

Codebook for Using Cross-game Behavioral Markers for Early Identification of High-risk Internet Gamblers

This codebook provides information for both raw and analytic datasets used to generate an algorithm to identify subscribers who experienced gambling-related problems (Braverman, LaPlante, Nelson, & Shaffer, 2013). These datasets come from the collaborative Internet gambling research project between the Division on Addiction (Division) and bwin.party digital entertainment (**bwin.party**), an Internet betting service provider headquartered in Vienna, Austria. These datasets are based on electronic records of the entire **bwin.party** betting history of 2,068 subscribers who triggered a responsible gambling intervention between November 2008 and November 2009 (i.e. RG cases) and 2,066 individuals who made an initial **bwin.party** deposit on the same day as an RG case, but did not trigger a responsible gambling intervention between November 2008 and November 2009 (i.e. controls). The analytic dataset contains indices of betting behavior for two sports betting products (fixed odds and live action), combination of five casino-type products, five poker-type products, and twelve other games.

To understand how these data relate to other publications arising from the Division on Addiction/**bwin.party** collaboration, please see the [master codebook](#).

Source(s): Division on Addictions, Cambridge Health Alliance, a teaching affiliate of Harvard Medical School

PI(s): Dr. Howard J. Shaffer

Sponsor(s): bwin.party, digital entertainment

Related publication(s): Braverman, J., LaPlante, D. A., Nelson, S. E., & Shaffer, H. J. (2013). Using Cross-game Behavioral Markers for Early Identification of High-risk Internet Gamblers *Psychology of Addictive Behaviors*.

Raw Dataset I – Demographics (n = 4,134)

Raw Dataset I Demographics includes the following demographic information: User ID, a variable indicating group (i.e. case versus control), country of residence, preferred language for interacting with **bwin.party**, gender, year of birth, **bwin.party** registration date, and **bwin.party** first deposit date. (We have changed date of birth to year of birth to protect participant privacy and comply with institutional review board (IRB) requirements.)

Raw Dataset II – Daily Aggregates (n = 981,782)

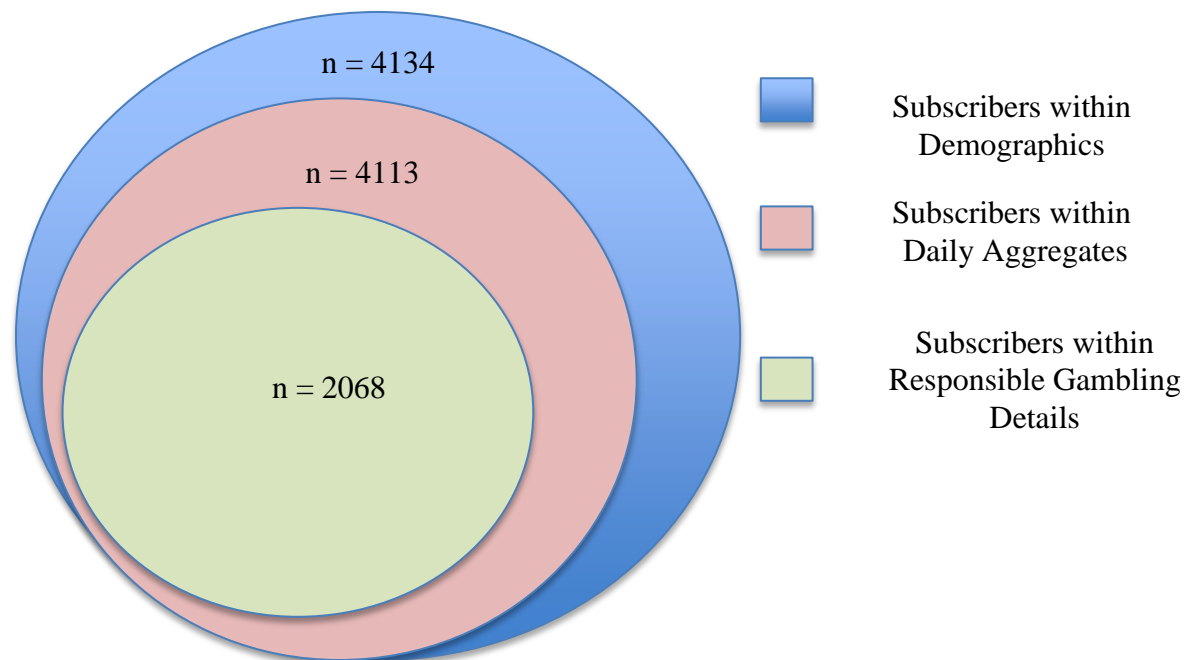
Raw Dataset II Daily Aggregates includes the betting information associated with each product (please see Appendix 1) for 4,113 participants for their entire betting history with **bwin.party**. This dataset contains the following information: User ID, date of transaction, product type, turnover (i.e. amount staked) for given day/product, hold (i.e. total amount lost) for given day/product, and number of bets for given day/product. All transactions are in Euros. Data are missing for 21 subscribers (all controls) who had no daily aggregates of betting behavior.

