

Financial Literacy as a Protective Factor Against Problem Gambling

Longitudinal evidence from the HILDA Survey

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Most people gamble without harm. A minority do not.

- **Harm goes beyond money:** distress, relationships, household wellbeing (AIHW 2025). Social cost of at least \$4.7b a year (Productivity Commission 2010).
- **The prevention question:** what distinguishes the minority of gamblers who experience harm?
- **Gambling decisions are financial decisions:** odds, expected value, cumulative losses, now versus later.
- **Yet the literature focuses on risk factors,** much less on capabilities that might protect.

In our HILDA sample

37.5%

gamble in a typical month

8.9%

of gamblers score PGSI 3+ (moderate risk or problem gambling)

Why would financial literacy protect?

1

Probabilistic reasoning

Less base-rate neglect, overconfidence and illusion of control

Kahneman (2011)

2

Intertemporal discipline

Future losses become more salient against the immediate reward

O'Donoghue & Rabin (1999)

3

Independent judgement

A basis for decisions when social settings normalise gambling

Duflo & Saez (2003)

What we know, and what is still open

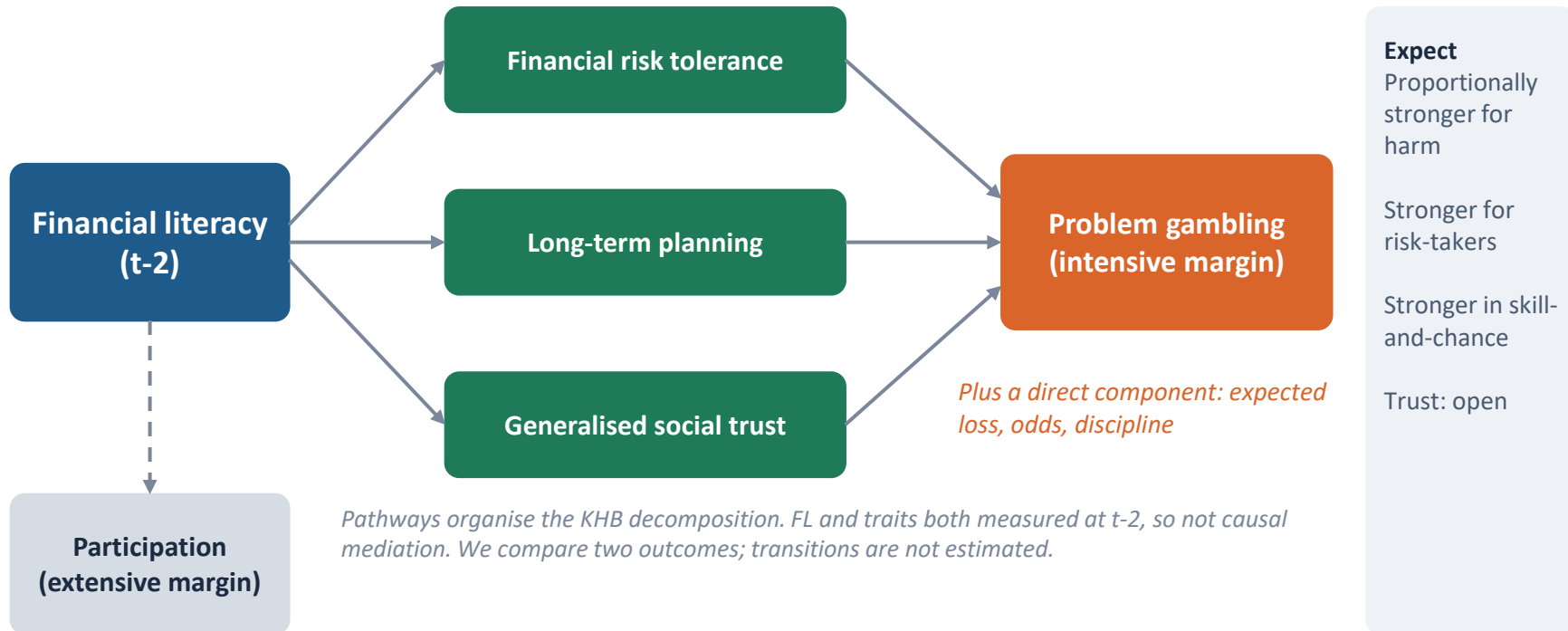
What we know

- Negative FL and gambling link in Japan, US, Thailand, China and Australia
- Two 2025 systematic reviews (O'Connor & Ivory; Barone & Graffigna): mostly cross-sectional, brief FL measures, frequency not harm
- Hoang & Vo (2026), HILDA: higher FL, lower PGSI risk; locus of control as mechanism
- Koomson et al. (2022): gambling severity predicts later financial stress

