What is Zung Jung?

Zung1 Jung4 is the Confucian book about the "Doctrine of the Mean" or the "Middle Way". It is also the name of a mahjong scoring system which has been developed in accordance with the Confucian doctrine. This is the official website for the Zung Jung Mahjong Scoring System.

The Zung Jung Mahjong Scoring System is included as one of the playable rules sets at Mahjong Time on-line mahjong game website.

Resources:

- •Forward
- •Zung Jung Mahjong Scoring System (v3.3)
    - •Basic Rules
    - •The List of Patterns
    - •Quick List (for print-out; chapter from book)
- •FAQ
    - •Miscellaneous mahjong rules for standard Zung Jung (a chapter from my work-in-progress book)
    - •"Freedom of Count" rule
- •Variants for casual family play
    - •The Uniform Payoff Scheme
    - •Zung Jung with bonus tiles
- •Miscellaneous articles
    - •The Selection Criteria for the Patterns in Zung Jung
    - •The Deeper Meaning of the Name "Zung Jung"
    - •Teaching Children to Play Zung Jung
    - •The Zung Jung average
- •Copyright Notice and Terms of Use

Forward

(English version)

Alan Kwan

In recent years, there have been some movements towards organizing international mahjong competitions. One obstacle is the variety of different mahjong rules, in particular different scoring systems, in different countries and areas. For the purpose of international competitions, the development of a scoring system which can be used as the international standard is paramount.

However, we have to admit that, we have yet to see a scoring system that truly

suffices as an acceptable international standard. The best known among the "international" systems is the one published by the Chinese Goverment in 1998; yet sadly, while that system is backed by 'official authority', its *contents* are not up to par as an international standard: not only is it overly complicated for wide propagation, but also it has many obvious problems subject to criticism (such as "self-draw inflation"). Its acceptance has been reluctant - and on a very limited scale, being conveniently ignored by the masses of mahjong players in China, Japan, and Hong Kong.

Zung Jung has been in development for over a decade, having started earlier than the Chinese Official system and others. As its name indicates, it aims to be a system of just the right amount of complexity, adopting enough patterns to provide the strategic challenge and excitement sought by veteran players, without including too many patterns and making the system too difficult to learn. The rules are clear and simple. The systematic categorization of the patterns, also, enhances the ease of learning. Zung Jung is suitable not only for international competitions, but also for casual family entertainment; this is a key prerequisite for wide propagation and acceptance. Our aim is to promote mahjong as a game for *everybody*; only a system which is simple enough to be learned and played by everybody, can become widespread and attract a larger player base and audience, and be widely accepted as a true international standard. What is the meaning in trying to promote worldwide a "sport" that needlessly restricts itself to a select few to begin with? How can spectators retain interest in watching a competition they cannot understand?

Zung Jung aims to be an international standard fair for players from different countries. It accomplishes this *not* by picking up bits and pieces from here and there, but by referring back to the historical, original versions of mahjong. There is little doubt that the classical, complex "triplet-point" counting system is outdated, and that the fun and excitement of modern mahjong lies in the scoring patterns. Dropping the former in favor of the latter has been the general trend in the evolution of mahjong scoring systems everywhere. However, local developments in different countries have added to the game not only the patterns, but also various local 'peculiarities' which, if adopted by an international rules set, would render it unfair to foreign players. By studying the original forms of mahjong, one can distinguish between desirable developments and local peculiarities, and eliminate the latter to produce a fair rules set.

The Zung Jung Mahjong Scoring System is being adopted by the World Series of Mahjong competition.

The Patterns in Zung Jung

There are a total of 44 patterns in 10 categories.

1.0 Trivial patterns

1.1 All Sequences (平和) : 5
The hand contains 4 sequences; no triplets/kong.
(There are no other restrictions as to the eyes pair, single call, or concealed hand.)

1.2 Concealed Hand (門前清) : 5
A regular hand which is concealed, without melding any exposed sets before winning. Winning on discard is okay. Concealed kong are okay.

1.3 No Terminals (斷□九) : 5
The hand consists entirely of middle number tiles (2 to 8); no terminals or honors.

2.0 One-Suit patterns

2.1.1 Mixed One-Suit (混一色) : 40
The hand consists entirely of number tiles in one suit, plus honor tiles.
2.1.2 Pure One-Suit (清一色) : 80
The hand consists entirely of number tiles in one suit.

2.2 Nine Gates (九蓮寶燈) : 480
A 9-way call hand, with "1112345678999" in one suit in your hand, and winning on any one tile in the same suit.

3.0 Honor Tiles

3.1 Value Honor (番牌) : 10 per set
A triplet/kong of Seat Wind (your own Wind) or Dragons.
Note: in Zung Jung the Prevailing Wind is not recognized.

3.2.1 Small Three Dragons (小三元) : 40
Two triplet/kong of Dragons, plus a pair of Dragons as the eyes.
Example: , , (eyes)
(This hand always includes two Dragon triplets, so it scores at least 40+10+10=60 points.)
3.2.2 Big Three Dragons (大三元) : 130
Three triplet/kong of Dragons.
, ,

(This hand always includes three Dragon triplets, so it scores at least

130+10+10+10=160 points.)

