Ethics of Care: African Perspectives

Additional Methodological Considerations

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The patient reader has repeatedly come across the following statement in this book: "The data collection procedure recommended by Anderson (2019) for this type of study was followed." It is now appropriate to say a little more. Norman H. Anderson is the creator of the methodology that was used in the studies reported in the thirteen chapters. His theory is called Information Integration Theory (Anderson, 1981) or sometimes Functional Theory of Cognition (Anderson, 1996, 2008).

Transparency

According to Anderson, data collection must be transparent to the participants (Anderson, 1982). Participants should first be informed of the purpose of the study, which is, for example, to ascertain their views on the acceptability of abortion in various circumstances (see Chapter 11). The word abortion itself may be used, as there is no reason why it should not be. There is no attempt to mislead participants into thinking that one is interested in anything other than the acceptability of abortion from their perspective (Fox, 1992; Mullet et al., 2012).

Participants are then read one of the scenarios composed for the current study or invited to read one of these scenarios. Once the scenario has been read, the participants are free to ask questions and the experimenter responds, without seeking to influence in any way the possible participants' reactions. The experimenter then presents the participants with a series of about ten scenarios from the set of scenarios. The participants read the information contained in the scenarios, one by one, and each time, indicate their answers along a scale that one wishes to be as natural as possible in this context, here a scale of acceptability, going, for example, from Not at all to Completely. The scale is simply a space that goes from a left to a right bound and in which the participants locate their answers.

This data collection procedure draws on the spontaneous ways of the average person to indicate quantities. For example, after returning from an angling trip, the angler goes, as he should, to the local bar to meet his friends and comment on his catch. To indicate the size of the pike, he spreads his arms and hands apart and the space between the hands is supposed to represent the size of the victim. The scale used in the studies reported here plays the same role. The left-hand marker is the left hand, which is usually fixed, and the mark on the scale, as a response, corresponds to the position of the right hand. The space between the left terminal and the mark indicates the level of acceptability, in the same way that the space between the two hands indicates the size of the pike. Another example is that of the father of a family who tells his friends the size of his eldest child in order to compare it to his own (Here I come!). In a natural gesture, he carries his hand on his abdomen. The ground is, in this case, assimilated to the left marker of the ladder, the body of the individual is the ladder (which he has chosen) and the right hand at the level of the abdomen is assimilated to the mark along the ladder.

The scales used generally do not include numbers (e.g., zero to ten) because numbers are neither necessary nor desirable.

Humans have been measuring and quantifying long before numbers were available. In Paleolithic rock engravings, when we know where to look for them, we find many indications of (albeit small) quantities. *Homo*'s sense of quantity comes from his primate and mammalian ancestors (Goodal, 1998). Anyone who shares the company of a cat knows that the cat will only jump from the floor to the kitchen table if he or she thinks it is possible to make a soft landing on it. Mammals are therefore good at quantifying distances without ever having taken a single geometry course.

Another reason for avoiding numbers in the collection process is that numbers are not necessarily used in the same way from one culture to another, which makes subsequent intercultural comparisons unnecessarily complicated. Moreover, introducing numbers into the response process is likely to change the response process. If numbers are carefully avoided, equally spaced markers are often placed on the response scale. This is because it has been found empirically that these markers (often small white circles, as in the sample scenarios presented in the various chapters) facilitate the response process, particularly in children and the elderly (e.g., Mullet & Paques, 1991).

Other adjustments are sometimes to be imagined when one wants to collect judgement data from very young children (Cuneo, 1982), or people with sensory deficits (Mullet & Miroux, 1996), or people with cognitive deficits (Morales Martinez et al., 2015), or people who have never been to school (Ouedraogo & Mullet, 2001), or even animals (Farley & Fantino, 1978). In the previously reported studies, no particular adjustment of the methodology was necessary. Africans do not differ from Europeans in their understanding of the type of material used in our studies.

Once the responses to the ten scenarios have been given, participants have the opportunity to go back, compare their responses and change the ones they wish to change. This first phase of familiarization with the material is a calibration phase. During this phase, participants become familiar with the information provided, learn about the extent of variation in that information and become familiar with the use of the response scale. They can interrupt the procedure at any time if they wish to have clarification. During this phase, the experimenter also checks that the participants have understood how to use the scale. If, for example, a participant uses only the two ends to answer, the experimenter explains again that it is possible to use all the marks on the scale. If she maintains her practice, then her style of response is respected. (We saw in Chapter 10 the example of many participants answering all or nothing). The calibration phase is usually individual. In some cases, it may be done in small groups of two to four participants. Experts in the field (e.g., physicians if the study is about a professional situation with which they are familiar) generally do not need a full calibration phase since they are, by virtue of their profession, already calibrated.

Once the calibration (or familiarization) phase is complete, participants are encouraged to continue. If they agree to continue, the so-called experimental phase can take place. The scenarios are then shown, one by one, in their entirety, and the participants respond. Generally, the scenarios are shown in a random order, an order that, moreover, differs from one participant to another. Given that every effort has been made to ensure maximum transparency and understanding, the experimental phase proceeds rapidly, which explains why, even in cases where the total number of scenarios is 64, it takes only 20 or 30 minutes to complete the judging task.

