

Little Chess Evaluation Compendium

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The purpose will be to give a fairly precise evaluation for all the most important terms. Some authors might find some interesting ideas.

For abbreviations, p will mean pawns, cp – centipawns, if the number is not indicated it will be centipawns; b – bishop, n – knight, k- king, q – queen and r –rook. Also b will mean black and w – white.

We will assume that the bishop value is 3ps, knight value – 3ps, rook value – 4.5 ps and queen value – 9ps.

In brackets I will be giving purely speculative numbers for possible Elo increase if a specific function is implemented (only for the functions that might not be generally implemented).

The exposition will be split in 3 parts, reflecting that opening, middlegame and endgame are very different from one another.

Opening

The general principles of middlegame will apply, except for the following.

Control of center

Control of focal center (i.e. the squares e4,d4,e5,d5)

Pawns occupying the focal center

+40 for each p on such a square

Pieces occupying the focal center

+20 for a minor piece and +30 for q on such a square

Pawns keeping control of focal center

+10 for such a function (eg. the c3,d3,e3,f3 ps are controlling one square each as well as the c4,d4,e4,f4 ps do)

Pieces keeping control of focal center

+10 for such a function for each square a piece controls (eg. the wnf3 has under control the d4 and e5 squares, so it would get a bonus of +20). This concerns all pieces.

Control of wider center (i.e. the squares bound by c3-f3-f6-c6 excluding the focal center squares)

Pieces occupying the wider center

+10 is given for every piece on a square of the wider center

Order of development

+20 for developing n before b

-30 for developing q before 2 minor pieces are developed

-50 for developing r before 2 minors are developed

+60 for castling to developing pieces on the other side

+50 for castling short to castling long if both possible

-35 for playing twice with the same piece in the opening

When the engine can choose between 2 variations more or less equal in score, one involving doing a pawn push and the other developing a piece - +20 for the developing move is given

-20 for a minor piece placed immediately before a central e or d pawn if the p is on the second rank.

Underdevelopment

In the case that one side has developed 2 light pieces more than the enemy side then - + 1.75ps for the better developed side.

Phalagian development (also middlegame)

Probably borrowed by Phalanx, I do not know. This assumes development of pawns and pieces in compact order. -20 for own p into the enemy camp unsupported by other ps (eg. wpb5, wpa2, no c pawn). -30 for own piece into the enemy camp unsupported by other pawns or pieces.

Losing castling rights

When losing castling rights, if the king stays in the center with that – then -2ps for that k
If the k goes to a more secure square on one of the sides but at the same time shuts in one of the own rooks in the corner from where it is difficult to develop – then -80 for the shut-in r (eg. bkf8 with brh8)

Temporary prevention of castling

+50 for a move, most often a rook or a bishop, that prevents temporarily the possibility of the enemy king to castle (that is, the king has not moved and can castle later) – eg. wke1, bba6, +50 for placing the b on a6 keeping the f1 square under control. This will often result in mating attacks.

Early exchange of queens with loss of right to castle

In the case of an early exchange of queens with a loss of castling rights for one of the sides (eg. exchange on d1 or d8) - -40 for the side losing that right

Bishop pair - +25 as a general rule as there are chances the pair will stay till the endgame

Pins

+40 for b pinning a n with k at the other end of the pin

Middlegame

Mobility

+ 10 for each free square a piece has access to

Mobility of pawns

+5 for each possible move, including captures

Control of center (as in Opening)

Coordination of pieces on the board

General piece attacking potential

0.02ps for each enemy piece or pawn attacked by own piece or pawn; 0.06 ps for a b or n attacked, 0.09ps for r attacked and 0.18 ps for q attacked – 0.02 times the value of each piece

General piece defending potential

0.01 times the value of each piece or pawn defended by other own pawns or pieces – 0.01 ps for the p, 0.03 ps for a n or b, 0.045ps for a r and 0.09 ps for a q. This principle is very important as with other factors being about equal the position should be won for the side whose pieces are better defended among themselves.

Intensity of interaction

For each point of intersection of 2 own pieces on the board (that would include empty squares, as well as squares occupied by enemy pawns and pieces) a certain bonus is given. Point of intersection would be, for eg., c2 and b3 for wbd1 and wnd4; d6 and d4 for wnf5 and wqd5, etc. The bonus points would be as follows: +5cps for an intersection of 2 minors; +7cps for an intersection of a minor piece and a rook; +10 for 2 rooks; +12 for minor and q and +15 for q and r. Intersections of q and b along the same diagonal are not taken into account, as well as intersections of heavy pieces along same files and ranks. For intersections of q and r only one square along each q diagonal is taken into account (eg. bqg5, bre8 – squares d8 or e7 would be counted, as well as e3, as long as there is not a wp or w piece on f4, or black such). This way of computing might boost somewhat the tactical power of engines.

For endgame the value will be factored by 1/2.

For king attack the value will be factored by 5, and for king attack in endgame 1/2x5.

Pawn structure

- 20 for an isolated p

- 50 each for double isolated ps

When the double p is part of a group of 3 or more – no penalty

In the case of double pawns part of a group of 3 or more when the double pawns are fixed - - 75 for the doubling; eg. bps c5,c6,d5, wps c4,d3

+ 25 for a passer

+ 50 for a protected passer

+ 25 each plus + 50 for the tandem for two connected passers

-35 for the b7 p (backward pawn) – structure of the type wp a5, bps a6, b7, as b7-b6 or b7-b5 is compromised to a fair degree

-20 for the b7 p (semi-backward pawn) – structure of the type wp a5, bps a6, b7, c7; or wp a5, bps b7, c7, as b7-b6 or b7-b5 is compromised to a certain extent (not sure all engines do that – 15 Elo)

-25 for the root p – structures of the type wps b3, a4, c4, where one p protects 2 others as the root b3 pawn could fall easy prey to the enemy pieces (not sure all engines do that – 10 Elo)

Pawn structures of type c3-d4-e5 - -10 as there are some intrinsic mobility restrictions

Pawn structures of type f7-g6-h7-f5 when fixed - -20

With 2 isolated double ps 2 ranks apart (eg. f7 and f4) – no penalty for the ps if the more advanced one is well defended (eg. bd6), actually just a bonus for space advantage factors for the f4 p.