3.3.1 Small Three Winds (小三風) : 30
Two triplet/kong of Winds, plus a pair of Winds as the eyes.

Example: 西西西 , 北北北 , 東東(eyes)

3.3.2 Big Three Winds (大三風) : 120
Three triplet/kong of Winds.

Example: 東東東 , 南南南 , 北北北

3.3.3 Small Four Winds (小四喜) : 320
Three triplet/kong of Winds, plus a pair of Winds as the eyes.

Example: 東東東 , 西西西 , 北北北 , 南南(eyes)

3.3.4 Big Four Winds (大四喜) : 400
Four triplet/kong of Winds.

東東東 , 南南南 , 西西西 , 北北北

3.4 All Honors (字一色) : 320
The hand consists entirely of honor tiles.

4.0 Triplets and Kong

4.1 All Triplets (對對和) : 30
The hand contains 4 set of triplets/kong; no sequences.

4.2.1 Two Concealed Triplets (二暗刻) : 5
The hand contains two concealed triplets/concealed kong.

4.2.2 Three Concealed Triplets (三暗刻) : 30
The hand contains three concealed triplets/concealed kong.

4.2.3 Four Concealed Triplets (四暗刻) : 125
The hand contains four concealed triplets/concealed kong.

4.3.1 One Kong (一槓) : 5
The hand contains one kong. (Irrespective of whether it is exposed or concealed; same below.)

4.3.2 Two Kong (二槓) : 20
The hand contains two kong.

4.3.3 Three Kong (三槓) : 120
The hand contains three kong.

4.3.4 Four Kong (四槓) : 480
The hand contains four kong.

5.0 Identical Sets

Identical sets are sets in the same suit in the same numbers. Obviously, only sequences can be identical.

5.1.1 Two Identical Sequences (一般高) : 10
Two sequences in the same suit in the same numbers.

Example: ,

5.1.2 **Two Identical Sequences Twice (兩般高)** : 60

The hand contains two groups of "Two Identical Sequences".

Example: , , ,

5.1.3 **Three Identical Sequences (一色三同順)** : 120

Three sequences in the same suit in the same numbers.

Example: , ,

5.1.4 **Four Identical Sequences (一色四同順)** : 480

Four sequences in the same suit in the same numbers.

Example: , , ,

6.0 Similar Sets

Similar Sets are sets in the same numbers across 3 different suits.
In Zung Jung, all 3 suits must be present; 2-suit patterns are not recognized.

6.1 **Three Similar Sequences (三色同順)** : 35

Three sequences in the same numbers across three different suits.

Example: , ,

6.2.1 **Small Three Similar Triplets (三色小同刻)** : 30

Two triplets/kong in the same number in two different suits, and the eye pair in the same number in the third suit.

Example: , , (eye)

6.2.2 **Three Similar Triplets (三色同刻)** : 120

Three triplets/kong in the same number across three different suits.
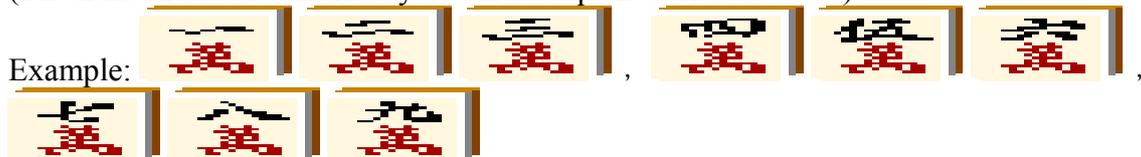
Example: , ,

7.0 Consecutive Sets

Consecutive sets are sets in the same suit in consecutive numbers. The patterns here require three or more such sets.

7.1 **Nine-Tile Straight (一氣通貫)** : 40

A "123" sequence, a "456" sequence, and a "789" sequence, all in the same suit.
(The hand must contain exactly the three sequences listed above.)

Example: , ,

7.2.1 **Three Consecutive Triplets (三連刻)** : 100

Three triplets/kong in consecutive numbers in the same suit.

Example: , ,

[ ] [ ] [ ]

7.2.2 Four Consecutive Triplets (四連刻) : 200

Four triplets/kong in consecutive numbers in the same suit.

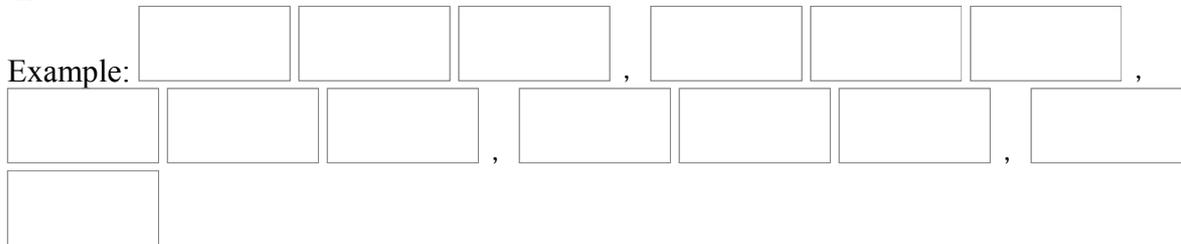Example: [ ] [ ] [ ] , [ ] [ ] [ ] ,

[ ] [ ] [ ] , [ ] [ ] [ ]

8.0 Terminals

Terminals are the 1 and 9 number tiles.

The *Greater* patterns consist of terminal tiles only, while the *Lesser* patterns include also "123" and "789" sequences.
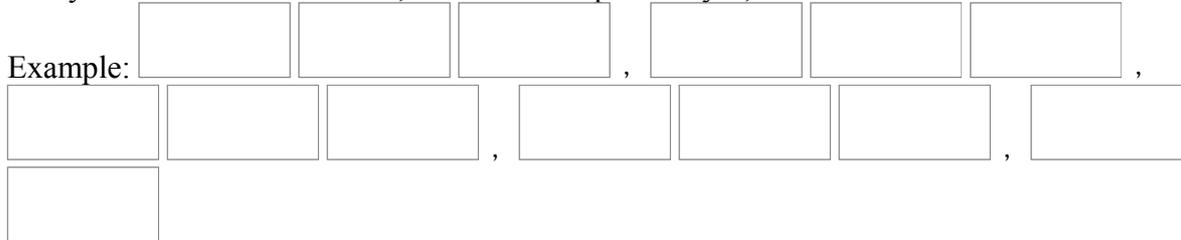
8.1.1 Mixed Lesser Terminals (混全帶么) : 40

Every of the 4 sets in the hand, as well as the pair of eyes, includes a terminal tile or an honor tile.

Example: [ ] [ ] [ ] , [ ] [ ] [ ] ,

[ ] [ ] [ ] , [ ] [ ] [ ] , [ ]

[ ]

8.1.2 Pure Lesser Terminals (純全帶么) : 50

Every of the 4 sets in the hand, as well as the pair of eyes, includes a terminal number tile.