Raw Dataset III –Responsible Gambling Details (n = 2,068)

Raw Dataset III Responsible Gambling Details includes details about the responsible gambling triggers and intervention used by **bwin.party** customer service for the 2068 RG cases included in this study. This dataset contains the following information: User ID, number of RG events experienced, First RG date, Last RG date, First RG Event type (we used the first RG event to classify subscribers.) and intervention type.

Figure 1 explains the interrelationships among the raw datasets. The total cohort includes 4134 unique subscriber IDs. **bwin.party** provided daily aggregates for 4113 of those subscribers. At the time of the data transfer from bwin.party to the Division, two thousand sixty eight subscribers had triggered Responsible Gambling (RG) interventions at least once.

Figure 1. The interrelationship between raw datasets within the entire betting history of Responsible Gambling triggered (RG) and control individuals.



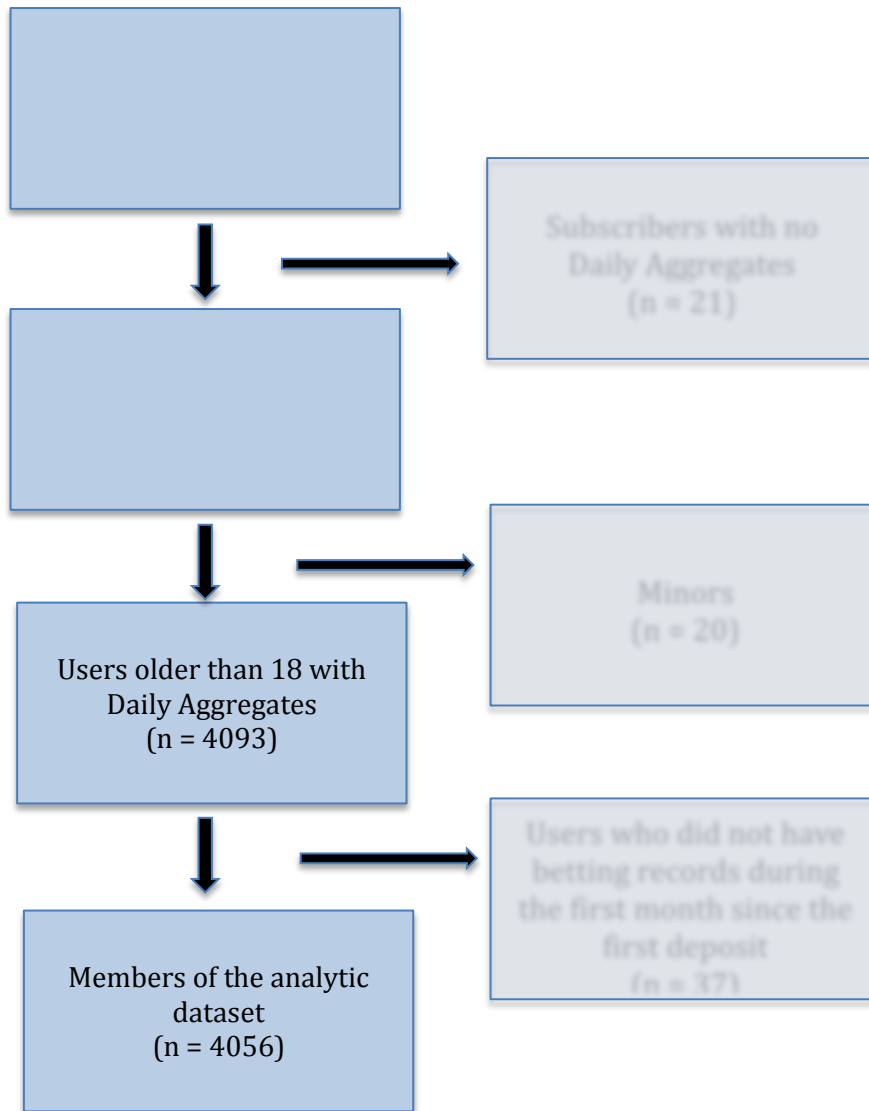
Analytic Dataset (n = 4,056)

