An Overview of the Impact of Perceptibility on the Moral Relevance of Detectable Effects: Pointing Towards a Higher Moral Ground in Decision-Making

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Abstract

The impacts that natural and human actions may have on individuals and/or groups are a central issue in scientific research. This is so because the nature and type of the impacts are directly related to the nature and type of policies necessary to mitigate them or enhance them. The morality on which policy formulation, evaluation, and planning is normally based is supported by measurable detectable/indetectable effects considerations only, perceptibility/ imperceptibility considerations of the effect are left out. People's perceptions or impressions of what their senses tell them have moral relevance. If they see sick people or degraded landscapes or if they smell polluted water or contaminated air they will insist that something be done to address the situation regardless of whether we can measure the effects or not.

Therefore, the morality of measurable detectable/indetectable effects can be altered even significantly if effect perceptibility considerations are added to the decision-making process. In other words, the morality of detectable/ indetectable effects when it includes both measurability and perceptibility considerations has a higher moral weight than if it is based on measurable detectable/indetectable effects considerations only, which makes the moral relevance of effect perceptibility/ imperceptibility an important consideration that is currently being missed in decision making and planning. And hence policy formulation, evaluation, and planning based on detectable/indetectable effect morality should include both the measurable/ immeasurable effects considerations and the perceptible/imperceptible effect considerations at the same time to reach a higher moral ground.

Not much is written to my knowledge about adding perceptibility to measurable effect considerations in detectable effect/indetectable effect based planning; and this is an attempt to share ideas on how the morality of detectable/indetectable effects can be altered when that is the case. A general goal of this paper is to highlight using qualitative comparative tools how effect perceptibility can alter the morality weight attached to specific detectable effects

Key words

Moral relevance, detectable effect, measurable effects, perceptible effects, indetectable effect, morality ranking, indetectable effects, immeasurable effects, imperceptible effects, qualitative comparative.

Introduction

a) Effect detectability/Indetectability

The impacts that natural and human actions may have on individuals and/or groups is a central issue in scientific research. This is so because the nature and type of the impact is directly related to the nature and type of policy necessary to mitigate it or enhance it. For example, if the impacts are negative we need to find and define moral ways to either prevent them from happening or minimize them if they are bound to happen. If the impacts are positive, we need to determine moral ways to promote them or replicate them.

OUP(2005, P. 258) defines the word **detect** as *"1. discover or perceive the existence of; 2. discover the real(esp. hidden or disguised) character of...."*. Therefore, something that cannot be detected then it is indetectable as it cannot be discovered or perceived or measured; and detectable is something that can be discovered or perceived or measured. Normally effect detectability/ indetectability refers to effect measurability/immeasurability as it is detailed below.

b) The moral relevance effect detectability/indetectability

The morality on which policy formulation, evaluation, and planning is normally based is supported by measurable detectable/indetectable effects considerations only, especially at the group effect level(Gertler et al 2011). Measurable group detectability/indetectability is preferred due to methodological efficiency problems associated with non-group effect based research or non-traditional methodologies(Muñoz 2002) and/or cost-effectiveness considerations making group measurability a cost-effective option in terms of methodology and costs(Muñoz 2017). The morality of measurable detectability from the indetectability point of view was advanced by Hansson(1999) placing the lowest moral weight on totally indetectable effects and the highest moral weight to detectable effects; and the morality of measurable detectability from the point of view of detectable effects was recently highlighted by Muñoz(2017) assigning the highest moral weight to total detectability and the lowest moral weight to total indetectability in a system arranged based on decreasing moral relevance as indicated below:

Total detectability > individual detectability > group detectability > total indetectability

In summary, moral weights attached to detectable effects normally are associated with the degree of measurability only, where total detectability/measurability has the highest moral weight and total indetectability/immeasurability has the lowest moral weight.

c) Linking effect perceptibility/imperceptibility to effect detectability/indetectability

People's perceptions or impressions of what their senses tell them have moral relevance. If they see sick people or degraded landscapes or if they smell polluted water or contaminated air they will insist that something be done to address the situation regardless of whether we can

measure the effects or not. Yet effect perceptibility considerations are left out of detectable/indetectable effect based planning as only the measurable component of the detectable effect is used.

