
15.S50 - Poker Theory and Analytics

Introduction

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Course Info

- When: MWF 3:30PM – 5:00PM, Jan 3 – Jan 30
 - Additional Review T/R 3:30PM – 5:00PM 4-159
- Instructor: Kevin Desmond
- Faculty Advisor: Paul Mende
- Level: 3 H Units

Course Info

- All course info will be posted online
- Gameplay
- Assignments
 - Three cases
- Lectures

Grading

- Gameplay
 - Cash in one Beginners Only Daily Turbo
 - or
 - Play in ten Beginners Only Daily Turbos
- Pass all three cases
- Attend at least 6 of 8 lectures

Gameplay

- The gameplay requirement will be completed in a private online league called MIT Poker Theory and Analytics on PokerStars

Club ID ▲	Club Name	Members	Status
557832	MIT Poker Theory and Analytics	345	Observer
606097	PokerSchoolOnline Community	4440	Observer
174248	PS Pro: fatty's dreamte4m	4046	Observer
819773	Showcase: LuvinPoker	1658	Observer
71252	Showcase: PokerGuru	3062	Observer
439262	Showcase: WSOPlay Money	9962	Observer



PokerStars




Play Money



PokerStars



Playing real money games is not allowed from the United States

 Residents of the United States and United States Territories are not permitted to make deposits into their accounts or engage in real-money activity (game play, transfer of funds, or TS trading) from anywhere in the world. They may cash out their balances.

Residents of other nations are not permitted to engage in real-money activity (game play, transfer of funds, or TS trading) while physically located in the United States and United States Territories.

Any attempt to circumvent these restrictions is a breach of the PokerStars Terms of Service. This will lead to your account being closed and your account balance being forfeited.

Click here for [further information on PokerStars and the USA](#).

Click here to read the [PokerStars Terms of Service](#) in full.

I have read and understood this message

OK



Massachusetts Institute of Technology

PokerStars



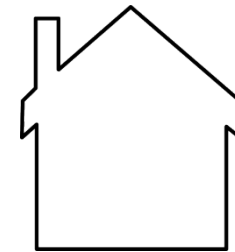
TM



Public Games

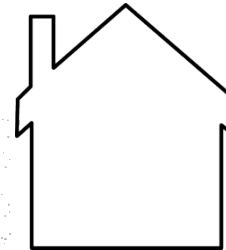



Home Games



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PokerStars MIT League



**HOME GAMES**
[Create a Poker Club](#)
[Join a Poker Club](#)

My Poker Clubs

[Open Club Lobby](#)

Club ID ▲	Club Name	Members	Status
<i>Please login to see private clubs associated with your account.</i>			
557832	MIT Poker Theory and Analytics	378	Observer
606097	PokerSchoolOnline Community	4275	Observer
174248	PS Pro: fatty's dreamte4m	4067	Observer
819773	Showcase: LuvinPoker	1461	Observer
71252	Showcase: PokerGuru	2908	Observer



PokerStars MIT League

Cash Games Zoom Sit & Go Spin & Go **Tournaments** Online Events Live Events Real Money Play Money

Game: No Limit Hold'em Buy-In: High Speed: All Type: Regular

Show Upcoming Only

Special \$5,000,000 GTD Edition of the Sunday Million!
 It's the biggest weekly tournament anywhere online, and for one week only the Sunday Million is having its guarantee boosted to an incredible \$5,000,000, including at least \$500,000 for the winner.
 Buy-in directly for \$215, or qualify now for only \$1.
[Register now](#)

