

COLLEGE

444 Lecture 24

Brian Weatherson

2024-04-11

COLLEGE

SOME STYLISTED FACTS

1. College is expensive, both in actual costs and opportunity costs.
2. College graduates get a lot more money over their lifetime than non-graduates.
3. Just getting into a fancy college does not trigger this higher lifetime earning.
4. Completing some but not all of a degree does not trigger this higher lifetime earning.
5. The increase earning to college graduates tends to get larger as people get older.

Table A4.1. **Relative earnings of workers compared to those with upper secondary attainment, by educational attainment and age group (2021)**

Adults with income from employment (full-time full-year workers); upper secondary attainment for each age group = 100

	Below upper secondary			Post-secondary non-tertiary			Tertiary															Total		
							Short-cycle tertiary			Bachelor's or equivalent			Master's, doctoral or equivalent											
	25-34 year-olds	45-54 year-olds	25-64 year-olds	25-34 year-olds	45-54 year-olds	25-64 year-olds	25-34 year-olds	45-54 year-olds	25-64 year-olds	25-34 year-olds	45-54 year-olds	25-64 year-olds	25-34 year-olds	45-54 year-olds	25-64 year-olds	25-34 year-olds	45-54 year-olds	25-64 year-olds						
OECD countries	(1)	(2)	(3)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)						
Australia	93	91	89	102	104	99	93	118	106	116	139	127	116	168	148	112	140	127						
Austria	85	74	77	116	112	114	117	135	127	113	133	104	142	186	171	125	159	144						
Belgium ¹	80	85	86	c	c	112	c	c	c	114	138	127	137	187	158	126	158	142						
Canada ¹	87	73	79	129	110	113	109	113	112	141	145	141	153	166	161	133	135	134						
Chile ¹	78	68	71	a	a	a	123	154	138	214	342	279	345	496	457	190	277	241						
Colombia ^{1,2}	72	69	71	m	m	m	x(19)	x(20)	x(21)	x(19)	x(20)	x(21)	x(19)	x(20)	x(21)	194	275	237						
Costa Rica	82	69	77	c	c	c	130	150	138	185	203	210	c	330	339	177	218	212						
Czech Republic ¹	71	66	67	m	m	m	124	118	117	122	143	131	142	180	167	135	174	159						
Denmark	92	90	90	c	119	124	104	116	110	116	113	129	161	144	117	132	124							
Estonia	93	91	92	99	89	93	m	100	89	122	129	132	152	154	148	135	137	135						
Finland ¹	100	99	100	113	114	116	c	116	122	112	130	122	138	172	163	122	143	139						
France ^{1,2}	78	95	89	m	m	m	102	133	129	112	185	151	149	229	189	127	177	157						
Germany	63	84	72	113	116	113	117	138	132	138	153	152	139	201	184	135	165	158						
Greece ¹	80	76	81	100	106	102	c	167	162	113	133	132	186	169	170	123	139	138						
Hungary	77	76	76	115	126	123	119	129	128	141	159	156	171	234	216	154	185	179						
Iceland	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m						
Ireland ¹	c	81	84	105	97	96	c	124	123	147	172	147	171	226	184	155	178	156						
Israel ¹	83	70	75	a	a	a	115	120	117	162	173	157	187	202	206	158	171	164						
Italy ^{1,2}	96	71	80	m	m	m	x(13)	x(14)	x(15)	121 ^a	101 ^a	102 ^a	128	130	148	125	125	138						
Japan	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m						
Korea	91	84	82	a	a	a	107	121	111	117	153	135	151	193	177	115	150	132						
Latvia	73 ^a	110 ^b	82 ^b	59 ^a	91 ^a	82 ^b	127 ^b	166	157 ^b	132 ^b	167 ^b	156 ^b	202 ^b	166 ^b	170 ^b	152 ^b	166 ^b	163 ^b						
Lithuania ¹	93	91	92	101	108	106	a	a	a	148	157	167	172	192	193	154	181	180						
Luxembourg ³	73	90	84	c	92	100	113	128	134	129	147	140	136	166	158	133	157	151						
Mexico ¹	86	75	80	a	a	a	109	116	117	139	180	153	209	323	308	139	185	158						
Netherlands	88	82	86	104	109	105	128	129	131	118	141	132	139	210	177	127	166	149						
New Zealand	102	89	92	102	103	102	110	122	115	119	137	125	122	166	150	118	140	128						
Norway	83	87	85	104	94	99	103	124	119	99	115	107	117	150	134	106	128	119						
Poland ¹	89	85	86	97	104	101	m	m	m	129	155	140	140	178	162	136	174	157						
Portugal	86	75	83	115	120	113	116	105	106	x(19)	x(20)	x(21)	x(19)	x(20)	x(21)	153	193	171						
Slovak Republic	89	80	82	m	m	m	106	126	122	116	135	126	126	170	156	124	165	153						
Slovenia	87	82	84	a	a	a	110	135	131	129	159	142	149	201	183	135	178	163						
Spain ¹	87	78	80	c	c	c	110	116	118	112	155	143	146	165	196	185	148	161	155					
Sweden	91	83	86	97	123	116	105	112	108	107	122	116	124	154	145	112	133	126						
Switzerland ^d	84	76	80	m	m	m	x(13, 16)	x(14, 17)	x(15, 18)	125 ^a	140 ^a	130 ^a	142 ^a	183 ^a	162 ^a	132	161	145						
Türkiye ³	80	74	77	a	a	a	x(19)	x(20)	x(21)	x(19)	x(20)	x(21)	x(19)	x(20)	x(21)	136	188	153						
United Kingdom	60	75	73	a	a	a	121	117	122	137	146	139	152	164	160	140	145	143						
United States	100	75	78	m	m	m	107	105	110	162	169	169	200	217	221	162	172	173						
OECD average	84	81	82	m	m	m	113	126	122	132	153	143	157	201	188	138	168	156						