Judgement Process

Obtaining answers in a numerical format does not imply, therefore, that the participant is asked to use numbers when answering. According to the theory proposed by Norman Anderson (2008) to account for the process by which the information communicated (in the scenarios but also more generally in everyday life, of which the scenarios are only representations) is taken into account at the time of judgment, this information is first converted into subjective values. The process of converting (objective) information into subjective values has been called the Valuation process. The concept of *valuation* expresses the finalized and contextualized nature of any judgement activity. *Valuation* is the operation that governs the creation of a representation (Gamelin et al. 2006). This creation is based on an external source – one of the information contained in the scenario, for example – and is a function of both (a) the goal pursued – judging the acceptability of a behavior, for example – and (b) all the personal and possibly professional experience accumulated by the person making the judgment. The idea of *valuation* is very close to the early conception of the French psychologist Janet (1889) for whom current sensations only make sense if they can be related to synthetic elements from previous experiences. The format of the information created by the *valuation* process is such that the resulting values are ready to be integrated. In other words, the *valuation* process ensures the commensurability of the information to be integrated in the course of the judgment.

Let's develop an example. The information communicated in the scenarios is expressed in a variety of formats. In Chapter 11 dealing with the acceptability of abortion, one piece of information is the reason given and another is the gestational age. These two pieces of information are not commensurable;

they are expressed along scales that vary in nature (type of reason, number of months) and in metrics. A prerequisite for integration is, in the framework of the theory proposed by Anderson, to ensure the commensurability of these two stimuli by translating them along a common scale. The *valuation* process achieves this translation. The common scale is in this case imposed by the situation; the aim is to judge acceptability. The scale along which a response, a judgement, is solicited is therefore a scale of acceptability. The subjective values resulting from the *valuation* process are usually referred to as scale values.

The *Rape* stimulus will be associated with a certain degree of acceptability of the abortion: e.g. High (high acceptability). Similarly, the *Six Months* stimulus will be associated with another value in terms of the degree of acceptability: for example, Low. The functions that relate the values of (external) stimuli to subjective (internal) values of acceptability can be quite varied. The one linking gestational age and acceptability is certainly a monotonically decreasing function. The higher the gestational age, the lower the acceptability. In other cases, the relationship may be more complex (e.g., monotonous increasing to a certain point and then decreasing).

Once this preliminary stage of *valuation*, which, it should be remembered, ensures the commensurability of the various pieces of information communicated, the subjective values or scale values are integrated to produce a unitary response, internal to the participant and known as the implicit response. The integration operation thus makes the transition from multiple determination (reason given, gestational age, age of the person) to singular response (acceptability). The concept of integration expresses the multi-determined character of any judgement.

At the time of integration, the subjective values resulting from the *valuation* process may receive different weights, reflecting the importance that the participant attaches to the various sources of information. For example, the weight associated with the scale value representing the stated reason may be double the weight associated with the scale value representing gestational age. A weight may be zero – the age of the woman carrying the fetus, in the example – if it is felt that this aspect of the situation does not need to factor into the judgement of acceptability (and even if a *valuation* process has previously taken place for this element of the situation).

A numerical example may help in understanding why scale value should not be confused with weight. In the previous example, it can be assumed that a given participant associates a high scale value with rape – 9 out of 10, in terms of the acceptability of abortion in this case. The same participant can be assumed to associate a low scale value with poverty – 1 in 10. Again in the previous example, it can be assumed that the participant associates a low scale value with six-month fetal age – 2 out of 10, and a high scale value with one-month fetal age – 8 out of 10. Finally, it can be assumed that the participant associates a low scale value at maternal age 30 years – 1 in 10, and a high scale value at maternal age 18 years – 5 in 10. In the process of integrating the scale values into an overall judgement of acceptability, the weight assigned by that participant to the reason for the abortion and the age of the fetus is likely to be greater – 3, for example – than the weight assigned to the maternal age factor: – 1, for example. But what is the relationship between scale values, weight, and final judgment?

Norman Anderson (1974) proposed the concept of cognitive algebra to account for the process of judgement. Applying the idea of cognitive algebra leads to the following equation to account for the process of judging acceptability in the situation of an 18-year-old woman who is one month pregnant because she has been raped:

$$\text{Acceptability} = (\mathbf{1} \times 5) + (\mathbf{3} \times 8) + (\mathbf{3} \times 9) = 56$$

Values 5, 8 and 9 are the scale values associated with 18 years, three months and rape. Bolded values **1**, **3** and **3** are the weights assigned to female age, gestational age and reason given. The equation is an algebraic metaphor for the judging process. This metaphor is useful in that, as discussed in Chapters 1-13, it allows analyzing participants' responses in a way that may improve our understanding of people's positions on potentially important (but not only) societal issues. To give a second example, in the situation of a 30-year-old woman who is six months pregnant and wants an abortion because she cannot afford to raise a child, the equation would be:

$$\text{Acceptability} = (\mathbf{1} \times 1) + (\mathbf{3} \times 2) + (\mathbf{3} \times 1) = 10$$

The idea of cognitive algebra proposed by Norman Anderson is not an *a priori* idea. On the contrary, it is an idea that slowly imposed itself on the author as a simple way to account, at a certain level of generality, for the fact that the patterns of curves observed in the studies carried out by his team since the 1960s presented, for the researchers of the time, regularities that they considered surprising. These patterns were patterns of parallelism (as in Figures 5 of Chapter 5 or Figures 4 of Chapter 9 in this book), right-opening fan patterns (as in Figure 2 of Chapter 8 or 13 in this book), or barrel-shaped patterns (e.g., in the field of art psychology, Karpowicz Lazreg & Mullet, 2001). Anderson's observation of these geometric shapes, unexpected in a context of human judgment, may remind us of earlier findings of a surprising nature, made in classical physics, such as the phenomenon of light refraction, studied by Newton (1671), or the organization of iron filings subjected to a magnetic field, highlighted by Maxwell (1865). A scientist creates a material device and a geometrical shape appears where previously there was no reason to expect it. Surreptitiously, Nature gives us a wink. But how do we explain such phenomena?

