Chapter 2
Ignorance and Cascades

The more you can create that magic bubble, that suspension of disbelief, for a while, the better.
—Edward Norton

2.1 Computer City

Computer City sells plenty of interesting gizmos and gadgets. So one day, Vincent went there and for reasons unknown fell in love with a small laptop, even though he is already the proud owner of four or five of them. As a good and informed consumer he asked the shop assistant various questions to acquire more information about the product.

What concerned Vincent that day was the following: A computer may have quite a high clock frequency and therefore be rather fast internally in the processor, but if the ‘highway’ (called the bus) on which data is transmitted from the processor to other central parts of the computer has a much lower clock frequency or speed limit, then it means zilch. It’s equivalent to driving a Ferrari Testarossa in first gear with the lever-brake pulled. You get a bottleneck. Therefore Vincent naturally asked the shop assistant:

– Excuse me, what’s the clock frequency on the bus for this laptop?
– I have no clue whatsoever!
– But since you are selling the product wouldn’t it perhaps be nice to know, or what?
– Listen! I don’t think you may find a single one of my colleagues in the store who knows it either.

At this reply Vincent turned crimson-faced with rage, and hurled candid oaths and curses at the shop assistant’s reasoning, which apparently came down to:

1. None of my colleagues know, and therefore you have no reason to expect that I know; and
2. None of my colleagues know, and therefore you have no reason to expect that I should know.

Granted, a tacit premise is in play to the effect that shop assistants know, or at least should know, what is valuable for the consumer to know about a certain product. But by the above reasoning, in contrast, it now seems to apply that Vincent naturally shouldn’t be critical of the shop assistant’s ignorance of what the clock frequency on the bus was, since one may no longer expect that shop assistants know such things,
or think they ought to know them. In this light it seems completely legitimate for all parties to remain ignorant about the clock frequency on the bus! What a travesty.

Alas, just because something appears reasonable, it doesn’t need to be, and that’s exactly why Vincent’s face assumed a, for him, hitherto unaccustomed color.

The reasoning in item (1) is an example of a rudimentary fallacious inductive inference. One cannot logically infer from the fact that some ravens are black, that all ravens are black. Just because some shop assistants don’t have knowledge of the product specifications doesn’t imply that all shop assistants in Computer City—and especially not the shop assistant who is specifically in charge of selling laptops—are equally ignorant. Thus, Vincent did have good reason to expect that the shop assistant would be able to answer the question.

But item (2) is even more interesting: Firstly because it occasioned the shop assistant’s indignation, and secondly because it constitutes the body of the information phenomenon known as pluralistic ignorance.

### 2.2 Today’s Lesson: Pluralistic Ignorance

The concept pluralistic ignorance was originally developed by psychologists Daniel Katz and Floyd H. Allport and refers to

> a situation where the majority of group members privately rejects the norm, but assumes (incorrectly) that most others accept it (Katz and Allport 1931, p. 152).

This distinct configuration of personal beliefs about other people’s beliefs may quickly turn inopportune. Most people as a rule assume—and often for good reason—that there indeed may be some merit in considering information pertaining to what other people believe or think you should do, before you decide what you personally should believe or do. But when pluralistic ignorance enters, this way of thinking may however lead to each individual in the end assenting to a certain norm, without he or she personally believing it justified.

Generally, pluralistic ignorance may arise when a group of decision-makers attempts to form an opinion at one and the same time based on a public signal. When you ask a newly commenced class of philosophy students gathered in a lecture hall if there was anyone who didn’t grasp today’s homework assignment, it’s often the case that no one raises their hand, despite the fact that today’s homework assignment is an extract from Martin Heidegger’s labyrinthine *Sein und Zeit.*

The lack of hands naturally seems strange, since each student presumably has an honest interest in exchanging confusion for clarity. Yet in deciding whether you should signify your ignorance or doubt, each student initially discreetly looks around to see whether there are others who have apparently had similar problems in grasping the homework assignment of the day. When all students do so simultaneously, everyone receives the same public signal, that is, no one apparently shares their problem. So the act of orientation itself creates a powerful public signal, which distorts the truth. To avoid damaging their reputation, each student accordingly chooses not to
2.2 Today’s Lesson: Pluralistic Ignorance

Fig. 2.1 A simple mechanism for establishing a state of pluralistic ignorance with \( n \) persons, who all receive a public signal ‘?’ from the instructor and must make a choice or decision ‘@’, where 1 denotes raising a hand, while 0 means to refrain from doing so. Each of the \( n \) persons observes others and each reacts like person \( a \), who doesn’t raise a hand since there is no one else doing so and so it goes.

raise their hand. In other words: Everyone omits acting on his or her personal knowledge concerning lack of the selfsame, because no one directly acts based on their personal ignorance, doubt or confusion due to the information in the public signal, that the very act of orientation transmits (Fig. 2.1).

