Management Center Innsbruck
Department Management, Communication & IT
ILV Digital Behavior

Reflection Paper: Digital Behavior
Florian Bigelmaier
November, 16th 2021

The Impact of Smartphone Use on Personal Satisfaction

Five hours every day. This is the amount of time my smartphone reports me as a usual daily display-on time. There is no other interpretation than to assume, that this small device is influencing my personal life in a tremendous way. As I try to show with some concepts and examples - there are positive aspects and reasons to behave like this. But simultaneously, being influenced by information technology at such a high level (actually five hours fill almost a third of my active day) has also negative consequences. My personal aim for doing this homework is to come to more conscious decisions and understand my smartphone as a technical instrument, not as a proxy for personal contact as it might appears to be sometimes. As I want to try to reflect on this aim and the process to it, I want to try to formulate this homework in a way that is at least inspired by scientific methodology and standards. Therefore, I will switch for the rest of this paper in an objective third person style. When trying to work scientifically it is basically necessary to define a hypothesis that can be validated or neglected. For this paper the hypothesis shall be:

The personal satisfaction in life increases when the use of the smartphone is limited to conscious usage.

This hypothesis is based on two assumptions. First, the smartphone seems to help in the everyday life in several ways. For this reason, one assumption is, that the basic use of the smartphone as a tool affects the personal satisfaction positively. Second, unconscious use of the smartphone has no clear generated value or outcome. This value might be seen in utility-oriented use or even in a conscious way of leisure use when conscious decisions are underlying. For example, endless scrolling in a social media feed beneath the usual dose of getting up to date does not seem to have any advantage. Thus the second assumption is, that unconscious use of the smartphone affects the personal satisfaction in a negative way. Both assumptions are necessary for stating the hypothesis.

Methodology

This paper does not comply with the standards of scientific methodologies as it is supposed to be a personal reflection. Nevertheless, this paper follows a structured idea of proving

the above-mentioned hypothesis. Furthermore, the two underlying assumptions need to be questioned. The methodology should therefore be open enough to challenge these assumptions as well.

The evaluation of this hypothesis will be measured by a personal experiment with the duration of three days. From 28th until 30th of October one test person will try to use the smartphone in a more conscious way as described later. The person will record their personal experience in a diary.

The dependent variable of the hypothesis is the **personal satisfaction**, which is apparently a complex dimension to be measured. In this case it will be tracked by a diary and the subjective impression how conscious decisions regarding the smartphone use affected the feeling of the person in any related manner. Hence, the above mentioned diary contains for each day notes on the following questions:

1. How long and in which manner did you use the smartphone today?

2. What are your positive and negative thoughts on the use of the smartphone today?

3. Which non-digital activities were possible due to the lesser extent of smartphone use?

4. Which digital activities did you consciously decide not to do?

5. How did these conscious decisions (regarding the last two questions) affect your personal satisfaction?

6. Do you want to add any further personal notes regarding your smartphone use today?

The independent variable that will be manipulated during the experiment is named in the hypothesis as **conscious usage**. More precisely, the affective decisions for smartphone use will be replaced by a rule-based decision making for the first above mentioned interval. The rules will emerge out of an analysis of smartphone use and thoughts and concepts that are presented in the following paragraphs. Therefore they will be formulated later on.

Context and Concepts: 14 Years Of Change

"Mobile is eating the world" (Evans, 2014)

When Benedict Evans, a former analyst of the U.S. venture capital fund *Andreesen Horrowitz*, formulated this statement in 2014 a revolution just had taken place in the seven years before: In 2007 the first iPhone was released and changed the way how people interact with digital systems tremendously without any question. But beneath this, the iPhone and smartphone brought several aspects with them, that changed even the everyday life for their users - i.e. a big part of the world's population. Just to name two

of them: The **ubiquity** of the mobile tech architecture including smartphones and the cellular access to the internet made it possible to access the internet wherever a demand could exist (Okazaki & Mendez, 2013, p.1). The **context sensitivity** of mobile devices differentiates them from former devices: Smartphones are not only small computers, they also come with several sensors that allow e.g. to determine the phones location (via GPS) (Minch, 2004, p.1). Other players in the mobile eco-system like providers of apps have the possibility to understand the context of the user by processing these sensor data and generate a contextualized environment.