What this paper adds

- 1 Separates entry into gambling from harmful escalation, with FL lagged two waves
- 2 Compares chance-only with skill-and-chance gambling
- 3 Tests risk tolerance, planning and trust as moderators
- 4 KHB decomposition of direct and behavioural pathways

A two-margin behavioural framework



HILDA data with a two-wave lag



Outcome waves bracket COVID-19 disruption and reopening; wave FE absorb common shifts

17,785

person-wave observations,
10,200 people

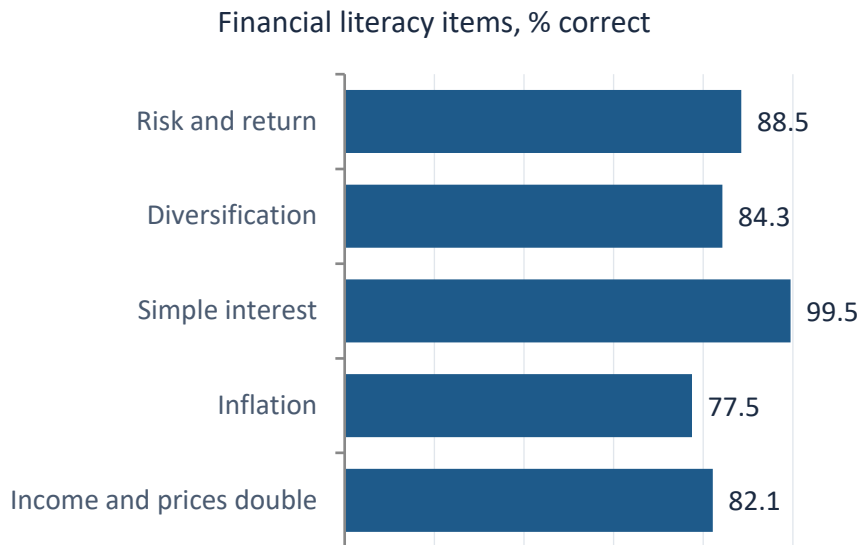
6,664

gambler observations, 4,100
people

590

at PGSI 3+ among gamblers

Key variables



Index 0 to 5, objective items. Sample mean 4.51.

Outcomes

Participation: gambles in a typical month. Harm: PGSI 3+ among gamblers (also continuous, 2+ and 4+)

Gambling type

Chance-only: lotteries, keno. Skill-and-chance: EGMs, sports, racing, casino (both goes here; a grouping label)

Behavioural traits (t-2)

Above-average risk tolerance; plans beyond next year; above-average trust. Measured with FL

Controls

Age, gender, schooling, log income, marital status, family, employment, children, major city; state and wave FE

Problem gamblers look different on behavioural traits



Problem vs non-problem gamblers

FL 4.30 vs 4.51

Younger (46.7 vs 53.4)

More male (70% vs 59%)

Less schooling, lower income

Non-gamblers and gamblers have almost identical mean FL (4.51 vs 4.50)

Empirical strategy

Baseline probit $\Pr(Y_{it} = 1) = \Phi(\alpha + \beta \text{FinLit}_{i,t-2} + \gamma'X_{it} + \delta_s + \lambda_t)$

Individual FE $Y_{it} = \alpha_i + \beta \text{FinLit}_{i,t-2} + \gamma'X_{it} + \lambda_t + \varepsilon_{it}$

β = association of interest (marginal effect) X = controls, incl. traits at t-2 δ, λ = state, wave effects α_i = person effect

Identification concern

Reverse causality

Gambling might change literacy

Approach

Financial literacy lagged two waves (t-2)

Time-invariant heterogeneity

Ability, personality, background

Individual fixed effects: estimate stable

Sample selection

PGSI observed only among gamblers

Heckman selection correction: estimate stable

Also: instrumental-variable checks (supporting only) and an Oster sensitivity test for unmeasured factors.

MAIN RESULTS

The association is proportionally stronger for harm

Participation

-2.1 pp

per extra correct answer

≈ 5.6%

of the 37.5% base rate

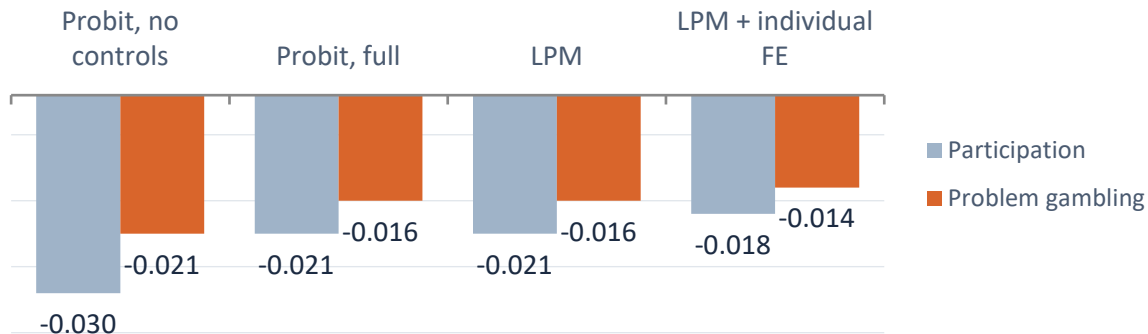
Problem gambling (gamblers)

