



# Interpersonal comparison of welfare in Harsanyi's veil-of-ignorance model

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## **ABSTRACT**

According to John Harsanyi's veil-of-ignorance model (1953, 1955) rational observers behind a veil of ignorance seek to maximize the sum of individual utilities. However, Harsanyi's model is based on the erroneous assumption that the observers' von Neumann-Morgenstern utility function allows comparing welfare interpersonally. This paper suggests a modification of Harsanyi's model that allows comparing welfare interpersonally, by using life years in perfect utility or happy life years as a measure of welfare.

**Keywords:** Interpersonal comparison; John Harsanyi; veil of ignorance; welfare

## **RÉSUMÉ**

Selon le voile d'ignorance proposé par John Harsanyi (1953, 1955), l'observateur rationnel derrière le voile d'ignorance cherche à maximiser la somme des utilités individuelles. Cependant, le modèle d'Harsanyi est fondé sur une hypothèse erronée que la fonction d'utilité à la von Neumann-Morgenstern de l'observateur permet la comparaison interpersonnelle de bien-être. Ce papier suggère une modification du modèle d'Harsanyi qui permet la comparaison interpersonnelle de bien-être, en utilisant les années de vie en parfaite utilité ou les années de vie heureuse comme mesure du bien-être.

**Mots clés:** Comparaison interpersonnelle, John Harsanyi, voile d'ignorance, bien-être

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## **INTRODUCTION**

John Harsanyi published in 1953 and extended in 1955 a theory of morality which in essence says that a rational society seeks to maximize the sum of individual utilities. According to standard terminology it is a preference, average-utility, act-utilitarian theory. Also called the Equiprobability Model, it not only considers egoistic preferences, but also moral value judgments about the utility distribution in society. These moral judgments are made by an impartial and rational observer behind a veil of ignorance. The observer has an equal probability of being any member of society. Each member of society possesses von Neumann-Morgenstern (vNM) preferences over lotteries. The observer has preferences over the positions in society which are also represented by a vNM utility function. These preferences are called extended preferences (Broome 1998). As John Weymark (1991) correctly points out, there is absolutely no information permitting an interpersonal comparison of extended preferences, however. The observer measures strength of preferences under uncertainty, by assigning numbers to the expected utility of lottery tickets. These utility numbers are then compared on a cardinal probability scale, but only with the possibility to rank them (Baumol 1958). The vNM utility function is not able to compare the utility of lottery tickets across individuals because each individual has a different “marginal subjective utility of an increase in the probability of winning [a prize in the lottery]” (Baumol 1958). Hence, the vNM utility function only allows an ordinal ranking of preferences. Additional criticism on Harsanyi’s model was provided by James Griffin (1986, p. 112-3), who argued that it remains unclear how the observer should bridge the preferences of individuals: Harsanyi’s observer is supposed to have no personal preferences, yet he must be able to perform intrapersonal comparisons by portraying extended preferences on his personal scale.

## **EXTENDING EXTENDED PREFERENCES**

Recently, Juan Moreno-Ternero and John Roemer (2006) have suggested an extension of Harsanyi’s model which allows the observer to make welfare interpersonally comparable without a personal scale. In detail, the observer first steps in the shoes of any person  $i$  and takes on  $i$ ’s risk preferences and vNM utility function. Then, the observer imagines how  $i$  would feel in terms of welfare if he ( $i$ ) were to be realized as any person  $j$  with a given wealth level. Next, the observer converts  $j$ ’s wealth to the welfare-equivalent wealth for  $i$ . By taking on every person’s viewpoint the observer has an  $n$  number of wealth distributions where  $n$  is the total number of individuals. The observer may then take the average of these wealth distributions to assess the utility of an action.

The principle idea is thus to convert utility into wealth as wealth can be compared across individuals. A further advancement compared to Harsanyi’s model is that the observer does not need to have a personal scale to portray  $i$ ’s preferences as he can use wealth as a representation of preferences. Still, this approach is limited by the assumption that utility only depends on wealth. However, utility also depends on health, longevity, and other factors. Thus  $i$  does not only need to consider  $j$ ’s wealth when determining a welfare

equivalent, but also  $j$ 's health and other factors influencing  $j$ 's welfare. Furthermore, it is not possible to state a welfare-equivalent wealth in each situation. For example, when  $i$  is severely handicapped, there is no amount of wealth that could provide  $i$  with the same level of welfare as  $j$ .

Instead of using wealth as a measure of welfare, I suggest using life years in perfect utility or happy life years (HLYs). This metric was originally developed to measure and compare quality of life in nations (Veenhoven 1996). When applying this metric in this model, person  $i$  assesses the number of HLYs that is equivalent to person  $j$ 's lifetime utility profile. Thus, utility is still measured in terms of preferences, as desired by Harsanyi's model. Lifetime utility depends on the utility state ( $Q$ ) and the number of life years ( $T$ ). All utility states are assumed to be preferred to death. The lifetime utility profile is referred to as  $Q\{n\}$ , where  $Q\{n\}$  is a vector of the utility state in each year ( $Q_i$ ), ie,  $Q\{n\} = \{Q_1, \dots, Q_T\}$ . HLYs are defined as the number of life years such that:

$$U(Q\{n\}) = U(Q^*, \text{HLYs})$$

where  $U$  denotes utility and  $Q^*$  denotes a perfect utility state<sup>1</sup>.

Obviously, HLYs have the desired property of being measurable on a cardinal scale. Furthermore, they can be compared without requiring the observer to have a personal preference scale. In fact, the only assumption HLYs require is that preferences are monotonic with respect to HLYs. One may object, though, that one HLY may mean something different to each individual, ie, may not be comparable across individuals: an individual who has low expectations may require less health and consumption to achieve perfect utility than an individual with high expectations. Note, however, that individuals reveal their level of expectation by the number of life years: when assessing person  $j$ 's utility, a low expectation translates into a high number of HLYs and vice versa.

## **CONCLUSION**

Preference utilitarianism (including the Equiprobability Model) seems to be today's most common variant of utilitarianism. It is supposed to avoid problems of classical utilitarianism which relate to defining utility as well as an absolute unit of measure for utility in order to allow interpersonal comparisons. However, the second alleged advantage has been questioned by several authors (Weymark 1991, Hausman 1995). This paper addresses this criticism by suggesting, based on the contributions of Harsanyi (1953, 1955) as well as Moreno-Ternero and Roemer (2006), a novel model to comparing welfare interpersonally. The proposed approach uses life years in perfect utility or happy life years as a measure of welfare.

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<sup>1</sup> See Johannesson (1995) for a similar description with regard to healthy-years equivalents.

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