Relative wage by educational attainment

SUMMARY

Region	Grads 25-34	Grads 45-54	All Grads
Europe	128	147	138
Nordics	107	121	114
Pacific	147	186	167
USA	162	169	169

NOTES

'Nordic' here is Norway, Sweden, Finland, Denmark;
'Europe' is rest of Europe; 'Pacific' excludes USA.

Source: <https://www.oecd-ilibrary.org/sites/9633d9f3-en/index.html?itemId=/content/component/9633d9f3-en#tablegrp-d1e7393-3a40fea345>

US SPECIFIC

For most of these facts we can get very resilient data cross-nationally.

But there's one group, which will be important in what follows, for which we really have to focus on US data.

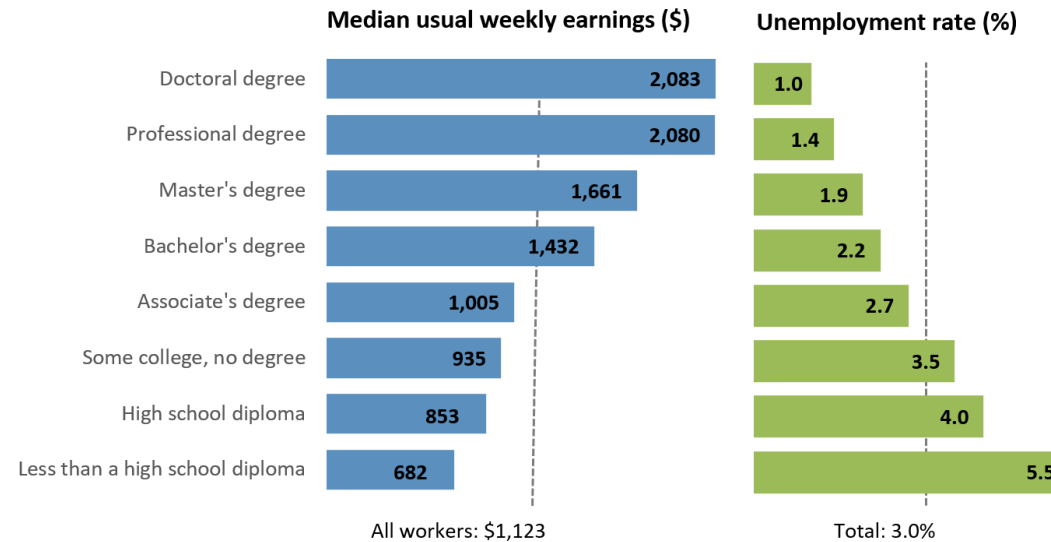
That's the 'some college' group.