The type of algebraic formulation proposed by Anderson is certainly elegant, but one is legitimately led to wonder where the additive and multiplicative symbols present in the two equations come from, which translate the observed regularities. Can a cognitive process obey such simple mathematical laws? Unless we consider that our faculties of judgment are of a purely spiritual nature, we must admit that our judgment processes operate, as Aristotle (-350, 2015 for a recent translation) already suggested, somewhere in our organism. One is strongly tempted to think that they operate mainly in our brains, but ideas have varied on this question (Soury, 1906). Our judgment processes are therefore, at a certain level, analyzable in terms of nerve impulses.

In the current state of our knowledge, there is nothing shocking to consider that these influxes can add to each other, or potentiate each other, or neutralize each other, or, why not, combine in yet another way. If we therefore take seriously what we know about our neuronal activity, there is no strong reason to object to the use of mathematical symbolism in the two equations presented above and, more generally, no strong reason to question the interest of the concept of cognitive algebra as proposed by Norman Anderson (1974). Our everyday mathematics comes to us, at an elementary level, from our neural activity and, at a more molar level, from our judgmental activity. Our complex mathematics is probably built on our everyday mathematics.

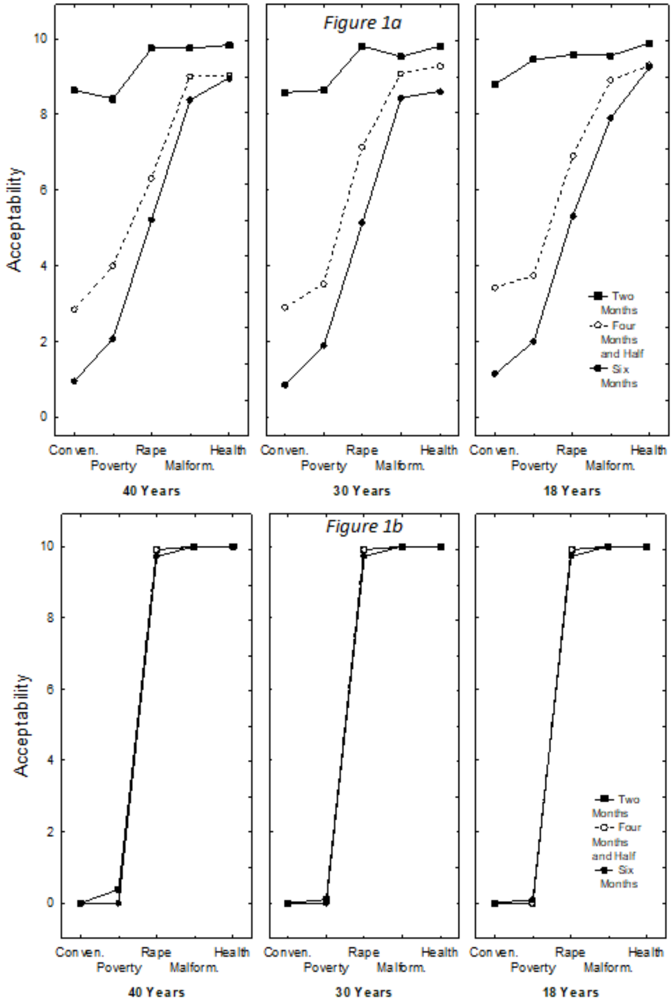
In the previous example, it was postulated that weight and scale value were independent. We can see, for example, that in both equations, the gestational age weight is always **3**, regardless of the scale value to which it applies (8 in one case and 2 in the other). In other circumstances, however, the weight assigned to the scale value may depend on the value itself. That is, each particular scale value is given a different weight. This can be illustrated by imagining, for example, that when the scale value is very high, then the weight assigned to it is very high. In the example, and regardless of the gestational age, if the reason given is given a *High* scale value, i.e. if there has been rape for example, then the weight of that stimulus will be very high. The impact of a high value on the final judgement of acceptability will then easily outweigh the impact of a competing low value (e.g., gestational age is six months).

Following the *valuation* and integration operations, i.e. in a third step, the implicit response is transformed into an observable response by a response operator. An observable response can be a facial expression, a physiological response, a verbal response (a cry) or a motor response. In the studies reported in this volume, the response is generally motor: the creation of a space between one point and another by selecting a level along a scale of judgment. As mentioned earlier, this is a type of response that is naturally used by people of all cultures (spread your two hands apart). Using such a device close to the natural conditions of response expression is a guarantee that the response function – the one that transforms the implicit response into an explicit response – is linear. The higher the implicit (non-observable) response, the higher the explicit (observable) response, in the same proportions. This greatly simplifies the study of integration processes.