The experienced student has of course learned to see through this mist. But that is not necessarily a great help to him or her, since one lonesome hand still exhibits the person in question as a lonely ignorant. Thus even experienced students often display this sort of behavior to avoid unfortunate exhibition and conform to the herd.

The experienced instructor, on the other hand, generally knows both how to exploit or handle this phenomenon. If you wish to avoid questions from the hall, you may just phrase or frame your question as just witnessed. If you instead wish to share your knowledge, you may for instance ask the students what they think most former students have had for problems with the specified homework assignment. By framing the question accordingly, you may avoid the first hand in the air becoming a display of ignorance. What the instructor is really doing to drive an answer from the students in this case is to remove the orientation act (forcing social proof when in individual doubt) creating the wrongful public signal.

Back to Computer City and the possibly dense reasoning of the shop assistant:

None of my colleagues have information about the clock frequency on the bus; therefore I don’t have reason to be informed about it. And therefore you as a consumer don’t have reason to expect to be informed on this subject either.
It now becomes evident that this is a case of pluralistic ignorance, where the Computer City assistant endorses a norm of ignorance, without he himself necessarily upon closer reflection finding it reasonable. For even though all Computer City assistants individually would find it relevant to know the clock frequency on the bus, and even though they probably also would find it entirely proper that the consumer asks about it, it follows from the norm that no one has sat down and tried to figure it out, since they are seemingly not expected to know it. Pluralistic ignorance is a collective state of erroneous belief.

Pluralistic ignorance thus explains the shop assistant’s lack of information about the computer details. In the recurring daily way to orientate himself, none of his colleagues has expressed that there is any sort of reason why he should know the clock frequency on the bus. Therefore the shop assistant finds it both just and acceptable that he doesn’t know it. The problem though is that good customers may quickly end up exposing a shop assistant’s ignorance by calling attention to the relevance of that which he is ignorant of. Customers tend to ask, if they are in doubt. As a sales clerk you can always attempt to make the customer believe that he or she is stupid by stating a couple of fallacious arguments. It is after all never pleasant for someone to have his or her ignorance exposed about what turns out to be obviously relevant.

2.3 C’mon!

Pluralistic ignorance also features as an essential explanatory factor in the so-called bystander-effect. The bystander-effect expresses that the more individuals who are gathered in one place, the less is the likelihood of people coming to the aid of a person in need. When an emergency situation occurs, it is on the contrary more likely that a person comes to the rescue if there are fewer or almost no witnesses to the accident: “C’mon, you’re standing right next to me!”

If one must fall, get badly hurt and be in need of assistance anywhere, then it’s better that it happens on a quiet residential street in Park Slope, Brooklyn, where it’s almost desolate, than if it happens on Times Square in Manhattan where thousands pass by on a daily basis.

Most people, upon hearing about the bystander-effect for the first time, generally have some trouble quite believing it. Meanwhile in a series of classic experiments, psychologists Bibb Latané and John Darley (1969) discovered that the time it takes for the trial subjects in a room to react and try to help is acutely sensitive to the number of people present. In one of the experiments the trial subjects were placed in the following scenarios:

1. Alone in a room,
2. With two other trial subjects, or
3. With two “co-conspirators”, who passed themselves off as being regular trial subjects.

In each of these scenarios the trial subjects were set a questionnaire to answer. While the subjects now sat neck-deep in questions, the room started to fill up with smoke.
2.4 The Structure of Bystander-Effects

The question was now, how the trial subjects would react to this, depending on which one of the scenarios immediately above they found themselves in.

The results showed that when the trial subjects were alone 75% of them reported the smoke, while only 38% called attention to the smoke if there were two other trial subjects present. Most alarmingly though is that in the last scenario, where the two co-conspirators were present, only 10% of the participants pointed out the smoke filling the room. These results in spite of the fact that the participants had noticed the smoke yet subsequently ignored it because everybody else apparently did.