Beneath new opportunities for entrepreneurs to build new businesses and the end users who profit with an increase of convenience, there is also a dark or at least shady side of this development. In his essay "Is Google Making Us Stupid?", Carr, 2008 provocatively lists several artifacts of this shady side. For this homework, the most important points of this article are the following ones. Carr, 2008 points out that online reading is faster and more superficial due to several factors, not least because of a shorter attention span that results from the wide variety of information and entertainment alternatives that are just a mouse click away. Furthermore, he draws an comparison to the invention of the printing machine and the upcoming revolution of cheaper books. The advantages like higher education and broader availability of information for a broader part of the society and the possibility to publish a bigger variety of knowledge came along with disadvantages. Just like the pros, the cons of the revolution initialized by the invention of the printing machine are also comparable with the digital revolution: The lower the burdens are to publish, the lower the trust is in integrity and authenticity of these publications. A third major point which will come up later again in this homework is the brain change, Carr, 2008 refers to. This change is not a kind of neurological mutation. A change can be more likely observed in the mental orientation of the individual and society. When clocks were available, the way how to plan a day shifted from a sun-oriented and gut-feeling-inspired one to a hard orientation towards the 24 hours of the day. Carr, 2008 sees this point in the last 14 years as well: In a more abstract way, smartphones changed the way, individuals orientate themselves in their construction of their environment.

An alternative point of view is delivered by Gergen, 2002 and Ward et al., 2017 who are referring to the concept of absent presence respectively the cognitive consequences of smartphone use.

"We are present but simultaneously rendered absent; we have been erased by an absent presence" (Gergen, 2002, p.227)

Gergen, 2002 already pointed out in 2002 that the use of modern forms of communication is so immersive, that people do not pay attention to and interact actively with their environment in which they are physically present. Gergen, 2002 is referring to this as a challenge. He states that "The erosion of face-to-face community, a coherent and centered sense of self, moral bearings, depth of relationship, and the uprooting of meaning from material context [...] are [...] repercussions of absent presence" (Gergen, 2002, p.236).

In addition to that, Ward et al., 2017 researched on the question how the extensive use of smartphones and the integration in the daily live affects the cognitive resources of humans. In two experiments they could prove, "that the mere presence of consumers' smartphones can adversely affect two measures of cognitive capacity — available working memory capacity and functional fluid intelligence" (Ward et al., 2017). The combined point of view of Gergen, 2002 and Ward et al., 2017 will be a basis for providing support to the conscious decisions to make for the experiment.

As the hypothesis is generated around the concept of conscious use, there is also a third concept of interest. Fogg, 2015 proposed in "The Fogg Behavior Model" that human behavior is driven by "Motivation, Ability and Trigger". In the context of this paper, human behavior can be interpreted as the sum of the possibility and the motivation i.e., internal or external drivers to act but also a certain trigger. Triggers might be in this very context app notification messages, ringing, vibration and many more.

Analysis of Smartphone Use

As a starting point for finding optimization for more conscious decisions there should be an analysis of the status quo. Especially three questions are of interest in this regard.

1. How long do you use the smartphone every day?

2. Which sort of activity do you carry out in this time?

3. When are the times where unconscious and non-value-adding smartphone use occurs?

1. How long do you use the smartphone every day?

Regarding the question of total smartphone use, the built in functionality of the person's smartphone (an iPhone XR) for display time analysis has been used as a basis. The row data has been extracted manually.
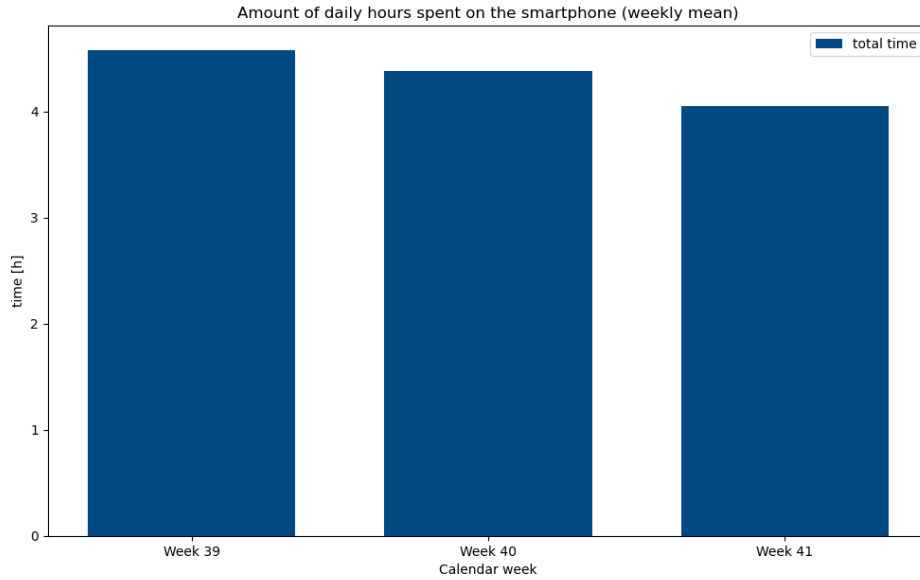
Figure 1: Graph shows weekly average of persons daily display time