Structures with root pawn on the fourth rank -20, as the root pawn would be more vulnerable to attack (eg. wps e4,f5, bps e5,f6)

Fixing a double pawn

For fixing a double pawn +35 is given in middlegame and +50 in endgame. Eg. bps b7,b6,c6, the bonus would go for a white p on c4.

Four-pawners

-20 for structures of type a3,b2,c3,d2 (too many holes)

-25 for structures of type h2,g3,f3,e2 with 2 root pawns on the second rank

-10 for structures of type h2,g3,f4,e4 (some mobility restrictions)

Five-pawners

For five-pawners derivative of four-pawner structures the rules for the latter will hold true.

Compositions of pawns

6 pawns chain and 1 separate pawn preferable to 2 chains consisting of 5 and 2 pawns (+20)

Chains consisting of 5 and 2 pawns preferable to chains of 4 and 3 pawns (+20)

When the chains are into the enemy camp, the estimates will be reverse as the probability of the smaller number of pawns to produce a passer would be higher

Pawn avalanche

Pawn avalanches consist of at least 4 connected passers on central and semi-central files, and maybe some other passers. The 4 passers striding together forward have a material value equivalent to 2 minors. 5 passers will even surpass that value. If the structure could be blocked, defence would be much more efficient.

Closed and semi-closed structures

Closed pawn structures are when we have pawns for both sides on both central and semi-central files (eg. wps c4, d5, e4, f3, bps c5,d6,e5,f4).

Semi-closed pawn structures are when we have pawns for both sides on the central d and e files as well as one pawn each on a semi-central c or f file.

Closed pawn structures are of 2 types – fixed and semi-fixed. Fixed structures are when enemy pawns are attached to one another with no spaces in between (eg. wps c4, d5, e4, f3, bps c5,d6,e5,f4). Semi-fixed structures are when there are spaces between pawns on one of the files (eg. wps c4,d3,e4,f5, bps c5,d6,e5,f6).

For this type of structures special evaluation bonus points for space advantage are given. For central pawn on fifth rank - +30 instead of +10 (eg. d5 pawn); for central pawn on sixth rank (quite rare) the bonus will be +60 instead of +30.

For semi-central pawn on fifth rank the bonus will be +20 instead of +10; if such a pawn is on sixth rank, the bonus will be +40.

Vertically isolated pawn

That is a pawn amidst a cluster of enemy pawns. Eg., wpe5, bps e6, f5, e4 - -35 for the e5 pawn.

Backward-fated pawn

This is a pawn the square in front of which is guarded by 2 enemy pawns and no own pawn can support its move forward. Eg. wps b3,c4,e4, bps c5,d6,e5 – d6 is a backward-fated pawn. The penalty for such a pawn will be -35 for middlegame and -50 for endgame.

Restricting pawn

Eg. wp g5, bps g7,g6,f7. Usually the black pawn structure looks quite normal in middlegame, but when there is a g5 pawn it restricts the movement of the enemy g pawns forward and the structure becomes bad. At least +40 for the g5 pawn would be wise.

Prospective passed pawns

In the event of existing pawn structures on one of the sides or in the center of the type 1 versus 2 ps, 2 versus 3 or 3 versus 4 ps, when the surplus p is a prospective passer - + 15 for the surplus p.

The style of Karpov

+10 for each own pawn on second or third ranks (better defended)

-5 for each square into the own camp (that would be the own half of the board, of course) not defended by a pawn or piece

-50 for active opp. piece into the own camp

Pawn structures consisting of 2 and 5 pawns preferable to pawn structures consisting of 3 and 4 pawns (+20)

Space advantage

Will be determined by the ps into the enemy camp

+10 for each p on the fifth rank, +30 for each p on the sixth rank

Special cases of b and n

+25 for a b or n on the fifth rank; + 50 for a bishop or n on the sixth rank, as the pressure these pieces exert on the enemy position is bigger than usual (not sure how many engines do that - 20 Elo)

Eternal knight

This is knight on a central square - d5, e5, that has no opponent knight or bishop of the colour the square the knight is on to attack it - +75 for the knight (5 Elo, quite rare)

King security

Position of the king

King position will be defined as all of the squares the k defends plus the squares in the immediate vicinity from where it can be checked, whether or not there are pawns on them. Eg. wkg1 - the position of the king will be f1,h1, f2,g2,h2, f3,g3,h3; wkh1 - king position will be h2,g2,f2, h3,g3,f3, g1

K on h1, g1, a1, b1 - bonus of plus 1p

K on f1, c1 - penalty of -50

K on e1, d1 - -1p

K on second rank - -50; third rank - 1p; fourth rank - 3 ps; into the enemy camp - -5ps

Additional free squares for the king

For each additional free square the king has access to - +15

Pawn shelter - with short castling - no penalty or bonus for shelter of 3 ps (f2, g2, h2), a bonus of + 50 for a fourth p, protecting the king, eg. on f3.

Penalty of -50 for 2 ps and -1p for a single p

Placement of the ps of the shelter

Ps on the second rank - no penalty or bonus; p on g3 - same; p on h3 - -25, p on f3 - -50

Ps being on the fourth rank - -1p each

Flawed pawn shelters

Shattering

Shattering is when the pawn shelter is broken into 2 separate groups of ps. In this case -20 is given for the shattering itself, and further -70 for the f6 pawn in structures of type bps h7, f7, f6; or -90 for the h6 pawn if the shattering is f7,h7,h6.

Shelters with doubling

-50 is given if the flawed shelters are of type h7,g7,g6 or f7,g7,g6

Piece shelter

+30 for own b being part of the defensive structure (usually on g2,g7)

In the case that one of the sides has very big space advantage so that the other side has almost no counterplay or very little counterplay – no penalty is given for pawn storms with pawns of the own shelter (eg. g2-g4, h2-h4, etc.).

In that very case a bonus is given for pieces defending own king: +30 for a r being able to defend own king if checked by an enemy piece; and +20 for knight or bishop with similar defence capabilities.