An important factor in the bystander-effect is, therefore, that the presence of other people seemingly gives rise to confusion about responsibility. Since there are other people around, each individual is less pressed to take action, given that the responsibility for taking action is assumed to be evenly distributed amongst those present.

One may be tempted to think that when a single person realizes that the others aren’t acting on their responsibility, then the entire burden of responsibility falls back on the particular person in question. Such a realization would cause the individual to act. But if a situation is ambiguous, the observation of others’ lack of action may lead one to believe that there is no reason at all to take action or responsibility.

In a case of much heated debate from New York City in the 1960s, the 28-year-old Catherine “Kitty” Genovese was assaulted and stabbed on the stoop to her front door. It happened despite scores of neighbors who witnessed large parts of this horrific chain of events, which lasted over half an hour. Subsequently the press reported that no less than 38 witnesses had admitted that they had omitted to act or call the police. In the public debate that followed, the common reader had no doubt as to what the explanation was: Like any other metropolis, New York City had made its citizens callous and indifferent towards fellow citizens.

Looking closer at the press reconstruction of the neighbors’ own explanations, it was however the fact that no one else seemed to have reacted, that had caused people to refrain from acting. The lack of reaction had instead made everyone believe that it wasn’t a case of definite assault, but rather two lovers quarrelling (Manning et al. 2007). In other words, it was the ambiguity of the situation coupled with confusion over responsibility and pluralistic ignorance, which lead to this tragic example of the bystander-effect. That is, when others don’t react, the individual views this information as a sign that a reaction is neither required nor socially demanded. The ironic point at the end of the day is that no one does anything, precisely because no one does anything.

2.4 The Structure of Bystander-Effects

The logical structure behind a bystander-effect includes (Hansen et al. 2013):

1. A set of agents that act concurrently in a number of rounds.
2. Three possible actions in each round.
3. A preference order on the outcome of choices.
Consider a set of witnesses to an emergency, who act simultaneously in a number of rounds. They can choose to either help, not help or inquire further to obtain more information. All agents prefer to help if help is required, but not help otherwise, i.e., their preference in choice depends on the true state of the world. If an agent chooses to help or not to help, the agent cannot choose in later rounds. It is however cost-free to “skip a round” by inquiring further or surveying the situation.

The decision is made under uncertainty: Agents do not know whether the situation in fact calls for assistance or not. There is no strategic interaction in the decision problem, so no agent will have an incentive to mislead subsequent agents by choosing in contrast to the best of their knowledge. Therefore the choices of other agents may be interpreted as conveying information regarding others’ interpretation of the situation.

Now, agents may choose to base their action not only on their private information, but also on the information extracted from their peers—social proof. The following assumptions are made pertaining to the information dynamical structure (see also Fig. 2.2):

Fig. 2.2 The structure of a potential bystander-effect for agent c receiving public signal “!” about an emergency and a public signal “@_c” consisting of the actions “A_a” and “A_b” of agents a and b in previous rounds
1. The underlying structure is known to all agents.
2. Each agent makes a rational decision in each round based on the available information, which consists of
   a. A public signal about the true state of the world,
   b. A public signal consisting of the actions performed by the previous agents.
3. A belief among the agents that others
   a. Given that they believe help is required, are more likely to help, than they are likely to either inquire or not help,
   b. Given that they believe help is not required, are more likely to not help, than they are likely to either survey or help, and
4. Knowledge of rationality as described in 2.

Pertaining to item (2), three things to note: First, in (2a), agents are assumed to receive a public signal about the true state of affairs. This signal consists of the emergency event, e.g., a visual impression that an elderly lady falls. This signal is assumed to be common knowledge, as everybody can see that everybody else can see the event, etc. But, it is not known to other agents how the individual agent interprets this signal.

Second, agents are not assumed to be made aware by the end of a round whether their actions were in accordance with the true state of affairs. That is, no external source of information is available between rounds to inform agents in later rounds. Third, notice the emphasis in (2b): It is not only assumed that agents perceive the choice, and not the private signal, of other agents, but also that they only perceive the performed output of this choice. This is essential, as the choices to survey and to not help are output equivalent.