Start	Game	Buy-In	Name	Prize Pool	Speed	State	Enrolled
Dec 28 ...	NL Hold'em	\$215	Sunday Million, \$5M...	\$5M		Registering	2432
Dec 21 ...	NL Hold'em	\$215	Sunday Million, \$1M...	\$1.48M		Completed	7420
Dec 21 1...	NL Hold'em	\$215	Sunday Million II, \$1...	\$1M		Completed	4802
Jan 4 14:30	NL Hold'em	\$215	Sunday Million, \$1M...	\$1M		Registering	84
Jan 11 14:30	NL Hold'em	\$215	Sunday Million, \$1M...	\$1M		Registering	20
Dec 21 11...	NL Hold'em	\$215	Sunday Warm-Up, \$...	\$712.4K		Completed	3562
Dec 21 11...	NL Hold'em	\$215	Sunday Warm-Up II, \$	\$587.8K		Completed	2939
Dec 23 1...	NL Hold'em	\$1,050	Super Tuesday, \$40...	\$531K		Completed	531
Dec 28 11:00	NL Hold'em	\$215	Sunday Warm-Up, \$...	\$500K		Registering	61
Jan 4 11:00	NL Hold'em	\$215	Sunday Warm-Up, \$...	\$500K		Registering	59
Jan 11 11:00	NL Hold'em	\$215	Sunday Warm-Up, \$...	\$500K		Registering	13
Dec 18 ...	NL Hold'em	\$1,050	Thursday Thrill [Pro...	\$437K		Completed	437
Dec 30 14:00	NL Hold'em	\$1,050	Super Tuesday, \$40...	\$400K		Registering	37
Jan 6 14:00	NL Hold'em	\$1,050	Super Tuesday, \$40...	\$400K		Registering	10
Dec 21 1...	NL Hold'em	\$530	Sunday 500, \$300K...	\$379.5K		Completed	759

Registering

\$215 Sunday Million, \$5M Gtd, \$500k+ to 1st

Prize pool: **\$5,000,000.00**
396 places paid

Starts: **14:30 ET Dec 28**
In 3 days 14 hours

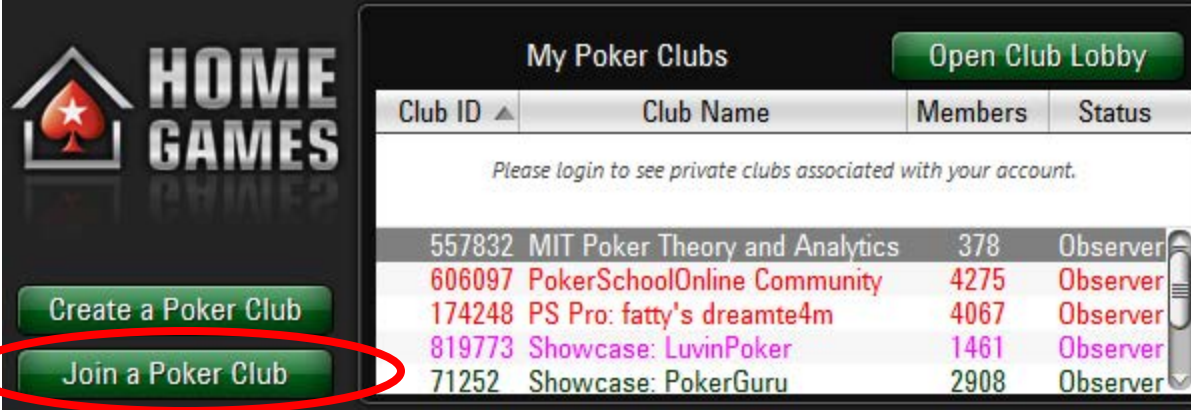
[551 Satellites Available](#)
for as little as \$0.88 or 10 FPPs





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PokerStars MIT League




The screenshot shows the 'HOME GAMES' section of the PokerStars interface. On the left, there are two green buttons: 'Create a Poker Club' and 'Join a Poker Club', with the latter circled in red. On the right, there is a table titled 'My Poker Clubs' with a green 'Open Club Lobby' button above it. The table has columns for Club ID, Club Name, Members, and Status. A message states 'Please login to see private clubs associated with your account.' The table lists several clubs, including 'MIT Poker Theory and Analytics'.

