difficult exercise, followed by an easy exercise and so on.

1636 = Big difference in difficulty (not ascending, but alternating).

1600 = The order was quite random in theme.

1345 = Um... that it's kind of weird if the board was gone right after my move, so you don't know if it was right. And if not right, you can't figure out what would have been right. Except when it was mated after the move, I saw that for a while :)

1300 = No, it didn't occur to me.

1124 = Exercises often disappeared suddenly or at least unexpectedly quickly.

1100 = For most it was not immediately clear what the best move was.

No rating = Felt that basic themes were repeated, sometimes by prefixing easier statements to more difficult ones.

No rating = No.

## 11. ChessQuiz

Welkom bij deze schaakquiz van Chessable

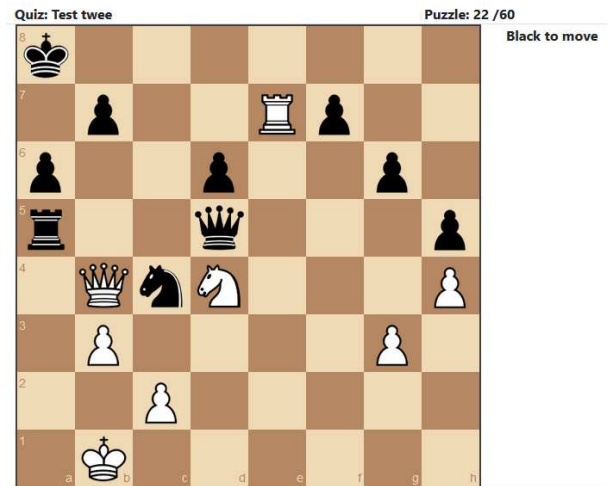
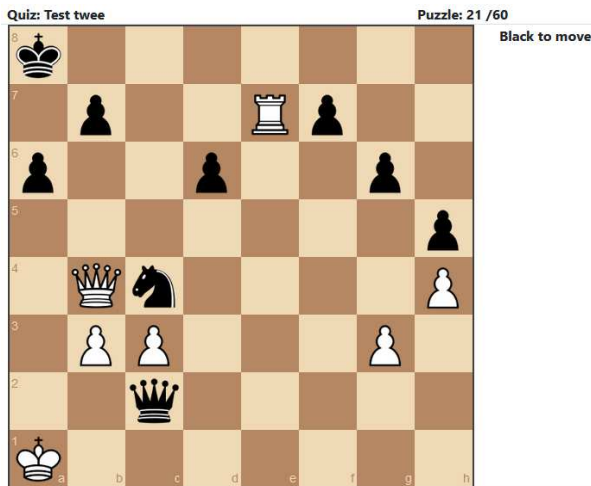
Bedankt voor het deelnemen aan het onderzoek van het wetenschappelijk team.

Wil je deze quiz 'Test twee' invullen door in elke stelling de eerste zet te doen?

Om de test te doen vul je je emailadres in.

Als je vragen hebt, mail naar [karel@chessable.com](mailto:karel@chessable.com)

Start



## About ChessQuiz

ChessQuiz is developed to support research projects run by Schaakacademie Apeldoorn.

## ChessQuiz uses

[chess.js](#), a Javascript chess library by Jeff Hlywa.

[chessboard.js](#), a JavaScript chessboard component.

[chessboard.js](#), a responsive mobile-first javascript chessboard library by Caustique.

## 12. Interview with David Bronstein

From the book 'Developing Chess Talent' by Karel van Delft and Merijn van Delft (KVDC 2010, see [www.chesstalent.com](http://www.chesstalent.com))

### D1 David Bronstein

*'Researching, developing possibilities. That's what chess is about.'*

'You shouldn't solve problems, you should create them', said grandmaster David Bronstein (72), who gave a guest training in Apeldoorn on October 8, 1995. Good calculation of variations is useful, but what matters most in chess is the way you approach problems. That is also what chess trainings should be about. By researching and discussing together, you can increase your understanding of chess and derive joy from it. Various strong youth players joined the workshop: Tim Lammens, Merijn van Delft, Jochem Snuverink, Tim Rimmel, Dennis de Vreugt, Joyce Fongers, Joost Hoogendoorn, Vincent Deegens, Joost Mellegers en Jaap Houben. Freelance journalist Peter Boel made a report for the local newspaper 'Apeldoornse Courant', and guest trainer Dharma Tjiam of De Schaakmaat was present as a listener. The training session was organized by Karel van Delft with financial support by local waste paper trader Schrijver.