**Educational attainment in the
United States (2018)^[5]**

Education	Age 25 and over	Age 25-30
High school diploma or GED	89.80%	92.95%
Some college	61.28%	66.34%
Associate degree	45.16%	46.72%
Bachelor's degree	34.98%	36.98%
Master's degree	13.04%	9.01%
Professional degree	3.47%	2.02%
Doctorate	2.03%	1.12%

Educational Attainment in the US (wiki)

Earnings and unemployment rates by educational attainment, 2022



Note: Data are for persons age 25 and over. Earnings are for full-time wage and salary workers.
Source: U.S. Bureau of Labor Statistics, Current Population Survey.

<https://www.bls.gov/emp/chart-unemployment-earnings-education.htm>

US weekly pay by educational attainment. Actually a little over million dollar bonus for college grads

US SUMMARY

Level	Proportion	Median Pay
High School	28.5%	\$853
Some College	16%	\$935
Associate	10%	\$1,005
Bachelors	22%	\$1,432
Masters	9.5%	\$1,661

QUESTIONS

1. Why do people go to college?
2. Why do employers pay so much extra for college graduates?

Ideally we should

- Consider radically different alternatives;
- Make everyone act rationally

THREE MODELS

Well, three plus/minus one:

1. Human Capital
2. Selection
3. Signaling

And one extra (that may be one of the last two)

4. Honest signaling

HUMAN CAPITAL

HUMAN CAPITAL

College develops skills, and those skills are valuable.

Employers are rationally willing to pay for employees with those skills.

Students develop those skills because the (appropriately discounted) returns from developing them are larger than the costs of developing the skills.

TWO CAVEATS

First, not everyone would develop skills by going to college, so not everyone should go.

For some people, going to college would be like building a fancy house next to a bunch of factories - not a good use of the land. (And that's true even if the land might be very valuable, just not in the way that is enhanced by a fancy house.)

TWO CAVEATS

Second, when we say **college** develops skills, we don't mean that **lectures** develop skills. College also includes:

- Discussion sections;
- Feedback on work;
- Extra-curricular activities (theatre, sports, social organisations)
- Living with unfamiliar people

WHICH SKILLS

Should be a bit careful about the last couple of points.

- Not all US colleges are residential, or have extensive extra-curriculars.
- In many countries, living on campus is the exception not the norm, but the college wage premium is still high.

PROBLEMS

1. Causal mechanism
2. Gate-keeping (or lack of)
3. Sheepskin effect

CAUSAL MECHANISM

I can see (dimly) how the stuff we're covering in 444 could be valuable for employers.

But the last big course I taught had a long unit on medieval epistemology, which I think is really philosophically valuable, but I have **no idea** how it leads to increased profits for an employer hiring someone who took the course.

And a commonly expressed worry is that lots of courses are like this.

CAUSAL MECHANISM

In reply, one might note that a lot of college courses set grads up with skills that come in useful in unexpected ways.

For instance, I'm told the people who are getting the best results out of image generating software are art history majors who have a better understanding of the ways in which pictures have been put together over the centuries.

In general, by not optimising for the present, we might produce good long term value.

GATEKEEPING

If you go to a UM soccer match, where tickets are like \$5, there is someone carefully checking the tickets.

On the human capital model, you'd think this lecture was **much** more valuable than a soccer match.

But there are no ticket collectors at the door. Anyone could walk in! We don't act like it is some special value.

GATEKEEPING

On the other hand, we don't grade just anyone's work, and we do restrict entry to the dorms.

If the lectures are a small part of the way in which we add skills, this might all make sense.

SHEEPSKIN EFFECT

This is the name for the premium people get for **finishing** a college degree.

It is really substantial.

On the human capital model, you'd think that 3 years of college would get you $3/4$ of the skill acquisition of 4 years of college.

But you really, *really* don't see that in the wage data.

SHEEPSKIN EFFECT

This is an objection to the human capital effect being **all** of the explanation for the college wage premium.

We'll want to be careful as we proceed about distinguishing:

- Reasons for thinking something isn't a full explanation;
- Reasons for thinking something isn't any part of the explanation.

SELECTION

SELECTION EFFECTS

Not everyone gets admitted to fancy colleges. Here's a model for the college wage premium.

- The premium is driven in large part by fancy schools; there isn't much premium for non-selective schools.
- Not everyone can go to fancy schools; we literally don't let everyone who applies in.
- The people we admit are independently valuable to employers.

SELECTION EFFECTS

The strongest version of this theory is that this explains 100% of the college wage premium.

I think (for reasons I'll soon get to) that is pretty implausible.

