

'Gay gene' testing apps are misleading and dangerous

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The launch of a genetic app titled "How gay are you?" prompted a well-deserved outcry from scientists and the public last month, with media coverage branding it "[disgusting](#)" and "[the latest bad idea](#)".

The app, which has since been withdrawn from sale, was just one of many available from online app store [GenePlaza](#). Billing itself as "a marketplace for genetic reports," this site offers a wide range of genetic tests that promise to reveal unassailable truths about your sleep, health, neuroses, ancestors, and even your intellect.

The genes tested in each "genetic app" are sourced from scientific reports that have established links between particular genetic variants and particular traits. But the tests are not directly affiliated with the scientists or their studies, and the interpretation and communication of the data produced by the apps is done solely by the developers.

The science behind the test

"How gay are you?" used data from a [paper](#) published earlier this year in the journal *Science*, showing that [sexual orientation](#) has a significant genetic component. According to the research, 8-25% of same-sex sexual behaviors can be accounted for by leafing through a few specific pages of the (very) lengthy book that represents your personal genome.

Sexual orientation is complex—thought to be the product of many genes, as well as environmental effects. Although certain gene variants are weakly related to same-sex attraction, the authors of this paper took pains to point out that genetics cannot be used to predict sexual orientation.

So what use is a genetic test if it can't predict individual differences? Not much, most scientists think.

Benjamin Neale, an author on the paper from which the genetic data was derived, [sent a letter to GenePlaza](#) asking it to take down the app. A [change.org petition](#) to remove the [test](#) has attracted around 1,700 signatures. "How gay are you?" now appears on GenePlaza under the

name "122 shades of gray," is no longer available for purchase, and carries a disclaimer stating that it does not predict same-sex attraction and is not associated with the authors of the Science study.

Genetic explanation and sexuality

These tests are not just useless, but potentially dangerous. Information about the genetic basis of traits can have profound effects on the way we understand ourselves and others.

For sexual orientation, the impacts of genetic information seem mixed. One [study](#) reported that learning about a [biological basis](#) for homosexuality increased anti-gay attitudes, whereas another [found the opposite](#).

Although many people who identify as homosexual [endorse a genetically determined view](#), among sexual minorities this belief seems to be a double-edged sword. Gay men who perceive their sexuality as biological are [more certain about their sexual identity, but also view themselves as more different from heterosexuals and in turn experience more self-stigma](#).

For heterosexual and LGBT populations alike, more research is needed to know what psychological effects the results of genetic tests of this kind might have.

Self-fulfilling prophecy

For some other traits, it is already clear that belief in a genetic basis has a negative effect. Women given biological explanations of gender differences are more likely to hold [negative self-stereotypes](#). In one study, women who were informed that women have genetically inferior

mathematical ability went on to [perform relatively poorly on a maths test](#)

This suggests that even if there is no genetic basis for a behavior or ability, receiving a genetic explanation can become a self-fulfilling prophecy. GenePlaza itself offers a [Math Ability](#) app, which promises to tell you how you stack up against the rest of humanity.

Obesity has also been shown to be affected by how we think about genes. Even the most common gene variant associated with obesity only explains a [tiny fraction](#) of the variability between individuals. Despite this, a whole cottage industry has sprouted to offer "genetically tailored" diets.

Not surprisingly, GenePlaza offers a [My Weight](#) app, with the tagline "can genes determine the size of your jeans?" The answer is possibly yes, albeit via your brain.

Learning that obesity has a genetic basis leads people to [discount the importance of exercise and a healthy diet](#). In [one study](#), participants given information about a link between genes and obesity ate more cookies than those who read a non-genetic explanation.

Perhaps most concerning is GenePlaza's [Depression App](#), which uses data from a [2018 Australian study](#) to provide information about one's genetic risk of depression (although it does feature a disclaimer that its results are "not a diagnosis, a prediction, or a predisposition score").

Social psychologists have shown that when people are told they have a predisposition to depression they are [less confident in their ability to cope](#), and even [remember more depressive episodes](#) in their recent past.

Belief in a genetic basis to mental illness not only affects our self-

perception, but our attitudes to others too. When thought to be genetically based, people are [more negative](#) towards those with a mental illness and more likely to [perceive them as dangerous](#).

These apps are marketed as a curiosity or as harmless fun. But there is danger in claiming to be able to use genetics to predict any aspect of someone's identity, abilities, mental health or sexual orientation. Misunderstanding of genetic information can have grave consequences for those receiving it.

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