Forefront piece shelter

In the case of pieces on squares of the king position in front of the pawns of the pawn shelter a bonus is given - +10 for q, +20 for a r and +30 for a minor piece (eg. wbf3, wng3 with pawns along the second rank and kg1)

Defending pieces

For each piece defending a square of the own king position attacked by an enemy piece a bonus is given - +20 for the q, +30 for the n and b and +50 for the r.

Enemy pawn sheltering king

In the case of a king attack, +50 is given for an enemy pawn sheltering the king, it would usually be an end pawn (eg. wps c2,b3, wka1, bpa2 or wps c2,b3, wka2, bpa3). It would be unwise to take the pawn as attacking chances would only increase.

Discriminate positioning of pawns of the shelter

With king attack, if two pawns are storming the k position and there are 2 sheltering ps along the same files, it would be indicated to keep the pawns positioned along the same rank as a pawn thrust could be met by closing the position (eg. wps g5,h5, bps g7,h7, g5-g6 would be met by h7-h6, deterring attacking chances). +30 for such arrangements is given

When the storming ps are 3 and along the same files there are 3 sheltering ps, +25 is given for fixing pawn chains as that would usually decrease attacking chances. Eg. wps f5,g5,h5, bps f7,g7,h7 – g7-g6 would be indicated, fixing the chains.

King attack

Pawn storms - + 40 for a p on the fourth rank against the enemy king position, + 60 for a p on the fifth rank and + 80 on the sixth rank

Attacking pieces

+ 1 p for a q attacking a square defended by the enemy king

+ 30 for a bishop or n attacking such square or in the case of the n attacking a square from which it can check the enemy king

+50 for a r on a semiopen file against the king

+70 for a r on an open file against the king

Double rooks on a semi-open file against the king - +80

With king attack, +10 for a piece attacking an enemy piece defending a square of the own king position – eg. Bg5 attacking Nf6 or Rf3 attacking same knight

+15 for a piece attacking the root p of the king shelter if there is such (eg. bps f7,g6,h7, +15 for wnd6 attacking f7 or +30 for wng5 attacking f7 and h7) Different combinations might arise.

Stray Queen

If one queen is not within 2 moves of a square from which it can defend the own king position, and the opponent's queen is within a move from a square attacking the enemy king position, then +1.5 ps for the attacking q or -1.5 ps for the stray queen. The case might arise when the stray queen is indulging on pawns in the enemy camp, say w q on b7 or a7, and the pawn structure or available pieces prevent it from easily going back.

Attacking queen and bishop

In the case of qs and bs of different colours on the board, when one b is attacking the enemy k position and the other is just passively defending it, then +2ps for the attacking b – indeed the tandem should be dominating and the other b useless which will soon lead to some gains.

Hidden Attacking Rook

When we have the case of a r on a file against the enemy k position, with one own and one opponents p along the file, own p storming on 4,5 or 6th rank and opp. p part of the shelter, then +40 for the hidden r. Different attacking possibilities with sacrifices using the then open file might arise.

Pawns yielding pressure on the enemy k position. In the case of a p directly affecting the enemy k position - +40 for the p. The case might arise with a wp on e5, bps on e6, f7, g7 when f7-f6 or f7-f5 will weaken the p shelter. The e5 p is severely affecting the position and creating possibilities for a k attack. Some engines might not consider this.

Attacking possibilities

If a piece is within 1 move from a square from where it can go on a square attacking the enemy k position, then +half the value for the piece on an attacking position. The most frequent use will be with knights as they are slow-moving and need to support the attack. If we have a n on e2, it should get +15 for going on f4 from where it can go on h5, while wn on say b2 will get no boost. This might lead engines trying to concentrate their pieces for a k attack which is very important.

Sacrifices

Here we refer only to sound sacrifices. Unsound sacrifices are more like losing exchanges. For a sacrifice to be sound we should have a big plus for one side with a strong k attack (1 or 2 ps at least). If, for the next 10 plies the score does not go up or a winning continuation is not found, then the engine is at a loss of how to proceed and the solution may be in sacrificing. Do the following: lower for the next 4 plies the values of the attacking pieces by one fourth so that the q will be around 7ps, the r 3 something, n and b around 2.25. Then return the score to normal. In that way, in the course of those 4 plies the engine might consider to exchange q for a r, a r for a piece or a piece for one or 2 ps which might be the actual and only solution. If nothing is found then go back to normal proceedings.

Weakened pawn shelter in relation to enemy opposite colour bishop

When all the pawns of the pawn shelter are on squares of one colour with presence of opp. bishop of different colour – a penalty should be given for the shelter or a bonus for the attacking b.

B along the long diagonal

Fixed pawn structure for black – ps on h7, g6, f7, wp on g5, wb along the a1-h8 diagonal - +1.5ps for the b.

B on 6th rank among pawns of the shelter

Bps on h7, g6, f7, e6, wb on f6 - +2ps for the bishop. There is a big likelihood of mating king attack.

Q and n attacking a weakened king shelter

In the case of a weakened king shelter of the type – bps on h7, g6, f7, with white queen along the long a1-h8 diagonal and the knight placed on a square attacking the weakened f6 and h6 squares (eg. on e4, g4, d5) – the knight will be assigned value of 4.50.

Restricting attacked king mobility

With the assaulted king (usually with sacrificial attacks) having access to the center or the other side where it can take shelter, + 50 for a move with a minor piece or usually a rook cutting the access points of the enemy king.

Rook behind passed pawn - +50

+1p for a p directly pressuring the enemy king position – eg. wpf6, bps f7,g6,h7, bkg8; +1p for the f6 p.

The Tal dimension

Rook on 8th rank pinning a minor piece with king on the other end of the pin - +90

Annihilating activity

If there are at least 2 factors of permanent nature stimulating the attack (eg. open file, pressuring p on sixth rank etc.), then +2ps for the combined action of the 2 factors. If there are 3 factors - +3ps etc. This might compensate for the enemy queen capturing a rook or so.

A pawn on sixth rank with ongoing attack and bare king - +1p

With bare king, +50 for each p that has crossed the center line.

Bare king, destruction of the king shelter - +4ps.