Club ID ▲	Club Name	Members	Status
<i>Please login to see private clubs associated with your account.</i>			
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PokerStars MIT League

Join a Poker Club



Join a Poker Club - if you have been invited to join a private poker club by an existing club member, please enter the Club ID and Invitation Code below, along with your name or comment. If you have not been invited to join a club yet, consider starting your own Poker Club and inviting your friends to join.

[Click here to create your own poker club](#)

Club ID (Number):

Invitation Code:

Your Name:

Privacy Note: Your name or comment above will only be seen by the Club Manager to approve your request to join the club. Please enter a name so the Club Manager will recognize you.

Your identity to all club members will be: **Desmond_MIT**

[Home Games Terms & Conditions](#)

I agree to the Terms & Conditions



PokerStars

- Name Choice
 - Smith_MIT
 - JSmith_MIT
 - JohnSmith_MIT
- Makes it clear who we are playing against
- Avoids getting stuck with embarrassing screen name
 - OMGClayAiken

OMGClayAiken

David Benyamine, Phil "OMGClayAiken" Galfond Biggest Cash Game Winners on Full Tilt in 2008

According to HighStakesDB.com, Benyamine has made over \$3.6 million dollars so far in 2008 (as of August 24th, 2008). Phil "OMGClayAiken" Galfond is in second place, nearly a million dollars behind Benyamine, with a total profit of \$2.75 million dollars.

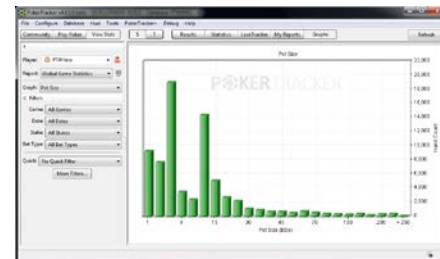
Source: "David Benyamine, Phil "OMGClayAiken" Galfond Biggest Cash Game Winners on Full Tilt in 2008." www.poker-king.com 25 Aug. 2008



PokerStars Hand Histories

```
HH20141123 T1053508533 No Limit Hold'em 900 + 100 - Notepad
File Edit Format View Help
PokerStars Hand #125604214357: Tournament #1053508533, 900+100 Hold'em No Limit
- Level I (20/40) - 2014/11/23 0:11:56 ET
Table '1053508533 5' 9-max Seat #1 is the button
Seat 1: gfro47666 (1000 in chips)
Seat 2: xandilino (1000 in chips) is sitting out
Seat 3: MateyDmitriy (1000 in chips) is sitting out
Seat 4: GOOSE BAY Z (1000 in chips)
Seat 5: Dobby2 (1000 in chips)
Seat 6: BonhamNreno (1000 in chips)
Seat 7: Herbert Sass (1000 in chips)
Seat 8: John_VH925 (1000 in chips)
Seat 9: Desmond_MIT (1000 in chips)
gfro47666: posts the ante 10
xandilino: posts the ante 10
MateyDmitriy: posts the ante 10
GOOSE BAY Z: posts the ante 10
Dobby2: posts the ante 10
BonhamNreno: posts the ante 10
Herbert Sass: posts the ante 10
John_VH925: posts the ante 10
Desmond_MIT: posts the ante 10
xandilino: posts small blind 20
MateyDmitriy: posts big blind 40
*** HOLE CARDS ***
Dealt to Desmond_MIT [8c 6c]
GOOSE BAY Z: folds
Dobby2: folds
BonhamNreno: folds
Herbert Sass: calls 40
John_VH925: folds
Desmond_MIT: folds
gfro47666: raises 280 to 320
xandilino: folds
MateyDmitriy: folds
Herbert Sass: calls 280
*** FLOP *** [Qc 4h Jd]
```

