An eclectic introduction to assurance cases

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This is Jon

This is Jon's dad
Tim will give me a ride to the game.
Tim will give me a ride to the game.

Is he a safe driver?
Yes, he is.

How do you know?
It’s just one of those things I know.

That’s not good enough. Try again.
No one says he’s not a safe driver.

How many people have you asked?
Um, ...
well, one,
but ...
... He passed the state test to get a license, so he must drive safely.

Just being legal doesn’t mean he’s safe.
Well, Dad, what’s gonna convince you to let me ride with Tim?

Reasons ...
Well, Dad, what’s gonna convince you to let me ride with Tim?

Reasons ...
Good reasons to believe Tim will get you there and back in one piece.
Well, Dad, what’s gonna convince you to let me ride with Tim?

Or, in other words, I want an assurance case.
I’ll ask Tim if he has one.

Or, in other words, I want an **assurance case**.
Does Tim have an assurance case?
If so, will Jon's dad let him ride with Tim?
Who’s playing in the game?
What sport are they playing?
Who will win the game?
Will Jon get home safely?
And . . .
What about Naomi?
We rejoin our friends a few hours later
I asked Tim about an assurance case.
I asked Tim about an assurance case.

What did he have to say?
He was a tad confused.

I thought he might be. What was he confused about?
Whether an assurance case is the same thing as a safety case. ...

Then he’s heard about safety cases?
Yes, from his sister Rose, who lives in Cardiff in the UK
That's where it all started, you know.

Yes, from his sister Rose, who lives in Cardiff in the UK.
Yes, from his sister Rose, who lives in Cardiff in the UK.
Safety cases came first. Assurance cases are a more general term.
All I really need from Tim is a simple safety case.
That should make Tim happy. Thanks dad!

All I really need from Tim is a simple safety case.
Oh, Dad, I almost forgot...

scene ii
... Tim also wondered ...
... if you want a brief case ...
... if you want a *brief* case ... or a long one.
... the conversation continues ...
... if you want a *brief* case ... or a long one.

Did he really ask it like that?
Well, no, of course not. He’s not as funny as I am.
Well, no, of course not. He’s not as funny as I am.

So, what did he really want to know?
He wanted more details about what you’re expecting.

That’s simple. I want a cogent argument.
Simple? ...
How will Tim know what you’ll think is cogent?

Well ... there’s one surefire way he’ll know ...
What’s that?

If you’re in the car with him riding to the game.
Cute Dad ...
but that’s a bit late
to find out,
don’t ya think?

If you’re in
the car with him
riding to the
game.
Cute Dad ... but that’s a bit late to find out, don’t ya think?

Yeah, sorry ... there really isn’t a simple answer.
Deciding if a case is good enough can be rather tough.

... a few minutes later ...
How tough is it to *create* the case in the first place?

Hmmm. Good question. I guess it sorta depends.
It sorta depends on what?

Lots of things...
It sorta depends on what?

Lots of things
...what the case is trying to show...
It sorta depends on what?

Lots of things...

what kind of evidence you have...
It sorta depends on what?

Lots of things
... who you’re trying to convince ...
I’m trying to convince you Dad, remember?

That you are, my son. ... ‘Tis probably best to just give up now.
I don’t wanna give up!  
Tim’s my only hope for getting to the game!
I don’t wanna give up!
Tim’s my only hope for getting to the game!

No, there is another...

scene iv
Huh?
Huh?

Never mind.
Huh?

Never mind. I was far far away for a second ...
I’ll show you how to create a case to convince me ...
Thanks Dad!

I’ll show you how to create a case to convince me ...

We rejoin Jon & his dad two days later
I’m so stoked
our case
convinced you!
Can’t wait ‘til Friday!

I’m happy for
you, too, Jon.
Hope y’all win.
One more question …
then I’ve gotta
do homework …

O.K.
Let’s hear it.
This case stuff really made me think. Tim said so, too ...
... it seems like such a great idea. Why don’t more people use it?
... it seems like such a great idea. Why don't more people use it?

Well ...
That's a hard question ...
... it seems like such a great idea. Why don’t more people use it?

... with lots of different parts to the answer.
Like what, for instance?
Like what, for instance? 

Lack of understanding of argumentation...
Like what, for instance?

... thinking it is harder than it is ...
Like what, for instance?

... or thinking it adds nothing to what’s usually done ...
Like what, for instance?

... (which is some times true) ...
Like what, for instance?

... or even just believing uninformed rants from so-called experts.
Sounds confusing. Will the problems get fixed?
Sounds confusing. Will the problems get fixed?

Don’t know if it ever will ...
Sounds confusing. Will the problems get fixed?

