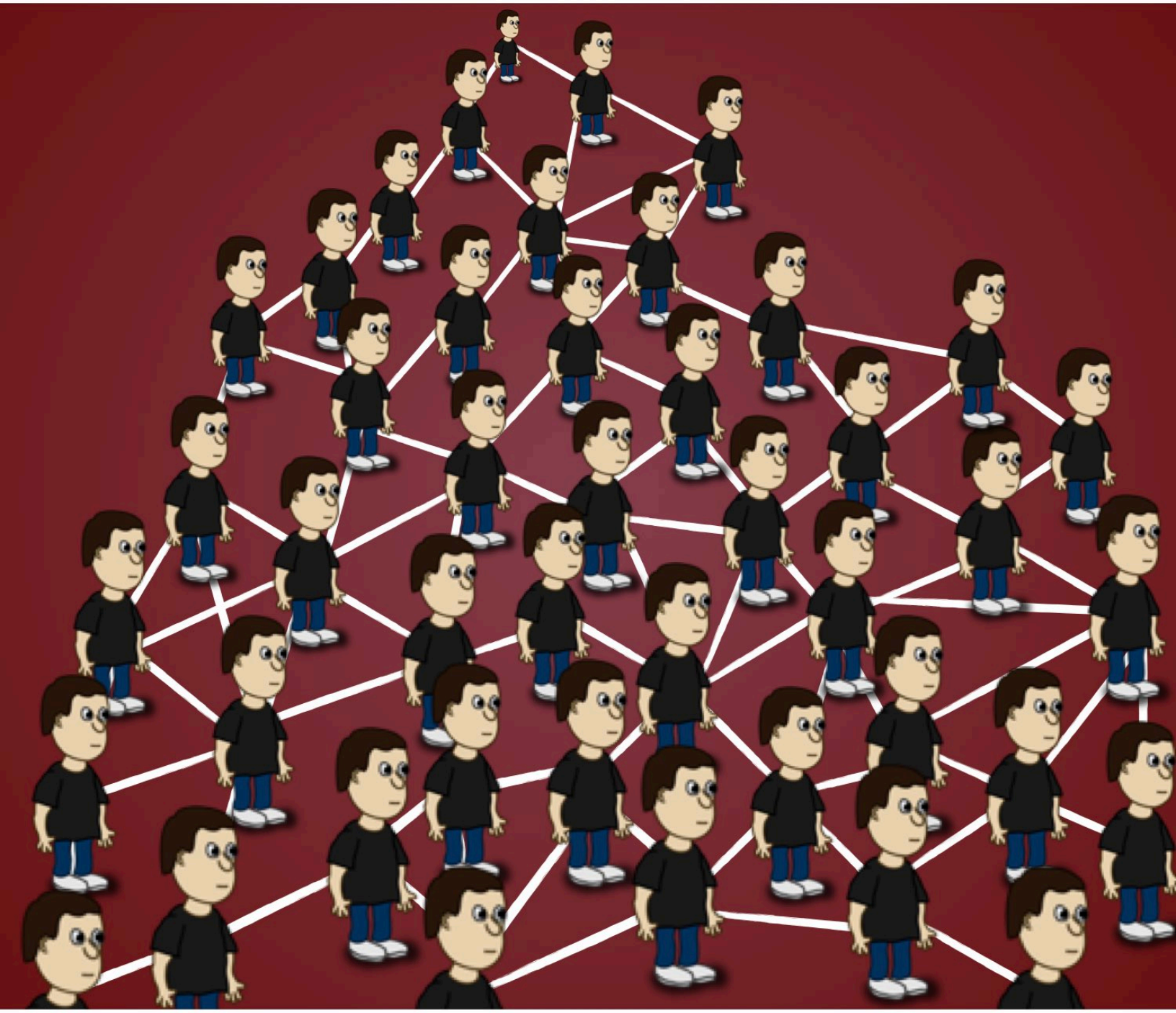
THE SCIENCE OF

# VIRAL MARKETING



NICK KOLENDA

# The Science of Viral Marketing

Nick Kolenda

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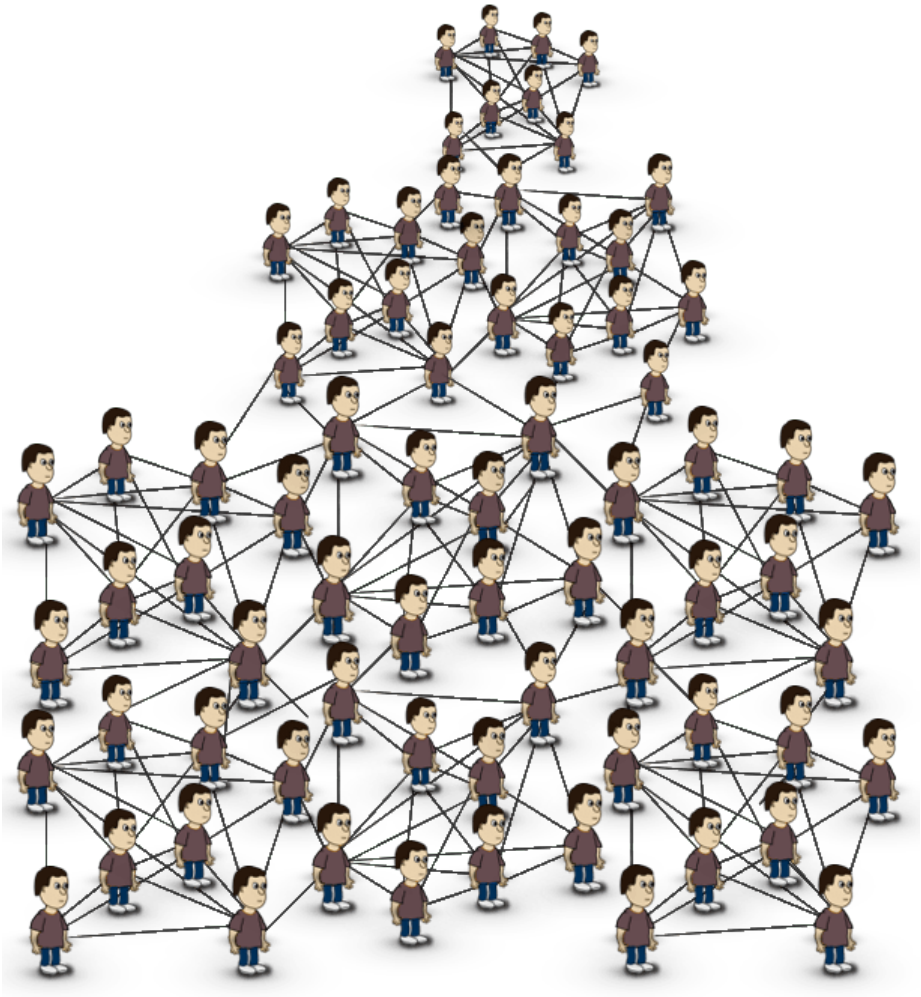
Viral marketing is the holy grail.

- Everybody wants it.
- Nobody knows how to do it.

But imagine if you COULD achieve it.

Just target a few central hubs. Then bam: **exponential growth**.



…but it's not THAT easy, right?

Viral marketing has mysteries:

- Why do people share messages?
- How do you gain initial traction?
- Which "seeds" maximize diffusion?

**Those questions irked me**.

If I could solve those mysteries, then maybe — just maybe — I could reverse engineer virality.

So I spent weeks combing through academic research.

I read everything I could find. From network theory. To epidemiology. To other fields with complicated-sounding names.