Graphical Analysis

Once the data has been collected, the marks are converted into numbers, usually from 0 (left terminal) to 10 (right terminal), for analysis. The type of analysis that is really interesting for the researcher working within the theoretical and methodological framework that has just been defined, consists of a graphical analysis of the responses. Let us continue with the example of the acceptability of induced abortion. Once the responses of a participant or a group of participants have been obtained, a factor graph is constructed by (a) plotting the participant's responses or the average responses of the group on the vertical axis, (b) plotting the levels of one of the factors manipulated in the scenarios on the abscissa (e.g., the reason given for the abortion), (c) plotting the levels of a second factor on curves, and possibly (d) indicating the levels of a third factor using several panels.

Figure 1a shows an example of a factor graph obtained from a group of participants, which was taken from Figure 2 in Chapter 11 and extended to three factors. By simple visual inspection, it can be seen that the factor Age of the fetal carrier (40, 30 or 18 years) has little impact on acceptability ratings; the graphs presented in the three panels are at the same height relative to the response scale (and are very similar). The Gestational age factor, on the other hand, does have an impact. The higher the age, the lower the acceptability ratings. The Reason factor is also found to have an impact. When the reason is endangerment of the woman's health, then the acceptability scores are higher than when the reason is personal convenience. More interestingly, we find that the effect of gestational age varies depending on whether the reason is personal convenience (the distance between the curves is maximum) or endangerment of the mother's health (the distance between the curves is reduced). This suggests that during the integration process, not only did the scale value associated with the reason given vary greatly depending on the nature of the reason (from convenience to endangerment), but also that the weight given to the reason varied greatly depending on the subjective value associated with it.



Figures 1a and 1b. Graphs obtained by plotting (a) the group mean responses on the Y-axis, (b) the levels of the factor Reasons (manipulated in the scenarios) on the X-axis, (c) the levels of the gestational age factor on the curves, and (d) the levels of the age of the female factor on the panels. Figure 1a corresponds to the Law in France. Figure 1b corresponds to the *Rape and Health* position observed among Togolese.

Inferential statistical analyses can of course then be performed, in this case an Analysis of Variance (ANOVA). The ANOVA will tell us that at the (fateful) cut-off point of .05, the effect of the Reason given factor is significant, the effect of the Gestational age factor is significant, and the effect of the Female age factor is not significant. The ANOVA will also tell us that the Reason x Gestational age interaction is significant and even that this interaction is concentrated in its bilinear component (it is responsible for the open-to-the-left fan shape of the curves). The effect sizes are .77 for the Reason factor, which explains 46% of the variance explained, .86 for the Gestational age factor, which explains less (36%), and .05 for the Female age factor. The interaction has an effect size of .61.

In short, we learn little or nothing that we don't already know, but inferential analysis is a ritual that must be followed if we want to publish or simply if we want to be taken seriously. As they do not tell anything that is not already contained in the figures, we thought it best to dispense the reader from these tedious analyses. The frustrated reader will be able to refer to the original texts whose absolute conformity to the rites in use we guarantee, many of which have been published previously in international peer-reviewed journals.

Graphic analysis can, of course, detect cases where no integration has taken place as well as cases where the *valuation* process has remained at an elementary stage. Figure 1b shows an example of a factor graph obtained from another group of participants, which was also taken from Figure 2 in Chapter 11 and extended to three factors. By simple visual inspection, it can be seen that the Age of female factor (40, 30 or 18 years old) also has no impact on the acceptability ratings; the graphs presented in the three panels are at the same height in relation to the response scale (and are very similar). It can be seen that the Gestational age factor has, in contrast to what was observed in the first group (Figure 1a), no impact either. Only the Reason factor has an impact.

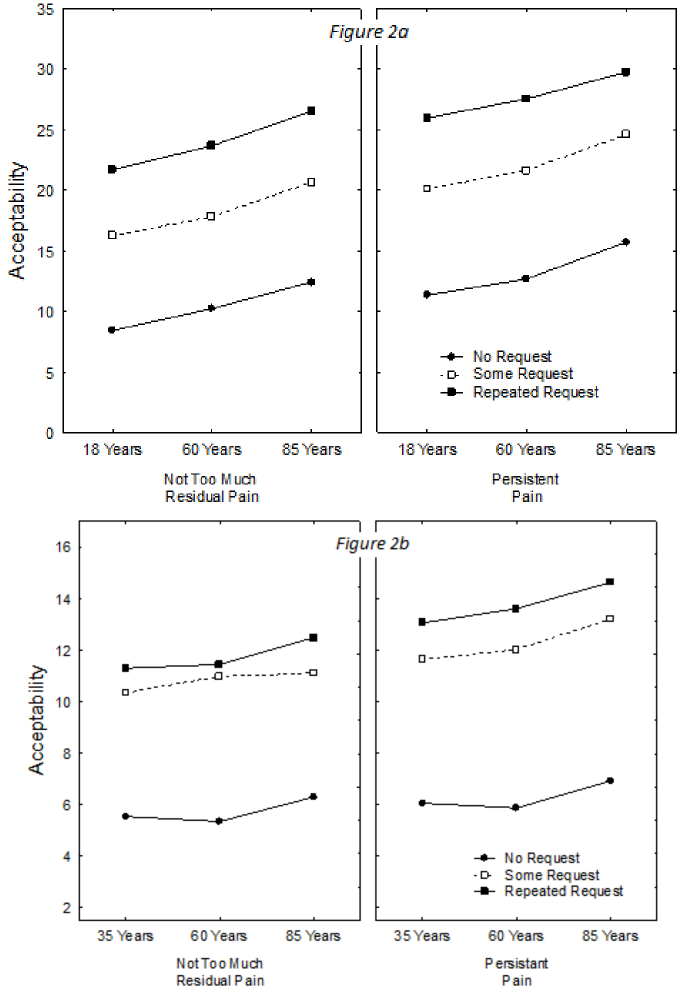
We also note the rigid nature of the response system of this group of participants, which suggests that the *valuation* process has remained at a very basic stage; it is an all-or-nothing process. When the reason is rape, fetal malformation or endangerment of the woman's health, then the acceptability ratings are the highest possible, without exception. When the reason is personal convenience or poverty, then the acceptability ratings are the lowest possible, without exception. If only this result were available, it could be concluded that respondents in this group do not have the ability to finely differentiate, in terms of values, the pieces of information according to the problem posed, nor to integrate several pieces of information into an overall judgement. This is known not to be the case (see Chapters 1-10). This result is specific to this situation and must be interpreted in the light of results observed in other situations. If, with regard to the acceptability of abortion, a group of respondents adopts such rudimentary cognitive functioning, it is likely that there is discomfort. The study of what results from the *valuation* process can sometimes also be the subject of special attention (e.g., Gamelin et al., 2006).