If the effects can be measured and if they are perceptible at the same time, then they may carry a higher moral weight than if those effects could only be measured. For example, having public access to information about high deforestation rates together with access to pictures of forest areas under clear cutting activities can lead to more people being more concern about the state of forest areas than if only deforestation rates are made public. On the other hand, effects that cannot be measured, but are perceptible have a higher moral weight than effects that just cannot be measured. For example, if an effect is subject to individual measured indetectability, but it is individually perceptible would not be considered as negligible as an effect that it is just not measurable as perceptibility would make it morally relevant and no longer negligible.

OUP(2010 P.1121) defines "Perceive" as "1. to notice or to become aware of…..2. to understand or think of ….in a particular way…" and OUP(2010 P. 1122) list "Perceptible" as 1. Great enough for you to notice…..2. that you can notice or feel with your senses. Therefore, effect measurability/immeasurability can be linked to effect perceptibility/imperceptibility by combining them. Therefore, the concept of effect detectability/ indetectability can be expanded if we add effect perceptibility/imperceptibility considerations to effect measurability/ immeasurability considerations. The linking of the measurability and perceptibility components allows us to have an idea of or to capture degrees of moralities missed by focusing only on the measurable/immeasurable aspects of detectability.

d) The moral relevance of effect perceptibility/imperceptibility

Therefore, the morality of measurable detectable/indetectable effects can be altered even significantly if effect perceptibility/imperceptibility considerations are added to the decision-making process. In other words, the morality of detectable/ indetectable effects when it includes both measurability and perceptibility considerations has a higher moral weight than if it is based on measurable detectable/indetectable effects considerations only, which makes the moral relevance of effect perceptibility/ imperceptibility an important consideration that is currently being missed in decision making and planning.

This is because different levels of perceptibility(individual, group or total perception) should be expected to have different impacts on the level of morality attached to each measurable detectable effect; and when doing so they can impact their morality weights as level of perceptibility go from imperceptible to totally perceptible. This means that in practice, effect detectability/ indetectability should not be concerned only with measurable/ immeasurable effects considerations, they should also include perceptibility/ imperceptibility considerations.

e) The search for a higher moral ground in decision-making

And hence policy formulation, evaluation, and planning based on detectable/indetectable effect morality should include both the measurable/ immeasurable effects considerations and the perceptible/imperceptible effect considerations at the same time to reach a higher moral ground. Not much is written to my knowledge about adding perceptibility to measurable effect considerations in detectable effect/indetectable effect based planning; and this is an attempt to

share ideas on how the morality of detectable/indetectable effects can be altered if this is the case. A general goal of this paper is to highlight using qualitative comparative tools how effect perceptibility can alter the morality weight attached to specific detectable effects.

Goals of this paper

The goals of this paper are three: a) To present a qualitative comparative framework that can be used to define a measurable effect model and a perceptible effect model; b) To use these models to show how perceptible effects may affect the levels of morality attached to specific detectable effects as they change; and c) to use the findings to stress the need to add perceptibility analysis to effect detectability determinations to formulate and implement policy with higher moral ground.

Methodology

First, the qualitative comparative terminology used in this paper is provided. Second, a measurable effect model is defined, which allows us to derive a set of effect measurability theses. Third, an effect perceptibility model is stated, which permits the determination of a set of perceptible effect theses. Fourth, general detectability situations are presented, which combine both measurable effect theses with perceptible effect theses. Fifth, these general detectability situations are used to point out the general effect that perceptibility theses have on the moral weight of measurable theses; and therefore, on the moral weight of detectability theses as they go from total imperceptibility to total perceptibility. And finally, some conclusions are presented.