Stuff like this:

$$1 - \mathrm{e}^{-s_j y_j} \geq \left(1 - \mathrm{e}^{-y_j \cdot \left(\mathbf{x}^\top M\right)_j}\right) / (1+\varepsilon).$$

trivial. For $y_j = 1$, since $(1+\varepsilon)s_j \geq \left(\mathbf{x}^\top M\right)_j$, we have $\mathrm{e}^{-(1+\varepsilon)s_j} \leq \mathrm{e}^{-}$
enough to show that $(1 - \mathrm{e}^{-s_j}) \geq \left(1 - \mathrm{e}^{-(1+\varepsilon)s_j}\right) / (1+\varepsilon)$, namely,

$$\frac{\varepsilon + \mathrm{e}^{-(1+\varepsilon)s_j}}{1+\varepsilon} \geq \mathrm{e}^{-s_j}.$$

bove inequality holds due to Weighted AM-GM inequality $\frac{ax+by}{a+b} \geq x^{a}$
y letting $a = \varepsilon, x = 1, b = 1, y = \mathrm{e}^{-(1+\varepsilon)s_j}$.

...which led to this:

Article 327 of 500

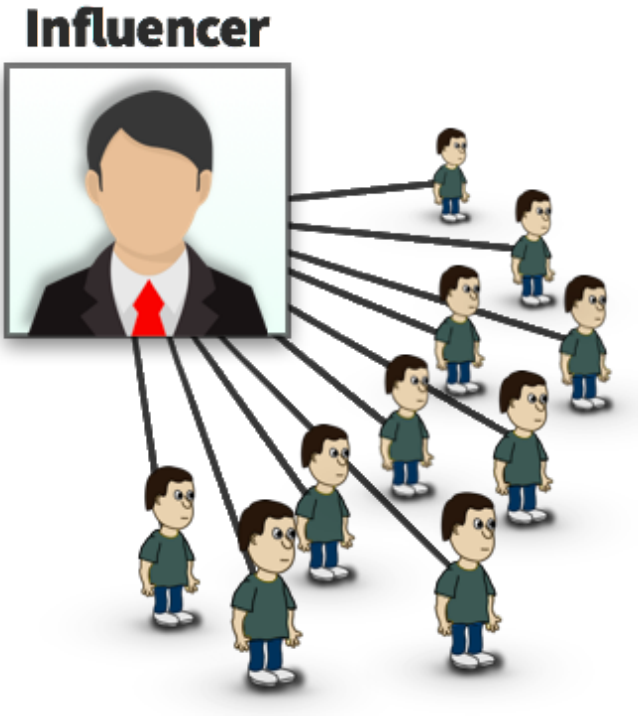
But in the end — and 500+ articles later — the headaches were worth it.

I had an epiphany: **It IS possible to control virality**.

This article explains how.

# PROBLEMS WITH THE COMMON STRATEGY

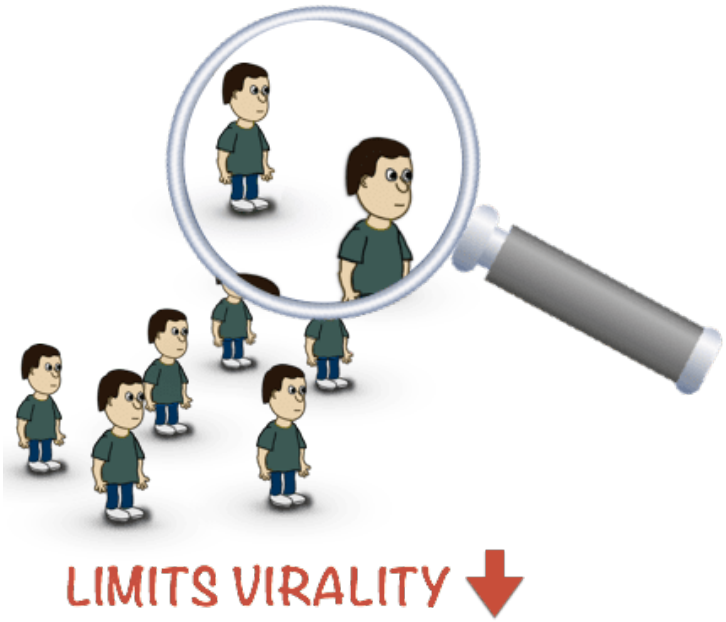
Typically, marketers target “influencers” with many connections.




And it CAN work.

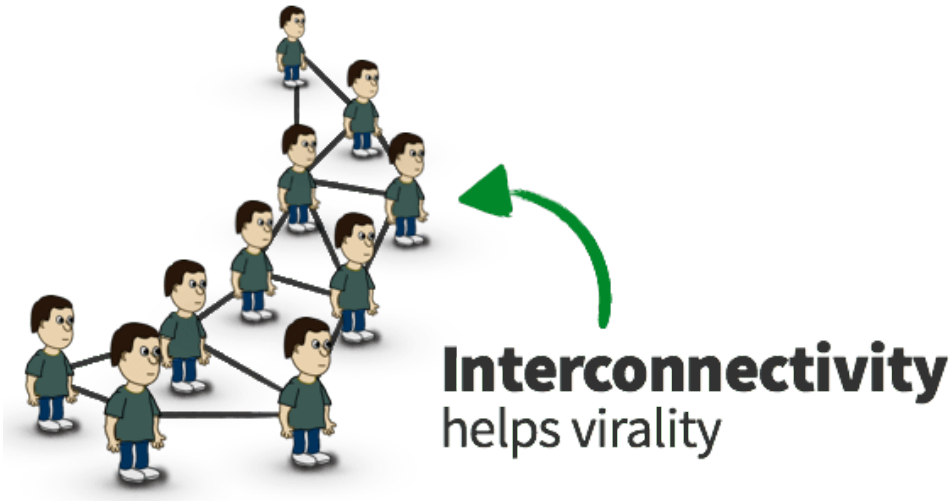
However, it *restricts* virality for 3 reasons:

# PROBLEM #1: LOW INTERCONNECTIVITY



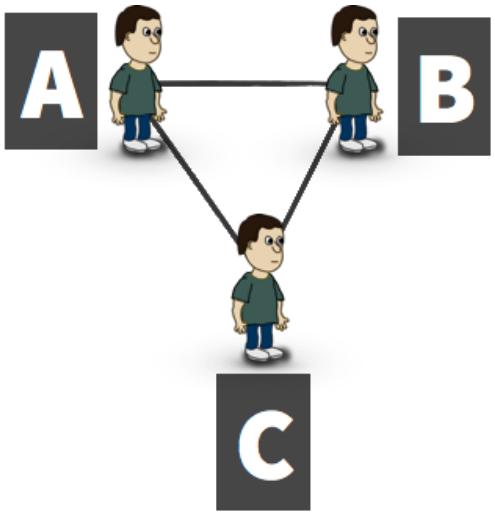

Those people aren't connected to each other.

Sure, they're connected to the source — the influencer. But that's not enough. To maximize diffusion, networks need *interconnectivity* (Lerman & Ghosh, 2010).




When nodes are interconnected, **infection builds WITHIN the network**.

Suppose that Node A shares a message. Then Node B reshares it.