Example: [ ] [ ] [ ] , [ ] [ ] [ ] ,
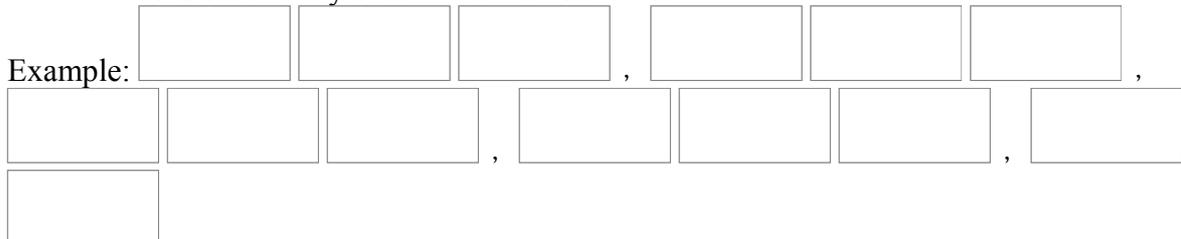
[ ] [ ] [ ] , [ ] [ ] [ ] , [ ]

[ ]

8.1.3 Mixed Greater Terminals (混么九) : 100

An "All Triplets" or "Seven Pairs" hand which consists entirely of terminal tiles and honor tiles. (Not applicable to a "Thirteen Terminals" hand.)

Example: [ ] [ ] [ ] , [ ] [ ] [ ] ,

[ ] [ ] [ ] , [ ] [ ] [ ] , [ ]

[ ]
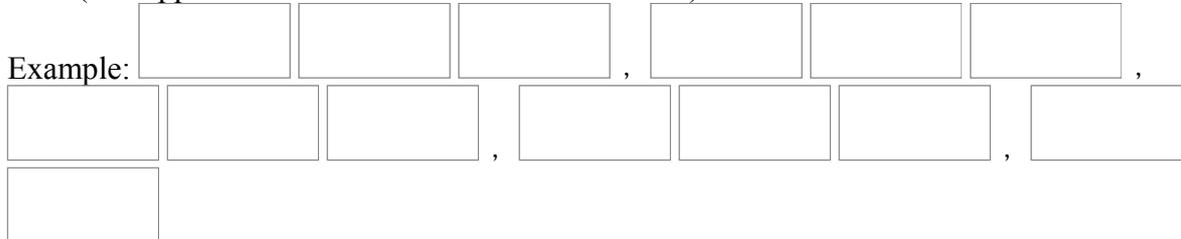
8.1.4 Pure Greater Terminals (清么九) : 400

The hand consists entirely of terminal number tiles.

Example: [ ] [ ] [ ] , [ ] [ ] [ ] ,

[ ] [ ] [ ] , [ ] [ ] [ ] , [ ]

[ ]

9.0 Incidental bonuses

Lucky bonuses for winning on rare opportunities.

9.1.1 **Final Draw (海底撈月)** : 10
   Self-draw win on the "seabed" tile (the last tile in the wall, excluding the king's tiles).
9.1.2 **Final Discard (河底撈魚)** : 10
   Winning on a discarded "riverbed" tile (the last discard by the player who has drawn the seabed tile).

9.2 **Win on Kong (嶺上開花)** : 10
   Self-draw win on a "supplement" tile (after declaring a kong).
   (If the supplement tile is also the seabed tile, both patterns can be counted.)

9.3 **Robbing a Kong (搶槓)** : 10
   Winning by robbing a kong (when another player makes a "small exposed kong").

9.4.1 **Blessing of Heaven (天和)** : 155
   East winning with his initial 14-tile hand.
   (Does not count if East has made a concealed kong.)
9.4.2 **Blessing of Earth (地和)** : 155
   A non-East player calling with his initial 13-tile hand, and winning on East's very first discard.
   Does not count if East has made a concealed kong.

10.0 Irregular Hands

Irregular Hands are hands that do not consist of 4 sets and a pair. Irregular hands do not count for "Concealed Hand".

10.1 **Thirteen Terminals (十三么九)** : 160
   Among the 13 types of terminals and honors, the hand contains one pair of one type, and one tile each of the other 12 types.

10.2 **Seven Pairs (七對子)** : 30
   The hand consists of seven pairs.
   Example: ☐☐ , ☐☐ , ☐☐ , ☐☐ , ☐☐ , ☐☐ , ☐☐
   Four identical tiles can count as two pairs as long as kong is not declared.
   A Seven Pairs hand cannot count those patterns which specifically require triplets, kong, or sequences. But it can count other patterns which do not have such requirements.