This analytic dataset contains actual betting behavior data that was available for fixed odds, live-action, casino-type, poker type and other games betting for each participant included in the Daily Aggregates raw dataset aggregated over the entire history of betting. The Division excluded minor subscribers (RG event = 8, see the Appendix 2) and those who did not have betting history during the first month since the first deposit date. Figure 2 demonstrates the exclusion and inclusion criteria we used for the analysis.

The Division transferred the following variables for each participant from the raw dataset Demographics to the Analytic Dataset: User ID, a variable indicating group (i.e. RG case versus control), first deposit date, **bwin.party** registration date, and demographic information (i.e. country name, language name, gender, year of birth, and age at registration).

The Division computed betting activity indices for betting by summing the data in raw dataset Daily Aggregates. These indices of betting activity are described in more details below, in the table “Variables in the Analytic Dataset.”

Figure 2. CONSORT diagram for development of Analytic dataset



Variables in Raw Dataset I. Demographics

Variable	Data Type	Description	N	Min	Max	Note
USERID	Numeric	User id	4134	31965	9859152	User ID was assigned to each participant by bwin.party at time of registration.
RG_case	Numeric	Subscriber's group	4134	0	1	0 = control; 1 = RG case
CountryName	String	Subscriber's country of residence	3967			Country name is missing for 167 subscribers (all controls).
LanguageName	String	Subscriber's preferred language	3967			Language name is missing for 167 subscribers (all controls).
Gender	String	Subscriber's gender	4134			M: male; F: female
YearofBirth	Numeric	Subscriber's year of Birth	3967	1918	1991	Year of birth is missing for 167 subscribers (all controls).
Registration_date	Date	Subscriber's bwin.party registration date	3967	1999/09/17	2009/11/27	Registration date is missing for 167 subscribers (all controls).
First_Deposit_Date	Date	Subscriber's bwin.party first deposit date	4134	2000/05/08	2009/11/27	

Variables in Raw Dataset II. Daily Aggregates

Variable	Data Type	Description	N	Min	Max	Note
UserID	Numeric	User id	981782	31965	9859152	User ID was assigned to each participant by bwin.party at time of registration.
Date	Date	Date of transaction	981782	01.05.2000	10.11.2010	
ProductType	Numeric	Product type	981782	1	25	Please see Appendix 1.
Turnover	Numeric	Amount staked	790242	0	1311342	Total betting stakes on a given day (Euro), for a given product. Missing data are explained at the bottom of Appendix 1.
Hold	Numeric	Amount lost	790242	-49701.5	34695	Total amount lost on a given day (Euro), for a given product. Negative values indicate money won. Missing data are explained at the bottom of Appendix 1.
NumberofBets	Numeric	Number of bets	981753	0	20587	Total number of bets on a given day, for a given product.

Variables in Raw Dataset III. Responsible gambling details

Variable	Data Type	Description	N	Min	Max	Note
UserID	Numeric	User id	2068	31965	9858876	User ID was assigned to each participant by bwin.party at time of registration.
RGsumevents	Numeric	Number of RG events	2068	1.00	8.00	Sum of RG events experienced by the subscriber.
RGFirst_Date	Date	First RG event date	2065	02-NOV-2008	30-NOV-2009	Date of first RG event. Data are missing for 3 subscribers.
RGLast_date	Date	Last RG event date	2067	02-NOV-2008	30-NOV-2009	Date of last RG event. Data missing for 1 subscriber.
Event_type_first	Numeric	Type of first RG event	2066	1	13	Type of RG event (for first RG event). Please see Appendix 2.
Interventiontype_first	Numeric	Type of first customer service intervention	2062	1	18	Type of intervention for first RG event. Data are missing for 6 subscribers. Please see Appendix 3.