A weaker version is that it explains some of the college wage premium. And it would be surprising if it explained nothing.

PROBLEMS

1. Non-selective colleges.
2. Dropouts

NON-SELECTIVE

Some colleges admit most applicants; some colleges admit all applicants.

These colleges do (as far as I can tell) have a *smaller* wage premium than Michigan or similarly selective schools.

But they do still have a premium, and the selection model can't explain this.

DROPOUTS

The strongest version of this theory is that it's just the admission of getting into college that's evidence you'll get a high paying job.

If that were true, we'd expect to see a very different world to the one we actually see.

DROPOUTS

Why does admission to college mean you'll get a high paying job?

1. Because it signals to employers (who are too stupid to see for themselves) that you're smart. But then why bother actually going? Why wouldn't an offer letter have the same market value as a degree?
2. Because it's a sign to you that employers will, independently, be able to tell that you're smart. But still why go to college? Perhaps because it's so much fun. But there are more fun things that don't involve calculus classes.

SIGNALING MODEL

TOY EXAMPLE

Spence gives an example where lots of variables are **continuous**.

We're going to use a much simpler example, where the variables are **binary**.

This will obviously mean much less realism, but I *think* it doesn't change the important strengths and weaknesses of the model. (As long as we don't fuss about details.)

Though if you think I'm being too fair (or more likely too unfair) to the model for this reason, say so!

STRUCTURE

- Nature assigns each player a **type**, we'll call it H for High Value, or L for Low Value.
- Worker goes to either C (for College), or B (for Beach). (In real world B might include starting work and using the money for more beach.)
- Employer decides whether to offer G (for Good) or P (for Poor) job.

PAYOUTS

For Employer it's easy

- They get 1 for offering Good to High, and Poor to Low; and 0 otherwise.

For Worker it's a bit trickier

- Poor is worth 0, and Good is worth 4.
- Going to Beach costs 0.
- Going to College costs 5 if Low, and 1 if High.

Nature	Worker	Employer	Work-Pay	Emp-Pay
High	College	Good	3	1
High	College	Poor	-1	0
High	Beach	Good	4	1
High	Beach	Poor	0	0
Low	College	Good	-1	0
Low	College	Poor	-5	1
Low	Beach	Good	4	0
Low	Beach	Poor	0	1