2 bishops attacking the enemy king position - +70

2 knights attacking the king position - +50

With sacrificial attacks, if the attack continues after pawns and pieces have been swapped, +2ps for the ability to continue conducting the attack.

Passed p on seventh rank with king attack - +2ps.

+30 for a rook on a central fourth or fifth rank

+5 ps for battery of type b and q if the opp. pawn shelter can not prevent the penetration of the q

+90 for minor piece on sixth rank directly affecting the enemy king position (eg. wbh6 or wnh6, bkh8, bps h7,g6)

Founded disregard for less active pieces

With king attack going on, -50 for any own minor piece and -60 for own rook that are not directly involved in the attack (this could lead to sacrificing those pieces in order to gain some tempos for the attack)

Rook prevailing over 2 minors

With sacrificial exchanges of 2 minors for opp. rook and maybe pawn and king attack - +2ps for the r if one of the minor pieces can not defend the king position within 2 moves.

Other

How we patzers used to win against older engines on slower hardware (and still sometimes do against newer engines on faster hardware)

Closed center with king attack - +2ps

Closed center with pawns storming the enemy king position, at least one of which is on the fifth rank, especially if part of the structure of the pawn center - +3ps (eg. wps c4,d3,e4,f5, bps c5,d6,e5. g4 will follow and white attack will become crushing. Black should at all costs take ef4 when f4 is played)

Incapacitating pawns

With king attack, +20 for taking opposition with a heavy piece against the enemy k with pawn in between (eg. wkg1, wpg3, bqg6). In this way attacking moves like nh4 or rh4 become possible.

Diagonal pins of pawns with king on the other end of the pin

Usually with king in the center - +20 for the pin, eg. wbh5 or wqh5, bpf7, bke8.

With relatively open position, +20 for the king of the attacking side going to a square where it cannot be checked.

Pins

+30 for bishop pinning a knight and +50 for rook pinning a knight or bishop (as there are bigger chances of gaining something with a pin along the file)

Blockade

Blocking a passed pawn

N or b blocking a passer - +30

Queen blocking a passer - - 50

For r irrelevant

(Not sure if all engines do that – 20 Elo)

Blocking a pawn that is not passed

This concerns a p that is not a passer but has no enemy ps on its file to promotion

+ 30 for a b or n taking the square in front of the p; + 20 for a rook (maybe most engines do not do that – 10 Elo)

Blocked pawns on initial position

+90 is given for ps blocked on the second rank, the blocker being n,b or r. Eg. wpe2, bne3 or bre3

If the blocker is a pawn, the bonus will be 1p (eg. wpd6, bpd7).

Piece configurations

+ 30 for a r along an open file

Tandems

+35 for two rs on the seventh rank

+ 30 for two rs along an open file

+ 30 queen and r along an open file

+ 30 for q and b along a diagonal (10 Elo)

+ 75 for a diagonal battery b plus q when the battery is pointed at the enemy king position (25 Elo)

Triplets

+50 for q and 2 rs along an open file

Opposition of pieces

Rook on a file against the enemy queen with one or more own/enemy pawns/pieces in between - +20 for the r.

General activity

+20 for a r on semi-open file

Two rooks on central e and d files with ongoing activity in the center - +50

With only one open thoroughfare for rook activity (eg. d file), +60 for opp. minor piece controlling the square of access to the file (eg. wbb6 or wnc6 controlling the d8 square.) – valid also for endgame

Losing tempo

+15 for attacking enemy q with ps or pieces

+10 for minor piece attacking rook

+5 for pawn attacking minor piece

Initiative

The concept is a bit tricky but important

Center of activity, active, inactive flanks, sides

When black has huge space advantage on the queen side and other factors in its favour on that part of the board (like mobility etc) but the pawns structure is blocked (eg. wps a3,b2,c3,d4 ; bps a4,b3,c4,d5) we shall evaluate only the pieces on or exerting pressure on the other side (where for example on the king side white has space advantage – p on e5, bps e6,f7; also greater mobility, attackers so on). In this way, although some engines might evaluate the position as about equal based on calculating the parameters for all pieces, the pieces present on the queen side are mere observers and it is useless to value them in any way. So that factually w should have huge, winning advantage.

(I think many strong engines do not know that – 30Elo)

Clash points

This is another concept for initiative I think most engines do not understand.

A clash point or a focal point is a point on the board around which the main and currently most important activity is centered. It might be a disputed pawn, fighting for a square or concentration on some spot attacked and defended. In this way this is the most important battle currently going on. Whoever wins it is likely to gain advantage, maybe decisive. In the fight for this clash point only a definite number of pieces are actively involved (in most cases

3 to 5 for both sides) so that factually they have much greater weight on the position and should be evaluated higher proportionally to other pieces on the board, say by a factor of 1.1. This will help the engine know where the focal points are and how it should strive for initiative.

For example, we have bp on d6, defended by b on f8, r on d8 and n on b7, while it is attacked by white r on d1, b on g3 and n on e4. We assume this will be the focal point. In that way we multiply the different parameters for each of the enemy pieces involved in the battle for the focal point by a factor of 1.1. This should give their real value in comparison to other pieces on the board.

(50 Elo if properly implemented)

Learning from Kasparov

+1p for one more piece developed and chances of king attack

+1p for activity on both sides

Sacrificing pawns

Endgame

+1.5 ps for gaining a permanent advantage consisting of one factor (eg. control of files or bishop pair)

+2.5 ps for gaining a permanent advantage consisting of 2 factors (eg. control of file and bishop pair)

Vectoral intersections

A bonus of +20 will be given for a square into the enemy camp occupied by enemy p on which diagonal or linear vectors of pieces meet. It would not matter if there is another enemy piece along the vector. Eg. wpb2, wnc3, brb8, bbg7 - +20 for the intersection of the r and b on b2. Or there might be a q on d4, or re2. If the point of intersection is a square of the enemy king position, the bonus will be +60.