The assumption made in item (3) amounts to the fact that the group of agents are neck-deep in pluralistic ignorance with respect to the decision rules used in the situation. This is exactly the situation “where a majority of group members privately reject a norm, but assume (incorrectly) that most others accept it” (Centola et al. 2005, p. 1010), but where the norm in question is not a true social norm, but rather a decision rule. In conjunction with suitable assumptions regarding payoff and degrees of belief, every agent will have a propensity to survey the situation instead of helping or not helping. However, qua (3), all agents also believe that others reason by a different choice rule, namely that they would choose to help or not help under the same circumstances.

Let’s have a test run of this simple setup. Consider three agents witnessing an event where an elderly woman trips in the street. Assume that the agents have 2 rounds to decide whether or not to help. The fact of the matter is that the lady needs help. The public signal sent by the event is, however, ambiguous: It may be interpreted as the lady tripping without being hurt or as the lady having badly twisted her ankle. Assume that all agents interpret the signal correctly, and therefore initially believe that the lady requires assistance.

Focus on a particular agent, $a$. Given that $a$ believes that she is no better at interpreting the public signal than others it will be reasonable for her to survey. By surveying, $a$ can observe the actions of others, and thereby gather information regarding their interpretation of the public signal. Under the assumption that others
are at least as good as she is in estimating the true state from the public signal, this further information will lead to a stronger basis upon which she can later choose to either help or not help.

Notice how the reasoning for choosing to survey implicitly utilizes the assumption of pluralistic ignorance from (3) above. For \( a \) to be able to infer information from other agents’ actions in the first round, it must be assumed that these actions reflect the agents’ private beliefs, even though the action chosen by \( a \) does not convey her own beliefs to others.

To see how \( a \)’s action misrepresents her beliefs to others recall the assumption in (2b) above, stating that agents perceive the performed output of the choices of other agents. In the presented case, the choice to survey and the choice not to help are output equivalent: Other agents cannot distinguish these two choices from each other, as both outcomes consist in staying put and witnessing the situation at hand. Following the assumption of pluralistic ignorance, all other agents now believe that \( a \) has chosen not to help.

Given that all agents have acted as \( a \) did in the first round, what new information is \( a \) left with after she is done surveying the situation? She has seen two other witnesses not doing anything, and as she, due to pluralistic ignorance, believes that they follow a different choice rule than she, she will infer that they both interpreted the public signal to show that the true state is one in which no help is required. As this goes for all agents, a situation of belief-oriented pluralistic ignorance again has occurred: a situation in which “no one believes, but everyone thinks that everyone [else] believes [that no help is required]” (Krech and Crutchfield 1948, pp. 388–389).

As \( a \) takes the two other witnesses to be her peers, she will now have compelling reasons for revising her belief. Since the roles of all agents are symmetric, agent \( a \) is not a special case though, and hence the second round will commence with all three agents believing that no help is required. They can obtain nothing from surveying further (as this is the last round), so the rational choice will be to not help.

So a group of rational witnesses suffering from pluralistic ignorance regarding each others’ decision rules may by social proof cause a bystander-effect.

2.5 “Todding”

Amanda Todd was a 15-year-old girl from Port Coquitlam, British Columbia, who took her own life on October 10, 2012. She was the victim of extensive and prolonged cyber-bullying on Facebook, YouTube and other social media platforms. Her last name has now occasioned the coining of a new, and quite morbid, expression on the web—“toddling”. Todding apparently now refers to loathsome and abhorrent campaigns against selected individuals on the web. After being exposed to such campaigns for some time, the victims (often teenagers) may develop everything from stress, depression, and anxiety attacks to substance abuse problems. For Amanda Todd, the result was suicide. She is probably not the first, and unlikely the last, who will kill herself as a result of “toddling”.

On September 7, 2012, Amanda Todd posts a video on YouTube entitled “My Story: Struggling, Bullying, Suicide and Self Harm”. Using queue cards she tells her story of the cyber-bullying she has been exposed to for a long period of time. Almost instantly the video goes viral and is shown more than 1,600,000 times worldwide to the day of her death. The media picks it up, shows it, and online newspapers “like” the video too. But nobody intervenes for real despite all the views, comments, announcements of sympathy and concern and “likes”.¹

Amanda Todd’s attempt to reach the public succeeded in the sense that a great many people apparently witnessed her cry for help, yet no one intervened for real. Why? There are two interconnected reasons for the lack of intervention. Views, comments and “likes” are cost neutral in the sense that the virtual disapproval of the horrific treatment of Amanda Todd and the terrible course of bullying events don’t commit the individual to real intervention. Since the individual, private user as well as public media, observe that everybody else is disapproving without committing to intervention, then it becomes legitimate, indeed the norm, to disapprove and sympathize with Amanda Todd in this very way. This is the case even if every individual privately thinks that more should be done. Thus one comes to subscribe publicly to a norm one privately finds questionable just because “no one believes, but everyone thinks that everyone believes.” That’s pluralistic ignorance again and it doesn’t get any better while everybody stands on the sideline watching how the ignorance uncontrollably goes viral and thus personally contributes to the bystander-apathy by a supporting “like”.