Bronstein is positively brimming with ideas about creativity and coaching. He shows great respect for the Dutch World Champion Max Euwe. With Euwe, Bronstein shares the urge to let others share his passion for the game. We haven't been able to report any positive utterances about today's Dutch chess prominents. Money and points, that is what they are after, Bronstein thinks. Dr. Euwe was of a different mould; at least he loved chess and he wanted to teach it to young people. 'I wonder if these boys here would have learned to play chess if there had been no Euwe', Bronstein said. A weekend with Bronstein is overwhelming. What an abundance of energy this man has! And his understanding of the game is stupendous. Obviously, without this understanding he would never have been able to off-handedly produce so many games and positions that corresponded to the questions put forward by the training participants.

One time, in 1951, Bronstein was almost World Champion, but when the match ended in a 12-12 tie, Botvinnik kept the title. However, with 'Zurich 1953' Bronstein did put the best tournament book of all time to his name. This book is still available.

Bronstein is not exactly charmed by the current generation of top players. They prepare the game to death and hardly dare to tread new paths. He plainly calls Kasparov and Anand 'gangsters' who do not stoop to cashing 1.5 million dollars for games where hardly anything new is tried out. 'It has never happened before during a world championship that in a game, the players repeated the previous game with changed colours and then agreed to a feeble draw.' Bronstein thinks this is outrageous, and he thinks that Karpov's games are more instructive than Kasparov's. Bronstein thinks it is even more outrageous that he himself has been given an Elo rating of 2400-something. 'I am being judged by my current competition results. As I am getting older, I'm not so good at visualizing (calculating by heart) any more, and because of this I lose a game now and then. I don't want to be judged by my results, but by my ideas.' And there is nothing wrong with his original ideas, as this training session has made clear. Still, at many tournaments free boarding and admission is given only to 2500+ grandmasters. 'Because they have stuck a low rating on my mind, I now have to pay to

participate. As if I have no ideas any more. It's preposterous, there is no more respect for older players like Smyslov and me. Take the Donner Memorial, last year they even put us in a separate group there.'

Obviously you have to study technique, understand positional play and know something about openings, but in Bronstein's opinion the most beautiful thing in chess is the combination. For youth players he has a crystal-clear piece of advice: winning games is not important. You will, eventually. Enjoy the game, try to confront your opponent with problems. Points are not important, the main thing is that you learn new things about the game every time. You should think independently, develop your own ideas and not rehash theory. Studying endgames and, at crucial points, first trying out for yourself what is possible, is the best way to find out what you can do with the pieces.

Bronstein was also critical during the training session. To his mind, the youth players too frequently asked for concrete solutions, for example to opening questions. Such knowledge can be found in books. It is more important to develop your own way of thinking. By playing through creative games, you can pick up many themes that you will be able to use in your own games. That is, if you have the guts to think independently and make decisions.

He made a compliment to Joyce Fongers (15 years old, and the Dutch U-20 girl's champion). Technically her game has many flaws, but at least she tries out ideas and goes on the attack, showing the right attitude. Bronstein found it tiresome that the players hardly entered any discussion with him, so that he was the only one talking for most of the time. The participants eagerly absorbed everything he said – they hung on his lips and were deeply impressed by everything he dished up. But discussion and research are the basis of development, Bronstein claims. That's what training should be about; it should not be one-way traffic from teacher to student. A chess player who wants to develop should ask questions and come up with ideas. Investigating all kinds of issues will help you think independently. Only then will you be able to find beautiful questions yourself, and will the game come alive for you. The 'secret' of his creativity is very simple, Bronstein says: 'Just keep on searching for interesting ideas and don't worry about results.' Often magnificent combinations are possible if you look further than your nose ('the secret of the Russian Chess School is that we studied a position until its very end').