Variables in Analytic Dataset

Variable	Data Type	Description	N	Min	Max	Note
USERID	Numeric	user ID	4056	32639	9859152	User ID was assigned to each participant by bwin.party at time of registration.
age	Numeric	Age	3912	16.00	84.00	Excluding users whose date of birth was not available
gender	Numeric	Gender	4055	1	2	1 – Male; 2 - Female
RG_case	Numeric	RG case	4056	0	1	1 – RG group; 0 - controls
ValidationSet	Numeric	Validation or Training set	4056	0.00	1.00	0 – Training set; 1 – Validation set
first_active_product1_31days	Date	First active date for fixed odds	3444	08-MAY-2000	27-NOV-2009	†
first_active_product2_31days	Date	First active date for live action	2382	22-NOV-2002	29-NOV-2009	†
first_active_product4_31days	Date	First active date for casino type products	799	14-DEC-2001	27-NOV-2009	†
first_active_games_31days	Date	First active date for other games	650	11-NOV-2003	24-NOV-2009	†

Variable	Data Type	Description	N	Min	Max	Note
first_active_poker_31days	Date	First active date for poker	766	28_NOV-2004	27-NOV-2009	†
p1sumstake31days	Numeric	Total wagered in fixed odds in 31 days since the first deposit date	4056	0.00	31150.03	
p1sumbets31days	Numeric	Total number of bets in fixed odds in 31 days since the first deposit date	4056	0.00	6651.00	
p1totalactivedays_31days	Numeric	Total active days in 31 days since the first deposit date for fixed odds	4056	0.00	31.00	
p1SDStakes31days	Numeric	Variability of wagers in fixed odds in 31 days since the first deposit date	3000	0.00	1418.97	††
p1SDBets31day	Numeric	Variability of number of bets per day in fixed odds in 31 days since the first deposit date	3000	0.00	189.57	††
p2sumstake31days	Numeric	Total wagered in live action in 31 days since the first deposit date	4056	0.00	162145.78	
p2sumbets31days	Numeric	Total number of bets in live action in 31 days since the first deposit date	4056	0.00	1895.00	
p2totalactivedays_31days	Numeric	Total active days in 31 days since the first deposit date for live action	4056	0.00	31.00	
p2SDStakes31days	Numeric	Variability of wagers in live action in 31 days since the first deposit date	1917	0.00	7603.11	††
p2SDBets31days	Numeric	Variability of number of bets per day in live action in 31 days since the first deposit date	1917	0.00	79.90	††

Variable	Data Type	Description	N	Min	Max	Note
pcsumstake31days	Numeric	Total wagered in casino in 31 days since the first deposit date	4056	0.00	519254.00	
pcsumbets31days	Numeric	Total number of bets in casino type games in 31 days since the first deposit date	4056	0.00	36419.00	
casino_totalactivedays_31days	Numeric	Total active days in 31 days since the first deposit date for casino	4056	0.00	31.00	
pcSDStakes31days	Numeric	Variability of wagers in casino type games in 31 days since the first deposit date	529	0.00	90490.91	††
pcSDBets31days	Numeric	Variability of number of bets per day in casino type games in 31 days since the first deposit date	529	0.00	1871.23	††
pgsumbets31days	Numeric	Total number of bets in other games in 31 days since the first deposit date	4056	0.00	8302.00	
games_totalactivedays_31days	Numeric	Total active days in 31 days since the first deposit date for other games	4056	0.00	26.00	
pgSDBets31days	Numeric	Variability of number of bets per day in other games in 31 days since the first deposit date	451	0.00	1060.69	††
firstGamePlayed	Numeric	First game played	4056	1.00	5.00	1 = Fixed odds; 2 = Live Action; 3 = Poker; 4 = Casino type games; 5= other games