Methodological Concerns

Concerns are sometimes raised that examining similarly structured scenarios in close succession could bias the results and that it would be better for each participant to be exposed to only one of the many scenarios. It has been empirically shown that these concerns are unfounded. The response patterns obtained in either of the two ways are, at the aggregate level, similar regardless of the type of information integration rule implemented by the participants (Mullet & Chasseigne, 2017; Chasseigne & Mullet, 2019).

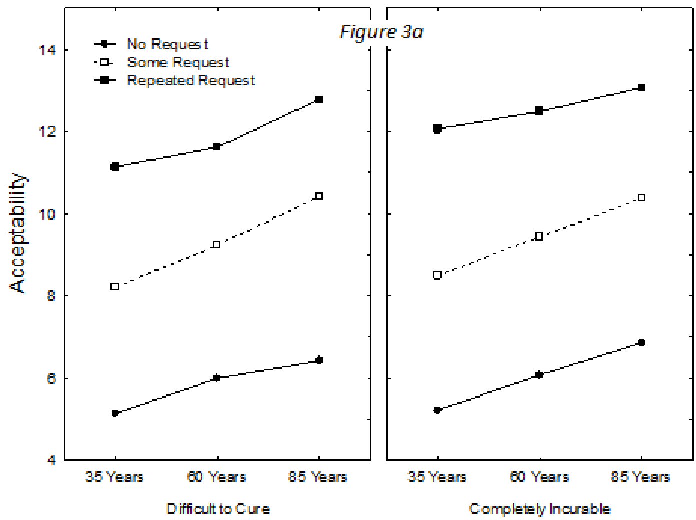
Figures 2 presents the responses of participants of various ages to scenarios of the type described in Chapter 12 regarding the acceptability of end-of-life decisions based on the patient's age, his or her request to help him or her die, and the level at which treatments can actually alleviate suffering. Figure 2a shows data that were collected (on a French sample) using the type of technique described in Chapter 12. The curves are clearly separated, indicating the importance of the Patient demand factor. The curves are slightly ascending, reflecting the reduced importance of the Patient age factor. They are higher in the left panel than in the right panel, reflecting the moderate effect of the Residual suffering factor. Overall, the curves are parallel, which attests to the additive nature of the cognitive integration process, i.e. each piece of information simply adds its effect to the effect of the other piece of information. Figure 2b corresponds to data that were collected using an inter-subject design. Each participant was shown only one of the scenarios. Again, the curves are clearly separated, slightly ascending, higher in the left panel than in the right panel, and generally parallel. Very similar conclusions can, therefore, be drawn. There is nothing in Figure 2b that would seriously contradict the conclusions, in terms of cognitive processes, drawn from the curves presented in Figure 2a.

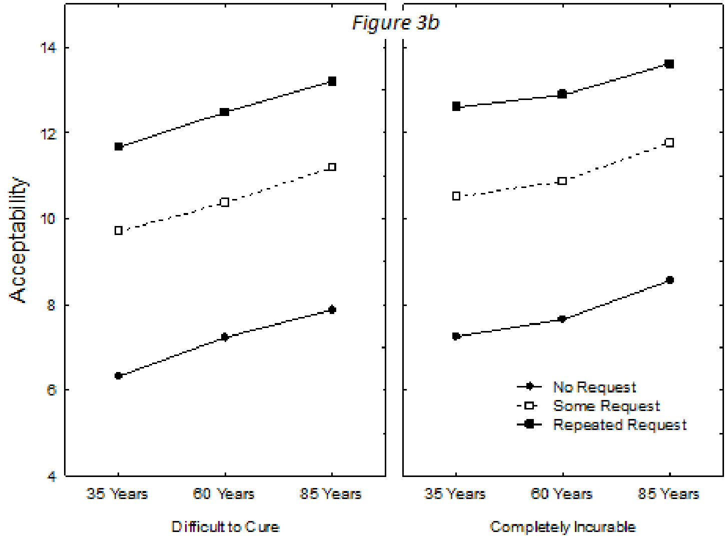
Concerns were also raised that the type of judgement required – framing the problem in negative or positive terms – could determine the nature, positive or negative, of the responses. The argument was that, (a) if an acceptability scale was used, participants would be prompted to respond more often acceptable than non-acceptable, while (b) if a non-acceptability scale was used, participants would be prompted to respond more often non-acceptable than acceptable (Murphy, 2007).