-- End --

Zung Jung: a Perspective of Mahjong History

Appendix G: Zung Jung Mahjong Scoring System (v3.3)
Quick List of Patterns

This quick list is for print-out and reference during play. Please set the print format yourself; try to print on a single page. (Page-flipping during play will leak one's intentions.)

```
1.1       All Sequences          :    5
1.2       Concealed Hand         :    5
1.3       No Terminals           :    5

2.1.1     Mixed One-Suit         :   40
2.1.2     Pure One-Suit          :   80
2.2       Nine Gates             :  480

3.1       Value Honor            :   10 per set
3.2.1     Small Three Dragons    :   40
3.2.2     Big Three Dragons      :  130
3.3.1     Small Three Winds      :   30
3.3.2     Big Three Winds        :  120
3.3.3     Small Four Winds       :  320
3.3.4     Big Four Winds         :  400
3.4       All Honors             :  320

4.1       All Triplets           :   30
4.2.1     Two Concealed Triplets      :    5
4.2.2     Three Concealed Triplets    :   30
4.2.3     Four Concealed Triplets     :  125
4.3.1     One Kong               :    5
4.3.2     Two Kong               :   20
4.3.3     Three Kong             :  120
4.3.4     Four Kong              :  480

5.1.1     Two Identical Sequences     :   10
```

```
5.1.2   Two Identical Sequences Twice :   60
5.1.3   Three Identical Sequences      : 120
5.1.4   Four Identical Sequences       : 480


6.1     Three Similar Sequences        :   35
6.2.1   Small Three Similar Triplets   :   30
6.2.2   Three Similar Triplets         : 120


7.1     Nine-Tile Straight            :   40
7.2.1   Three Consecutive Triplets     : 100
7.2.2   Four Consecutive Triplets      : 200


8.1.1   Mixed Lesser Terminals        :   40
8.1.2   Pure Lesser Terminals         :   50
8.1.3   Mixed Greater Terminals       : 100
8.1.4   Pure Greater Terminals        : 400


9.1.1   Final Draw          :   10
9.1.2   Final Discard       :   10
9.2     Win on Kong         :   10
9.3     Robbing a Kong      :   10
9.4.1   Blessing of Heaven  : 155
9.4.2   Blessing of Earth   : 155


10.1    Thirteen Terminals  : 160
10.2    Seven Pairs         :   30
```

Zung Jung Mahjong Scoring System (v3.3)

中庸麻雀計分法 (v3.3)

(English version)

Alan Kwan

Introduction

"Zung Jung" means "the Middle Way" as in Confucian doctrine. "Zung Jung" ("Zung1 Jung4") is (Cantonese) "Jyut Ping"; the "j" has a "y" sound.

Zung Jung is designed to be a pattern-based mahjong scoring system. As the name suggests, the system tries to include enough patterns for interesting, strategic play, while maintaining its simplicity and ease of learning.

Basic Rules

1. Only the winning hand is scored. The winning player collects points corresponding to the value of his hand, from the other three players according to the "payoff scheme".
2. The 44 "patterns" in Zung Jung are listed in the "List of Patterns" document. Each pattern specifies a certain condition; for fulfilling the specified condition, the winning hand scores the specified point value. There are no "basic points" in Zung Jung; a hand scores only for the patterns it contains.
3. The patterns are organized into **categories** and **series**. In the numbering, the first number indicates the category, and the second number indicates the series (within that category). For example, "3.3" indicates the "Honor Tiles" category and the "Winds" series.
4. **Additive Rule**: When the winning hand fulfills the conditions for multiple patterns, the value of the hand is generally the sum of the values of the relevant patterns. (The multiplicative "Faan" system is not used.) You can count all patterns contained in the hand (even if one of them "implies" another), provided that they belong to *different series*. You cannot count multiple patterns from the same series, nor can you count the same pattern more than once. ("3.1 Value Honor" is an exception: you can add 10 points for each set of value honors in your hand.) As an example, a hand with "Four Concealed Triplets" is always also a "Concealed Hand" and an "All Triplets" hand, so such hand always scores at least 125+5+30=160 points.
5. **Minimum Requirement**: In standard Zung Jung, there is no minimum point requirement for winning; any hand which qualifies as a "winning hand" (a "regular hand", or one of the "irregular hands" listed in category 10) may win. A hand which does not contain any patterns (called a "chicken hand") scores a

token 1 point. There is an official variant in which there is a 5-point minimum requirement for winning; a chicken hand may not win, and will be considered a "false win". (This variant may possibly be adopted by the World Series of Mahjong event; please refer to the official website of WSoM for details.)

6.**Maximum Limit**: There is a "limit" of 320 points. If the hand contains multiple patterns of which values add up to 320 or more, the hand scores 320 points (called a "Compound Limit Hand"). But if the hand contains a pattern which has a listed value of 320 or more (called a "Listed Limit Hand"), it scores the single highest-valued pattern in the hand. (It scores for one single pattern only.)

Payoff Scheme

1.**Fixed Payoff Principle**: The total income of the winning player is determined solely by the total value of the patterns in his hand. It will not fluctuate just because the player luckily self-draws. The payoff scheme here specifies how this payment should be split among the three other players.

2.The **Zung Jung Formal Competition Scheme** is adopted. The winning player's total income is always 3 times the pattern value of his hand.

3.**Everybody pays for self-draw**: When the winner self-draws, no one is "responsible". When no one is responsible, the payment is split equally among the three other players: each player pays the winner 1 time the total pattern value of his hand.

4.**Discarder pays for big hands**: When the winner wins on discard, in general the discarder is "responsible" (exception explained below). 25 points is taken to be the standard score value; for small hands of 25 points or less, the three players split the payment equally (regardless of who is responsible), and each player pays the winner 1 time the total hand value. For a big hand of over 25 points, each player first pays the winner 25 points, and then the responsible player pays the rest of the balance (so that the winner receives in total 3 times his hand value). For example, if the winning hand is 70 points, the two non-responsible players each pay 25 points, and the responsible player pays the remaining 160 points. The winner gets in total 210 points, which is exactly 3 times 70 points.

5.**Rule of Same-Round Immunity**: When the winner wins on discard, if in the same round (starting from and including the winner's previous discarded tile, until before the win) another player has just discarded the same tile as the winning tile, then the discarder will not be "responsible" for having followed with the same discard. If it is the winner who has just discarded the winning tile, then no one will be considered responsible (the three players split the payment equally). Otherwise, the player who first discarded the winning tile in the same round (after the winner's previous discard) will be considered responsible.

Zung Jung: a Perspective of Mahjong History

Chapter 1 ~ Zung Jung Mahjong Scoring System (v3.2)

Section 2: Miscellaneous Rules

Due to many variations in recent mahjong rules, this section lists some standard rules for Zung Jung. (These are *recommended* standard rules and are not strictly mandatory for those who wish to play their house variants, although it is recommended not to temper with the first three rules.)

The winning hand

A regular hand consists of four sets (each set being a sequence, a triplet, or a kong) and a pair. A hand must conform to either a regular hand or an irregular hand (listed in category 10) in order to win. The patterns in categories 1 through 9 do not define the winning hand; a hand which satisfies a pattern requirement without conforming to a winning hand cannot win. For example, an "All Honors" hand can win only if it is a completed regular hand or a "Seven Pairs" hand.