It can be stated, that the usual daily display time is approximately four hours.

2. Which sort of activity do you carry out in this time?

To analyze deeper, how the smartphone is used, the used applications and contents have been clustered in four categories. These are the following: social media, instant messaging, web browsers and news and entertainment. To ensure a proper analysis, this time the total weekly amount of use per category has been chosen as a suitable metric because of variations in the distribution from one weekday to another. The web browsers are a frequently used category as the person uses the browser frequently for streaming radio or television when there is no technical requirement to install an app.
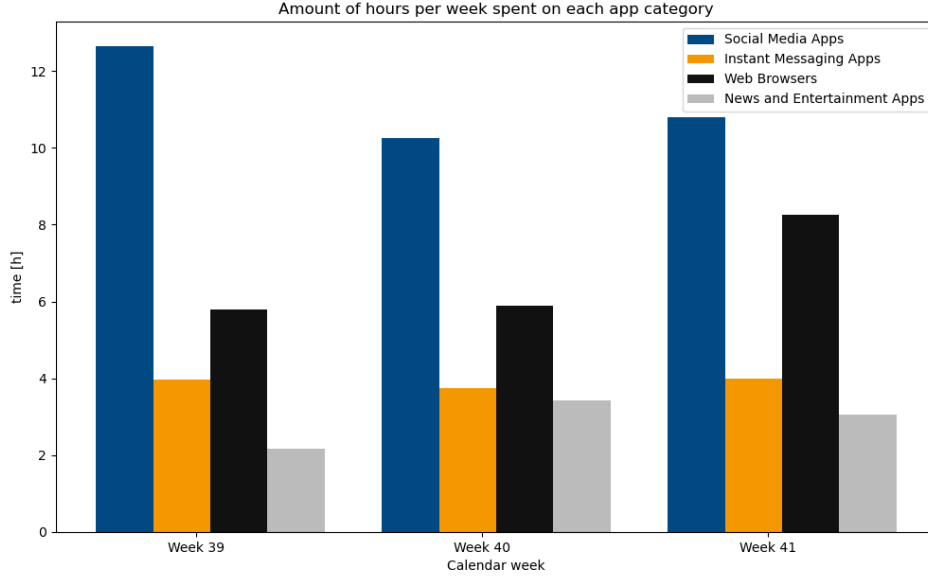
Figure 2: Graph shows how the evaluated person used the smartphone in the three weeks before the experiment

This data set provides several interesting insights: Social media is the category of apps which sums up to the most hours of use. This finding seems to be suitable to question conscious decisions. At first glance, there is no rational explanation for ten to twelve hours of social media use per week. Furthermore, the browsing is a category with much attributed display time. As a browser is a universal tool to access different types of media and content, there are several browsed sites behind this amount of time. One reason for the high amount of time is the usage for streaming news like the German *Tagesschau* or the Austrian radio station *Hitradio Ö3*. Together with the news and entertainment apps (sums up for two to three hours per week) this could also be a starting point to think about optimized and conscious news consumption. Last, apps used for Instant Messaging (i.e., *Whatsapp*, *Signal*) have also a high absolute amount of display time around six to eight hours per week.