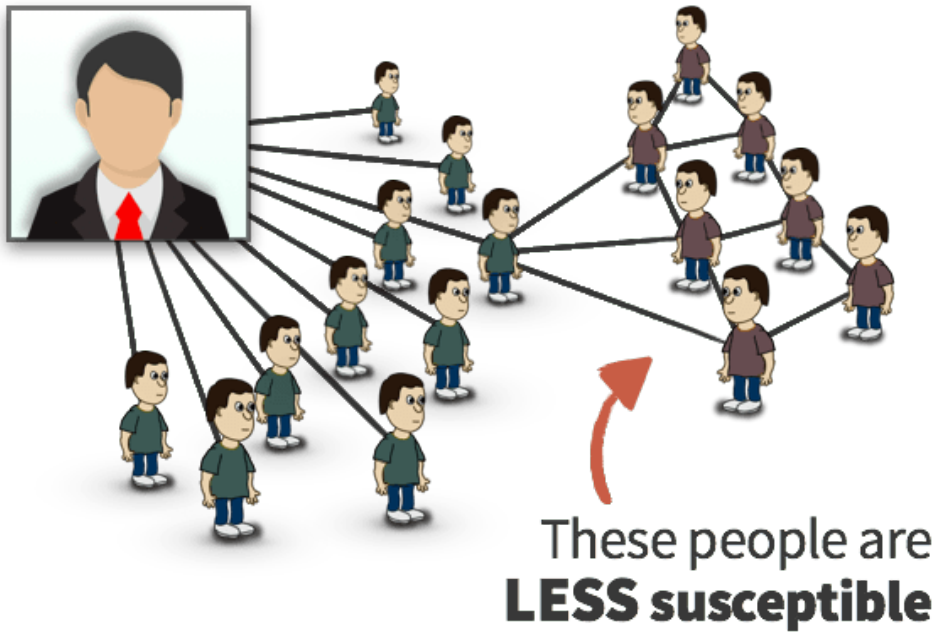



In that network, Node C is exposed to the message *twice*.

Those repetitions trigger a snowball effect. *With more exposures, there's more infection. With more infection, there are more exposures*.

Similarly…

# PROBLEM #2: SECONDARY SUSCEPTIBILITY

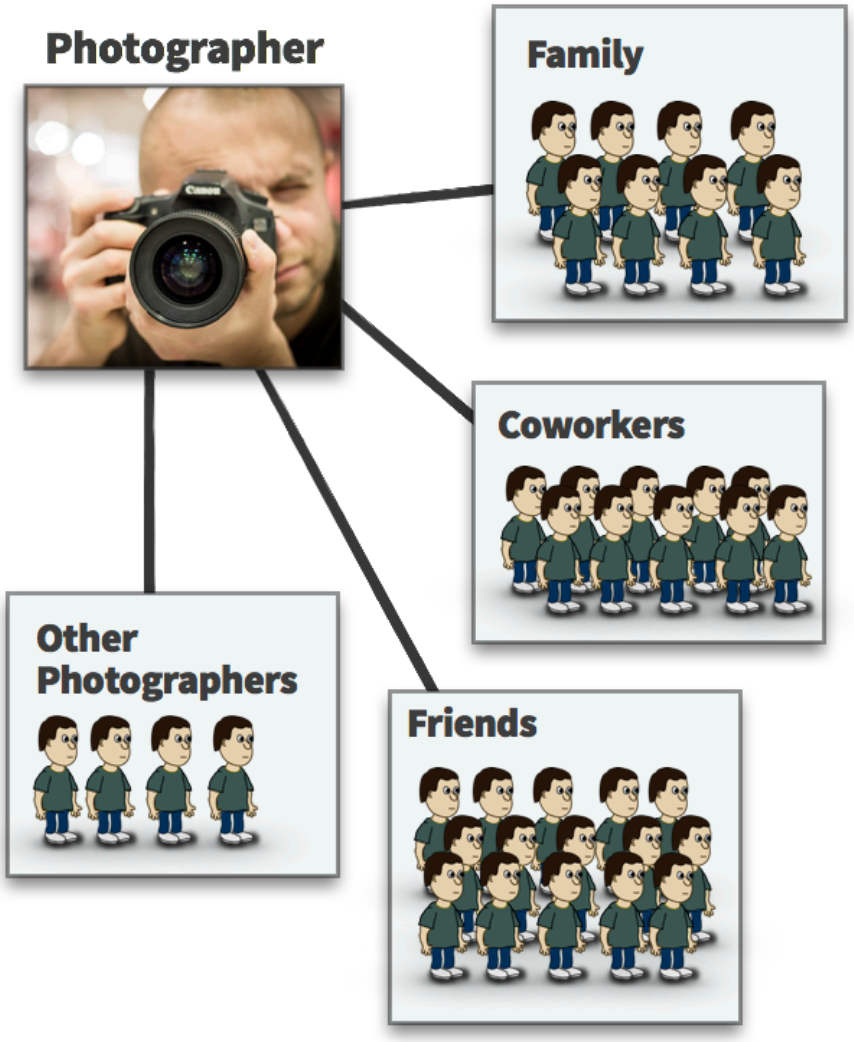



Without interconnectivity, nodes transmit messages OUTSIDE the network.

That might *seem* helpful — because your message is reaching new networks. But it's usually detrimental. Those secondary recipients are often less susceptible.

Consider a photographer.

What's the typical social circle for a photographer? Maybe this:



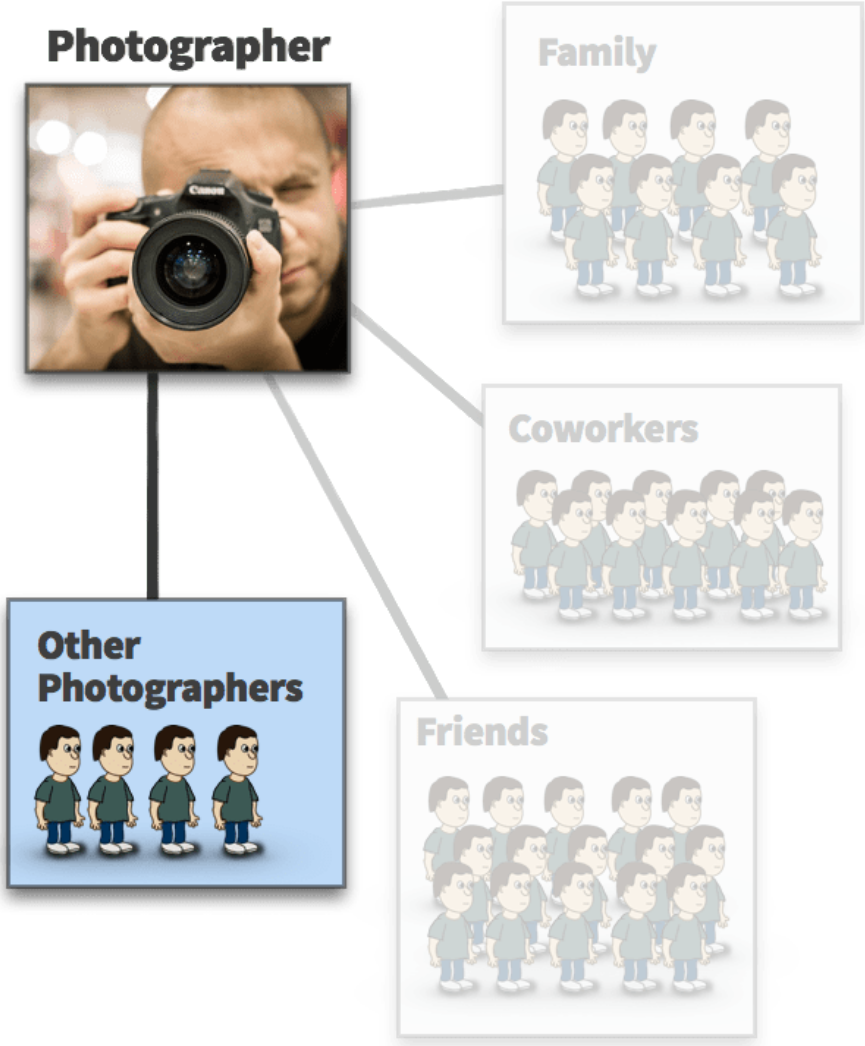

Now, suppose that you need to reach photographers for your business. So you write an article on photography.