Counterplay

In the case that an engine has a low, maybe a losing score, then it is useless trying to defend the weak spots or just shuffling around as this strategy will only increase the eval. for the opp. side with time with the presence of factors like space advantage, higher mobility, so on. Instead the engine should try to seek counter chances on the other end of the board where its score should be decent. In that case measuring separately the scores for the k and q sides might be indicated. If w has lost position on the q side, then the game may not be lost and the fight continue if white decides to launch a k attack. Give a factor of 1.2 or 1.3 in case of a bigger negative score for all attacking pieces. In this way the engine will prefer to counterattack instead of just defending. Or, in the case of a low w score on the k side with black attacking, seek counter chances on the opposite side, launching pawn storming of the enemy q side to open files – give +20 for every wp on the 6 or 7th rank. Thus the engine might prefer not to simply defend.

Prevention of counterplay

If one of the sides is in firm control of the center and the other has to do a pawn thrust in order to try to destroy the enemy control, then +50 is given for an additional pawn control of the square the enemy pawn is thrust to; and +20 for an additional piece control of that square (eg. wps e4,d5,c4, bps c5,d6,e5; in order to prevent bpf5 wpg4 would be indicated or placing of a knight on e3 or bishop on d3)

Trapped pieces

In the case that a piece is into the enemy camp surrounded by pawns and pieces and has less than 3 free squares to go where it is not captured for the r or b, less than 4 free squares for the q and only 1 or no free squares for the n – then a penalty of one third the value of each piece is given. Thus the q will be valued by 6ps, the r by 3ps, the n and b by 2 ps. The eval. will look much more realistic.

Weak squares-bridge points/loss of squares-control of squares

In the case of central (e4,d4 for white), semi-central (e3,d3) or the squares c3, c4, f3, f4 into the own camp that are not controlled by own pawn and the number of enemy pieces controlling the square is greater than the number of own pieces, then – 50 for the central squares, -35 for the semi-central and -20 for the other squares, or a plus of same magnitude for the opp. side.

Unreasonable retreats

Black knight or bishop on d8 or e8 - -40

Different types of opposing configurations

Bishop vs knight

+15 for the b as a general rule since the configuration can endure into the endgame
-5 for each fixed pawn on a square the colour of the bishop, -10 in the case of a pawn of the focal center (i.e. the squares e4,e5,d4,d5)

Same rules for bishop and knight vs 2 knights apply.

Same colour bishops

-5 for each fixed pawn on a square the colour of the bishop, -10 in the case of a pawn of the focal center

Opposite colour bishops

+50 is given to the weaker side so that the engine might eventually consider trading one of the bishops for a knight with escape chances.

Unhealthy mutual piece positioning

-25 for two knights defending each other unless they are fighting for access to a strategically important square

Positional peculiarities

Bad pieces

Pawn bishop

With fully reduced activity of a b by own ps, eg. bbd6, bps c5,e5,c7,e7 - -1.5ps for the b

End-file knight

A n on an end a or h file (usually on 4th or 5th rank) with no free squares to go because of enemy ps - -50

Useless attackers

-50 for a well-positioned piece that cannot influence the fight (eg. bnb3 with bps a4,c4,d5, wps a3,b2,c3,d4, wbe3) usually because on this part of the board the position is closed and the

main battle is on the other end of the board. This could be recognized by where the pawn structure is fixed and where not. A bonus for transferring the n into the right direction.

Erroneous activity

-50 for attacking a p that is well defended. This just loses tempos.

Imprisoned queen

In the case that a q is restricted to some part of the board by own and enemy ps and pieces but has some free squares to go, -5ps if the material equivalent of the enemy pieces able to attack the q exceeds 9ps.

Building a stonewall

With score advantage for the enemy side and big pawn chains, +1p for placing all one's ps on squares of the same colour with at least 2 of the ps being on squares of the focal and wider center (eg. f5 and d5 or e5 and c5). Thus enemy activity could be considerably restricted.

Endgame

General Principles

Mobility

Same as in middlegame

Space advantage – same as in middlegame

Pawn Structure

Isolated p - -40; double isolated ps - -40 for each p

Double p when it is part of a group of 3 or more - -35

Structures of the type wp a5, bps a6, b7 - -35 for the b7 p

Passed pawn - +50

Passer to the seventh/second rank - +70

Protected passed pawn - + 75

Two connected passers - +50 each plus +75 for the tandem

Pair of bishops – pawn structure irrelevant, except passers

Doubling is not counted if one of the double ps is an advanced passer. (also middlegame)

Prospective passed pawns

In the event of existing pawn structures on one of the sides or in the center of the type 1 versus 2 ps, 2 versus 3 or 3 versus 4 ps, when the surplus p is a prospective passer - + 25 for the surplus p.

+25 for controlling the square in front of a passed pawn

Bishop guarding the square on which an advanced passer promotes - +40

Position of the King

Wk on c3, d3, e3, f3 - +25

K on c4, d4, e4, f4 - +35; K on fifth rank - +50; K on sixth rank - +75

Other general principles and rules of thumb

If all pieces are on just one part of the board and the score for the side that is better is not bigger than +70, then – draw

If the play is on two sides and the score for the side that is better is more than +40, then – the better side is winning. Indicated is measuring the scores for both sides separately, especially the space advantage; +50 for a move on that part of the board where the score for the better side is lower (that concerns piece activity, but especially improving one's pawn structure, gaining space advantage, etc.). Same principle applies with activity in the center and one of the sides. Note: this is the famous two weaknesses principle.

Fixed/semi-fixed pawn chains

In the case of fixed or semi-fixed pawn chains (of the type wps g3,f4,h4, bps h5,f5,g4) the rule of thumb is attacking the root pawn of the chain – g3 for w, h5,f5 for b. +25 for such a move. The rule holds true for all types of endings.

Access to penetration points

With big fixed pawn chain, usually on both sides, +50 for a heavy piece landing on a square into the enemy camp that is not defended by the enemy pieces (the so called penetration points). Although the engine might not see at first a decisive advantage, it will come with time as the pressure increases

Quiet defence

-30 is given for any pawn moves on a side where the defending side has pawns in minority. This will only lead to creating new weak spots.

King attack

If there are pieces on the board materially equivalent to or surpassing 9ps (no queens), then +50 for a move attacking the position of the king. Often such attacks will be essential.

Symmetrical defences

In endgame, +35 for achieving a symmetrical pawn structure if being the weaker side (at least what concerns pawn placements on files).