Figures 2a and 2b. Graphs obtained by plotting (a) the group mean responses on the vertical axis, (b) the levels of the Age of patient factor (manipulated in the scenarios) on the abscissa, (c) the levels of the Patient’s request factor on the curves, and (d) the levels of the Residual pain factor on the panels. Figure 2a shows the data obtained using an intra-subject design. Figure 2b shows the data obtained using an inter-subject design.

It has also been empirically shown that these concerns are unfounded. Figures 3 presents the responses of participants of various ages to scenarios such as those described in Chapter 12 regarding the acceptability of end-of-life decisions based on the patient's age, their request for help in dying, and the type of suffering. Figure 3a corresponds to data that were collected (on a French sample) using an acceptability scale, i.e. using the type of technique described in Chapter 12. Figure 3b corresponds to data that were collected using a non-acceptability scale. The only visible difference between the two sets of response patterns is that the ratings are very slightly higher for the non-acceptability scale than for the acceptability scale, in contrast to what would theoretically be the case with a framing effect. Consequently, and within this methodological framework, whether an acceptability or non-acceptability scale is used, neither the responses nor the judgement processes are altered (Muñoz Sastre et al., 2010).





Figures 3a and 3b. Graphs obtained by plotting (a) the group mean responses on the y-axis, (b) the levels of Patient's age factor (manipulated in the scenarios) on the x-axis, (c) the levels of Patient's request factor plotted on the curves, and (d) the levels of Disease curability factor on the panels. Figure 3a shows the data obtained using a scale ranging from Not at all acceptable on the left to Totally acceptable on the right. Figure 3b shows the data obtained using data obtained using a scale ranging from Not at all unacceptable on the left to Totally unacceptable on the right. These data have been inverted so that the response patterns are comparable.

Diversity of Positions

The patient reader also encountered the following sentence several times: "The analysis procedure recommended by Hofmans and Mullet (2013) for this type of data was followed." It is also time to say a little more. Cluster analysis is simply about saving diversity. During the experimental phase, several scenarios are presented and a response is obtained for each scenario, except when the participant has decided not to respond, which is his or her right. In the case of a disciplined participant nevertheless, the 54 scenarios presented (as is the case, for example, in the study reported in Chapter 7) will correspond to 54 responses and therefore 54 numbers ranging from 0 to 10 once the marks have been digitized (and since this is the response scale). It is likely that this participant's 54 responses will be, if only slightly, different from the second participant's responses and so on. If the sample of participants is 250, it is even likely that none of the 250 sets of 54 responses is identical to any other. But since the problem addressed, which in this book is always an ethical problem; that is, a socially sensitive problem, it is unlikely that the 250 number profiles are so diverse that groupings cannot be made.

In ancient times, i.e., before the availability of laptops and computer programs for statistical processing, researchers drew a graph for each participant similar to those in Figure 1 (Mullet, Hofmans, & Schlottman, 2016). Then, working in pairs or threes to control each other, they examined the various graphs and decided to assign each one to a category based on criteria defined *a priori* (e.g., presence of a regular right-open fan shape) and also based on criteria that they had to develop along the way in light of the surprises revealed by the results.

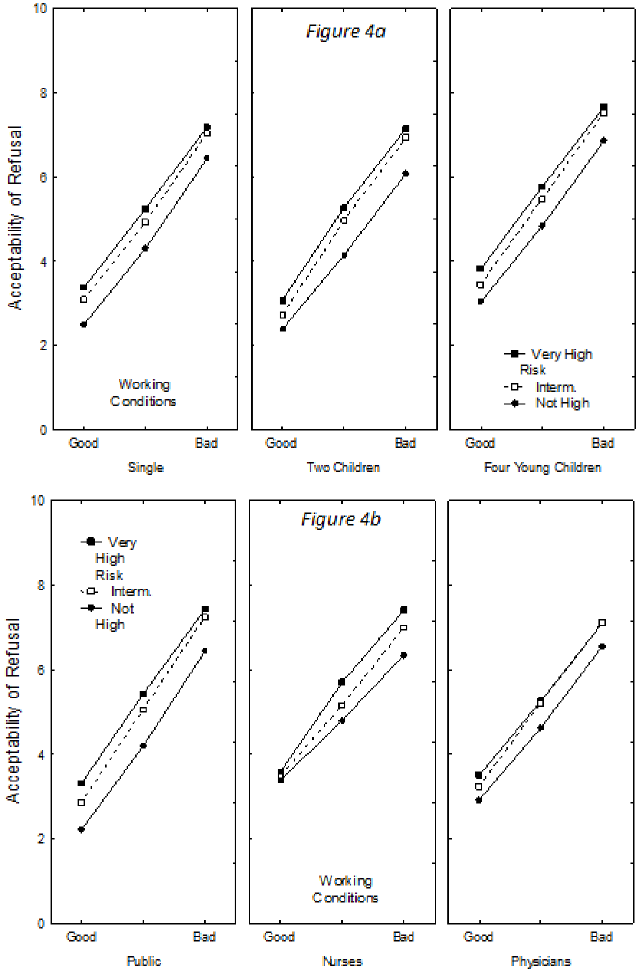
This procedure made it possible to considerably reduce the diversity of positions. From 250 positions at the beginning, in theory, it was reduced to, say, five positions. It took time, but not as long as it seemed. Whenever the problem posed is not a laboratory abstraction but a problem of everyday life, it is easy to recognize, in the graphs of results, positions known to be those of various segments of society. To take the example of the acceptability of abortion, it is not necessary to develop exceptional cognitive abilities to recognize a pattern of response that could have been produced by the reactions of a representative of the Holy See, another that could have been produced by the reactions of a member of the National Ethics