-1.6 pp

per extra correct answer

≈ 18%

of the 8.9% base rate



*All $p < 0.01$. Oster δ 1.75 to 2.45.
Survives individual FE. Two outcomes compared, not transitions.*

The harm estimate barely moves

Lower PGSI 3+ probability per extra correct answer (pp)

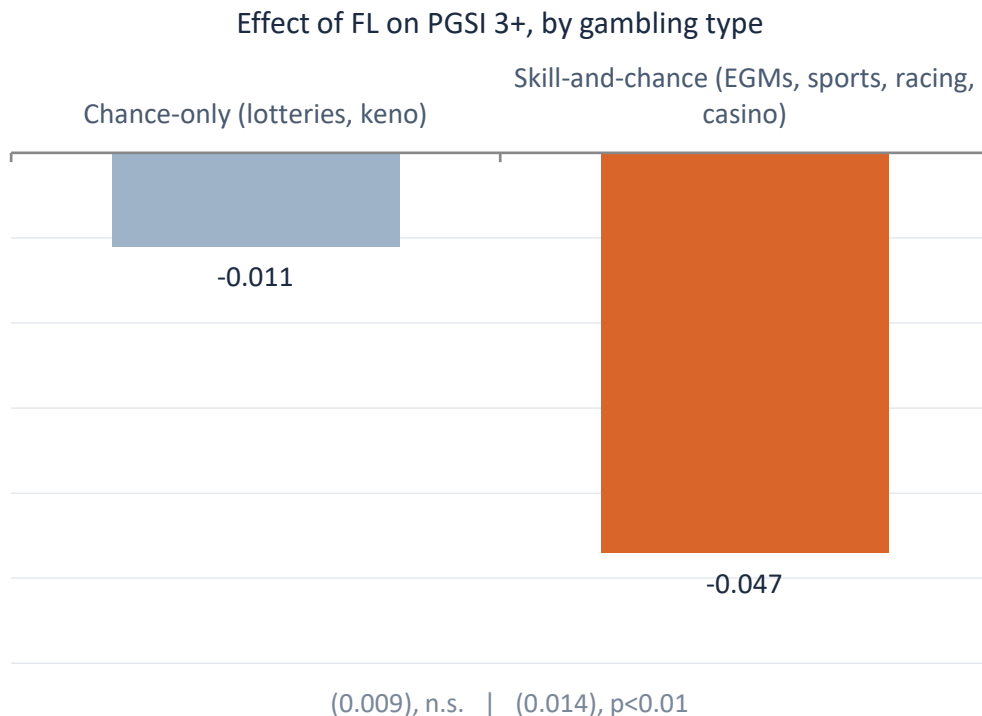


Also holds for

- PGSI 2+, PGSI 4+ and the continuous score
- Each wave separately
- Men and women

IV diagnostics are not clean, so IV results are supporting checks, not proof of causation.

Stronger in skill-and-chance gambling



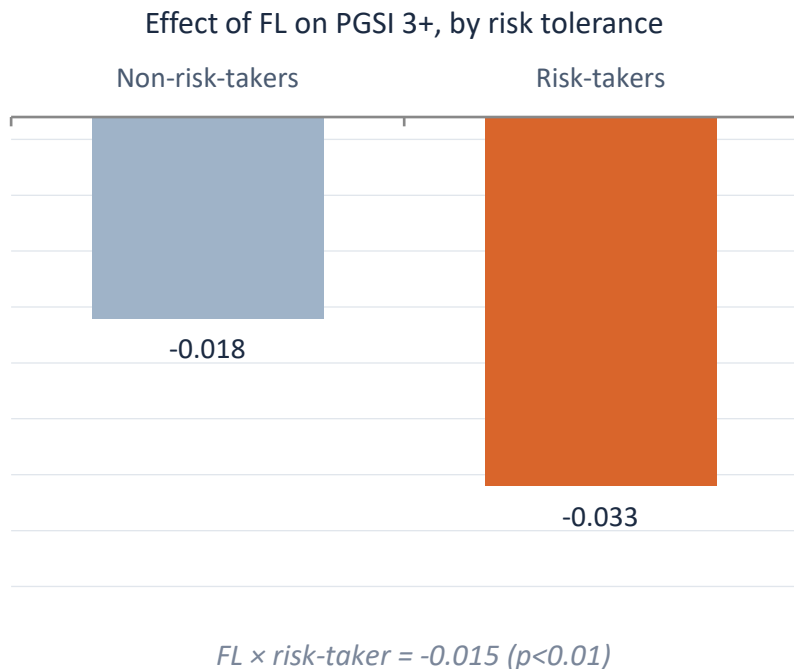
-4.7 pp

per extra correct answer among skill-and-chance gamblers (N = 2,446; 406 at PGSI 3+)

Consistent with literacy mattering most where products are complex, fast and repeated, and losses can build quickly.

