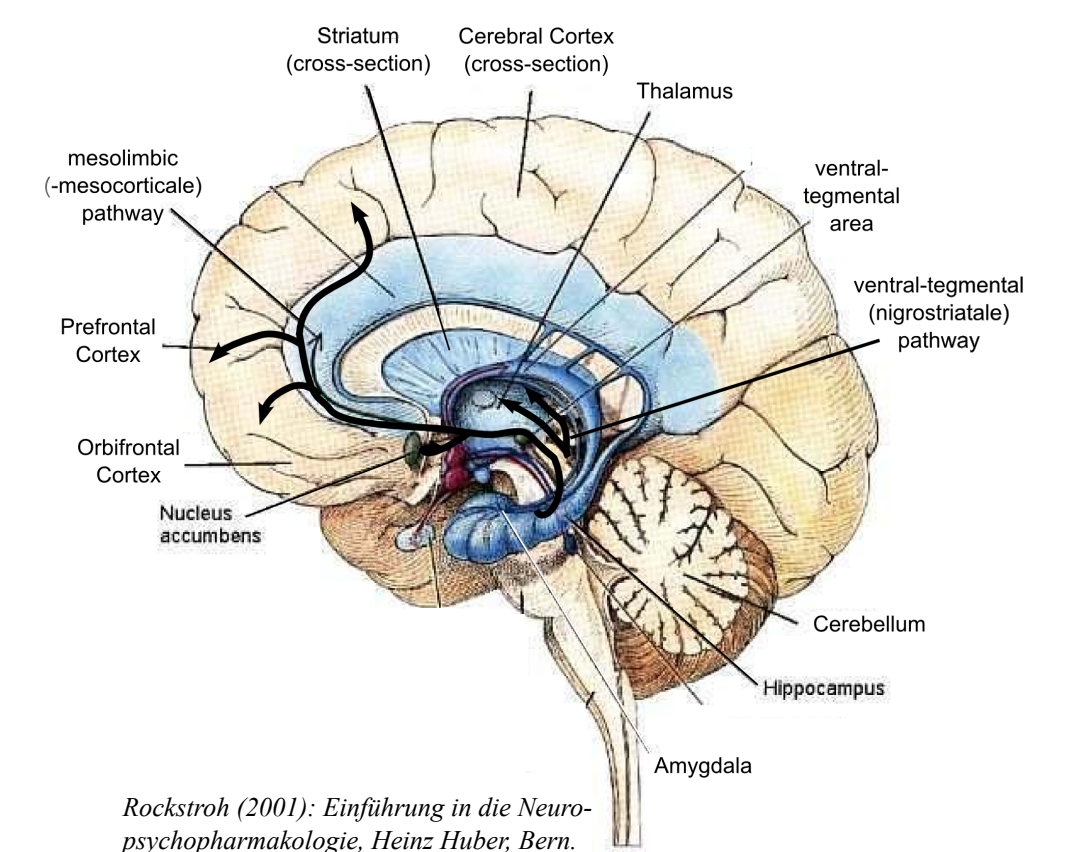


A neuroeconomic perspective on social gaming and social gambling

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Background

Today, one of the main issues in gaming research is the convergence of gaming and gambling in the digital world. More and more users play online in coop-mode or MMO games, in social networks, and on mobile devices. Digital distribution and free-to-play (F2P) games are extremely popular and gaming has long become a socio-cultural and community-based activity.

At the same time, various legal and illegal providers of gambling have entered the online market in the form of online poker, sports betting apps, lottery websites, slot machine games with real payments, and many others. In many parts of the world, the market for online gambling is strictly regulated or simply illegal. Yet, law enforcement in the *www* is complex and painstakingly slow, creating an enormous de facto free market for online gambling.

Research question

How can we differentiate social gaming from social gambling under rational choice?

Gaming or Gambling? (Gainsbury et al. 2014)

Gambling (classical): Consumption of risk on purpose. Outcomes predominantly depend on chance, participation against monetary payment (legal criteria). Risk factor (r) is constant.

Gambling in a broader sense: Doesn't meet all legal criteria for classical gambling, e.g. Poker schools online, F2P Roulette mobile apps without payments.

Gaming (classical): Playing games just for fun (SU_H), outcomes depend on fixed game design and "skill level". No expectation of monetary prizes.

Gaming in a broader sense: Expected *hedonic* utility SU_H is mutable through monetary payments: $r = var$.
 - **P2P**: Subscription based MMO (e.g. WoW)
 - **F2P**: Purchase of in-game vanity items or game extensions for real money (pay to customize), e.g. *LodR Online's* "premium subscriptions".