And suppose that you convince an influencer — who has a following of photographers — to share it.

That's great, right?

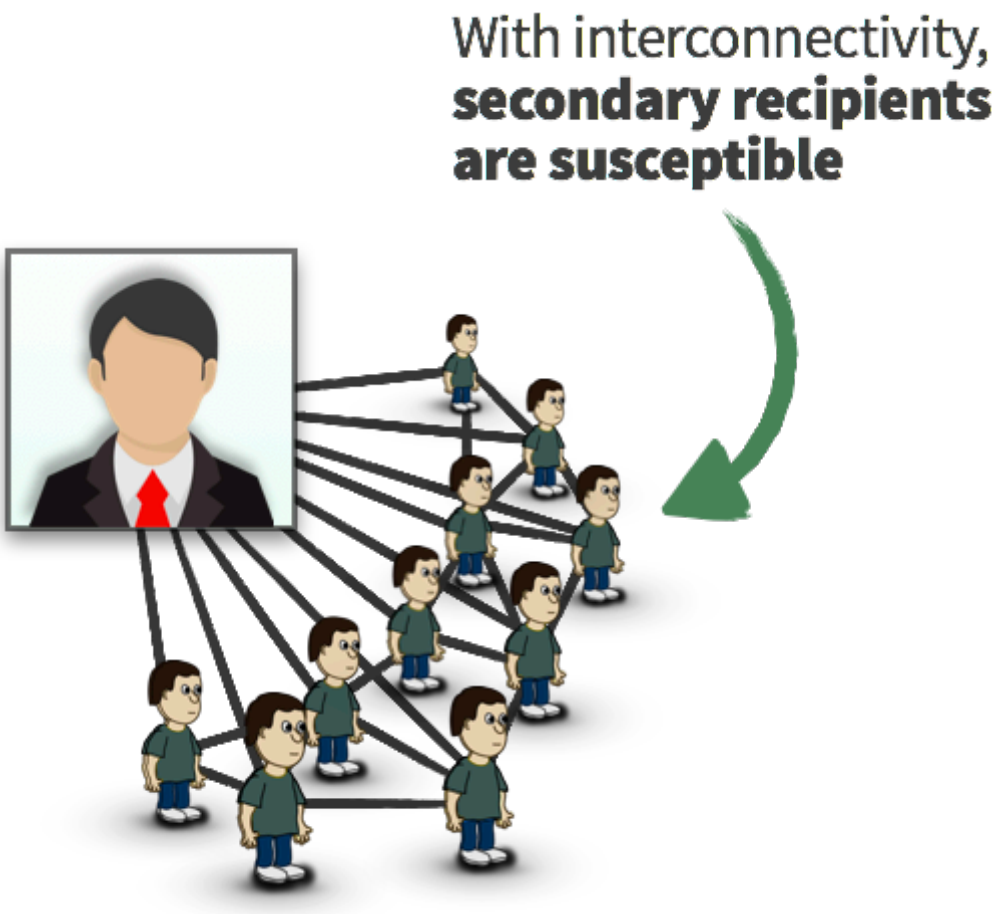
Well, it's good. But it's not great. **The virality is limited**.

When those photographers share the article, they're sharing it with their social circle. And — as we just saw —their circle only has a few photographers.



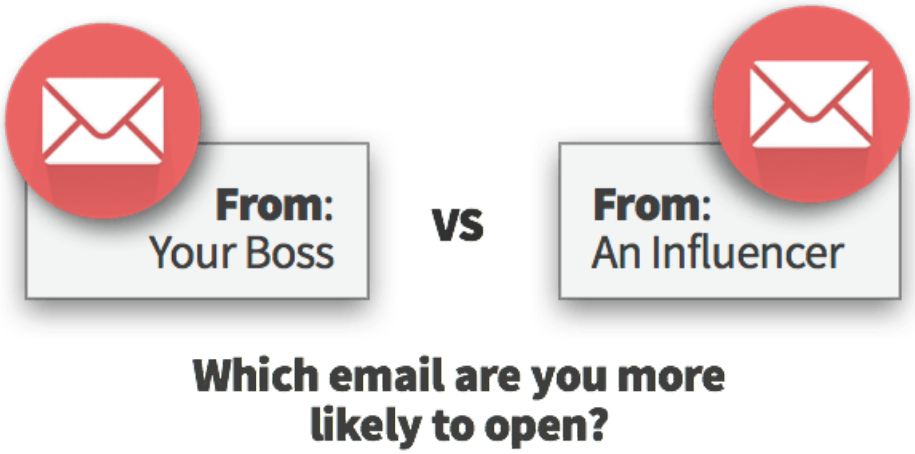

Thus, only a few people are susceptible.

Now, imagine if the influencer's network were *interconnected*. If a photographer shares the article, then other photographers are exposed to it.




*Those nodes ARE susceptible*. So infection builds WITHIN the network.

## PROBLEM #3: WEAK CONNECTIONS




Influencers have MANY connections. But those connections are weak.

It's not the end of the world if you ignore a blogger's email.

(except my emails, of course)

To maximize virality, you need *strong* connections (Reagans & McEvily, 2003).

Those three problems — low interconnectivity, secondary susceptibility, and weak connections — can be resolved through micronetworks.

# WHY MICRONETWORKS ARE THE SOLUTION

In my research, I kept encountering a theme. I eventually called this theme a "micronetwork."

## WHAT IS A MICRONETWORK?

> **MICRONETWORK** — A dense network with strong interconnections

My definition has three pieces:

- **INTERCONNECTED**: People know each other.
- **DENSE**: It's small. Most people know everyone in the network.
- **STRONG**: People frequently interact. And the communication is important.

## THE ROLE OF MICRONETWORKS IN VIRALITY

Viral messages usually originate from micronetworks.