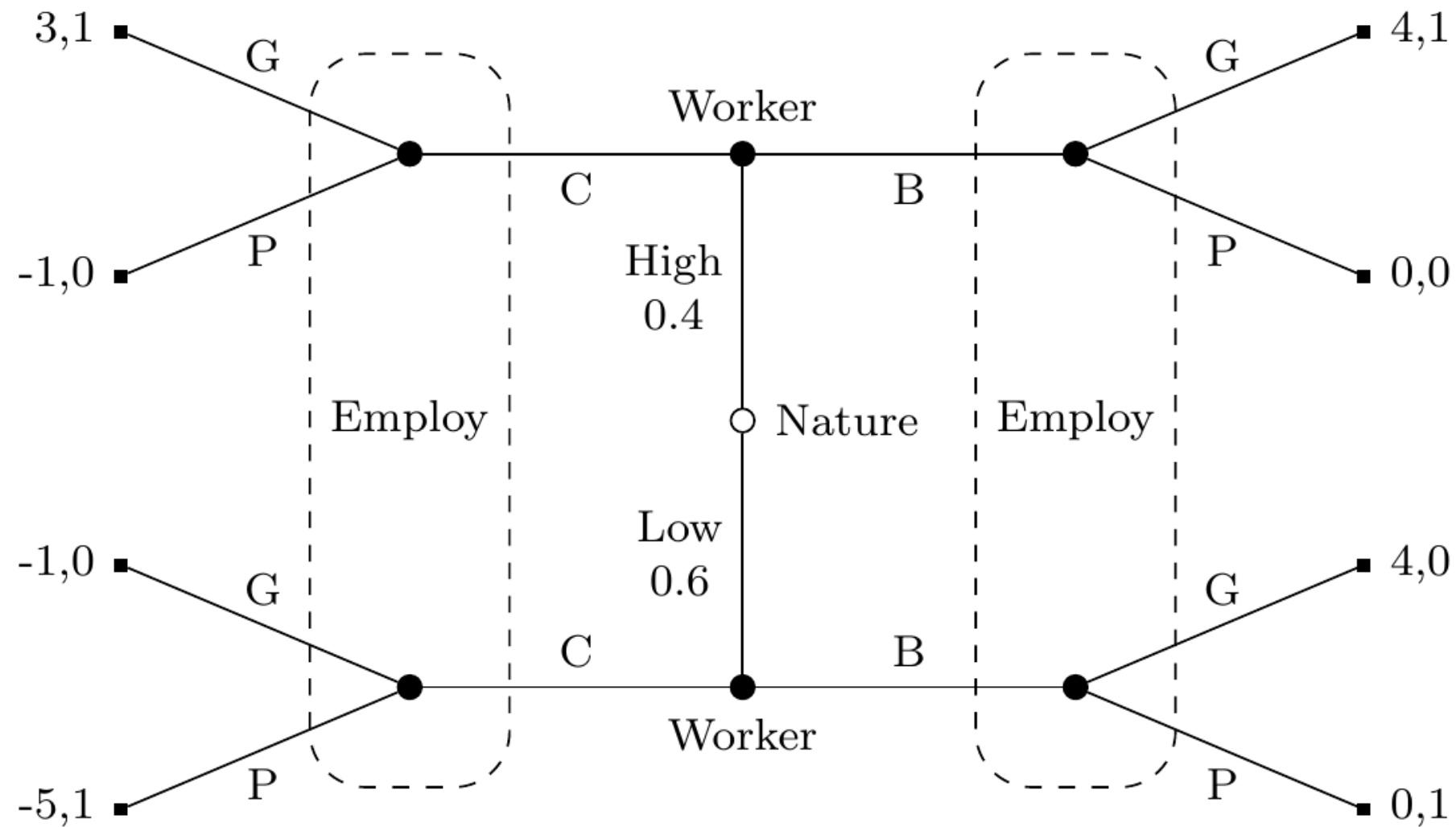


Figure 1: College or Beach game

AN EQUILIBRIA

This tree has a separating equilibrium:

- High workers go to College; Low workers go to Beach
- Employers offer Good jobs to College; Poor jobs to Beach

DETAILS

The model is obviously silly in some ways.

- If the percentage of High goes above 50%, the natural equilibrium is that all workers go to Beach, and employers offer Good to everyone.
- But that problem goes away if you replace the binary variables with continuous ones.

BENEFITS OF MODEL

Solves all the problems of previous models:

- Explains why finishing is rewarded; that shows you were willing to pay the (variable) price of going to college.
- Shows why it doesn't matter what the content is, and why we don't restrict attendance: it's the degree that matters.

DOWNSIDERS OF MODEL

1. Inefficient
2. Wage premium for older workers
3. Costs are too high
4. Costs not correlated with skills

INEFFICIENT

It's really inefficient! The best workers in your workforce spending 4 years doing nothing useful just as a sorting device.

- Even if this makes sense for all individuals, someone at the systemic level should do something about it.
- Surprising that no country has solved this problem. (Though maybe the Nordics have.)

AGE PROFILE

Why does the college wage premium **rise** with age?

- Model assumes employers can't tell that Workers are High or Low.
- That's plausible for 25-34.
- It's not that plausible for 45-54. Why is it still an information set for those workers?

COSTS OF MODEL

The college wage premium is over one million dollars.

- You have to think calculus classes are really really painful to think that they are not worth a million dollars.

COST CORRELATION

The model requires that college is more costly for Low workers than High workers.

- In my experience, the people who liked college most were the professional students who loved reading, getting into dorm room debates about esoteric details, etc.
- These were not the best employees!
- Even careful model requires tight correlation between felt cost of being at college and value to employer.

HONEST SIGNAL

HONEST SIGNALS

There's an annoying terminological point here. Different people use the phrase 'honest signal' in different ways. Some people use it for any situation where there is a separating equilibrium. I prefer using it for games like the following.

REVISED GAME

Low **can't** go to college. At least, they can't finish it.

Everything else in the graph is the same. So here's the revised tree.