3. When are the times where unconscious and non-value-adding smartphone use occurs?

This question cannot be resolved in a such easy manner like in the above answered questions as there is no row data nor report from the smartphone itself. Much more this depends on subjective perception of the observed person. In this case there are especially three occasions of unconscious use: First, in the morning right after the ringing of the alarm and before the way to the bathroom and breakfast. Of course, there is a subjective perceived need to inform about messages and information that could have come in the

night before, but after this the time is misused for unintended scrolling and browsing in social media apps. Second, during the day in focus times (e.g., learning, working etc.) the smartphone seems to be attractive for a quick look even if there is no rational need for or just because of a trigger like a notification. Third the consumption of news is unstructured and distributed over the whole day, driven by notifications and occasional opening of news apps like *Der Spiegel* or *Der Standard*.

Derivation of a plan for the experiment

The aim of this paper is to find out, if there is a correlation between the subjective perceived satisfaction and a more conscious use of the smartphone. Consequently, the hypothesis implies that there should be more conscious decisions during a normal day of smartphone use. As seen in the section above, the person uses his smartphone around four hours per day and just based on the interpretation of the smartphone use, there are already several possible starting points for a more efficient and less time-consuming smartphone use. Nevertheless, this amount also shows that conscious decisions are not possible for every time unlocking the phone. Therefore, it is inevitable to work with simple rules which aim to reduce the smartphone use based on the mentioned possible interesting starting points for further exploration. These rules are suitable to reduce the complete unintended use. Anyways, if there is a good reason for the use of the smartphone, a conscious decision can always override these rules.

Rule 1: Social media in the morning
One obvious point of a possible unconscious and unintended use of the smartphone is the scrolling and browsing in social media apps in the morning. Thus, the rule says that the person may not use the smartphone before the end of the morning routine including breakfast.

Rule 2: Shift browsing to notebook or desktop devices
One rather hypothetical idea is to reduce the time spent on the mobile browsers by reducing the casual browsing. If there is something interesting to look up, notes should be taken by the person instead of an immediate search on the smartphone which may lead to an unintended browsing after the actual question has been answered.

Rule 3: Concentrate news consumption to one period per day
A further reason for the extensive amount of time spent on the browser and the smartphone in total is to get the latest news in Austria, Germany, the marketing and tech industry and the whole world. As there are seldom news that need to be consumed within hours, it should be enough to consume news once a day in the evening. This allows to focus on the preferred channels but also to investigate further on one or two interesting topics in detail and not browse in news apps several times a day superficially.

Rule 4: Instant Messaging not in focus times

Instant Messaging requires instant reading and answering at least if the term is interpreted verbatim. This understanding is unrealistic but leads to the consequence that the person is checking incoming messages frequently. On a rational point of view, a look on the smartphone once in two hours during the active working and study times of the day should be enough to answer with an adequate response time. This allows the user to focus on his work and studies. This argumentation concludes in the last rule: Do not use the smartphone during self-set focus times of 30 minutes to two hours in a block.

Observations during the experiment

Regarding the observation during the experiment there can be stated several points. All of these points are based in a short diary that answers the above-mentioned questions on a daily basis. The diary is formulated to be self-explanatory, therefore there will be no further explanation.

Day 1

Question	Answer
Qu. 1	4h 20min, no activity in the morning before end of breakfast. Use of social media several times during the day, looking up some translations and short research where immediately needed, a lot of instant messaging
2	Positive: The smartphone helped me a lot during my day, e.g., for information research. Negative: I scrolled a lot (but less than usual) in my breaks on Social Media Apps
3	Planning my day in the morning
4	Social Media in the morning and News for all the day except once in the evening
5	I managed to do more stuff and I missed nothing
6	The two strict rules are easy to obey (rule 1 + rule 3), the other two are harder because they require more active behavior

Table 1: **Diary of smartphone use, day 1**

Day 2

Question	Answer
1	5h 51min, no activity in the morning before and during breakfast, reduced, but still high social media use, looked up some information, instant messaging
2	Positive: my smartphone connected me with people from far away, whom I could not meet in person. Negative: Social Media and Instant Messaging even during important learning time before an exam
3	Planning my day in the morning and reflecting the past one
4	News all the day, for a couple of time also no social media use
5	The mornings feel more active and it is easier to start the day with a good gut feeling
6	A long, planned zoom call of two hours via the smartphone biased the amount of smartphone use heavily. Without that, the time was still under the usual average. The zoom call affected my personal well-being positively as I could talk to a good friend I could not meet in person. As a result of the second day, I felt that rule 4 was the one for which I used the least effort