Freedom of Count

If there are multiple ways of arranging the concealed tiles in order to compose the winning hand, the winning player may freely choose an arrangement which one feels is best for oneself, and score the hand according to that arrangement. A hand may only be scored according to one arrangement; patterns from different arrangements cannot be both counted. (For example, a hand cannot score both

"Three Identical Sequences" and "Three Consecutive Triplets", nor both "Two Identical Sequences Twice" and "Seven Pairs".)

Concealed Triplet

With regards to series #4.2 "Concealed Triplets", a triplet is considered "concealed" if all three tiles are drawn from the wall (including during a self-draw win), and is "exposed" if one of the tiles is claimed (through "pong" or "win on discard") from another player's discard while two tiles are drawn from the wall.

Win with any completed hand; no "sacred discard" prohibitions

The "rule of same-turn immunity" replaces any "sacred discard" and such prohibitions. One may win whenever he has a completed hand; there are no sacred discard prohibition rules in force. Nor are there any similar prohibitions concerning pong/kong claims.

Passing the deal

The deal is passed after every hand. East never repeats the deal. (This rule helps control the length of a session.)

Dead Wall

The dead wall consists of 14 tiles; 14 tiles remain unused at the end. The 15th last tile in the wall is the "seabed" tile and is the last tile drawn from the wall. After that player discards (and if no one wins on that tile), the hand ends as no-win.

Interception

Classical "interception" rule applies in case of competing "win" claims. (The upper-and-lower-seat interaction is a standard mahjong tradition, and to read other players' tiles so as to evade the upper seat and block the lower seat should be considered a skill.)

Immediate disclosure of concealed kong

A player who declares a concealed kong must disclose all four tiles immediately for the purpose of verification.

No special privilages for Thirteen Terminals

A Thirteen Terminals hand enjoys no special privilages. It cannot rob a concealed kong, and it can be intercepted by any other hand.

Robbing a Kong considered win on discard

"Win on Kong" is considered a self-draw win. "Robbing a Kong" is considered win-on-discard. (For big hands, this affects how the payment should be split.)

---

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"Freedom of Count" rule

A question I frequently receive is: "If the hand can be arranged in multiple ways so as to form the sets to compose the regular hand, how should it be scored?" The following hand is an example:

 win on:
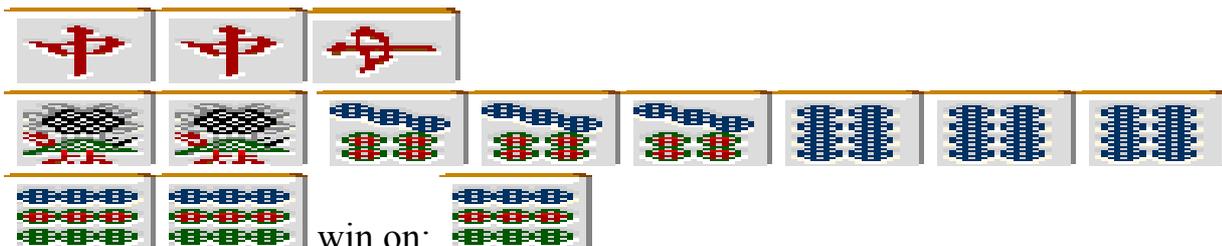
To answer this question, we need to refer to the "Freedom of Count" rule. This is supposed to be a basic mahjong rule, so it has not been included in the Zung Jung documents.

Freedom of Count (自由數和):

If there are multiple ways of arranging the concealed tiles in order to compose the winning hand, the winning player may freely choose an arrangement which one feels is best for oneself, and score the hand according to that arrangement. A hand may only be scored according to one arrangement; patterns from different arrangements cannot be both counted. (For example, a hand cannot score both "Three Identical Sequences" and "Three Consecutive Triplets", nor both "Two Identical Sequences Twice" and "Seven Pairs".)

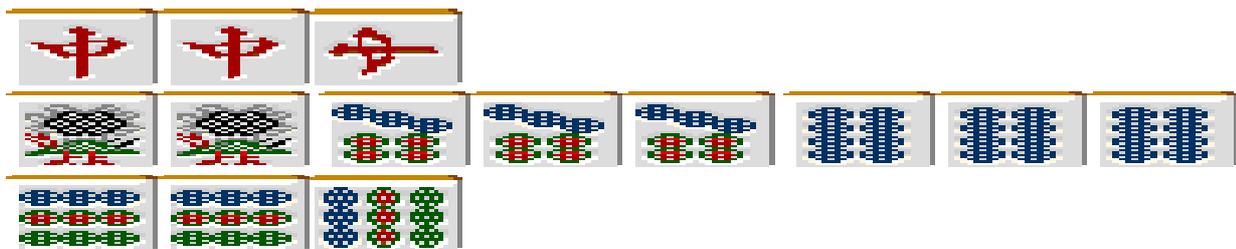Let's looking at the sample hand above. Assume that the hand wins on a discarded . There are two ways of arranging the 3x3 block: either as Three Identical Sequences, or as Three Consecutive Triplets. We can choose the arrangement which gives the higher score. Let's compare them:
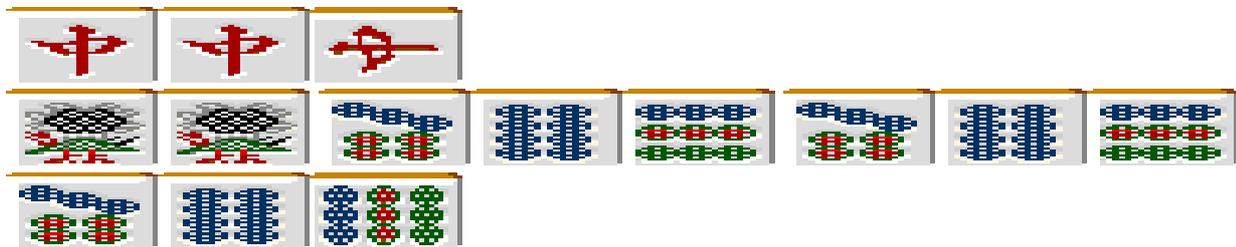
```
 120   Three Identical Sequences
  40   Mixed Lesser Terminals
  10   Red
 ---
 170
```
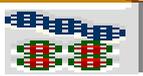

```
 100   Three Consecutive Triplets
  40   All Triplets
  10   Red
   5   Two Concealed Triplets
 ---
 155
```


For this case, we can see that "Three Identical Sequences" would score more points. Thus, the hand should be scored as "Three Identical Sequences", for 170 points.

