

## MicroChat: Elements of critical thinking

### Who benefits?

(Kenneth Timmis and Joan Timmis)



Jess is the boy in the centre of the image, Kate is on the right, and Ximena (Cindy-Lou; 9 years old in this earlier photo, but now 16) is in the front feeding her pet rabbit with its favourite delicacy. (created by Fran Jebok; <https://www.theabsurdmicrobe.com/recurring-characters/>)

*Ximena (called Cindy-Lou by her family but Ximena, another of her names, by farmer Giles who finds it more attractive and fitting to her personality):* Morning Farmer Giles: I hope your chickens are laying nice eggs for us today. Mum wants to bake a Victoria Sponge cake for us today.

*Farmer Giles:* Oooh: then I will have to think of a reason to call by later in the afternoon: your mum's sponge is the best ever!

*Ximena:* Oh, yes – it is divine!

Do you know what? My friend Jane came up with a fantastic idea yesterday: she said we could become agents for eco-beauty products and for everything we sold over a certain amount, we would get products worth 10% of its value. This means that some of the pocket money mum gives me each week could go towards new apps for my phone, instead of beauty products.

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*Farmer Giles:* Well, that sounds interesting. It would also give you a part-time job which would be good experience for future work and job applications.

Errr: which company is it and who would be your immediate contact?

*Ximena:* Oh, Jane says it is a new company I haven't heard of that markets really good products containing microbially-made ingredients<sup>1</sup>. Her boyfriend is the company Regional Sales Manager.

*Farmer Giles:* Ahh – microbes are absolutely amazing and are being harnessed by microbiologists to provide all manner of products and services we need, including components of personal care products, like perfumes, face creams, sunscreens and so on<sup>1</sup>. They even deliver things like Botox though, I must say, puffy lips don't appeal to me personally.

However, although eco-products are the future, not all of those being marketed will necessarily be good. Have you checked on the web what is known about the company and its products? I am sure Jane is a nice girl, but it is always important to get a representative overview of the quality of products you use, and especially those you might give or sell to others. Web ratings may not be very reliable but can often provide useful information.

*Ximena:* Errr....no...I did not think of it. Actually, I have my iPad in my bag – I can check now.

How strange! There is not much information at all about the company, but the scores range from really good to really bad.....here is one that says the products are fabulous and have hugely improved the social life of the girl. But another says that they caused a rash and could not be used any more. And here is another that also complains about a rash. That does not sound too good....

*Farmer Giles:* No, and this shows that it is always crucial to do a reality check yourself on suggestions made to you, including those made by friends. They may be acting in good faith, but they may not be as critical of the issue as they should be, especially if they are simply transmitting information from a friend or partner.

If *you* make a mistake, that is one thing: we all do from time to time and they teach us the lessons of life and how to minimise mistakes. But: if you fail to recognise a mistake of others, accept and perpetuate it, and propagate it in your network, it grows out of control. Just like that weed over there that I keep forgetting to pull out and that is seeding itself all over the place! And, if a mistake can result in damage of one sort or another, its perpetuation amplifies the damage made.

*Ximena:* Oh, golly! Jane was so enthusiastic – I wonder why *she* did not check on the company?

*Farmer Giles:* Well, because it was her boyfriend who proposed that she get you involved, I suppose she just trusted him because of their relationship. They say 'love is blind'!

The thing is: I imagine that, as Regional Sales Manager, he will be getting a significant amount of financial reward for sales. Such sales will be made primarily by you and Jane, and any others he can recruit, who will be working hard to find and persuade customers to buy. While he gets

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paid for the work you do, you do not! Okay, you receive some free samples from time-to-time, but this essentially costs the company nothing.

*Ximena:* Well, that is not fair!

*Farmer Giles:* Exactly! And, actually, it may be worse than this because, if you sell a product that causes problems like a rash, as the first point of contact, you will get the blame and your reputation in school will be affected.....you may even lose some friends because of it.

*Ximena:* Gosh: I never thought of that! What should I do?

*Farmer Giles:* Well: the first thing to do is to discuss it with your mum who, in addition to producing the best cakes, is the wisest person I know, and to follow her advice. I expect she will tell you to politely decline Jane's invitation on the grounds that you do not have enough time. She may also suggest that you tell Jane you read that there may be some problems with the beauty products, just to sow some seeds of doubt in Jane's mind that may prompt her also to do a reality check.

*Ximena:* Yes, and Mum is always so sympathetic when we get into trouble!

*Farmer Giles:* Well, that is what mums and dads are for – it is part of their job descriptions.

By the way, the question “Who benefits?” is really interesting in many ways, also regarding microbes. For example, when mums breast-feed their babies, they are not only giving them all the nourishment they need, but also antibodies and other materials that fight off infections that could otherwise overwhelm the growing infant who is still in the process of developing its own defences.

*Ximena:* Oh, yes: we learned in school about the importance of breastmilk for infants.

*Farmer Giles:* Excellent! But did you know that in addition to containing all manner of components that feed the baby, breast milk contains compounds called human milk oligosaccharides, or HMOs, that the infant is unable to digest? Now why would mothers use their precious energy and food to make materials for milk that do not feed the infant?

*Ximena:* Gosh, I did not know that but, from the topic of our conversation, I assume that someone else benefits..... maybe the gut microbes?

*Farmer Giles:* Oh, my goodness, you are clever! Yes, exactly: the HMOs can be used as food by a few types of microbe, microbes that are beneficial to babies. So the HMOs stimulate the growth of these microbes which in turn inhibit the growth of other microbes that can be harmful. Not only that, but, because the gut microbes steer development of the immune system, and the HMO-stimulated bugs steer its development in a good way, they have long term benefits for the developing infant.