Dead pins

In the case that a rook manages to pin a minor piece (n or b) with opp. rook on the other end of the pin (eg. wre8 pins bbc8, bra8) so that it is very difficult for the weaker side to free itself without some kind of losses - +75 for the pinning rook. Some engines seem to neglect such developments.

Negatively valued passed pawn

Only in the case of central d or e pawns – if the passer has already advanced into the enemy camp (eg. bpe4,e3 or bpd4,d3) and the enemy king is 2 squares closer to the p than the own k – then -70 for the passer is given as it is almost certainly going to fall. The rule holds true for all kinds of simple and composite endings, excluding queen where other factors influence the position too. Some engines seem to miss that as they do not see the p fall in 8 or 10 moves.

Blockade

The principles of middlegame will apply.

Blocking minors when part of pawn structure

With fixed pawn chains and minors being part of the pawn structure,

+80 is given for n blocking enemy p, and +60 for b blocking enemy p, if it still retains good mobility (eg. wps a4,b3, d5, wnc4, bps a5,b4,c5,d6; or wps a4,b3, wbc4, bps a5,b4,c5). Usually the blocking position will ensure a passer on the other side of the board or in the center.

Different types of endings

Simple endings

Pawn endings

For this type of endings specific values for the pawn structure apply

Outside passer - +1p

Structures of the type wp a5, bps a6, b7 - +1 for the a5 pawn, when b7-b6 or b7-b5 is close to impossible

Double p in a group of 3 or more - -50

King supporting own passer - +50

Other endings

For those endings the general principles of endgame apply plus some specific parameters

Bishop endings

Same colour bishop endings

+15 for each p on a square of opposite colour of the bishop

+30 for k supporting own passer

+60 for outside passer (eg. bpb5, wpd4 - +50 for the b5 p)

Bad bishop

A bad bishop is when all or most of the pawns of the side with the b are placed on squares the colour of the b, with fixed p chains. Then the advantage of the stronger side is usually decisive.

Same colour bishops

-15 for each p on a square of the colour of own b and an additional penalty of -30 for play on both sides or on one side and in the center

Knight vs bishop

Same as the above rule shall apply.

Opposite colour bishop endings

Same principles apply, except that +60 for k supporting own passer is given

One surplus passer for one of the sides - +50 for that side

Two surplus passers for one of the sides that are connected – draw

Two surplus passers that are separate more than 2 files apart – stronger side wins; otherwise – draw; one exception is when one of the separate passers is on an end file promoting on a square opposite of the colour of the own bishop – then draw, if the king of the weaker side keeps access to the square of promotion

Three connected surplus passers – stronger side usually wins; draw, if the passers are straddled, eg. bps f5, e6, d5, and the opp. king and bishop control the square in front of the root passer, or in the case of a e6, f5, g4 structure, the opp. king controls the square in front of the middle pawn of the chain

Knights endings

Distant, outside passer - + 50

King supporting passer - +30

+50 for fixing a backward pawn – eg. wpg5, bps g6, h7, -50 for the h7 p

+2ps for composition of type wpa5, bnb7 with white move as the knight can not stop the passer after a6

+25 for a knight guarding the square of promotion of own advanced passer

Bishop versus Knight endings

+15 for each p on a square of opposite colour from that of the bishop

+30 for the b if the play is on both sides of the board

+30 for k supporting passer

With play on both sides and less than 3 ps each - +50 for the b side

Immobilized knight

Composition b vs n with the n having no free squares - +60 for the b (eg. wna1, bba4 or bna7, wbd7)

Rook endings

+30 for a rook on open file

+50 for k supporting own passer

+50 for r behind own passer

+30 for r behind enemy passer

R stuck with defence of own p - -85 for the opp. side (eg. wpa5, bpa6, wr sixth rank, br a8 - -85 for the br)

Rook on seventh/second rank when there are 2 or more enemy pawns on it - +40

Cutting the access of the enemy king to the center with a move along a file or rank - +50; if the access of the king is denied already for the seventh/second rank or a file next to the end one of the board a bigger bonus would be indicated – say +70.

+2 ps for a passer 2 squares closer to promotion than enemy passer

Many engines severely underestimate passers

Shut-out rook

With all types of simple and composite endings with rooks a penalty of 1.25 ps is given if a rook cannot be transferred to the other side of the board within 3 moves because its movements are restricted by the existing structure of own and enemy pawns.

Endings of type k and 3 ps each on the k side, wk on second rank, wra8, bra1, bpa2, with the end a pawn being useless as the rook has no mobility at all and the bk cannot support the own passer as it will be permanently checked from behind by the wr – draw

3 pawns and r vs 2 pawns and r on one side of the board – draw

Invalidated rook

+60 for a unique composition of type brb8, wpb7, wbc8

Queen endings

+50 for pawn shelter of the k consisting of 3 ps

-20 for shelter of 2 ps; -50 for 1 p

+20 for k supporting own passer

Otherwise, -80 for king staying apart from own passer on the other end of the board where it can be perpetually checked.

Different types of opposing configurations

Queen versus rook

Only in the case of q vs r and p of the type wkg1, wpg2, wrf3, where black cannot penetrate into the f1-f3-h3 zone – draw. Other cases lost for the r side.

Queen vs two rooks

Q and passed p vs two rooks – draw

Q and 2 passers vs 2 rs – q side wins

Queen vs 3 minor pieces

If the minor pieces are badly coordinated - +2ps for the q side, almost certainly winning material

Q vs n and 2 bs – draw

Q vs bishop and 2 ns - +75 for the q side

Queen vs r, n and p - +50 for the q side

Queen vs r, bishop and p – draw

Rook vs two minor pieces

R and p vs 2 bishops – the b side wins except in special cases

R and advanced passer vs b and n – draw; in the case of distant advanced passer, say wp on a7 or b7 or a6/b6 – small plus for w - +35

R and advanced passer vs 2ns – draw or +50 for the r side if the passer is distant

R vs pawns

R vs 3 passed ps still into the own camp – r wins

R vs 3 central pawns – r wins

R vs 3 ps at the end of the board (f,g,h) when at least 2 of the passers have gone into the enemy camp with well placed k supporting them – draw

R vs 2 advanced passers on fifth and sixth rank with kings on the opposite side of the board – draw or win for the r side if the r is behind the more advanced p; the r side loses if the r does not stay behind the more advanced p.