Variable	Data Type	Description	N	Min	Max	Note
p3totalactivedays_31days	Numeric	Total active days in 31 days since the first deposit date for poker	4056	0.00	31.00	
p1avgbetsperactiveday	Numeric	Average number of bets per active day of fixed odds	4056	0.00	246.33	
p2avgbetsperactiveday	Numeric	Average number of bets per active day of live action	4056	0.00	120.00	
pcavgbetsperactiveday	Numeric	Average number of bets per active day of casino	4056	0.00	2135.00	
p1avgbetsperday	Numeric	Average number of bets per any day during the period of observation of fixed odds	4056	0.00	214.55	
p2avgbetsperday	Numeric	Average number of bets per any day during the period of observation of live action	4056	0.00	61.13	
pcavgbetsperday	Numeric	Average number of bets per any day during the period of observation of casino	4056	0.00	1174.81	
p1avgbetsize	Numeric	Average bet size in fixed odds	3444	.02	999.07	†
p2avgbetsize	Numeric	Average bet size in live action	2382	.08	756.11	†
pcavgbetsize	Numeric	Average bet size in casino type games	799	0.00	5110.43	†
wk1frequency	Numeric	Number of active days during the 1st week	4056	0.00	.29	
wk2frequency	Numeric	Number of active days during the 2nd week	4056	0.00	.29	
wk3frequency	Numeric	Number of active days during the 3rd week	4056	0.00	.29	
wk4frequency	Numeric	Number of active days during the 4th week	4056	0.00	.29	
wk1_p1sumstakes	Numeric	Total wagered during 1st week for fixed odds	4056	0.00	3245.35	
wk1_p2sumstakes	Numeric	Total wagered during 1st week for live action	4056	0.00	36014.10	
wk1_pcsumstakes	Numeric	Total wagered during 1st week for casino type games	4056	0.00	303551.00	

Variable	Data Type	Description	N	Min	Max	Note
wk2_p1sumstakes	Numeric	Total wagered during 2nd week for fixed odds	4056	0.00	2968.00	
wk2_p2sumstakes	Numeric	Total wagered during 2nd week for live action	4056	0.00	18487.57	
wk2_pcsumstakes	Numeric	Total wagered during 2nd week for casino	4056	0.00	34892.00	
wk3_p1sumstakes	Numeric	Total wagered during 3rd week for fixed odds	4056	0.00	4555.14	
wk3_p2sumstakes	Numeric	Total wagered during 3rd week for live action	4056	0.00	9928.89	
wk3_pcsumstakes	Numeric	Total wagered during 3rd week for casino	4056	0.00	41649.00	
wk4_p1sumstakes	Numeric	Total wagered during 4th week for fixed odds	4056	0.00	2520.00	
wk4_p2sumstakes	Numeric	Total wagered during 4th week for live action	4056	0.00	14646.77	
wk4_pcsumstakes	Numeric	Total wagered during 4th week for casino	4056	0.00	96322.00	
wk1_p1sumbets	Numeric	Number of bets during 1st week for fixed odds	4056	0.00	620.00	
wk1_p2sumbets	Numeric	Number of bets during 1st week for live action	4056	0.00	425.00	
wk1_pcsumbets	Numeric	Number of bets during 1st week for casino type games	4056	0.00	4559.00	
wk1_pgsumbets	Numeric	Number of bets during 1st week for other games	4056	0.00	2562.00	
wk2_p1sumbets	Numeric	Number of bets during 2nd week for fixed odds	4056	0.00	1185.00	
wk2_p2sumbets	Numeric	Number of bets during 2nd week for live action	4056	0.00	412.00	
wk2_pcsumbets	Numeric	Number of bets during 2nd week for casino type games	4056	0.00	3731.00	
wk2_pgsumbets	Numeric	Number of bets during 2nd week for other games	4056	0.00	2207.00	
wk3_p1sumbets	Numeric	Number of bets during 3rd week for fixed odds	4056	0.00	587.00	

Variable	Data Type	Description	N	Min	Max	Note
wk3_p2sumbets	Numeric	Number of bets during 3rd week for live action	4056	0.00	215.00	
wk3_pcsumbets	Numeric	Number of bets during 3rd week for casino type of games	4056	0.00	3631.00	
wk3_pgsumbets	Numeric	Number of bets during 3rd week for other games	4056	0.00	2674.00	
wk4_p1sumbets	Numeric	Number of bets during 4th week for fixed odds	4056	0.00	1126.00	
wk4_p2sumbets	Numeric	Number of bets during 4th week for live action	4056	0.00	335.00	
wk4_pcsumbets	Numeric	Number of bets during 4th week for casino type games	4056	0.00	4820.00	
wk4_pgsumbets	Numeric	Number of bets during 4th week for other games	4056	0.00	892.00	
wkend_p1sumstakes	Numeric	Total wagered in fixed odds during the weekends	4056	0.00	10143.14	
wkend_p2sumstakes	Numeric	Total wagered in live action during the weekends	4056	0.00	41582.92	
wkend_pcsumstakes	Numeric	Total wagered in casino type games during the weekends	4056	0.00	312939.00	
wkend_p1sumbets	Numeric	Number of bets placed in fixed odds during the weekends	4056	0.00	2543.00	
wkend_p2sumbets	Numeric	Number of bets placed in live action during the weekends	4056	0.00	1093.00	
wkend_pcsumbets	Numeric	Number of bets placed in casino type games during the weekends	4056	0.00	7033.00	
wkend_pgsumbets	Numeric	Number of bets placed in other games during the weekends	4056	0.00	3327.00	
wkday_p1sumstakes	Numeric	Total wagered in fixed odds during the weekdays	4056	0.00	21006.89	
wkday_p2sumstakes	Numeric	Total wagered in live action during the weekdays	4056	0.00	120562.86	
wkday_pcsumstakes	Numeric	Total wagered in casino type games during the weekdays	4056	0.00	323975.00	