Table 2: **Diary of smartphone use, day 2**

Day 3

Question	Answer
1	3h 57min
2	Positive: Again more time and better feeling in the morning, more effective learning Negative: -
3	I talked more with my flat mates and other students than usually without the smartphone in the hand
4	I decided to avoid social media and instant messaging during the lecture and breaks
5	I did not miss the less amount of smartphone use, the personal contact felt personally good
6	Notifications seemed to trigger (or tried to trigger) smartphone use, especially social media and news

Table 3: **Diary of smartphone use**

The effect of conscious decisions regarding smartphone use on the personal satisfaction

Based on the experiences written down in the diary, the hypothesis and the underlying assumptions can be further discussed. First, there has been stated the assumption, that the smartphone seems to help in the everyday life in several ways and that the basic use of the smartphone as a tool affects the personal satisfaction positively. Because of several quotes in the diary, it can be stated, that basically, smartphone use *can* have a positive influence on the personal satisfaction. To name some of the experiences and diary entries:

- "A long, planned zoom call of two hours [...] affected my personal well-being positively as I could talk to a good friend I could not meet in person"

- "The smartphone helped me a lot during my day, e.g. for information research"

The first quote is heavily related to the above-mentioned concept of *Presence Absence*: Even though personal contact was not possible, the virtual presence enhanced the personal relationship and the quality of the conversation above the level of a written message like a letter. The second quote shows that the utility of the smartphone also affects the personal well-being as time can be saved and a more fluent stream of learning is possible when single pieces of information are missing.

The second assumption claims that unconscious use of the smartphone has no clear generated value or outcome. Again, there are several experiences listed in the diary that support this assumption. Again, there shall be two examples two represent the idea.

- "Social Media and Instant Messaging even during important learning time before an exam"

- "Again more time and better feeling in the morning"

Obviously, the excessive use and omnipresence of social media use does affect negatively the overall working and studying performance (compare first quote). One explanation of this behavior could be the above mentioned "Fogg Behavior Framework" (Fogg, 2015). Behind the motivation to use social media and instant messaging (e.g. fear of missing out, joy of use, curiosity, the utility and many more) these apps also use notifications such as sounds and displayed messages that are supposed to trigger the usage of one app. Furthermore, the reduction of certain time frames with significant amount of unintended social media use influenced the personal well-being positively and allowed more time for reflection and planning the upcoming day in the morning (compare second quote).

Finally, the hypothesis itself can be evaluated with a view on the diary. The dependent variable of personal satisfaction is for itself no quantitative dimension, nevertheless there are several statements that indicate a relative improvement of this variable. For example there can be found these three ones:

- "the mornings feel more active and it is easier to start the day with a good gut feeling"

- "did not miss the less amount of smartphone use, the personal contact felt personally good"

- "I managed to do more stuff and I missed nothing"

The first quote indicates, that a more restricted use of the smartphone in key phases of the day such as the wake-up have an influence on the well-being. That means that a more conscious use could affect the personal satisfaction in certain contexts positively. The second cited entry demonstrates, that the above mentioned concept of absent presence Gergen, 2002 is still a challenge that might also apply today, even twenty years of technological evolution and increased media competency later. To be aware of that challenge and make conscious decision where to apply absent presence could affect the personal well-being positively. Third, there is an even more rational oriented argument towards a more conscious use of the smartphone: The third quote suggests, that unconscious use might also be a negative influencing variable of one's productivity.

In total, all these experiences and interpretations just represent a short period of time for one single person, the results may not even state, that the results might be applicable for the long term for the observed person, let alone for others individuals. Nevertheless, the results could be a starting point to further exploration of the hypothesis and questioning the mentioned outcome. This limitation does apply as much to this section as to the following one.

Discussion and reflection in combination with the article

As this homework is designed to reflect to the above mentioned article "Is Google Making Us Stupid?" from Carr, 2008 the final discussion is meant to combine the content of this paper with the main points of Carr's article. When introducing the article, three major arguments were taken out of it - not with the purpose of a summary but more for the reason of maximizing the effect of personal reflection on this article.