POKERTRACKER™

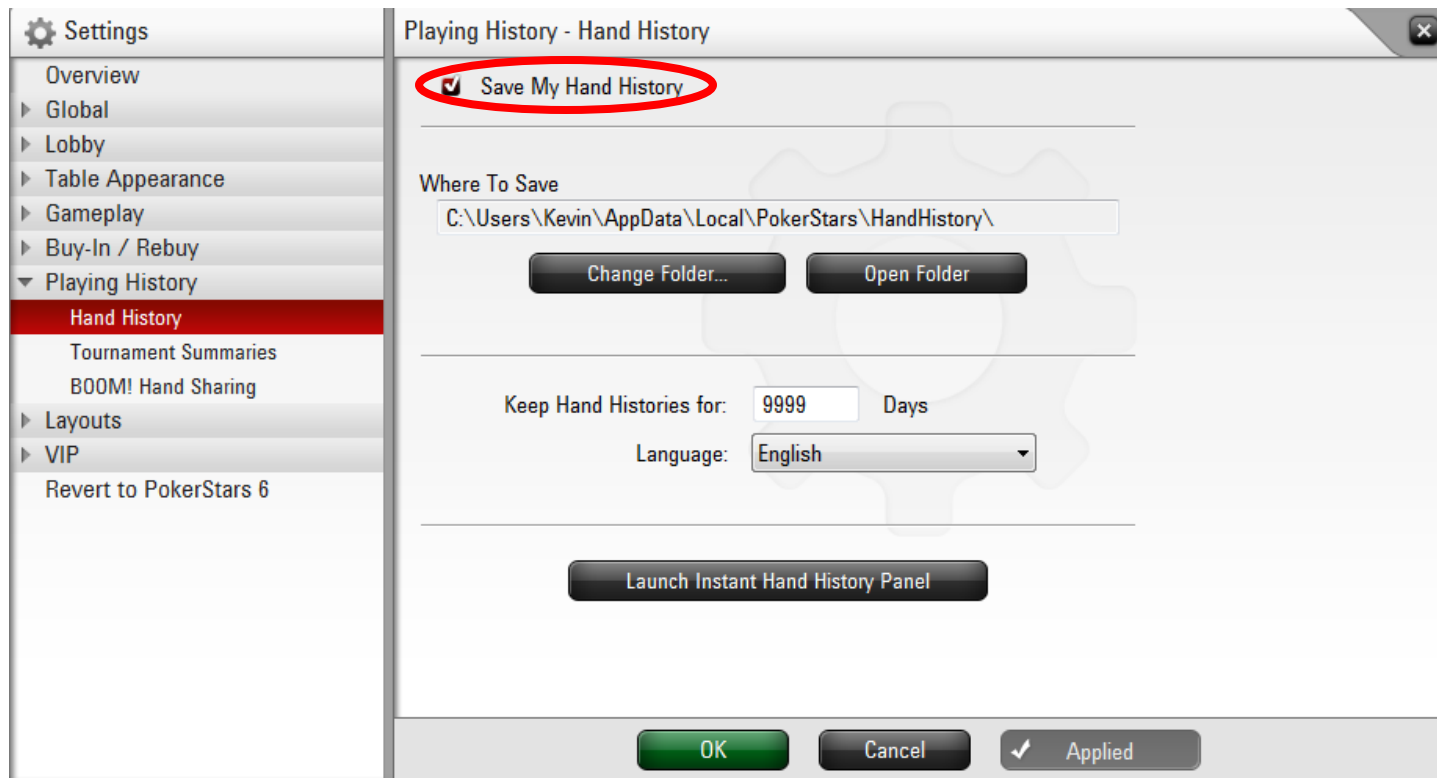


PokerStars Hand Histories

The screenshot shows the PokerStars interface with the 'Tournaments' tab selected. The filter bar at the top shows 'No Limit Hold'em', 'High', 'All', and 'Regular'. A search bar contains 'Find a tournament...'. A promotional banner for the 'Special \$5,000,000 GTD Edition of the Sunday Million' is visible. Below it is a table of tournament results with columns for Start, Game, Buy-In, Name, Prize Pool, Speed, State, and Enrolled. On the right, a detailed view for the '\$215 Sunday Million, \$5M Gtd, \$500k+ to 1st' is shown, including the prize pool of \$5,000,000.00, 396 places paid, and a start time of 14:30 ET Dec 28. A 'Register' button and 'Tourney Lobby' button are at the bottom of the detail view. A red circle highlights the settings gear icon in the right-hand navigation bar.