F2P-P2W: Expected *functional* utility $SU_F(r)$ is mutable through monetary payment. **Game or gamble?**

F2P = free to play; P2W = pay to win

Social gam(bl)ing = transition from individual to collective risk consumption

Without social interaction, gaming and gambling are two separate spheres of risk consumption. Casual games might imitate classical gambling mechanisms (such as online roulette for entertainment) but the market for gambling is separated on a *legal* basis.

In reality, online gaming is a free market: Gaming and gambling become two extremes of *one* fully transmissive continuum and create hybrid forms of F2P-P2W games.

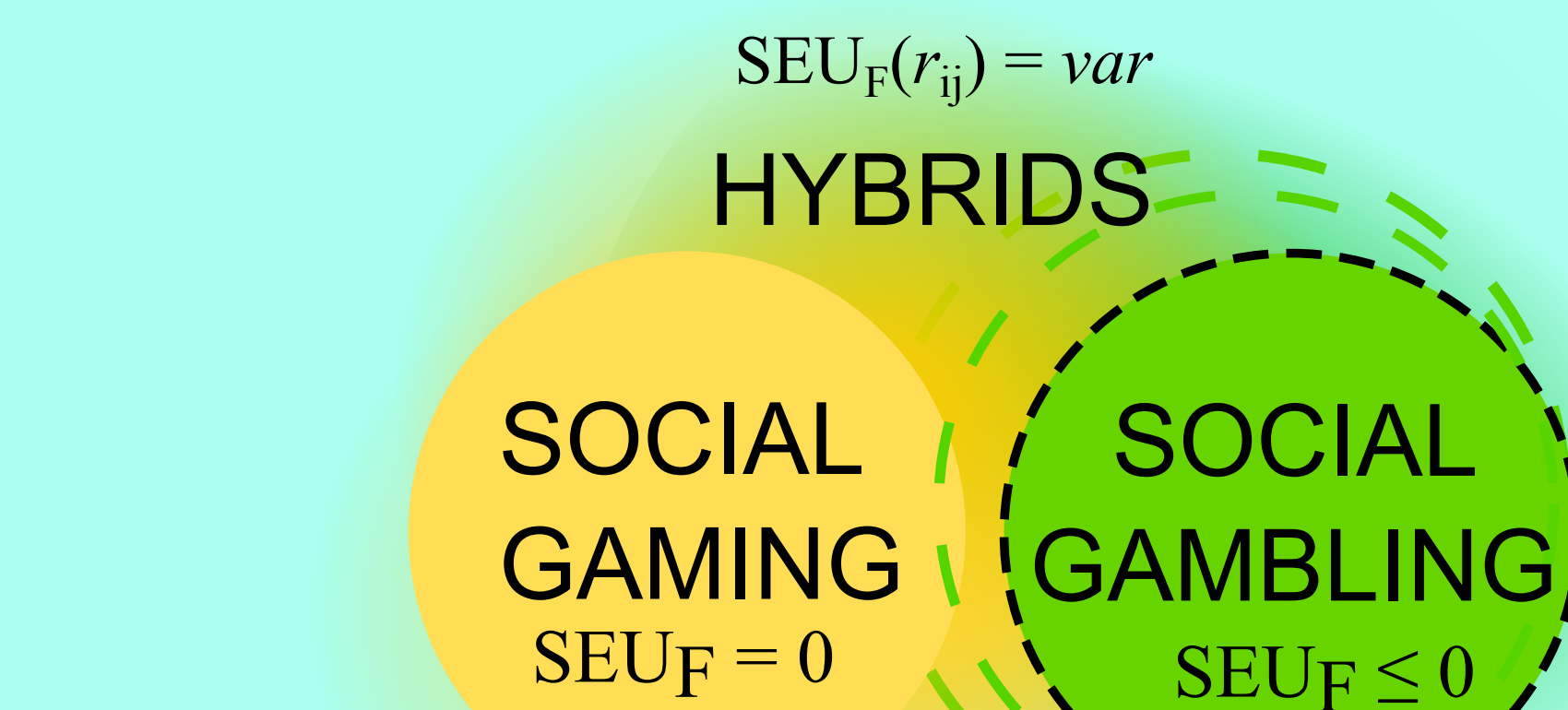


Figure 2: Collective (social) risk consumption: Hybrid forms, bilateral intersection of spheres. Functional game utility depends on the actions of other gamers!