Terminology

Table 1 Qualitative terminology used in this paper

M = Measurable effect	m = Immeasurable effect
A = Individual measurability	a = Individual immeasurability
E = Group measurability	e = Group immeasurability
P = Perceptible effects	p = Imperceptible effects

B = Individual perceptibility b = Individual imperceptibility

F = Group perceptibility f = Group imperceptibility

D = General detectability d = General indetectability

The measurable effect model

The variability of measurable effects(M) can be expressed as follows:

1) M = A + E

The measurable effect model(M) above says that we have a measurable effect when it is individually measurable(A) or when it is group measurable(E) or when it is both individual and group measurable at the same time. It also allows us to establish that we have an immeasurable effect(m) when it cannot be measured at the individual(a) and group(e) level at the same time.

All the situations mentioned above lead to the following effect measurability theses:

i) Zero measurability

There is zero measurability(m_1) when an effect cannot be measured at the individual(a) and group level(e) at the same time, which is expressed as follows:

2) $m_1 = ae$

The zero measurability model(m_1) stated above is consistent with the traditional notion of total indetectability, which considers the immeasurability of impacts at both the individual and group level as the same time as an event that is morally negligible(see Hansson 1999, P. 104)

ii) Group measurability

There is group measurability(M_2) when an effect is measurable only at the group level(E), as indicated below:

3) $M_2 = aE$

Under the group measurability(M_2) thesis only group statistics matter and individual statistics are lost in the analysis process. The lost of individual concerns is a process traditionally known as statistical victimization. Morality here is group based and therefore, appropriate policies are those that reflect this group based morality.

iii) Individual measurability

There is individual measurability(M_3) when an effect is measurable only at the individual level, as shown below:

4) $\mathbf{M_3 = Ae}$

Under the individual measurability(M_3) thesis, individual statistics are morally relevant even in the absent of group statistics. The relevance of individual impacts is a fundamental part of processes such as individual empowerment and individual participation movements. Morality here is individually based, and hence, appropriate policies are those that reflect the concerns of individuals.

iv) Total measurability

There is total measurability(M_4) when an effect is measurable at the individual(A) and group level(E) at the same time, as stated below:

5) $\mathbf{M_4 = AE}$

Under the total measurability thesis(M_4) , individual and group statistic consistency is required. Effects subject to total measurability have the highest moral weight among measurable effects.

The perceptible effect model

The variability of perceptible effects(P) can be expressed as follows:

6) $\mathbf{P = B + F}$

The perceptible effect model(P) above says that we have a perceptible effect when it is individually perceptible(B) or when it is group perceptible(F) or when it is both individual and group perceptible at the same time. The model also allows us to establish that we have an imperceptible effect(p) when it cannot be perceived at the individual(b) and group(f) level at the same time.

All the situations mentioned above lead to the following effect perceptibility theses:

i) Zero perceptibility

There is zero perceptibility(p_1) when an effect is both individual imperceptible(b) and group imperceptible(f) at the same time, which is expressed as follows:

7) $\mathbf{p_1 = bf}$

Notice that as stated above, zero perceptibility(p_1) is not the same as zero measurability(m_1). However, conjuncturally both form part of zero detectability as it is shown below.

ii) Group perceptibility

There is group perceptibility(P_2) when an effect is perceptible only at the group level(F), as indicated below:

8) $P_2 = bF$

See that group perceptibility(P_2) is not the same as group measurability(M_2) as an event can be subject to group measurability, but not be group perceptible.

iii) Individual perceptibility

There is individual perceptibility(P_3) when an effect is perceptible only at the individual level(B), as shown below:

9) $P_3 = Bf$

Notice that again, individual perceptibility(P_3) is not the same as individual measurability(M_3) as an event can be subject to individual perceptibility, but not be individually measurable.

iv) Total perceptibility

There is total perceptibility(P_4) when an effect is perceptible at the individual(B) and group level(F) at the same time, as stated below:

10) $P_4 = BF$

These is the type of impact that increases the morality to act whenever we have a measurable effect, as what our senses can clearly appreciate has a very strong impact not just on the aspects that can be measured, but on the aspects that can not be measured too.

The moral impact of perceptibility on detectable effects

Now that the different theses for effect measurability(M) and effect perceptibility(P) are known, we can proceed to combine them to see how the level of morality attached to specific effects is affected as the type of perceptibility changes. The procedure followed here is that of combining a constant measurable thesis with the four types of perceptible impacts possible according to the perceptibility model.