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PokerStars Hand Histories



PokerStars MIT League

Goals

- Create a competitive online environment
 - to practice techniques from class in real situations
 - to compete against others playing correctly
 - to collect stats to analyze playing styles
- Earn credit for the course via playing poker



PokerStars MIT League

- Total Points determines prize eligibility (top 15 or so)
- Points per Game (PPG) determines order

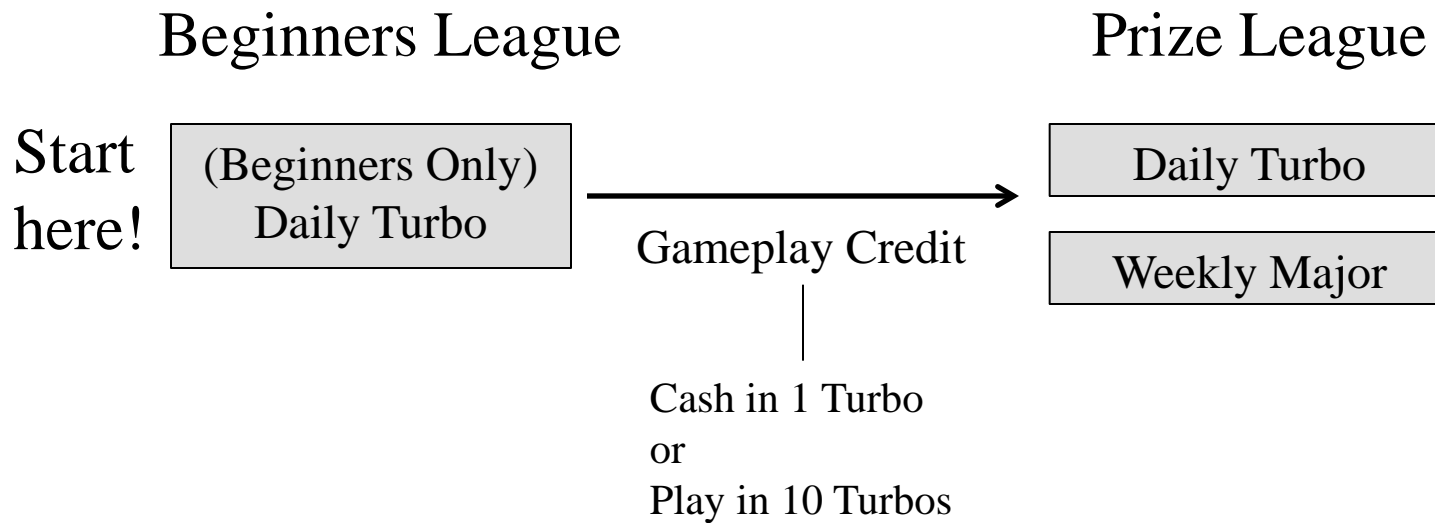


PokerStars MIT League

Beginners Tournament Series (Gameplay Requirement)

- 6PM, 8PM, 10PM (Beginners Only) Daily Turbos every day
- Top 20% cashes
- Passing requirements
 - Cash in at least one daily turbo
 - or
 - Play in at least 10 daily turbos
- Earns no Tournament Leaderboard (TLB) Points
- Every player must start playing Beginners Turbos
- Players graduate to Prize League after one cash