Note that the patterns in the two lists differ, and not only in the first pattern. The identical sequences qualify for Mixed Lesser Terminals, but the consecutive triplets

don't (the and triplets are not terminal triplets). And of course the identical sequences don't qualify for All Triplets. This example should illustrate the rule clearly enough. In practice, concealed 3x3 blocks themselves are rare enough, and the combination with Lesser Terminals even rarer; Three Consecutive Triplets would usually yield more points if the fourth set is a triplet (because you can count "All Triplets"), otherwise Three Identical Sequences would usually score more (because of its higher explicit value).

An interesting fact is that, if the win is on a self-drawn , then the consecutive triplets would score barely more points, because of "Three Concealed Triplets":
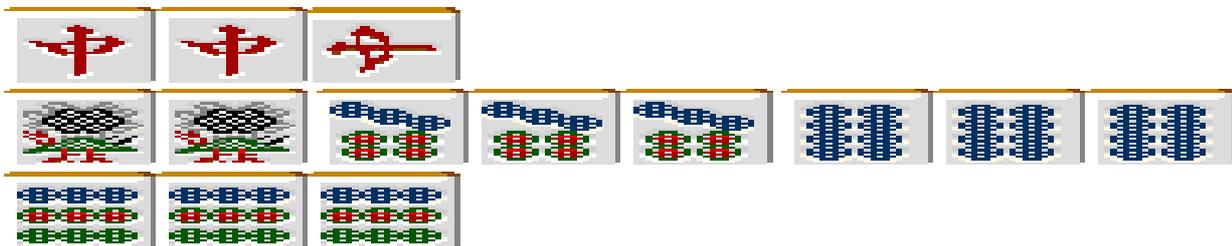
```
 100   Three Consecutive Triplets
  40   All Triplets
  10   Red
  25   Three Concealed Triplets
 ---
 175
```

Thus for the self-draw win, the hand would score 175 instead of 170.

On a side note, the above hand is actually calling for three tiles: , and . Among the three possibilities, gives a much bigger score than the others. gives "All Triplets" but without "Three Consecutive Triplets", while gives only "Two Identical Sequences", for a puny 20 point hand (with the Red).

The case with a concealed "Two Identical Sequences Twice" hand is simpler. Two Identical Sequences Twice always scores more than Seven Pairs, so you can go ahead and score the hand as Two Identical Sequences Twice, without considering Seven Pairs.

The Uniform Payoff Scheme

The "<u>Basic Rules</u>" document lists the **Formal Competition Payoff Scheme**. That scheme is ideal for formal competitions: it punishes the player who carelessly discards to let a big hand win, while encouraging the classical tactic of letting an

opponent win with a small hand in order to prevent another opponent from winning a big hand ("tactical alliance"). It gives the players the most room to exercise their skill, and also serves to prevent collusion to some extent.

In casual family play, the players may not necessarily be at such a high skill level, and for them it may be more important that the game is fun and exciting. The**Uniform Payoff Scheme** described here serves to enhance the fun and excitement factor (at some sacrifice of the skill factor), by encouraging the players to be more aggressive in building bigger hands. It also has the advantage of being much simpler and easier to teach. In a casual family playing environment, especially among novices, you may consider using the Uniform Scheme instead of the Formal Competition Scheme.

Rules

1.**Everybody pays**: Whenever a hand is won (regardless of how), every other player always pays the winner 1 time the total pattern value of his hand. Thus the winner collects a total income of 3 times the hand value.

And that's it!

The Use of Bonus Tiles

Bonus tiles contribute little to the skill factor of the game, but adds more luck and also some rules complexity too. Thus they are not used in formal competitions.

In casual family play, some players may want to use the bonus tiles, to add some flavor to the game. These rules explain how the bonus tiles can be used with the Zung Jung scoring system.

The standard set of 8 bonus tiles are used. They are divided into two groups of 4 tiles each; the groups are called "Flowers" and "Seasons" for convenience. In each group, the 4 tiles are each "proper" to one of the 4 different seats. Thus each seat has one proper Flower and one proper Season, and 6 "improper" bonus tiles. The common mahjong rules for declaring and replacing bonus tiles should be followed.

Bonus tiles are counted as the 11th category. These patterns are all cumulative with no exclusions (regardless of series). Thus, a complete set of 4 Flowers (a "bouquet") would score:

10 (Four Flowers) + 4 (Proper Flower) + 2 + 2 + 2 (3 Improper Flowers) = 20 points

And a hand with all 8 bonus tiles would score 40 points for them.

A hand with any bonus tiles is not a chicken hand, and does not get 1 point added for chicken hand.

11.0 Bonus Tiles

11.1.1 **Improper Flower/Season (□□)** : 2 per tile
    A flower/season tile which is not proper to one's seat.
11.1.2 **Proper Flower/Season (正花)** : 4 per tile
    A flower/season tile which is proper to one's seat.

11.2.1 **Four Flowers (齊四花)** : 10
    A complete set of all 4 Flower tiles.
11.2.2 **Four Seasons (齊四季)** : 10
    A complete set of all 4 Season tiles.

(Note: Playes who wish to use flowers, but want them to be of lesser weight, may agree to halve all the point values listed above.)