Cooperative episodic social games (e.g. WoW) bias SU_H : External peer pressure, rankings and championships; punctual arousal in events and raids.



Competitive continuous social games (e.g. FarmVille) bias SU_H : Constant emotive involvement, regular repetitive cues, mobile integration.

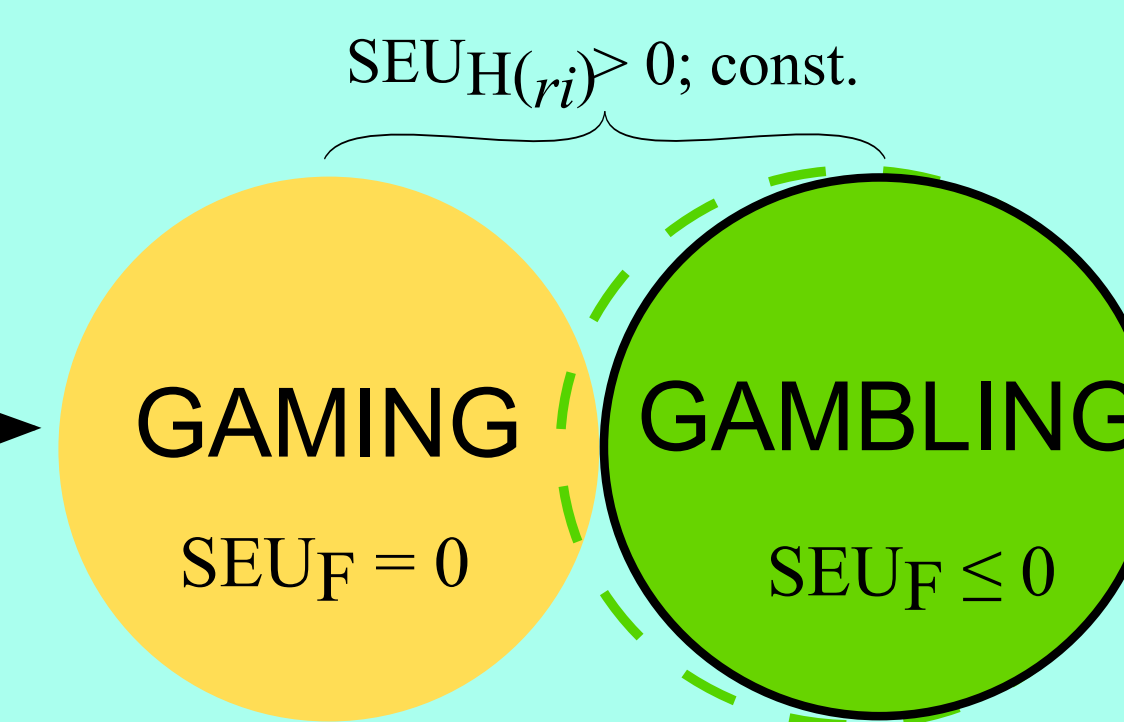


Figure 1: Individual consumption: Traditional boundaries, unilateral intersection of spheres. For users, gaming and gambling differ by expected functional utility.

Social interaction fundamentally changes user motivation: Expected utility now depends on the behavioral strategies of *other* players (j).

$$SEU_F(r_{ij}) = \begin{cases} f SEU_F(r_j) \\ f SEU_H(r_j) \end{cases}$$

Different types of social gaming and social gambling trigger dissimilar behavioral cues through social motivation and lead to *distinctive patterns of usage*:



Social gambling SU_F : Multiple tables and higher frequency through mobile real-time integration increase (biased) expected rake.

Hybrid F2P-P2W: affect both systems (SU_F and SU_H) through the *social* variability of risk factors.

- SU_F : Sunk cost fallacies and repetitive consumption, medium effect.
- SU_H : peer pressure through large community, emotive habituation.

