

How much information can you pack into one bit

Written by Magnus Ramage Lecturer in Information Systems at The Open University



Yo! And to say it again, yo! There's a [new app available](#) which does precisely one thing: it sends the single word "yo" to another user. No context, no other message, not even "no". Just "yo". Yo. Yoyo. Yikes.

How much information is there in that message? Apparently one bit (the standard unit of information). The only message you can send is the word "yo"; the only alternative is not sending it. And as system theorist Gregory Bateson [once observed](#), even "the letter which you do not write can get an angry reply".

But then as Bateson went on to say, information is not just news of a difference – the presence or absence of a Yo, in this case – but it is a particular difference which is meaningful in a particular situation, and to a particular observer. In his classic phrase, it is a difference that makes a difference.

And the thing about Yo that is interesting is the context in which it is used. Because it's not actually true that the only information that is conveyed is the presence or absence of the word. The app also tells you who sent the Yo, and when they did it.

The marketing for the Yo app suggest a set of uses where the semantics of the Yo are agreed in advance, so that a Yo from a particular user at a particular time has a specific meaning, such as a Yo from a sports team when they score, or a Yo from a blog you follow when it has a new posting available, or even (obligatory slightly creepy geolocation reference) a Yo from the local ice cream van when it's round the corner from you.

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In that respect, Yo reminds me of the way we used telephone rings when I was a teenager, to send a message between friends, or child and parent, while avoiding paying for a call – “three rings means come and pick me up”, that kind of thing.

It’s utterly contextual. Without pre-agreed semantics, it’s just a bit of fun. But in an appropriate context, it can convey quite a lot. Charles Arthur at the Guardian [reports](#) that their tech reporters are using Yo as a “method of prodding people to look at [a] particular screen” when a message from a colleague is waiting there.

There’s a slight problem with this particular app, in that Yo was hacked pretty rapidly. And also that using it makes you look like a hipster with too much time on your hands. But these issues don’t stop the question about its information content being interesting. As ever with information, context is everything. Does Yo send more than one bit of information? Yo. And no.

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