On October 13, 2012, the day after Amanda Todd’s suicide, “R.I.P. Amanda Todd” becomes a worldwide trend on Twitter. After her cry of distress on YouTube more than 700,000 Facebook-users had liked Amanda Todd’s Facebook memorial page—now it is over a million. Despite this vast number of sympathizers there were still former classmates and trolls who added scornful comments like “I’m so happy she is dead”. Amanda Todd had attempted to take her own life on an earlier occasion by drinking bleach before her father found her in a ditch. Home from the hospital after this sad incident she collected comments on social media like “She deserved it. Did you wash the mud out of your hair? I hope she is dead”² and an ad with the text “Clorox—it’s to die for” with Amanda Todd’s face superimposed on a person standing with a Clorox bottle in hand. Even after she committed suicide by hanging herself, bullies were still haunting her, posting photos on her memorial pages of bleach, ditches and hangmen with comments like “R.I.P Amanda Todd. I hope they sell Clorox in Hell.”³ On October 15, 2012 the Clorox Company issued a statement condemning

¹ More than 1,600,000 viewed Amanda Todd’s video prior to her death, the count is up to more than 8,000,000 now; On Saturday, October 13, 2012, the day after her death, the video had more than 9,000 comments Metro UK reported (http://metro.co.uk/2012/10/13/bullied-teen-amanda-todd-made-youtube-video-before-suicide-599773/), as of August 8, 2013, the number is up 187,408, still counting . . .
the cyber-bullying of Amanda Todd and expressing their deepest condolences to

The cyber-bullying continued after her death because it is as cost neutral to bully
as it is to sympathize and the cascade mechanisms are the same when based on social
proof. New social media can’t block human propensities to do deeds good and bad but
apparently only reinforce already existing tendencies—infostorms again. The new
social media are also lopsided in certain ways, the consequences of which remain to
be seen. “Todding” is just the beginning, but for Amanda Todd it was the end.

\section*{2.6 The Frailty of Ignorance}

Even though pluralistic ignorance is a widespread phenomenon, sometimes having
tragic or at least unfortunate collective consequences, the phenomenon still has a
weak point. From H.C. Andersen’s \textit{The Emperor’s New Clothes}, we know that the
circle of collective ignorance may be broken by a credible source of information—in
this case a small child—pointing out the actual circumstances, which is allowed to
circulate to everyone in low voices:

\begin{itemize}
  \item “But the Emperor has nothing at all on!” said a little child.
  \item “Listen to the voice of innocence!” exclaimed his father; and what the child had
  said was whispered from one to another.
\end{itemize}

If it’s true that children and drunks always speak the truth, it means that once the
child has released the truth about the emperor’s naked self, it’s hard to hold back. It
happens because everyone suddenly comes to know that everyone else also knows,
and what one already had good reason to believe! Thereby the pluralistic ignorance is
undermined, since it’s precisely erroneous information of others’ information which
both constitutes the pluralistic ignorance’s focal point and the Achilles’ heel. Or, if
but one student is courageous enough to admit that today’s homework in \textit{Sein und
Zeit} verged on the incomprehensible, there are generally suddenly more lining up to
publicly announce their similar difficulties.

The frailty of collective ignorance has recently been demonstrated in a theorem
\cite{Hendricks}. This theorem states the relationship between the knowledge one
person, say $a$, possesses about a given proposition $p$, and the ignorance about the
same proposition $p$ for every other person $u$ member of a given group of unknowing
agents.

Somewhat simplified, the theorem reveals that the child in \textit{The Emperor’s New
Clothes} (under special circumstances which have no significance here) may transfer
knowledge of the emperor having no clothes covering his body to all of those who
are in doubt or ignorant about this matter. This means that the collective ignorance
may be fought with knowledge transmissibility and general enlightenment from just
one single person. In more detail the theorem says that if:
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How to Take Information Punches and Save Democracy
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