Minor piece vs 3 pawns

Knight vs 3 connected passers - +50 for the p side

Knight vs 3 ps 2 of which are connected – p side wins

Knight vs 3 separate passers – p side wins

Bishop vs 3 pawns

3 connected passers - +25 p side

2 connected and one separate passer – p side wins

3 separate passers - +50 p side

Note that this is true only for simple endings. If there are more minor or other pieces on the board, then the proportion is reverse with the rest of the pieces being able to attack the ps and I would give a small plus for the side with a piece more, say +25. Other factors, like presence of 2 bishops should also be taken into account.

Some rules for some very basic endgames

I know that most engines are using nowadays tablebases, but it may be that the user does not have those, or does not want to install them. In order that the engine does not look extremely stupid, it must know at least some very basic examples.

Pawn endings

K and p vs k

K before own pawn - +50

K taking opposition - +50

Endings with end pawn are drawn if the enemy k has access to the promotion square

K and 2 connected passers vs k and 2 connected passers

Draw, except in very special occasions

K and protected passer vs k and 2 connected passers – draw; it would be wise to give an additional bonus of say +75 for the protected passer as some engines think the side with the 2 passers has big advantage.

K, bishop and end file pawn vs k

The game will be drawn if the pawn promotes on a square of opposite colour the colour of the bishop and the enemy king controls that square.

K, rook and p vs k and rook

If the king of the weaker side is in front of the enemy pawn – draw; otherwise, if it lags behind – stronger side wins

K, rook and 2 ps vs k and rook

If the passers are separate – stronger side wins; one exception – if the passers are f and h pawns - +50 for the stronger side, but the result may vary depending on different factors

If the passers are connected, stronger side usually wins; one exception is when the passers are end and next to end file ps, eg. g and h, still have not passed into the enemy camp or only one of them has done so and the enemy king has managed to straddle them – then draw

K and queen vs k and p

Stronger side wins except in special cases.

P on end file or c and f files advanced to the rank next to promotion with the king next to his p and the enemy k placed on a distant square – draw as self-mate comes to the rescue

K, rook and p vs k and minor piece

The stronger side wins except in one rare occasion

K, r and f file pawn vs k and bishop

If wp is already on f5, wkg4, r say on e2, with a dark-coloured bishop for black guarding the f6 square in front of the p and the bk also controlling that square – then draw as a kind of fortress is achieved

Minor piece and 2 connected passers vs rook

Usually the game will end in a draw.

+50 for the b side when the passers are already into the enemy camp and are central e and d pawns

+35 for the knight side under the same conditions

+35 for the b side when the passers are already into the enemy camp and consist of one central p and a p on a file next to it

+25 for the knight side under the same conditions

If the passers are still into the own camp, then +35 for the b side if the passers are central; otherwise draw.

2 ps and minor piece vs 1 p and minor piece on one side of the board or in the center – draw, except when the proportion is knight and 2 ps vs bishop and p on a square the colour of the bishop in the center with active king for the stronger side (eg. wps d4,e5, wng4, bpe6, bbb3 with wk on f6 and bk on d7). In this case white must win.

K, bishop and rook vs k and r

+4ps for the stronger side

K and 2 knights vs k

Draw

K and 2 bishops vs k and n

+2 ps is given for the pair

K, bishop, knight and p vs k and r

+5ps for the stronger side

K, b and n vs k – mate possible only in that corner of the board with corner square the colour of the bishop

Composite endings

The general principles of endgame as well as the different types of simple endings specific parameters apply

Different types of composite endings

2 rook endings

+50 for doubling the rooks on the second/seventh rank

Queen and knight vs queen and bishop

I would give a small plus for the q and n tandem (in the range of +10), sometimes even not

Queen and rook vs queen and rook

No penalty for double pawns of whatever kind.

+35 for a move of the rook on a file next to the enemy king, if pawn sheltered – eg. wkg2, wps f2,g3 - +35 for brh8 or bra1

Rook and bishop vs rook and bishop of opposite colour

+75 for attacking a pawn with the r and b defended by the enemy k and r – eg. wkg2, wpf2, wrf1, bbd4, brd2 – the advantage will be decisive as the rook is stuck to passive defence and the bishop helpless.

Rook and other minor pieces each with pawn directly pressuring the enemy king position

+50 for the configuration with the pawn – eg. wpf6, bps f7,g6, bkg8

Passed pawn races

With 2 separate passers each, or 2 connected passers each, or one side having 2 connected and the other 2 separate passers - +70 if the more advanced passer of one side is 2 squares closer to promotion than the more advanced passer of the other side, and +30 with same conditions and just one square closer. +50 for the more advanced passer of the second pair if 2 squares closer to promotion than opp. more advanced passer of second pair, and +20 if just 1 square closer. The rule is valid for all types of endings.

Importance of central passers (valid also for middlegame)

+30 for a passer on a central d or e file

+20 for a passer on semi-central c or f files

The only exception would be pawn endgames.

It is interesting that most of the engines I know completely ignore this rule.

Special positional techniques

Fortress

Middlegame

Existence of a fortress

With big fixed pawn chains, one single consisting of 5 ps or more, or 2 separate consisting in all of 5 ps or more, when usually there are only one or two open files through which the enemy pieces can penetrate the opp. camp, if all the points of penetration are well defended by the weaker side – draw. The stronger side may have very big advantage in score based on spatial factors but the game is a draw. Many engines do not recognize this and think they are largely winning.

Endgame

Natural Fortress

A natural fortress is one when one of the sides has a considerable advantage based on activity of the king, space, etc. but with all the access points into the own camp being guarded by pawns or pieces. In this case it would be wise to give +75 for a construction of the own pieces guarding all access points – the game is a draw.

A good example for that is a b vs knight ending when for eg. black whose king will be less active, places his knight in a way to guard the central squares of one colour, and a pawn guarding the central squares of different colour so that the enemy king will not be able to penetrate (a n on e7 with a p on d6 will be a good construction).