Selection Criteria for the Patterns

(English version)

<div align="right">

Alan Kwan

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The set of patterns adopted by Zung Jung are largely based on that of Modern Japanese mahjong. But the ultimate decision of which patterns to adopt is not just arbitrary personal preference, but rather, the selection process follows a set of objective criteria:

    1.**Traditional Patterns**: Patterns traditionally and widely adopted by major existing scoring systems, such as the One-Suit patterns, "All Sequences", "All Triplets" etc. are mostly adopted obligatorily.
    2.**Coherence and Consistency of the Hand**: The patterns should reward hands which demonstrate extra coherence and consistency, such as "Pure One-Suit", "All Triplets", "Two Identical Sequences", "Three Similar Sequences" etc. Patterns which, on the contrary, reward inconsistency or "mixture" in the hand are rejected, such as "13 Unconnected" (later evolved into "Honors and Knitted Tiles"), "Five Suits" ("All Types"), "Fully Exposed Hand" ("Melded Hand"). Also, patterns which are too easy and worthless are discarded, such as "Single Wait", "2/5/8 Eyes".
    3.**Symmetry**: The patterns should preserve the symmetry among the 34 types of tiles, such as the symmetry among the three suits, or between the three Dragons, or between Ones and Nines (up and down), etc. Reject the patterns which are based on the drawings on the tiles, such as "All Green" and "Reversible Tiles". Avoid specifying certain numbers as the basis for patterns (except for the Terminals in category 8), thus rejecting "All Fives", "All Even", "Upper/Middle/Lower Tiles" etc. Finally, because the Prevailing Wind will

generate the Double Wind, causing asymmetry and even unfairness among the four players, it is rejected. (Many players do not know that, the Prevailing Wind was not adopted in mahjong since the beginning, but rather was a later addition in the process of 'inflation'.)

4.**10 Categories**: After the above selection process, the patterns are gathered into 10 categories. The patterns in these 10 categories are considered for adoption, while those outside the 10 categories are rejected, such as "Mixed Straight", "Shifted Chows" etc. (Those patterns demonstrate weaker coherence and consistency than the patterns in the 10 categories.)

5.**Logical Consistency of the List**: Each category is sorted into one or more series. For the sake of logical consistency, once lower patterns in the series are adopted, the higher patterns must always be adopted (such as "Three/Four Identical Sequences"). Conversely, the lower patterns in the same series are considered, and "Big/Small Three Winds", "Small Three Similar Triplets" etc. are adopted. Two-set patterns which are too easy and would increase the compexity of the exclusion rules are rejected, such as "Two Similar Sequences", "Two Similar Triplets", "Old and Young" etc. Among this type of two-set patterns, only "Two Identical Sequences" (which demonstrate the strongest consistency) is adopted. "Original Call" would increase rules complexity, and is thus rejected.

6.**Incidental Bonuses**: Incidental Bonuses (category 9 patterns) add little to the skill factor of the game, but their inclusion does add color and flavor, and also some excitement. Thus, their point values are set at lower levels than other patterns with comparable frequencies of occurence. This way, the above advantages can be obtained without adding too much luck to disrupt the skill factor. "Self-draw", which has a very high rate of occurence, is of course discarded without any doubt.

The Deeper Meaning of the Name "Zung Jung"

(English version)

Alan Kwan

"Zung Jung" means "the Middle Way" as in Confucian doctrine. "Zung Jung" ("Zung1 Jung4") is (Cantonese) "Jyut Ping"; the "j" has a "y" sound.

On the surface, "Zung Jung" means to be "moderate": neither being inadequate nor going overboard. As a pattern-based scoring system, Zung Jung endeavors to adopt just the right amount of patterns, enough for interesting, strategic play as a game of

skill, while simple enough to be learned easily and played for family entertainment.

On a deeper level, the Confucian doctrine of "Zung Jung" tries to suggest a way of life that is just and unchanging. The ideal man (the "true man") should live a life of righteousness and justice, not going into stray paths; and he should live that way at all times, and not behave differently when in private versus in public, nor be easily tempted into wrongdoing.

And therein lies the deeper meaning of the name "Zung Jung" for the mahjong scoring system. When one studies the development history of mahjong scoring systems, one will eventually come to asking the question: *what if* mahjong had always developed in a unified manner, instead of having different developments in hundreds and thousands of localities? What if the development had always been guided by the wisdom of mathematics, philosophy and history, so that the logical consistency, mathematical balance, and conceptual coherence of the game had never been undermined by local 'peculiarities'? What if the best solution had always been sought in every case, so that the development was along a path of steady improvement, instead of resorting to makeshift methods, which introduced worse problems calling for more fixing later? Zung Jung attempts to provide an answer to these questions; it tries to be the version of mahjong that would have been today's, had the development of mahjong always been along an ideal path.

For example, if during the transition from East-doubling payoff scheme to discarder-doubling, people had been aware that self-draw inflation isn't necessary, the self-draw player would have been receiving 4/3 instead of double payoff, and self-draw inflation would never have come about. Perhaps it could have appeared briefly, only to be quickly corrected by some wise mathematician. In any case, it definitely would not have received such wide propagation as now. And then, to emulate the Classical "pao" rules in an environment with many medium- and high-scoring patterns, while maintaining rules simplicity as much as possible; and to avoid unwieldy fractions (or large multipliers) in the discarder-doubling scheme, while also avoiding the overly defensive game of hiding in turtle shells (abandoning any hand which does not win quickly within a few turns) under the "discarder-pays-all" scheme, the Zung Jung Formal Competition Payoff Scheme would be a very possible eventual result.

As another example, when it was felt that the simple limit system would not suffice in an environment of inflated faan values, it should have been realized that the culprit was not the limit system, but rather the faan system (which broke down in such environment). And thus the solution of adopting an additive system should have been applied, instead of resorting to convoluted "complex limit systems".