Variable	Data Type	Description	N	Min	Max	Note
wkday_p1sumbets	Numeric	Number of bets placed in fixed odds during the weekdays	4056	0.00	4108.00	
wkday_p2sumbets	Numeric	Number of bets placed in live action during the weekdays	4056	0.00	1542.00	
wkday_pcsumbets	Numeric	Number of bets placed in casino type games during the weekdays	4056	0.00	29386.00	
wkday_pgsumbets	Numeric	Number of bets placed in other games during the weekdays	4056	0.00	5351.00	
mostFrequentGame	Numeric	Most Frequent Game	4056	1.00	5.00	1 = Fixed odds; 2 = Live Action; 3 = Poker; 4 = Casino type games; 5= other games
playedFO	Numeric	Played fixed odds at least 3 times	4056	0	1	0 = No; 1 = Played
playedLA	Numeric	Played live action odds at least 3 times	4056	0	1	0 = No; 1 = Played
playedPO	Numeric	Played poker at least 3 times	4056	0	1	0 = No; 1 = Played
playedCA	Numeric	Played casino type games at least 3 times	4056	0	1	0 = No; 1 = Played
playedGA	Numeric	Played other games at least 3 times	4056	0	1	0 = No; 1 = Played
NumberofGames31days	Numeric	Number of games during the first 31 days since the first deposit date	4056	0.00	5.00	
weekfrequencytraj	Numeric	Trajectory by weekly frequency	4056	1.00	3.00	

Variable	Data Type	Description	N	Min	Max	Note
FOBetsWeeklyTraj	Numeric	FO. Trajectory by weekly bets.	4056	1.00	3.00	
FOstakesWeeklyTraj	Numeric	FO. Trajectory by weekly stakes.	4056	1.00	3.00	
LABetsWeeklyTraj	Numeric	LA. Trajectory by weekly bets.	4056	1.00	3.00	
LAstakesWeeklyTraj	Numeric	LA. Trajectory by weekly stakes.	4056	1.00	3.00	
CasinoBetsWeeklyTraj	Numeric	Casino. Trajectory by weekly bets.	4056	1.00	3.00	
CasinostakesWeeklyTraj	Numeric	Casino. Trajectory by weekly stakes.	4056	1.00	3.00	
GamesBetsWeeklyTraj	Numeric	Games. Trajectory by weekly bets.	4056	1.00	3.00	
p1wkendsumbetsratio	Numeric	ratio of number of bets made during weekends compared to weekdays for fixed odds	3444	0.00	1.00	†
p2wkendsumbetsratio	Numeric	ratio of number of bets made during weekends compared to weekdays for live action	2382	0.00	1.00	†
pcwkendsumbetsratio	Numeric	ratio of number of bets made during weekends compared to weekdays for casino type games	799	0.00	1.00	†
pgwkendsumbetsratio	Numeric	ratio of number of bets made during weekends compared to weekdays for other games	650	0.00	1.00	†
p1wkendsumstakesratio	Numeric	ratio of total wagers made during weekends compared to weekdays for fixed odds	3444	0.00	1.00	†
p2wkendsumstakesratio	Numeric	ratio of total wagers made during weekends compared to weekdays for live action	2382	0.00	1.00	†
pcwkendsumstakesratio	Numeric	ratio of total wagers made during weekends compared to weekdays for casino	798	0.00	1.00	†

Variable	Data Type	Description	N	Min	Max	Note
period_tillDeposit	Numeric	Number of days since registration till the first deposit date (31 max)	4056	0.00	32.00	
RiskGroup1	Numeric	Risk Group 1: Many games, active casino players	4056	0	1	0 = Low risk; 1 = High risk
RiskGroup2	Numeric	Risk Group 2: Two games, ActiveLA players	4056	0	1	0 = Low risk; 1 = High risk
RiskGroupCombined	Numeric	Risk group 1 or 2 combined	4056	0	1	0 = Low risk; 1 = High risk
totalactivedays_31days	Numeric	Total active days in 31 days since the first deposit date	4056	0.00	31.00	
totalactivedaystillDeposit_31days_max	Numeric	Total active days till the first deposit date	4055	0.00	95.00	
USERID	Numeric	user ID	4056	32639	9859152	

† Data are missing for the subscribers who did not engage in this product during the window of observation.