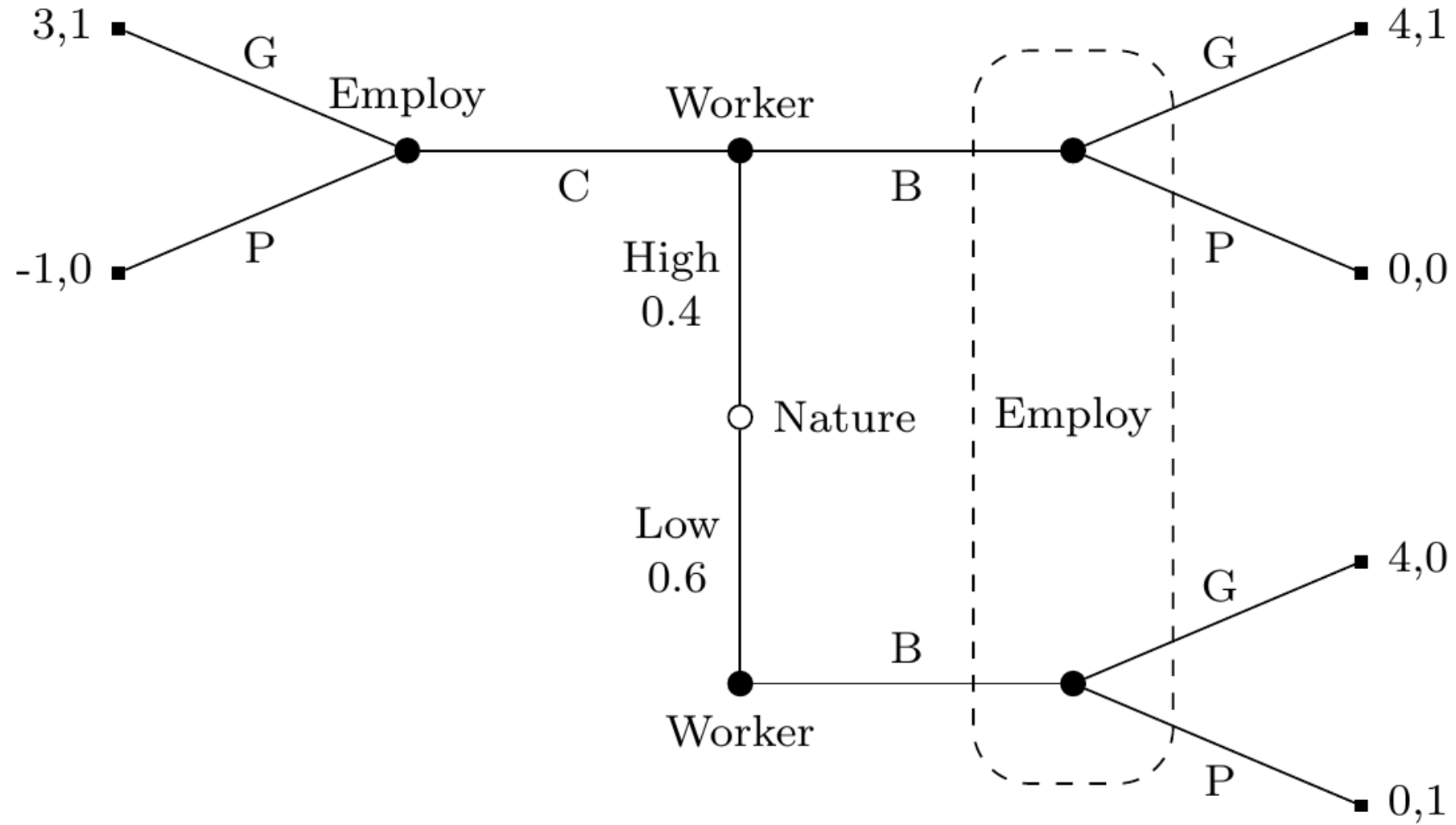


Figure 2: Honest College or Beach game

BIOLOGICAL ANALOGIES

If we have time (we probably won't) I'll talk through how these models are used in biology.

The general idea is that sometimes it is worth doing something to signal, perfectly reliably, that you can do it.

IMPROVEMENT?

This gets rid of the third problem - it's not that Low refuses to take the million dollar bonus, it's that they can't.

I'm not sure it helps with the other three, but on the other hand, I thought that was the biggest problem with the first model.

SELECTION

This model has some features in common with the selection model.

What makes someone get a Good job is the same thing that causes them to (be able to) finish college: namely, that they are a High.

YOUR VIEW

Which is most likely in your view to be **most** of the explanation of the college wage premium.

- a. Human Capital
- b. Selection
- c. Signaling
- d. Honest Signaling
- e. None of the above/other

FOR NEXT TIME

We'll swing back to somewhat traditional epistemology, looking at how philosophers in the last decade or so have used some of the tools we've seen in this course to get a better understanding of