Neuroeconomic framework

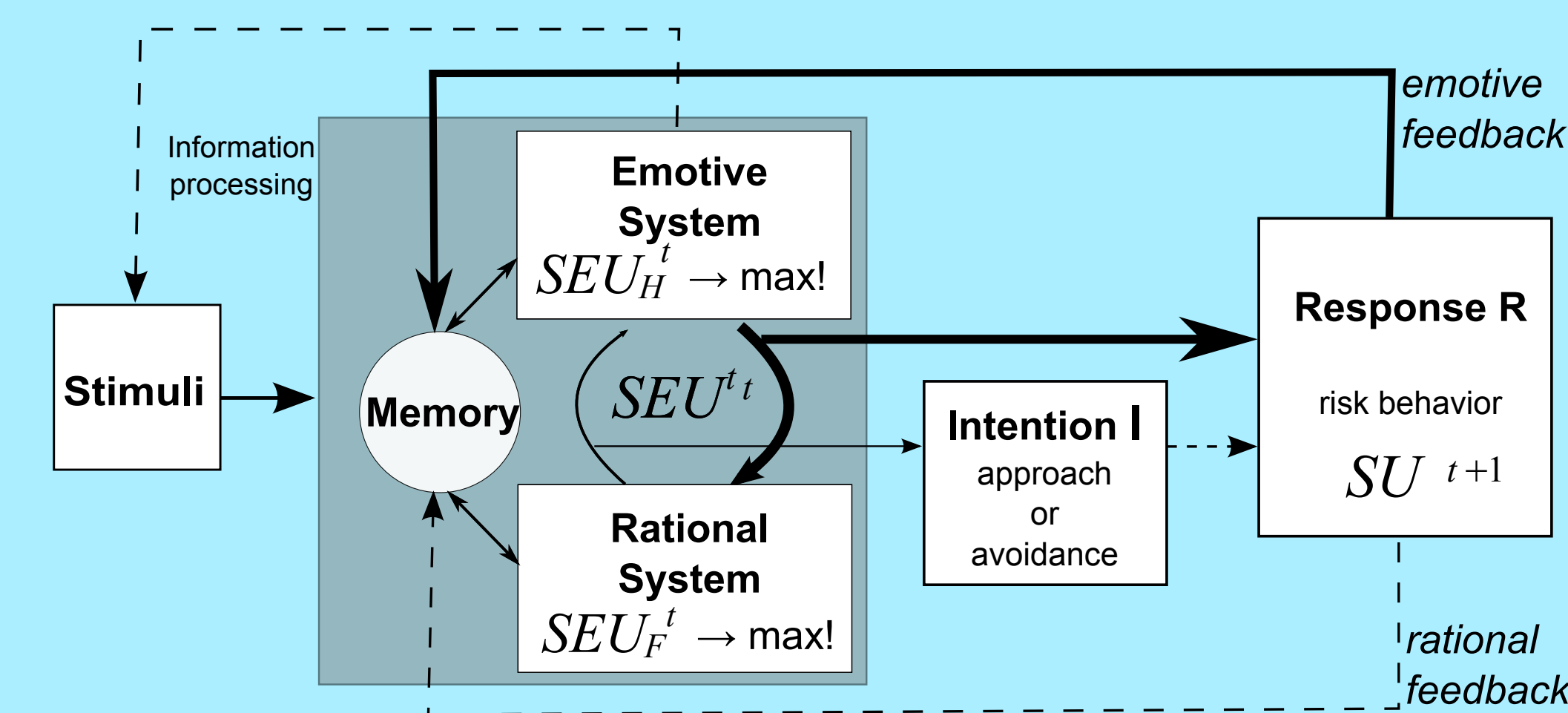
(Dolan & Sharot 2012; Kahneman 2003; Petry 2012; Bracha & Brown 2012)

Rational actors try to maximize both emotive and hedonic utility as a function of the risk factor r

$$SEU_F(r) + SEU_H(r) \rightarrow Max!$$

Risk behavior is influenced by the rational and emotive calculus rooted in the dopamine-based system of evaluation. Both intrinsic and extrinsic cues trigger gaming and gambling (*SIR*-model).

Pathological risk behavior can be rational. Releases of phasic and tonic dopamine guide intertemporal choice but also bias feedback systems and goal hierarchy updating resulting in:



- decreased or maladaptive sensitivity,
- cue-based (implicit) conditioning, and
- hyperbolic discounting.

Examples: SEU_H : fun from playing or winning. SEU_F : winning money or tradeable items.

Conclusion

Gamification of gambling and the variability of risk factors trigger both intrinsic and extrinsic cues for **rational addiction**.

Heavy users are especially vulnerable to hybrid forms such as F2P-P2W because they bias both the assessment of SU_F and SU_H .

Three strong criteria to differentiate social gaming from social gambling: (maladaptive) patterns of behavior, subjective expected utility, payment (volume and frequency). Need for quantitative analysis on big user data!

Stricter internet **law enforcement** is key to breaking the illegal market and improving user protection.

Market leaders systematically create communities in order to **exploit neuroeconomic biases**, to create social pressure, and to drive economic demand for both social gaming and social gambling. Interaction effect?

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