So, there is a surprising answer to our question “who benefits from HMOs” in mother's milk because the immediate beneficiaries are certain gut microbes, not the infant. But the infant is an indirect beneficiary through the activities of the bugs that benefit from the HMOs. And this

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benefit is hugely important for the health and development of the baby. So mums have evolved to make HMOs, not to feed the baby but to feed certain gut microbes and thereby steer the composition of the gut microbiota, which in turn steer development of the baby's immune system, which in turn makes healthy children.

*Ximena*: Wow: how fascinating! Mother's milk – feeding gut microbes – immunity – health: everything is connected!

*Farmer Giles*: Absolutely! Humans and their microbiomes are tightly integrated systems that have co-evolved together for mutual benefit.

But, to return to humans and the lesson we learned. When people try to persuade you to do something, always look beyond the picture they paint for you and ask the question: who benefits? Who gains personally?

It may be that everyone involved benefits more or less fairly, which is fine. But it may be that someone benefits unfairly, making the entire issue something to be avoided. In such cases, the main benefactor often tries to hide the benefit distribution from the others involved. It is therefore really important to dig into the benefit distribution.

But what are the benefits that should be considered? Well: they can vary according to the situation, but money, relationships, and influence/power are the usual culprits, hence the maxims: 'follow the money!' (i.e. look to where/whom the money of the operation flows), and 'cherchez la femme!' (which roughly translates as 'follow the romantic or otherwise influential partner', since this person may be the ultimate recipient of the majority of benefit, and may even be secretly steering the operation in their own interest). Other benefits can include advancing career, boosting personal popularity and/or ego, gathering information that can be used for gain, and so forth. And of course, multiple forms of benefit can also be sought.

Most importantly, however, *never, ever* take an immediate or fast decision on a proposition. Anyone putting pressure on you for a fast decision should always be a red flag signalling that the proposition may be fishy/dodgy. *Always, always* think it over in peace and quiet, discuss with your mum and dad, or friends. And, above all, seek relevant and reliable information about the issue, to help you make the right decision.

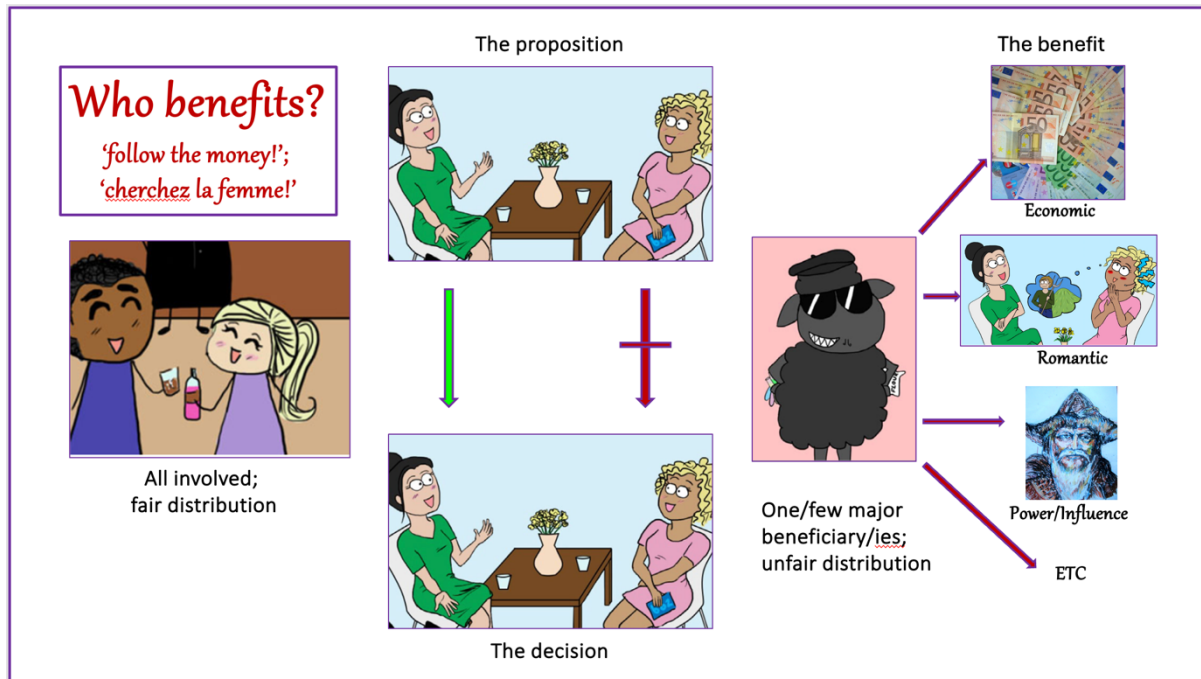
*Ximena, looking rather chastened*: Oh: I think 'follow the money!' and 'cherchez la femme!' would both have been good strategies for me to have followed in this case!

*Farmer Giles* – your advice is always so helpful. I think farming must be especially good at teaching people how to think sensibly.

*Farmer Giles*: My dear – that is a very profound thought and, I think, correct assessment!

*Ximena, more cheerfully and looking just a little proud*: Well: I best be off. Don't forget to choose the best eggs for mum! See you later (blows a kiss)!

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<sup>1</sup> e.g. see following Topic Frameworks in TF Section Microbial gifts - Biotechnology  
*Compatible solutes: our and their protectants*, by Hans-Jörg Kunte  
*Microbial sunscreens*, by Ellie Rose Mattoon, Arturo Casadevall and Radames Cordero  
*Microbial biopolymers and surfactants*, by Tony Gutierrez  
*Perfumes and flavours*, by Patricia Godoy, Estrella Duque and Juan Luis Ramos  
*Applications of toxins and virulence factors*, by Shelley Payne