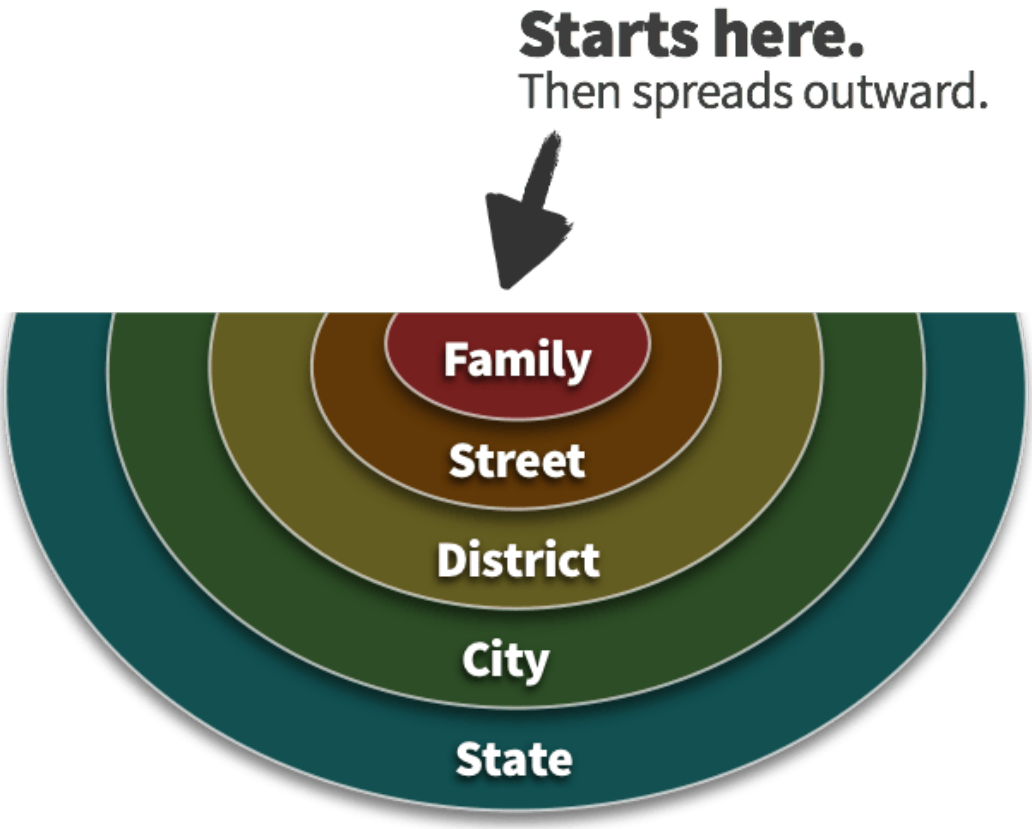
And that makes sense. Based on epidemiology, widespread epidemics originate from small networks — like families (Ball, 1997).

When one person becomes infected, the immediate family becomes susceptible. Infection spreads easily because they live in the same house.

**Then it triggers a snowball effect**.

Once the family becomes infected, adjacent networks — like families across the street — become infected.

And it *keeps* spreading outward.




Suddenly the whole region becomes infected. And it all started from a micronetwork.

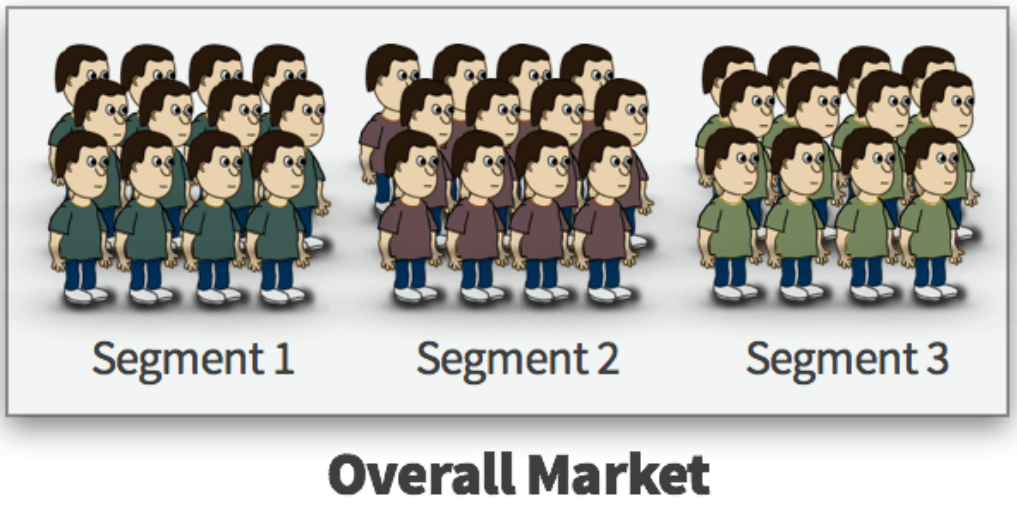
# HOW TO USE MICRONETWORKS IN VIRAL MARKETING

Viral marketing is a HUGE topic. I compiled all my research into an online course. If you're subscribed to my blog, I'll send you a message when I open enrollment.

This article explains 3 strategies.

## STRATEGY #1: TARGET A MICROSEGMENT, THEN SCALE OUTWARD

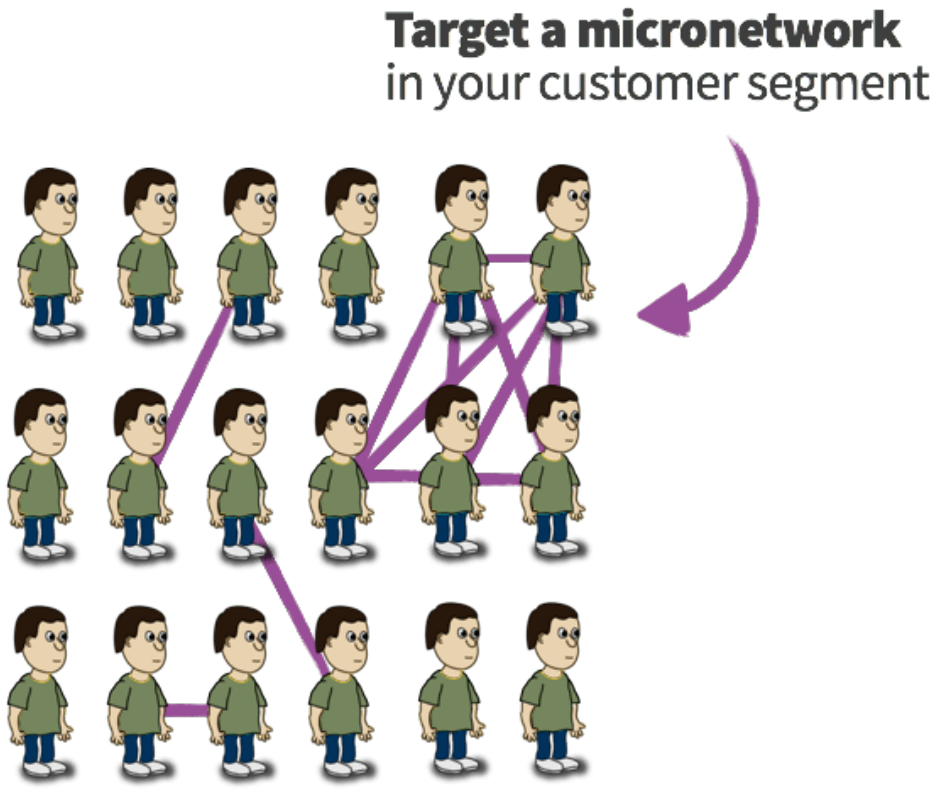
Most marketers target large segments *within* their target market.




However, those "best practices" are restricting growth.

In large segments, most customers are disconnected. **Infection builds separately within those segments**.

Instead, epidemics originate from *tight clusters*. So don't target random people throughout a segment. Target a small cluster *within* your segment. *Then* scale outward.



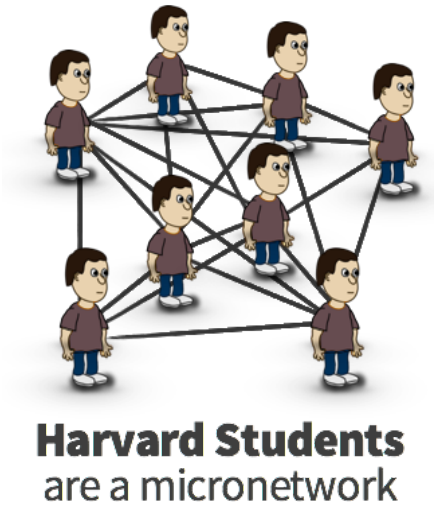

Let's see a real example…

## Case Study: Facebook

Micronetworks caused the explosive growth of Facebook

When Zuckerberg launched Facebook, he didn't target everyone. In fact, he didn't target a "big" market.