Tournament League Structure



PokerStars MIT League

Prize League

- For players with at least one cash in the Beginners League
- Over 100 tournaments scheduled
- Awards 1 TLB point for each registered player
- Top 20% cashes, but this doesn't count towards anything

Daily Schedule

- 6:00 PM - Daily Turbo (Starting Week 2)
- 7:00 PM - Daily Turbo (Starting Week 2)
- 8:00 PM - Daily Turbo (Starting Week 1)
- 9:00 PM - Daily Hyper-Turbo (Starting Week 2)

Weekly Majors

- Sundays 2pm – Weekly Deepstack Turbo (Real Prizes)

Prize League Sponsors

optiverTM  akunaTM capital 

 **POKER** TRACKERTM  Jane StreetTM

 **SIG**TM
SUSQUEHANNA  CITADELTM  PRISMATATM

League Prizes

- An iPad Mini from Jane Street
- A GoPro from Citadel
- Private coaching from Will Ma
- Kindle Paperwhite and \$100 Amazon Gift Card from Prismata
- A customized poker chip set from SIG
- Lots of books donated by Ed Miller, Jon Tannen, Jared Tandler, Verneer, Doug Zare and Andy Bloch



Weekly Majors

Saturday, Jan 10, 2PM – Major Warm-up (TLB Points Only)

Saturday, Jan 17, 2PM – Akuna Major I

Saturday, Jan 24, 2PM – Akuna Major II



Akuna I Prize Pool

Beats Wireless Headphones

Apple TV

Bose Speakers

\$300 in Gift Cards

Akuna II Prize Pool

iPad Air

iPad Mini

Beats Wireless Headphones

Apple TV

Bose Speakers

\$200 in Gift Cards



Live Optiver Tournament

Saturday Jan 31, 2PM – Optiver Tournament

Optiver Prize Pool



An iPad 4

An iPad Air

An iPad Mini

A PlayStation 4

A Kindle Fire

A GoPro Camera

Bose Speakers

An Apple TV

Beats Headphones

\$400 in gift cards



Schedule

- Basic Strategy
- Analysis Techniques and Applications
- Preflop Analysis
- Tournament Play
- Poker Economics
- Game Theory
- Decision Making



Schedule (Guest Speakers)

- Analytical Techniques (Joel Fried)
- Poker Economics (Aaron Brown)
- Game Theory (Bill Chen)
- Decision Making (Matt Hawrilenko)



How to Study

- C – Fundamental Concepts
- P – Practice
- A – Advanced Techniques





Concepts

- Basic framework for decision-making
- Focus on un-exploitable play
- Solid ABC poker





Advanced Techniques

- Deriving decision rules
- Exploitive play
- Metagame concepts





Practice

- Techniques to apply concepts in real-time
- Developing rules of thumb
- Determining sensitivity of decision rules to rounding
- Identifying factors impacting live performance





How to Define Winning

- Cash Games
 - BB/100 hands (online) or BB/Hour (live) [5 BB / 100 or 5 BB / hour]
- Tournaments
 - Return on Investment (ROI) [30% for MTTs, 15% for SnGs]
- General
 - Hourly [\$50 - \$200/ hour]





Perspective of the Course

- Most of the views are from an online MTT grinder
- Focusing primarily on ROI
 - Some consideration to hourly
- Focus on Live Tournaments
- Prefer conservative, low-variance play





