<u>A case against the "Fundamental Theorem of Poker".</u>

One thing that still bothers me is the "fundamental theorem of poker." Obviously I have no problem with the basic idea of trying to maximize your expected value. But I think that, the way Sklansky expresses this "theorem" is kind of offensive. A theorem is supposed to be a precise, mathematical statement that can be proven. The way he states it, it's definitely not precise and in fact is not even true. The statement is that every time you make a "mistake", you lose, and every time your opponents make a mistake against you, you gain, and a mistake is defined as any time you play in a way that's different from the way you'd play "if you could see your opponents' cards." Here are my problems with it.

1) The conclusion that you "gain" is imprecise, that this gain occurs "every time" is unclear, and he doesn't state the conditions under which this conclusion holds. He is obviously referring to the law of large numbers, for which you have to assume that you're repeatedly playing a sequence of independent events with constant expected value and variance, and the conclusion is then that your long-term average will ultimately converge to your expected value. It's not obvious that gaining "every time" is referring to long-term convergence of your sample mean.

2) Those assumptions in the law of large numbers are not all that trivial. The variance of no-limit hold'em is high. If you are only going to play finitely many times in your life, you might lose money in the long term even if you play perfectly. And if you only have a finite bankroll and play in the same game all your life, there's a chance that you will ultimately lose everything, even if you play perfectly. This is especially true if you keep escalating the stakes you play at. This is all closely related to a point brought up on this forum many months ago, when it was questioned whether the law of large numbers really applies to games like tournament hold'em, where the variance may be SO large that talking about long-term averages doesn't really make sense for the typical human lifetime.

3) Someone could also object to the independence assumption: it might in some cases be profitable to make a really stupid, -EV play, if it will give you a big edge later on.

4) The conclusion is obviously not true. He even gives a counterexample right after the statement, where you are dealt a flush in draw poker and bet, and your opponent calls you with a pair of aces. He classifies this as a "mistake", although it's obviously the right play. As a group, players who call there will probably make more money than those who don't.

5) There's no reason why conditioning on your opponents' cards is necessarily the right thing. There are lots of unknowns in poker, such as the board cards to come. Your opponents' strategies for the hand are also generally unknown and might even be randomized, as with *Harrington's watch.* What if I define a mistake as a play contrary to what I'd do if I knew what board cards are coming? Better yet, why not define a mistake as a play contrary to what you'd do if you knew your opponents' cards and what cards were to come, and how everyone would bet on future rounds? Then, if you could play mistake-free poker, you really would win virtually EVERY TIME you sat down.

6) Since it's generally impossible to know exactly what cards your opponents hold, it's just unclear why we should entertain the notion of people who always know their opponents' cards as ideal players. Instead, why not focus on your overall strategy versus those of your opponents? Suppose I define an ideal player as someone who uses optimal strategy for poker (given that, in poker, one does not know one's opponents' cards), and who is also excellent at adjusting this strategy in special cases by reading opponents' cards, mindsets, mannerisms, and strategies. Wouldn't it make more sense to say that, the closer you are to that ideal, relative to your opponents, the higher your expected value will generally be, and therefore the higher you expect your long-term winnings to be?

7) It has been shown mathematically that the ideal strategy in certain games is probabilistic -- e.g. in some situations it might be ideal to call 60% of the time, and raise 40%. That seems to contradict the notion of the fundamental theorem, which implicitly seems to suggest that you should try to do the non-mistake play "every time".

8) If this is really a theorem, where's the proof?