Instead, he targeted a micronetwork. He targeted a small network with strong interconnections. ***He targeted Harvard students***.




That decision changed everything.

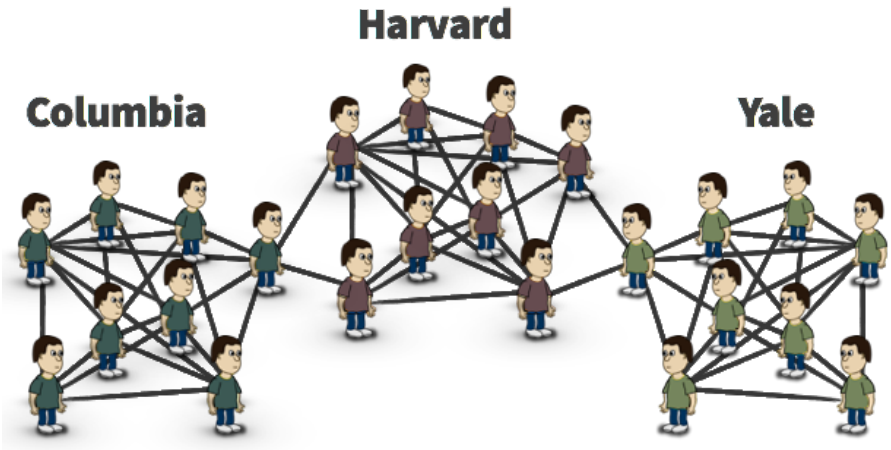
By targeting a micronetwork, word-of-mouth could spread quickly WITHIN that network. In 24 hours, half of Harvard signed up (The Guardian, 2007).

But here's the key:

**Micronetworks are connected to external networks**.

Harvard students aren't separated from the world. They have other friends.

When Facebook diffused among Harvard, other schools became susceptible.



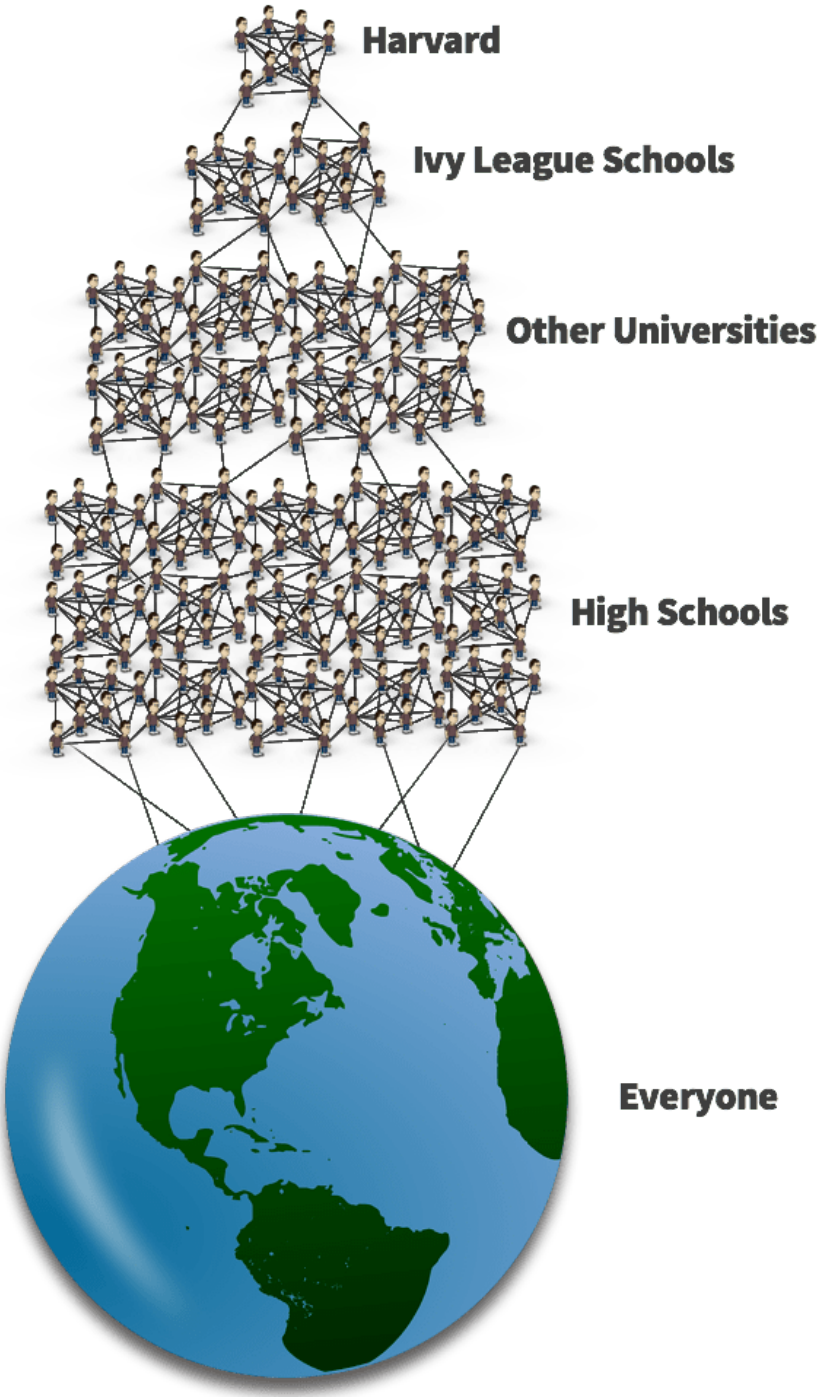

*Hmm, other schools? Aren't those micronetworks too?*

Aha. They are. Zuckerberg could replicate the strategy in new schools.

And he did.

**Facebook scaled their company by dominating an overlapping series of micronetworks**.

On a broad scale…



Facebook was an epidemic. It infected the entire planet.

And it all started from a tiny micronetwork.

# STRATEGY #2: USE MAVEN GROUPS TO PROMOTE CONTENT

In The Tipping Point, Malcolm Gladwell defines a maven.

> **MAVEN** — Knowledgeable person with a passion for ideas and information

I'm extending that definition to groups.

> **MAVEN GROUP** — A small group of people that crave knowledge in a domain

Examples include…

- Small companies centered around a topic
- Small organizations that share a mission
- Small teams in a large organization

Essentially, **maven groups are micronetworks**. And they can trigger virality.

## Case Study: How My Pricing Article Gained 325k Visitors

In 2015, I launched my article on pricing.

I had just launched my blog. So I was desperate for traffic. *Any* traffic.

To get visitors, I looked for small businesses that sold pricing software and services. And I sent them my article.

No catch. No hard sell. I was just giving value.

Since these companies were small, I aimed for 300 visitors. Maybe 400, if I was lucky.

In two days: *the article surpassed 20,000 visitors*.


Today, it's accumulated over 325,000 visitors.

And I never understood why. It never clicked until researching this article on viral marketing. Only two years later. Whoops.

Here's what I surmised: **those pricing companies were maven groups**.

Essentially, the companies were micronetworks.