And most importantly, to meet the growing desires of players for pattern-centered play, more patterns should have been adopted, and the reward for merely winning taken out, instead of resorting to the illogical minimum requirement for winning. And in order to maintain the conceptual coherence of the game (which also helps to maintain ease of learning), the selection of the patterns should have adhered to some guiding principles, instead of throwing in anything one can think of, as in New Style (or Chinese Official).

It would quickly have been realized that, the three-triplet patterns have a low 'combinatoric ratio' to Big Three Dragons (and are rare in practice too), and therefore should be assigned values on nearby levels.

And the list goes on. *If* mahjong had developed following the way of *Zung Jung* (the Confucian doctrine), free from local peculiarities; if its development had been guided by wisdom instead of ignorance, illiteracy and errors; the mahjong we would have today might well look very much like Zung Jung. And this is what I believe which sets Zung Jung apart from other "international" systems: it has been built on the world of cause, not on the world of phenomena; it attempts to present an international system by emulating unified, ideal historical development of mahjong, instead of merely collecting bits and pieces here and there from various systems and arbitrarily throwing them together. Zung Jung is the 'lost present' of mahjong, and with sincere hopes from its author, its future.

Teaching Children to Play Zung Jung

In Chinese soceity, mahjong is often considered be a family game, and many people would teach the game to children. I myself learned the game as a child, from my family. After all, it's just the "Chinese rummy game".

A full-fledged scoring system is often too complicated for small children. Fortunately, thanks to the category system, Zung Jung can be taught in a step-by-step process.

First, familiarize the child with the basic rules of mahjong: the regular hand, the draw-and-discard mechanism, and the claiming of discards. One method is to start playing with a smaller tile set, and/or with a smaller hand: you can start with only one suit, and then add a second and a third, and finally the honors; and you can start with a 7-tile or even a 4-tile hand, and then progress to the 10-tile hand and eventually to the full 13-tile game. Introduction of a scoring system can wait until one is fully comfortable with the basic rules of play.

The patterns in Zung Jung can be introduced category by category, while offering a consistent and coherent game at each stage. You can add one or two categories in each step, depending on the child's ability. I recommend introducing the categories in a certain order, based on the historical and symbolic significance of the categories. The order is:

- •category 3 : Honor Tiles
- •category 2 : One-Suit
- •category 4 : Triplets and Kong. (One suggestion is to postpone the introduction of the rules for Kong until this stage.)
- •category 8 : Terminals
- •category 1 : Trivial patterns
- •category 5 : Identical Sets
- •category 6 : Similar Sets
- •category 7 : Consecutive Sets
- •category 9 : Incidental bonuses

- category 10 : Irregular Hands

Until the introduction of category 1, there may be a large number of "chicken hands", so you may add the "basic points" of 5 points to all winning hands.

The <u>Uniform Payoff Scheme</u> is recommended until the child has become familiar with all the categories. In fact, in a family playing environment, there is no need to deduct points at all; one just gains points when he wins a hand, and the player with the highest total at the end of the session is the winner.

The above method can also be used to teach the system to adults; bigger steps of three or more categories can be used, and the recommended order can be altered if, for example, the learner has prior experience with certain patterns, such as those in categories 9 and 10.

The Zung Jung Average (中庸平均□)

An average which balances the characteristics of the mean and the median

(English version)

Alan Kwan

This article is not about mahjong. But rather, this is a mathematical paper.

Introduction

Two commonly used "averages" are the *arithmetic mean* and the *median*. The arithmetic mean (hereafter simply "mean") has the advantage that all data values are taken into account, but has the weakness that it is much affected by extreme data values. The median, on the other hand, has the advantage that it is not affected by extreme data values, but the weakness that it largely "ignores" them.

This paper proposes the *Zung Jung average* which tries to balance the two. It has the advantage of taking into account all data values, while alleviating the impact of extreme data values.

Observations

We observe that, the mean satisfies the following equation:

sum (xi - mean(X)) = 0

While the median satisfies the following equation:

sum (sgn(xi - median(X))) = 0

The idea of the Zung Jung average is to use a function which alleviates the impact of large differences (x_i - y) without going so far as to render them all to unity as per the sign function. Hence we use the square root.

Definition

The **Zung Jung average** ZJ(X) is defined as the value y which satisfies the following equation:

sum (sgn(xi - y) * sqroot(abs(xi - y))) = 0

In other words, instead of using the raw value of the differences (as for the mean) or applying the sign function (as for the median), we take their square roots (while preserving the signs).

For a couple of simple examples, if the data values are [0, 0, 1], the Zung Jung average is $1 / (2^2+1) = 0.2$. If the data values are [0, 0, 0, 1], the Zung Jung average is $1 / (3^2+1) = 0.1$.

Computation

The above examples are by no means representative of typical cases. For typical data which contains more than two different values, there is no known closed-form formula computation for the Zung Jung average. The best method for computing the Zung Jung average seems to be using iterated linear interpolation, by evaluating the above formula with approaching values of y until a value which gives a result close enough to zero is found. Since the above formula is a continuous and absolutely decreasing function, this method should be safe and efficient. For most data, the mean and the median should be good starting values for y. However, in some cases the mean and the median can be identical or very close while the Zung Jung average is not between the two; in such case, some other starting values should be used.

The computation is impossibly tedious if carried out manually (even for a small number of data points); this is the main drawback of the Zung Jung average. However, the computation can be easily performed using the computer.

Applications

The Zung Jung average balances the characteristics of the arithmetic mean and the median, and has the strengths of both. Thus, it is a very good and representative average for many practical purposes.

Higher Orders

A variation is to use higher-order roots instead of the square root. This strengthens the characteristic of the median over the mean:

sum (sgn(xi - y) * (abs(xi - y))(1/r)) = 0

Of particular interest is the cubic root (r=3), because with odd-numbered r, the sign of the root is preserved automatically. Whether this would allow for a more convenient method of calculating the average value is an open topic for further research.

sum ((xi - y)(1/3)) = 0

Note that when r=1 , we simply have the arithmetic mean. As r approaches infinity, we approach the median.

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(English version)

Alan Kwan

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