†† Data are missing for the subscribers who engaged in < 2 betting days.

Appendix 1: Product Type IDs, Names, and Types

Product ID†	Product Name	Product Type
1	sportsbook fixed odds	Fixed odds
2	sportsbook live action	Live action
3	poker boss media 4*	Poker
4	casino boss media 2	Casino
5	Supertoto*	Games
6	games VS*	Games
7	games bwin*	Games
8	casino chartwell	Casino
9	race book*	Games
10	poker bwin*	Poker
14	games football*	Games
15	Minigames*	Games
16	mobile games*	Games
17	mobile casino	Casino
19	gamArena*	Games
20	Gratta e Vinci*	Games
21	Fantasy Sports*	Games
22	Paradice*	Games
23	Backgammon*	Games
24	Sidegames*	Games
25	Bingo*	Games

* For these third-party (vendor) products, we consider turnover and hold information included in the daily aggregates file sent from bwin.party invalid due data storage procedures. In **Raw Dataset II.Daily aggregates**, we have set to “missing” the turnover and hold values for these products. For these products, we urge caution in interpretation of the variable “number of bets.” In Braverman, LaPlante, Nelson and Shaffer (2013), we do not analyze wager-related data for all Games and Poker product type.

† Four additional products (identified by bwin.party as “poker B2B,” “casino B2B,” “casino B2C,” and “poker B2C”) are not represented in the daily aggregates dataset because none of the participants engaged in these products during the window of observation.

Appendix 2. Responsible Gambling Event IDs, Labels, and Descriptions

RG event ID	RG event label	RG event description
1	3rd person contact	A 3rd party (e.g., a relative) contacts bwin.party customer service (CS) to get the account blocked due to RG reasons.
2	account closure/reopening	The subscriber CS to have his account closed due to problem gambling or reopened after a closure due to problem gambling
3	cancel outpayment	The subscriber issues an out-payment from the <i>bwin.party</i> account but then calls CS to cancel the out-payment
4	change of limit: manual change	The user requested a change in the personal deposit limit and was advised by CS to make the limit change in the interface
6	fair play - heavy complainer	The subscriber complains heavily about fair play
7	inpayment block request	The subscriber requests to block one method of in-payment to the <i>bwin.party</i> account (e.g., payment from <i>bwin.party</i> to the subscriber's credit card)
8	minor case	The subscriber or someone else identifies the subscriber is identified as a minor
9	partial block	The subscriber requests <i>bwin.party</i> ; CS to block one or more (but not all) products due to problem gambling
10	problem reported	The subscriber reports a problem, which may or may not be justified
11	user request higher limit	The subscriber requests a personal deposit limit which is above the standard permitted deposit limit
12	two events on the same day	Subscriber experienced two RG events on the same day
13	not reported by bwin	Event type not reported by bwin.party

Appendix 3: Customer Service Intervention Codes and Descriptions

Intervention Code	Intervention Description
1	bwin.party gives additional RG advice to subscriber
2	Subscriber's account is re-opened upon customer request after closure or self-exclusion period had elapsed
3	The customer's request was technically not possible.
4	Account blocking for investigation and asking the customer for a detailed statement about his situation
5	Change of personal deposit limit from 'VIP' subscriber accepted.
6	Request for partially blocked account block could not be conducted completely. The third party who has made a request is advised about privacy regulation; the customer is contacted and asked for a statement; the customer account remains open until further evidence indicates confirms suspicions.
7	
8	Request for partially blocked account block could be conducted completely.
9	Inpayment method not blocked as requested.
10	Inpayment method blocked
11	Request for higher personal deposit limit denied.
12	Request for higher personal deposit limit accepted.
13	Daily/weekly personal deposit limit is changed.
14	Imposed account block by bwin.
15	Betting limit changed.
16	Account remains closed.
17	Account is blocked and reimbursement is given.
18	Partial block of products requested by subscriber is not possible.