Basic Tools and Concepts

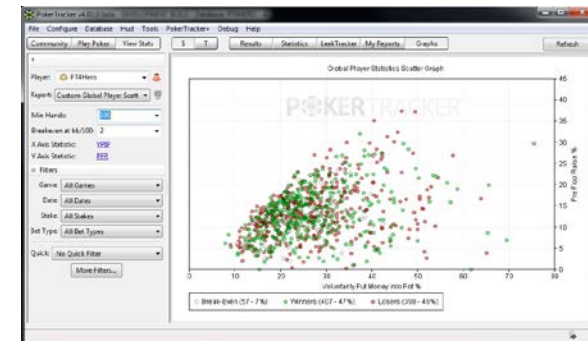
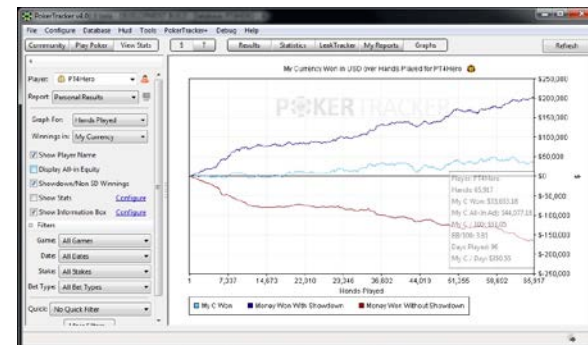
- PokerTracker and Hand Replayer
- Stack, Effective Stack
- Harrington's M Ratio





PokerTracker

- Poker analytical software
- Imports PokerStars HHs
- Includes additional poker tools such as Equity Calc, ICM, etc
- Three-month subscription for members of Poker Class
- Install instruction sent via email





Universal Replayer

- Poker HH visualizer software
- Reads hand history text files
- Many other features
- Freeware





Universal Replayer





Stack Size

- Stack Size = Value of Chips in front of you
- Effective Stack Size = Min (Your Stack, Biggest Stack Still in Play)
- Effective Stack Size = Most amount of chips you can lose in a hand
- We are basically always talking about effective stack





Dan Harrington


- “Action Dan”
- Generally considered solid Tight-Aggressive ABC Player
- Won 1995 WSOP Main Event
- Two WSOP Bracelets
- One WPT Title



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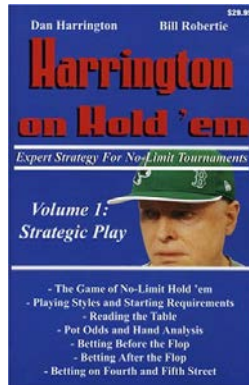


Temperaments in Poker

	Aggressive (Bets Often)	Passive (Bets Infrequently)
Solid ABC	Tight (Calls Seldom) TAG	TP “Weak”
	Loose (Calls Often) LAG	 Calling Machine Complete Fish



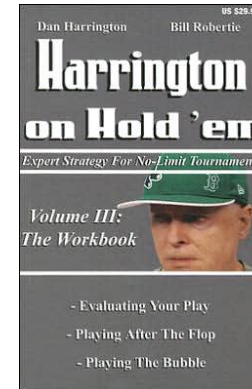
Dan Harrington



Strategic Play



Endgame



Workbook

Harrington, Dan and Bill Robertie. *Harrington on Hold'em Expert Strategy for No Limit Tournaments*,

- [Buy at Amazon](#) *Vol. I: Strategic Play*. Two Plus Two Pub, 2004.
- [Buy at Amazon](#) *Vol. II: The Endgame*. Two Plus Two Pub, 2005.
- [Buy at Amazon](#) *Vol. III: The Workbook*. Two Plus Two Pub, 2006.





M Ratio

- Invented by Paul Magriel
- Magriel
 - Backgammon theorist
 - Most backgammon tournament wins in the world
 - Commentator for WSOB
 - Eight WSOP final tables
 - Really good at math



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M Ratio

- Harrington's M Ratio
- $M = \text{Effective Stack} / \text{Sum of Blinds and Antes}$
- In other words, it's the amount of rounds you can survive until you are blinded out
- And more importantly, it's the ratio of your stack to the value of stealing the blinds
- A way to normalize the decision making process across different blind levels





Other Harrington Ratios

- Q ratio = Stack size / average player's stack
- Effective M ratio = $M * \text{Number of Players} / 10$



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