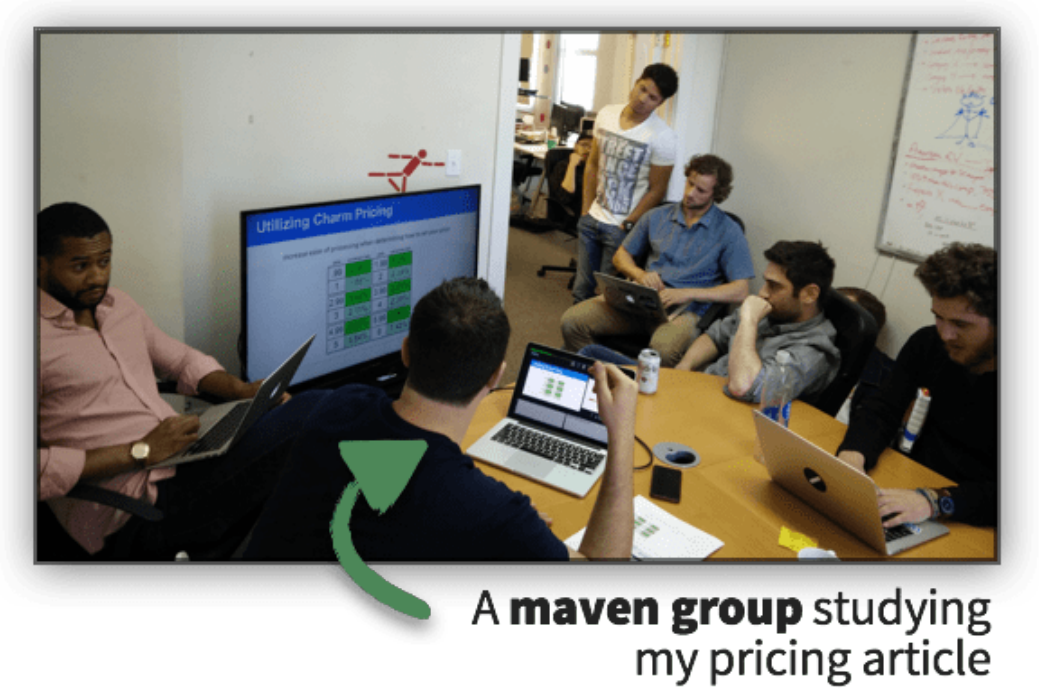
- Everyone shared the same connection: *pricing*.
- The companies were small. Everybody knew each other.
- Employees interacted frequently.

Everyone lived and breathed pricing. *They craved new and interesting ideas*.

And that's what I gave them.

I infected a critical node with new information. And — thanks to the structure of micronetworks —my message propagated.

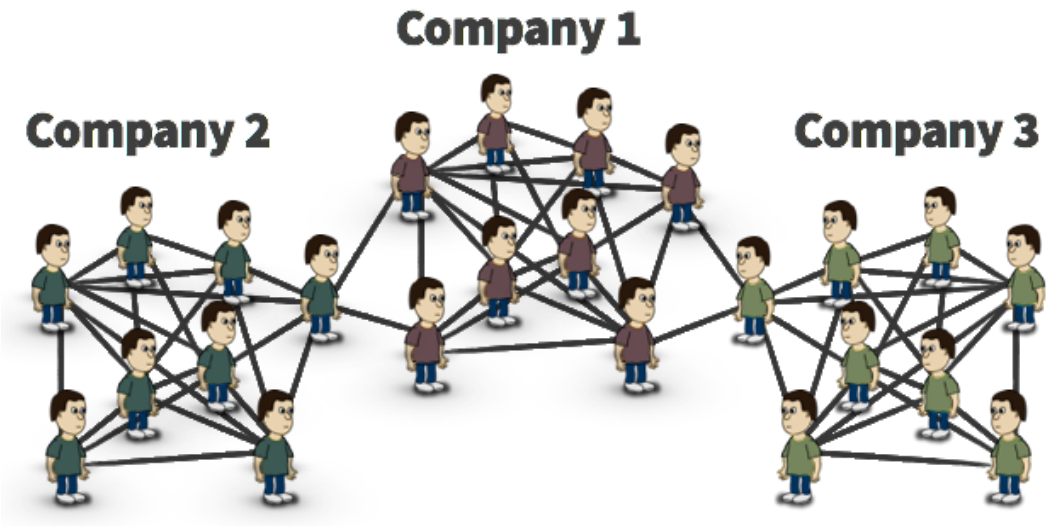
Here's a perfect illustration…




I sent my article to Arie Shpanya, the co-founder of Wiser. And he sent me a picture of his team discussing my article.

Wiser was a maven group. **And I contacted MANY similar companies**.

After infecting those tight-knit groups, the infection spread to nearby networks.



This concept is the polar opposite of the "standard" approach.

Most marketers target LARGE audiences with their outreach. It's almost a no-brainer.

But is it *really* the best strategy?

**Maven groups are more susceptible to infection**. Therefore, you might gain more traction by pitching a larger quantity of *small* networks in your domain. *Then* scale outward.

## STRATEGY #3: TARGET CUSTOMERS WITH HIGH INTERCONNECTIVITY

I explained the importance of interconnectivity. When nodes are interconnected, infection builds WITHIN a network.

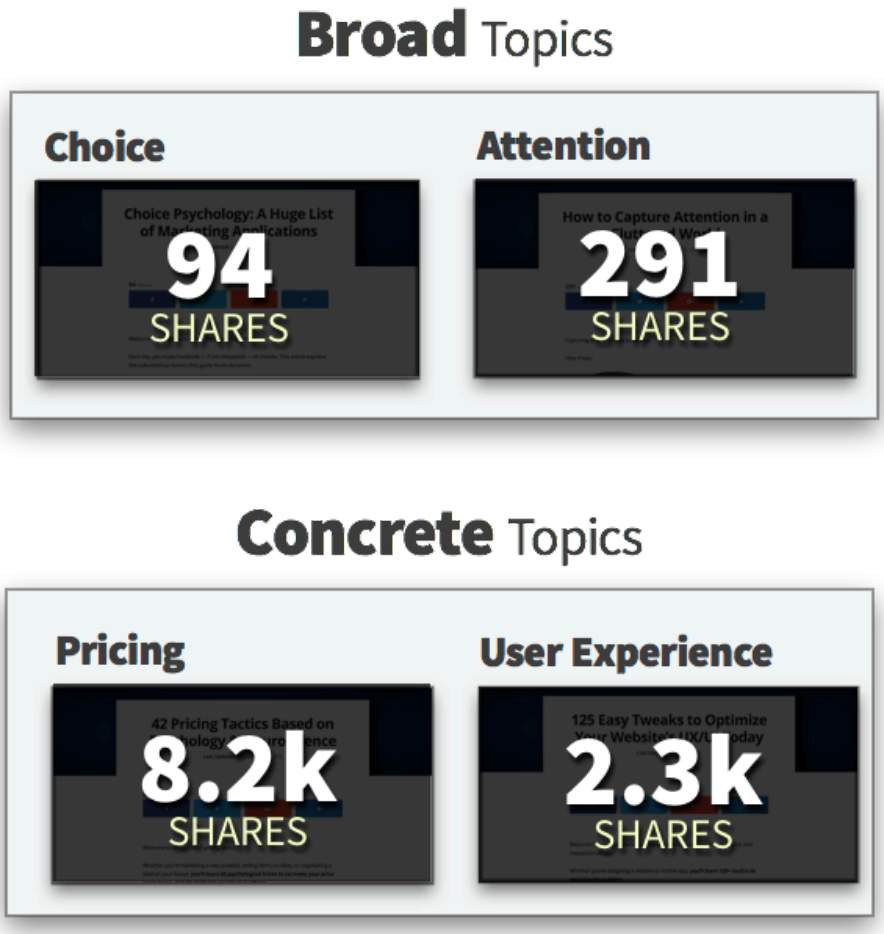
This concept applies to customer segments.