... because no one really knows how...
Sounds confusing. Will the problems get fixed?

... to figure out if one method is better than another one.
Better get going on my homework now.
Better get going on my homework now.

What is it?
Reading two essays in *Studies in Pessimism*
Never read it. …

Every man takes the limits of his own field of vision for the limits of the world.

Reading two essays in *Studies in Pessimism*

Sounds like something I could’ve written, ‘though.
Yes. ... Yes, it does.
Answers to our original questions ...
Does Tim have an assurance case?

Yes. Yes, he does.
We argue Tim is a safe enough driver to take Jon to the game by showing five independent sources of support for Tim's ability to drive safely. These sources are (1) Tim has satisfied all legal requirements for driving; (2) Tim has not been in an accident; (3) nothing untoward is going on in Tim's life that might cause him to drive less well than usual; (4) Tim has a good reputation for driving; and (5) Tim's car does not pose any special danger. We assume that Tim will be the driver and Jon the only passenger.

Premises:
- Tim has a good reputation for driving (A-2)
  - Safe Driver X believes Tim is a safe driver (A-1)
- Tim's car does not pose any special danger (A-3)
- Tim has not been in an accident (A-4)
- Tim has satisfied all legal requirements for driving (A-5)
- Nothing untoward is going on in Tim's life (A-10)
  - Tim is not currently in any fights (A-8)
  - Tim's academic life will not affect his driving (A-7)
    - Tim consistently gets good grades (A-6)
  - Tim has no big life decision that may distract him (A-9)
X represents the number of safe drivers attesting to Tim’s safeness.

**Safe Driver X believes Tim is a safe driver (A-1)**
The argument for Safe Driver X actually being a safe driver is found in <reference>. Through the statement provided by Safe Driver X regarding Tim’s driving, we conclude Safe Driver X believes Tim is a safe driver.

**Tim has a good reputation for safe driving (A-2)**
We assume a safe driver will not say that someone is a safe driver without adequate evidence. By the testimony of the known safe drivers seen in A-1, we conclude Tim has a good reputation for safe driving.

**Tim’s car does not pose any special danger (A-3)**
Based on evidence to be provided at a later date, we conclude Tim’s car does not pose any special danger.
Tim has not been in an accident (A-4)
Based on common knowledge, DMV records, and insurance records, we conclude Tim has not been in an accident.

Tim has satisfied all legal requirements for driving (A-5)
Given that Tim has a driver's license, which appears to be genuine we conclude Tim has satisfied all legal requirements for driving.

Tim consistently gets good grades (A-6)
Based on Tim's transcript, we conclude Tim consistently gets good grades.

Tim's academic life will not affect his driving (A-7)
By the argument A-6, we conclude Tim's academic life will not affect his driving.

Tim is not currently in any fights (A-8)
Based on common knowledge and testimony of friends and family, we conclude Tim is not currently in any fights, disagreements, or arguments with friends or classmates.

Tim has no big life decision that may distract him (A-9)
Based on testimony from friends and family, we conclude Tim has no big life decisions that may distract him.
Nothing untoward is going on in Tim’s life (A-10)
Only two of these three arguments need to be shown true for the sub-conclusion, nothing untoward is going on in Tim’s life, to be true. Jon’s dad was not satisfied by 2 of 3 and insisted on all three.

Argument One:
By showing Tim is happy and healthy in his personal life based on the argument in A-7, we conclude nothing is going on in Tim’s life that may cause him to drive less well than usual.

OR Argument Two:
By showing Tim is happy and healthy in his personal life based on the argument in A-8, we conclude nothing is going on in Tim’s life that may cause him to drive less well than usual.

OR Argument Three:
By showing Tim is happy and healthy in his personal life based on the argument in A-9, we conclude nothing is going on in Tim’s life that may cause him to drive less well than usual.
Tim is a *safe enough* driver (A-11)
Using multiple independent sources of support justified by arguments A-2, A-3, A-4, A-5, and A-10, we conclude Tim is a *safe enough* driver to take Jon to the basketball game.

Glossary

- **safe enough**: at least as safe as Jon's dad
- **special danger**: a problem safe driving cannot overcome
- **good grades**: at least a B+ average
Based on
... will Jon’s dad let him ride with Tim?

Yes.
Who’s playing in the game?

Garden View High School (Jon’s school)

v.

Catronville High (GVHS’ rival).
What sport are they playing? 

Basketball.
Who will win the game?

Sadly, Catronville.

(Happily, in just four months, GVHS will defeat CHS in an epic battle for the state championship in baseball. Jon will drive in the winning run.)
Will Jon get home safely?

Yes, without incident.
What about Naomi?

Her dad wouldn’t let her go to the game.