Pooled probit interaction test $p = 0.03$ (index scale). Product and player differences not isolated.

Strongest association among risk-takers



Risk tolerance

Negative in both groups, almost twice as large for risk-takers. For participation, an association only among risk-takers.

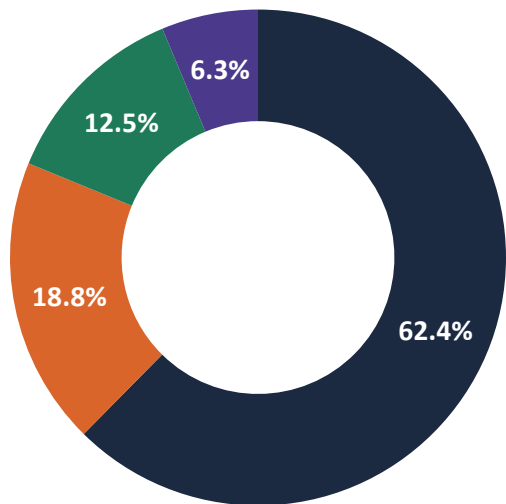
Trust

Participation: -0.018 ($p < 0.10$, suggestive). Harm: +0.011 ($p < 0.05$), a weaker association among high-trust gamblers. Social norms not measured.

Long-term planning

Weak. Only marginally significant for problem gambling (+0.008*). Suggestive.

Over a third is shared with behavioural traits



■ Net of traits
 ■ Risk tolerance
 ■ Long-term planning
 ■ Social trust

Component	AME	Share
Total effect	-0.016***	100%
Net of traits	-0.010***	62.4%
Shared with traits	-0.006**	37.6%
via risk tolerance	-0.003**	18.8%
via long-term planning	-0.002*	12.5%
via social trust	-0.001*	6.3%

Gamblers only (N = 6,664). FL and traits both measured at t-2: a descriptive decomposition, not causal mediation.

LIMITATIONS

Limitations

Identification

Two outcome waves; no direct estimate of transitions. Lag does not remove time-varying confounding. Sargan rejects for Lewbel.

Selection

PGSI observed only for gamblers. Heckman relies on the major-city restriction. Attrition and under-coverage of severe gamblers.

Gambling type

Broad categories that differ in speed, venue and design. The contrast does not isolate which product feature matters.

Mechanisms

Traits are proxies, measured with FL, so KHB is descriptive. No measures of gambling maths or self-control.

Policy reach

Observational AMEs are not forecasts of what a financial education program would achieve.

Next steps: more waves and trajectories, finer product categories, direct mechanism measures, intervention trials.

Financial literacy matters selectively, not uniformly

Harm, not just entry

Proportional association with harm ($\approx 18\%$) is over three times that with participation ($\approx 5.6\%$)

Where

Concentrated in skill-and-chance gambling (-4.7 pp)

For whom

Strongest for financially risk-tolerant people

Policy: a complement to regulation, with applications to evaluate

- Expected-loss and cumulative-spend disclosures designed for different literacy levels
- Brief objective FL screening in gambling and financial counselling services
- Target risk-tolerant groups and wagering and EGM settings; test pairing with social-norm messages

Thank you

Questions and comments welcome

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This paper uses unit record data from HILDA, conducted by the Australian Government Department of Social Services (DSS) and managed by the Melbourne Institute. The findings and views are those of the authors and should not be attributed to DSS or the Melbourne Institute.

IV and selection diagnostics

Model	FL estimate	Key diagnostic	N
Postcode IV (leave-one-out mean)	-0.076* (0.043)	First-stage F = 37.1; exactly identified	5,324
Lewbel IV	-0.019*** (0.005)	F = 124.6; Sargan $\chi^2(24) = 66.6$, $p < 0.001$	6,664
Lewbel + postcode IV	-0.016*** (0.005)	F = 96.5; Sargan $p < 0.001$; C-test $p = 0.138$	5,324
Heckman selection	-0.016*** (0.005)	$\rho = -0.037$ ($p = 0.001$); major city excluded	17,785

In plain terms: the postcode IV is imprecise and its interval includes the baseline. The Lewbel tests reject, so those models are sensitivity checks only. Major city predicts gambling (0.043) but not harm among gamblers (-0.003, n.s.). Oster δ is reported only for the linear models (1.75 to 2.45).