Building a fortress

This is a special drawing technique when one of the sides has a considerable material advantage. If the weaker side manages to place its available pieces in a way establishing a zone, usually square, but sometimes also rectangular in shape, or with 2 bishops triangular, into which the enemy king cannot penetrate – then it would be advised, for simple endgames, to give a bonus of +3ps for the weaker side as the game is drawn.

Most often examples will include endings with q for the stronger side, eg. pawn and rook building a fortress, or 2 bishops building a fortress, or n and b shutting the enemy king out. Two knights building a fortress is close to impossible less for the pawn structure.

Another possibility would be to have 2 minor pieces and pawns building a fortress with the presence of 2 enemy rooks. The game will be drawn as sacrifices will lead to other drawn endings.

Perpetual check

Middlegame

When one of the sides has considerable advantage, + 80 for a move destroying the enemy king shelter and checking the king; the possibility for giving a perpetual would increase.

Endgame

Only in the case of queen and p endings, when one of the sides is with advantage, eg. trying to promote a pawn with the support of the own q, then +50 for a move with the q of the weaker side acceding to a square from where it can check the enemy king on the next move.

Passivity of pieces

Middlegame

Passivity restricted by own pawns

Often some pieces have more of an observer status. If all of the own ps are placed in way to restrict fully the play of a piece so that it does not have a move – then -2ps for that piece. (Most often it will be a knight or bishop; eg. bnb8, bps a6,c6,d7 fixed by wps; in this way the n will be fully useless until some major changes occur)

Passivity restricted by own king/shut-in rook

This will usually be the case of a k fully restricting the mobility of own r more or less permanently – eg. bkg8, brh8, bpsh7,g6,f7, wbh6 - +3ps for a move of the wb on h6, fully restricting the r, or -3ps for the r.

Passivity restricted by enemy pawns

This more or less results in the same consequences, but it is now the enemy ps that restrict the activity of the piece. Eg. bba8, bps c7, b6, wps c6,b5 - -2ps for the a8 bishop as it can come into the battle only if sacrificed for a p. Often some engines do not take this into account.

Endgame

More or less the same penalties should be assigned for full or almost full passivity.

Passivity restricted by own pawns

This is the more rare case, but sometimes engines do commit such mistakes – eg. wbh2, wps g3,f2, bps g4,f3 - -2.5 ps for the wb as it is fully useless and in endgame this counts even more.

Passivity restricted by enemy pawns

This occurs more often and even strong engines sometimes ignore it. Eg. bbh7, bps f6,e5, wps f5, e4, d5 – the bishop on h7 is useless for the moment - -2.5 ps for the b, because even if sacrificed for a pawn white advantage will be huge and bigger than 2 ps.

Optimal positioning of pieces

Endgame

If one of the sides has an advantage less than 0.50 ps and does not see a way of increasing it – then check the positioning of own pieces and if there is a way of placing some of them better - +20 for landing on such a square, even if it takes some time (in many endgames time is not that important, more important is to have all of the pieces actively positioned). This might open the eyes of some engines for an existing win.

Positional sacrifices

Endgame

Exchange sacrifice

If one of the sides has an advantage but does not see a way of increasing it – then +50 for an exchange sacrifice if with that the better side gains some other small assets – eg. wps d5,c4,

bps d6,c5, bbd7. +50 for wre6. Then after bxe6, dxe6 instead of the exchange white will have 2 small assets – a passer on e6 and a penetration point into the enemy camp (the d5 square) through which the wk can pass. In endgame most often 2 small assets are worth more than a single bigger one as with time the 2 small ones are going to increase – therefore a bonus for such development is indicated. The assets gained could be an open thoroughfare, more active placement of the king or far bigger mobility.

Congestion of pieces

If 3 or more pieces of one side are placed on squares within a square shape of 3 squares length (eg. within h7-h5-f5-f7), then -50 for this constellation in the middlegame and -30 in the endgame. Usually those pieces will not only have far lower mobility, but will also have a very bad coordination and stand in the way of each other.

Control of thoroughfares

Only concerns heavy pieces fighting for control of an open file.

+5 for each own p controlling a square along the file into the own camp not controlled by enemy ps; +10 for the same conditions if the square controlled is in the enemy camp.

+35 for a knight on central square (eg. d5 or e5) protected by 2 own ps and with no enemy ps being able to attack it or placed in front of it. The exchange of that knight would result in a passer.

Powerful bishop

Bishop on a square of the focal center protected by 2 own ps and with no enemy ps being able to attack it or placed in front of it. +50 The exchange of that bishop would result in a protected passer.

Dominating knight

That would be a knight on a square of the focal center (usually with closed structures) protected by 2 own ps, with no enemy ps being able to attack it and no enemy minor pieces having the possibility to control the square the n is on within 2 moves. +50 Usually it would be wise to give a bonus for a second knight controlling the indicated square.

Beauty in chess

Gandalf cross

Pawn structures of type e3,d4,f4,e5. I have watched this in games of Gandalf. The structure is very sturdy, the root pawn cannot be attacked from ahead, and usually the doubling is compensated by open files, etc. Even if objectively a bonus should not be applied to this structure, I would give +20 for the sheer looks of it. (Envision placing a bishop on e4)

Serpentine

Pawn structure of type c2,b3,c4,d5 – I would give +10 even if the structure could be somewhat deficient in some respects

Checkers-type structure

Eg. bps e7,g7,f6,e5,g5. Of course, at least -50 is indicated for the double doubling, but it looks interesting.

Sturdy bastion

Pawn shelter consisting of 2 rows of 2 pawns each – eg. bps g7,f7,g6,f6. I would give +50 for a fourth pawn and -30 for the doubling, so that a bonus of +20 would result.

Mighty triplets

Triplets of heavy pieces along an open file in the exact order r,q,r (eg. brd8,bqd5,brd2). This is awe-inspiring. Apart from the triplets bonus a bonus of +20 for the exact ordering is given.

Alternating battery

2 bishops and q on diagonals next to each other pointed at the enemy king position (eg. bbb6, bbb7, bqc6). Big bonus is indicated.