Since we have four types of measurable theses, we have four different scenarios to assess the impact of perceptibility theses on them or on their morality weight, which is described below:

i) Perceptibility impact on zero measurable effects

The combination of the zero measurability thesis(m_1) with each of the four perceptibility theses(p_1, P_2, P_3, and P_4) leads to the following effect detectability situations:

11) d_1 = $m_1.p_1$ = ae.bf = immeasurable/total imperceptible

12) D_2 = $m_1.P_2$ = ae.bF = immeasurable/group perceptible

13) D_3 = $m_1.P_3$ = ae.Bf = immeasurable/individual perceptible

14) D_4 = $m_1.p_4$ = ae.BF = immeasurable/total perceptible

Notice that if the perceptibility impact is left out($p_1 = P_2 = P_3 = P_4 = 1$), all expressions from 11 to 14 become theses "ae", which is the total immeasurable thesis associated with indetectable effects..

Traditionally, this total immeasurable thesis is taken as the total indetectable thesis with negligible moral weight. However, when the perceptibility theses are added to the analysis as shown above, the level of moral relevance attached to total immeasurable effects(ae) increases as the level of perceptibility increases from total imperceptible(p_1) to totally perceptible(P_4).

For example, immeasurable events that fall within the domain of expression 14 have a higher moral weight than immeasurable events that fall within the expression 11 as total perceptibility is more relevant than total imperceptibility. See also that immeasurable events that fall within expression 12 and 13 have higher moral relevance than if they were within the totally imperceptible thesis.

ii) Perceptibility impact on group measurable effects

The combination of the group measurability thesis(M_2) with each of the four perceptibility theses(p_1, P_2, P_3, and P_4) leads to the following effect detectability situations:

16) D_5 = $M_2.p_1$ = aE.bf = group measurable/total imperceptible

17) D_6 = $M_2.P_2$ = aE.bF = group measurable/group perceptible

18) D_7 - $M_2.P_3$ = aE.Bf = group measurable/individual perceptible

19) D_8 = $M_2.p_4$ = aE.BF = group measurable/total perceptible

It is important to point out that if the perceptibility impact is left out($p_1 = P_2 = P_3 = P_4 = 1$), all expressions from 16 to19 become theses "aE", which is the group only measurable thesis associated with group effect detectability.

Traditionally, this group only measurable thesis is taken as the key condition for

determining appropriate polices to affect group conditions, and appears to be the preferred tool to determine general moral actions on which to base policy formulation. But when the perceptibility theses are added to the analysis, the level of moral relevance attached to group measurable effects(aE) increases as the level of perceptibility increases from total imperceptible(p_1) to totally perceptible(P_4).

For example, group measurable events that fall within the domain of expression19 have a higher moral weight than group measurable events that fall within the expression16 as total perceptibility is more relevant than total imperceptibility. See also that group measurable events that fall within expression 17 and 18 have higher moral relevance than if they were within the totally imperceptible thesis.

iii) Perceptibility impact on individual measurable effects

The combination of the individual measurability thesis(M_3) with each of the four perceptibility theses(p_1, P_2, P_3, and P_4) leads to the following effect detectability situations:

20) $D_9 = M_3.p_1$ = Ae.bf = individual measurable/total imperceptible

21) $D_{10} = M_3.P_2$ = Ae.bF = individual measurable/group perceptible

22) $D_{11} = M_3.P_3$ = Ae.Bf = individual measurable/individual perceptible

23) $D_{12} = M_3.p_4$ = Ae.BF = individual measurable/total perceptible

Again, if the perceptibility impact is left out($p_1 = P_2 = P_3 = P_4 = 1$), all expressions from 20 to 23 become theses "Ae", which is the individual only measurable thesis associated with individual effect detectability. Traditionally, this individual only measurable thesis is taken as the key condition for determining appropriate polices targeted to address specific individual conditions, and appears to be the preferred tool to determine specific moral actions. But when the perceptibility theses are added to the analysis, the level of moral relevance attached to individual measurable effects(Ae) increases as the level of perceptibility increases from total imperceptible(p_1) to totally perceptible (P_4),