Committee, another that could have been in line with the protests of people who find that the law goes too far, and finally a last one that could reflect the protests of people who find that the law doesn't go far enough (and that the Batave law is much more attractive). At this point in the analysis, the researcher can only be pleased to note that small marks along scales printed on scraps of paper in response to stories aimed at mimicking everyday life are organized into response patterns in which one can recognize the various philosophical currents that, on a given subject, permeate and animate social life. When it comes to validity of all kinds, one could not dream of anything better.

Cluster analysis computer programs do nothing other than what was done by hand in ancient times. They are, on the other hand, devilishly faster, which makes it possible to test various solutions in the blink of an eye: one with two clusters, one with three, one with four and so on. There are mathematical criteria that propose an optimal number of clusters (Schepers & Hofmans, 2009). These criteria are useful tools, but our recommendation is to be guided by the body of extra-statistical knowledge one has (e.g. knowledge of the official position of a minority group) when deciding on the optimal formula. In other words, the recommended approach is to go for all wood, i.e. (a) to base oneself, in the first instance, on the recommendations of the statistical programme and (b) to adjust the firing (the number of clusters) according to the available extra-statistical, extra-mathematical knowledge. It should never be forgotten, when carrying out a cluster analysis, that statistical tools are at the service of the researcher and that researchers are not at the service of their tools. The program certainly moves faster than the researcher, and it does not make any mistakes other than those that have sometimes crept into the programming, but the researcher knows things that the program cannot know. It is in the union of the two – statistics and extra-statistics – which, as our neighbours the Belgians reassure themselves, that the strength is. A particularly suggestive illustration of how the cluster analysis programme used in all the studies presented here – the K-means – works can be accessed at https://en.wikipedia.org/wiki/K-means clustering.

What does cluster analysis bring to us? Let's look again at the data from the study analyzed in Chapter 5. The task of the participants was to judge the acceptability of refusing to travel to areas where an epidemic has broken out to provide care to sick people. Four factors were considered in this study: (a) the professional status of the caregiver (e.g., doctor), (b) the caregiver's family responsibilities (e.g., unmarried with no children), (c) the level of risk of becoming infected (e.g., four reported cases of Ebola virus transmission in this health facility in the last 12 months), and (d) the working conditions in the health facility (e.g., inadequate personal protective equipment, irregular remuneration, no risk premium). These four factors were combined orthogonally, resulting in 2 x 3 x 3 x 3 = 54 different situations.

Figure 4a shows the average response patterns in terms of acceptability. The curves are clearly ascending, somewhat separated and more or less at the same level in all three panels. At a glance, therefore, it can be seen that the determining factor in judging acceptability is the Working conditions factor and that the Risk level and Family burden factors play only a secondary role. This result is important. From a practical point of view, it shows that people in general find acceptable that doctors and nurses can refuse to work in risky situations if the working conditions they are given are not minimally decent. The use of force to persuade such staff to obey a requisition order may, if their working conditions are really bad and if this is publicly known, not prove to be politically profitable.



Figures 4a and 4b. Graphs obtained by plotting (a) on the ordinates the average responses of the group, (b) on the abscissa, the levels of the Working conditions factor (manipulated in the scenarios), (c) on the curves, the levels of the Personal risk factor, and (d) on the panels, the levels of the Family burden factor (Figure 4a) or the (Between-Subject) Group factor (Figure 4b).

Figure 4b shows that the response patterns do not vary much according to the identity of the participants (public, nurses or doctors). The averages of the ratings given by caregivers are somewhat higher than those given by members of the public. This result is also important. From a practical point of view, it indicates that the public and caregivers have a more or less common understanding of the duty to care. Since caregivers themselves do not view the duty to care as an absolute duty, it is to be expected that caregivers will be reluctant to comply with requisition orders that do not take into account the conditions under which the work will have to be performed.

A comprehensive processing of the data collected therefore provides interesting information on how the duty to care is viewed by various segments of the population. Cluster analysis makes it possible to go further. Figure 5 is derived from Figure 2 in Chapter 5, and as already discussed in this chapter, no less than five qualitatively different positions could be identified. The one corresponding to the largest number of participants (*N* = 178) is, unsurprisingly, close to the one highlighted by the treatment carried out at the level of the whole sample. Nevertheless, the response pattern has become more refined. The curves are significantly more ascending than those in Figure 4 and are virtually identical. Despite its high frequency, however, this is a minority position (38% of the sample).

Another position, which is shared by a considerable number of participants (*N* = 110), a position similar at first sight to the first, is that, even in the case of good working conditions, refusal to travel to epidemic areas to provide patient care is not unacceptable. This result introduces a new dimension to the debate. For a sizeable proportion of the participants, the decision to provide care is therefore the carer’s own decision. While it is true that when working conditions are good, the refusal to provide care is not as acceptable as when they are bad, the refusal is at least tolerable and therefore cannot easily be prosecuted.