Bronstein thinks it is terrible that many chess players are so afraid to lose that they do not play interesting games any more. Without reason, they go through life as nervous wrecks instead of inventors. He has a point of advice for those who want to get rid of this attitude, which was followed up during the training: play each other on four boards at a time, then analyse the games together. This way the result may be 3-1 or 2,5-1,5, which will do more justice to the balance of powers. Bronstein is charmed by the fact that on the digital chess clocks the option of the 'Bronstein system' has been included. With a time increment after every move, you never have to lose on time. Analysing together after a game is very important, Bronstein claims. You can push each other to new heights. By confronting your ideas with your opponent's, both of you will get new ideas that neither of you would have found separately.

'I like to play against computers, because at least they do not come up with all sorts of excuses when they have lost a game', Bronstein says sarcastically. Again, he means that many players attach too much importance to gathering points. Instead, they'd better look for what other moves were possible during the game. Even the winner has probably missed all kinds of marvellous ideas, and therefore a little modesty is in order. Being ashamed of a lost game is about the most stupid thing Bronstein can think of: what matters is what you can



learn from your games! You will be doing yourself a bad turn if you never dare to try something new. 'These days, many chess players prepare entire games at home, and they try to beat each other that way. That's not chess. You have to try and discover new possibilities at the board. You are not fighting a human being, you are fighting to develop new ideas.' In other words, in fact you are fighting yourself and points on the scoreboard do not matter – the only thing that matters is what you learn.

In chess, what matters is how well your pieces cooperate. Bronstein calls this 'energy'. In various positions he indicated on cards which squares were controlled by the pieces. With this aid, you can check if the pieces cooperate well. In a game you search for possibilities to pinpoint the weak spots in the position of your opponent. Bronstein's aid helps you to understand certain types of position. Players follow the fashion too much, i.e. the issues of the day, and because of this they only play certain openings. Bronstein thinks it is short-sighted nonsense to claim that a move is no good because it is not in the books. And even if a position is no good, you have to know why this is so.

Rehashing other players' moves will not get you anywhere – you must investigate positions critically and make your own judgement. Only if you have found out yourself why certain positions are good or bad, you will know how to handle them and be able to play a proper game of chess.

Bronstein claims that chess is more than just calculating variations. He applauds the fact that during trainings at De Schaakmaat there are regular discussions about all kinds of views and experiences. He thinks it is highly important to learn to think independently and to solve problems on your own. By exchanging thoughts you will gain new insights – not only factual knowledge, but also a 'philosophy', a way of thinking. Playing against a computer together and discussing what happens is an excellent training method, Bronstein thinks. He also considers playing through annotated games where ideas are explained verbally to be an excellent exercise. 'You have to look between the moves', he says, and you can formulate your ideas in words. That's what it's all about. It's not about variations, because they are only elaborations on ideas. Of course, it is useful to train variation calculation – for instance, by putting an interesting position on the board and then calculating all kinds of continuations in your head. The best way to develop this skill is by starting at a young age, and doing it regularly.

Creativity means using your imagination. Fear will only paralyse your fantasy.

Only if you look in every direction with an 'open mind', you will see many things. That something may go wrong and you may lose a point now and then, is a price that you should be willing to pay for conceiving beautiful ideas. And Bronstein has proved that this attitude may get you a long way too. You can develop your imagination by taking inspiration from interesting games by players like Tarrasch, Simagin, and Boleslavsky. Bronstein himself loves flexible positions, where the pawn structure is not fixed. By playing through a number of his games, you will see how a pawn mass may 'suddenly' get rolling (although you should keep in mind that there can be no attack without proper preparation), opening many lines, along which the pieces execute the sentence over the opponent.

By just rehashing moves you will not learn anything. That is why Bronstein advises to regularly look first at what you yourself would play in a certain position when playing through a game. This will make the game come alive for you, and you will understand it better. In order to become a really creative player, you must learn to investigate and to reason independently. 'First think for yourself, and only then ask, or look up in the book, what's going on.' It is quite unwise to adopt things indiscriminately. 'You shouldn't believe anyone just like

that, you shouldn't believe me either. I don't want to give you advice anyway, I only want to make my convictions clear.' Bobby Fischer may have been talking about 'crushing the other guy's ego', Bronstein's approach is much more friendly. 'You do not beat your opponent. He makes wrong evaluations and that is why your position is better. But the winner also makes all kinds of mistakes. You have to have respect for your opponent. After the game you can investigate all the possibilities together. Investigating, and developing possibilities – that is what chess is about.'

***Interview: Karel van Delft, October 1995***