For example, individual measurable events that fall within the domain of expression 23 have a higher moral weight than individual measurable events that fall within the expression 20 as total perceptibility is more relevant than total imperceptibility. See also that individual measurable events that fall within expression 21 and 22 have higher moral relevance than if they were within the totally imperceptible thesis.

iv) Perceptibility impact on total measurable effects

The combination of the total measurability thesis(M_4) with each of the four perceptibility theses(p_1, P_2, P_3, and P_4) leads to the following effect detectability situations:

24) D_{13} = $M_4.p_1$ = AE.bf = total measurable/total imperceptible

25) D_{14} = $M_4.P_2$ = AE.bF = total measurable/group perceptible

26) D_{15} = $M_4.P_3$ = AE.Bf = total measurable/individual perceptible

27) D_{16} = $M_4.p_4$ = AE.BF = total measurable/total perceptible

Notice that if the perceptibility impact is left out($p_1 = P_2 = P_3 = P_4 = 1$), all expressions from 24 to 27 become theses "AE", which is the total measurable thesis with total effect detectability.

Ideally, this total measurable thesis should be taken as the key condition for determining consistent policies targeted to address group and specific individual conditions, and should be the preferred tool to determine consistent moral actions. Total measurability has the highest moral weight within the effect measurability model, and within the effect detectability model based only on effect measurability.

When the perceptibility theses are added to the analysis of detectable effects, the level of moral relevance attached to total measurable effects(AE) increases still more as the level of perceptibility increases from total imperceptible(p_1) to totally perceptible(P_4). For example, total measurable events that fall within the domain of expression 27 have a higher moral weight than total measurable events that fall within the expression 24 as total perceptibility is more relevant than total imperceptibility. See also that total measurable events that fall within expression 25 and 26 have higher moral relevance than if they were within the totally imperceptible thesis.

Finally, it is important to point out that the 16 effect detectability theses described above from 11)/D_1 to 27)/D_{16} could have been derived by defining the effect detectability model(D) as follows:

28) D =M + P = (A + E) + (B + F) = A + E +B + F

Hence, the effect detectability model((D) above captures all situations where events are only measurable(M) or only perceptible(P) or both measurable and perceptible at the same time. As shown, the model(D) can also be expressed to capture any detectable situation containing any combination of measurability or perceptibility of individual and/or groups.

Also notice that the total effect indetectability thesis could be derived from expression 28 as follows:

d = mp = (ae)(bf) = aebf

The effect indetectability thesis(d) takes place when effects cannot be measured and be perceptible at the same time at any level of analysis.

In summary: Adding effect perceptibility/imperceptibility considerations to

detectable/indetectable effect analyses brings them to a higher moral ground as it increases the morality of specific measurable/immeasurable effects as we moves from total imperceptibility to total perceptibility.

Specific conclusions

In practice, effect detectability means effect measurability and effect indetectability means effect immeasurability. However, in reality effect detectability is made up of measurable and perceptible characteristics. As shown in this paper, as the degree of detectability varies from totally imperceptible to totally perceptible the level of morality attached to specific measurability situations changes.

It was pointed out that effect perceptibility increases the moral relevance of detectable and indetectable effects by affecting the moral relevance attached to measurable and immeasurable effects as it goes from imperceptibility to total perceptibility. And hence, it was stressed that effect perceptibility must be included in the analysis of the moral merits of detectable effects as they contribute to over all detectability: the addition of perceptibility considerations brings detectable effect/indetectable effect analyses to a higher moral ground.

General conclusion

It was shown above that the qualitative comparative framework introduced in this paper provides a simple way to determine effect measurability and perceptibility theses and a convenient way to look at the impact of different levels of perceptibility on specific measurable effects to point out clearly that perceptibility matters.

It was pointed out too that the exclusion in practice of effect perceptibility from the analysis of detectable effects may lead to either an overstatement or understatement of the moral relevance attached to specific measurable detectable effects. Therefore, it was highlighted that effect detectability analyses must include the perceptible component to provide a complete moral weight to measurable/immeasurable detectable effects reaching that way a higher moral ground.

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