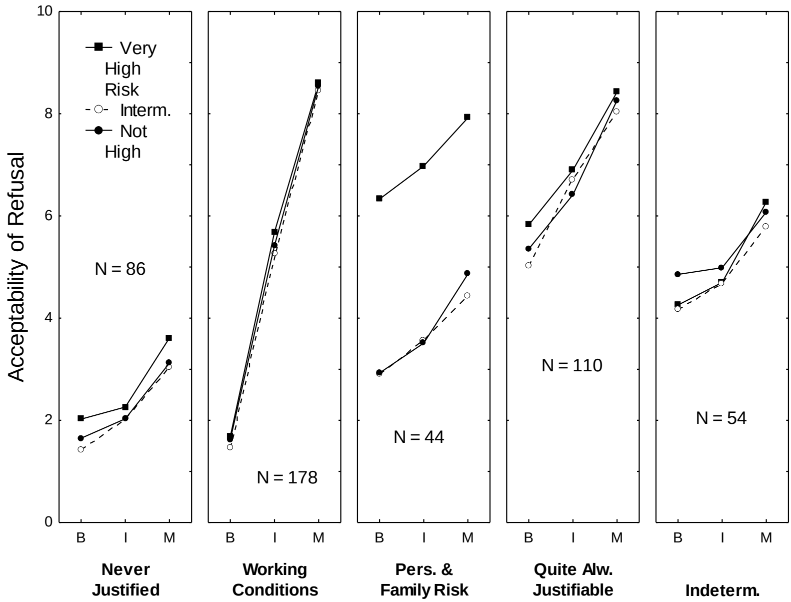


Figure 5: Average ratings observed among participants in the five clusters. Average acceptability ratings are plotted along the vertical axis. The horizontal axis carries the three levels of the Working conditions factor (B = Good Working Conditions, I = Average Conditions, M = Poor Conditions). Each curve corresponds to a level of risk of contamination. Each panel corresponds to a position.

The principled position of considering the duty of care as an absolute duty is not a purely philosophical position. It is also encountered. It was expressed by a significant number of participants (*N* = 86). It is the existence of such a position, which is the opposite of the previous one, which leads most directly to questioning the justification for data processing that would remain at a global level. Averaging (a) the data from participants who expressed this principled position and (b) the data from participants who believe that the care decision is at the discretion of the caregiver can only lead to results that are largely meaningless. It is customary to be told that there are three kinds of lies: big lies, small lies and statistics. Here is an illustration of what a statistical lie can be. There is no intention to harm, of course, on the part of the researcher who sticks to an overall analysis. There is simply the fact that in a given population, there are different views. Failure to take that diversity into account can lead to statistical misrepresentation.

Furthermore, imagining that this diversity can be taken into account by multiplying analyses by demographic category can prove to be an illusion. As Figure 4b shows, when the data for the three subgroups are processed separately, diversity is not necessarily obtained. Diversity must be sought using tools designed to highlight it. In this case, the use of between-subject designs would hardly capture diversity, since if there is only one response per participant, there is little hope of truly entering into the participant's way of thinking. If, on the other hand, several responses per participant are available and these responses are organized into a structured plan, then one is somewhat more likely to get into the participants' thinking. The combination of the use of within-subject designs and the use of cluster analysis provides a step towards an understanding of how each person deals with the situation.

The cluster called *Indeterminate* (N = 54) is also interesting from a methodological point of view. The participants in this cluster did not express a clear position. Their answers remained close to the center of the acceptability scale. These participants would most certainly have ticked the *I don't know* box of a binary questionnaire with the possibility of non-response. The reasons why some participants express a lack of opinion have been studied, notably by Johnston Conover et al. (2002). The main reasons appear to be an awareness of a lack of information on the subject matter, an awareness of a lack of competence to judge, fear of expressing an opinion publicly, fear that the opinion is not consistent with others' views (politically incorrect), not really knowing what to say, and seeing certain issues as invasions of privacy. Although the ratings are almost always in the middle of the response scale, the pattern of responses cannot be interpreted to mean that, under any conditions, the decision to refuse is tolerable (neither unacceptable nor acceptable). This is a case of true indeterminacy. In the context of overall data processing, the responses of this group would necessarily be considered to be moderately supportive of the refusal decision, which they most likely are not. This is another illustration of what a statistical lie, in good faith, can be.

Finally, for a limited number of participants (N = 44), the level of perceived risk is truly determinative and not marginal as the overall data processing outcome would suggest. From a practical point of view, an improvement in working conditions will only truly alter the idea that refusal is unacceptable among these people if, at the same time, technical measures are taken to limit contagion. It is therefore to be expected that a minority of people will consider an improvement in working conditions alone to be insufficient.

Once each of the positions has been characterized, it becomes child's play to attribute the majority to one demographic category or another. Not surprisingly, for example, the *Almost always acceptable* position was expressed by one-third of nurses (see Table 1, Chapter 5). The ability to relate the observed positions to demographic variables and the finding that the results of this linkage make sense is an important part of the process. They make it possible to realize the extent to which the cognitive processing of information, carried out by the participants, is rooted in social life. It is not always possible to anticipate the form that these relationships will take; moreover, this is partly what justifies the study of each problem. However, overall, over a set of studies, the relations observed between ethical positions and positions in society form, as we have seen in this book, a fairly coherent whole.

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