Your customers should interact. Frequently. **Those interactions trigger word-of-mouth**.

And this applies to content marketing.

Marketers create content to attract specific segments. However, topics vary in interconnectivity.

For example, I noticed a trend on my blog. Broad topics perform worse than concrete topics:

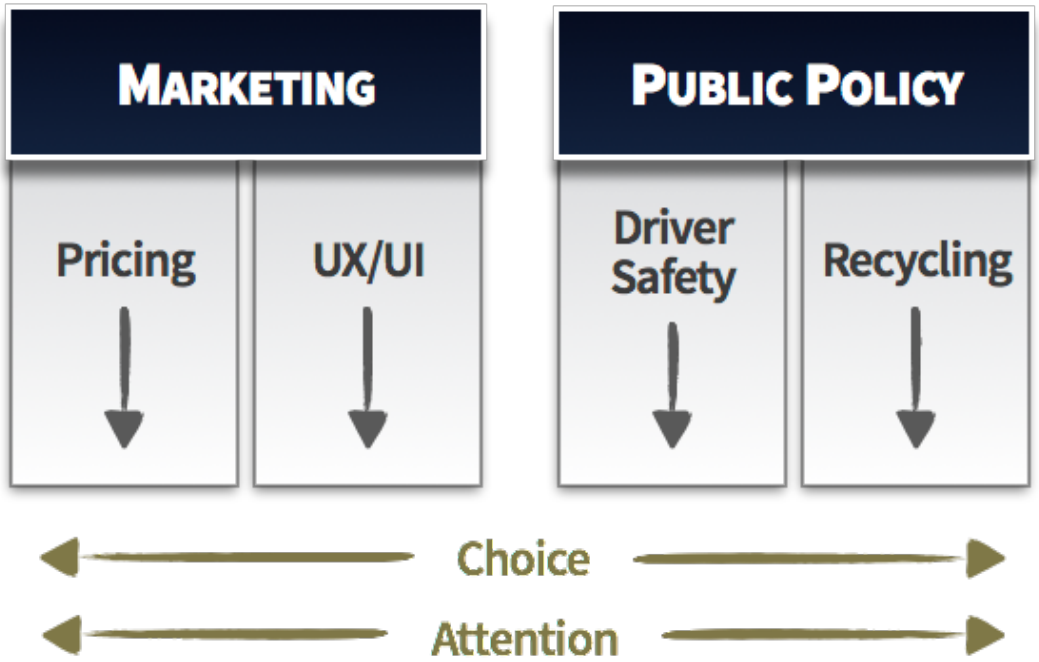


Now, you can't make conclusions from that data. There are many factors at play.

But indulge me.

I want to propose 2 categories of content:

- **HORIZONTAL TOPICS** — Topics that spread *across* domains
- **VERTICAL TOPICS** — Topics in a *single* domain



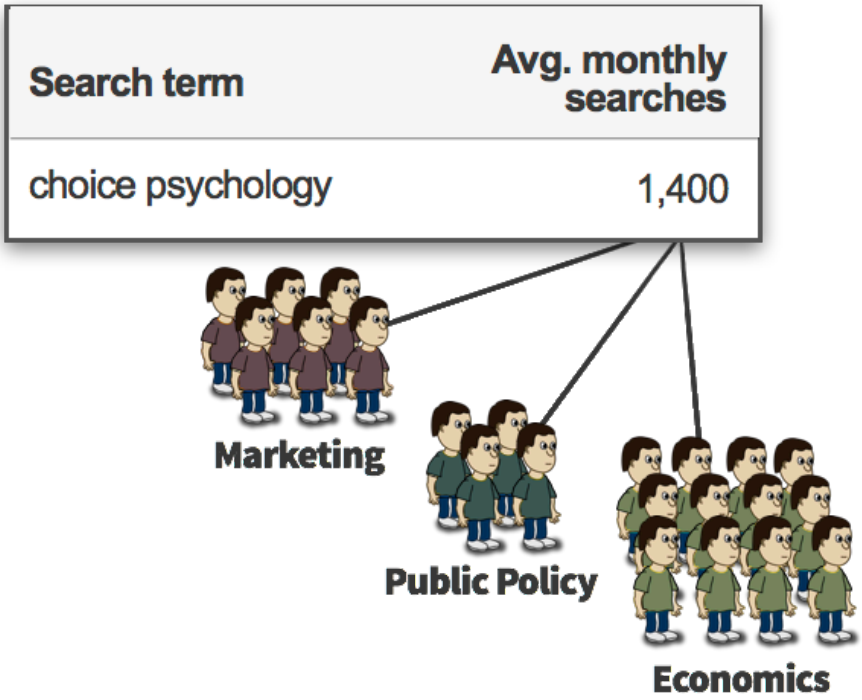

Horizontal topics span across different domains. So they have lower interconnectivity.

Sure, those topics might have search volume:

| Search term | Avg. monthly searches |
|---|---|
| choice psychology | 1,400 |

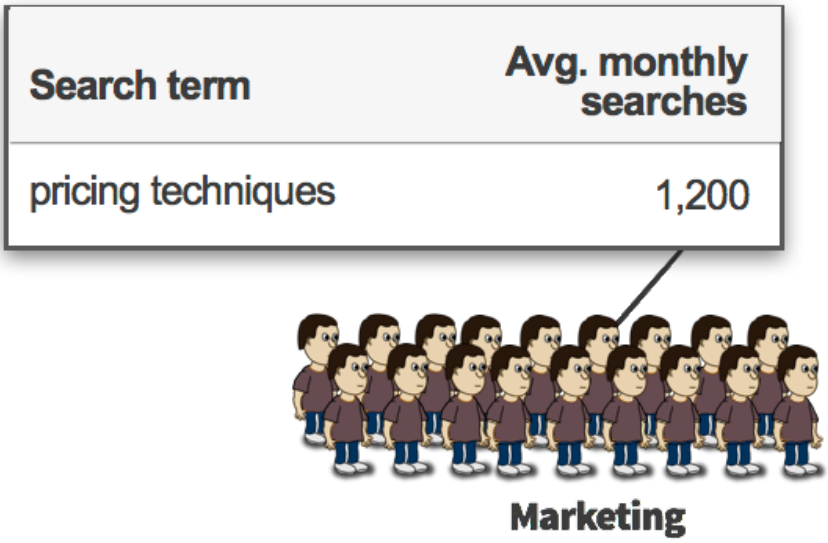
However, you need to consider the *interconnectivity* among those people.

People searching for "choice psychology" have different needs. So they're disconnected.




Thus, infection builds separately.

In vertical topics, however, most people share the same need. People searching for "pricing techniques" are more connected.



Not everyone will be interconnected. But the degree of interconnectivity is much higher. So word of mouth is easier (and your content is more likely to spread).

Thus, when choosing topics —or defining customer segments — always consider interconnectivity. Infection should build *within* a segment.

# FINAL THOUGHTS

I usually pack a ton of information into my articles.

For this article, though, I wanted to focus on a central theme: **small networks can make large impacts**.

That concept is the secret to viral marketing. And that concept changes the "best practices" in entrepreneurship.

However, **that concept is only scratching the surface**.

I packaged my leftover research into a large online course. If you subscribe to my blog, I'll send you a message when I open enrollment