First, a link to the Carr's point of superficial reading can be pulled. To sum up Carr's argument, information is available in such an amount and velocity, that the immersiveness of reading decreases (Carr, 2008). With a deeper look into the diary above, this statement seems to apply for the observed person as well. While reducing especially unconscious social media and news consumption, there has been experienced no further loss of personal satisfaction. This could imply, that engaging one with such contents is superficial and does not add any further value from a certain, but undefined point on. Triggers such as notifications seem to further amplify this behavior.

Second, Carr, 2008 refers to a revolution of information availability, i.e. the use of digital systems enhances the possibility for anyone to publish media content with lower

costs than ever before. He refers to this as a kind of repetition of Gutenberg's invention of the printing machine (Carr, 2008). Carr sees positive and negative points in this development and for the observed behavior in the diary there can be found pros and cons: On the one hand, the faster availability of information allows one to reach important information even faster. Topics of interest can be answered within one *Google* search, missing translations can be found within seconds, therefore modern information technology increases one's productivity. Regarding the hypothesis this might also affect personal satisfaction positively. On the other hand, the reliability of information and the quality aspect is certainly on a lower level. In times when printing a book or newspaper costed and it is an economic decision but also one that affected the reputation and authority of a publisher, the integrity and the quality of a piece of information is on average on a higher level due to certain gatekeepers such as the mentioned publishers. In the diary there can also be found some interesting point regarding this: The reduction of social media and news consumption may not only be seen as in the first paragraph of this section, but also as a process where verification and questioning content requires a lot of energy and mental work. More conscious use and a reduced focus time for news consumption seems to minimize this problem when certain time slots are available to research information and forming an opinion regarding a topic of interest.

Last, there can be found a third major relation between this paper and Carr's article. Carr, 2008 claims that the availability of clocks and a framework for dividing the day into units of time (i.e., hours and minutes) changed the human behavior in a way that the clock determined one's daily schedule. According to Carr, 2008, it appears that information technology seems to have a similar effect. And indeed, there can also be found several points in the diary that can be explained with this argument. For example, the positive effect of abolishing smartphone use in the morning made it possible to reflect and plan the day without information technology on a more human, undetermined level. Furthermore the notifications of social media and news apps trigger and therefore determine at least partly behavior. It seems, that triggers, fear of missing out and certain effects within using technology has a massive influence on the consciousness of decisions regarding smartphone use.

The aim of this paper is to reflect the article of (Carr, 2008) with personal experiences. It can concluded that in this very observation, the hypothesis has been validated and the personal satisfaction increased for the observed time frame due to conscious decisions realized by four simple rules. Moreover, several of Carr's points seem to repeat in the personal experiences such as technical determinism, the cultural aspect of loss of immersive media consume, especially reading and the effects of easy and cheap publication for everyone. For the future, it might be interesting to explore, whether this hypothesis can also be approved with experiments and more data points (i.e., more persons and longer observation period). A second spot of the authors personal interest is the application of the results, especially the effect of the proposed rules and the consequences of triggers such as notifica-

tions that came up later on. The author will personally try to comply with the rules for a longer period after the experiment and switch off all app notifications where not necessary.

4061 words (text incl. headlines)

References

Carr, N. (2008). *Is google making us stupid?* https://www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid/306868/

Evans, B. (2014). *Mobile is eating the world.* https://www.slideshare.net/a16z/mobile-is-eating-the-world-40841467

Fogg, B. J. (2015). *The fogg behavior model.* http://www-personal.umich.edu/~mrother/KATA_Files/FBM.pdf

Gergen, K. J. (2002). The challenge of absent presence. In J. E. Katz & M. A. Aakhus (Eds.), *Perpetual contact: Mobile communication, private talk, public performance* (pp. 227–241). Cambridge University Press. https://doi.org/10.1017/CBO9780511489471.018

Minch, R. P. (Ed.). (2004). *Privacy issues in location-aware mobile devices.* University of Hawai'i at Mānoa.

Okazaki, S., & Mendez, F. (2013). Perceived ubiquity in mobile services. *Journal of Interactive Marketing*, *27*(2), 98–111. https://doi.org/10.1016/j.intmar.2012.10.001

Ward, A. F., Duke, K., Gneezy, A., & Bos, M. W. (2017). Brain drain: The mere presence of one's own smartphone reduces available cognitive capacity. *Journal of the Association for Consumer Research*, *2*(2), 140–154. https://doi.org/10.1086/691462