

Social Perception as Behavior Aggregation

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1 Extended Abstract

It frequently happens that we bring an overall judgment about a given group of individuals, such as “Princeton students are smart”, “French women are beautiful”, “Turkish people are hospitable” or “Muslims do not eat porc”. Such judgements are typically based on our observation of the behavior of the group members. For example, we look at Muslim women; we see that some wear a scarf, some do not and as the individual observer, we bring a judgment: “Muslim women wear scarf” or “Muslim women do not wear scarf”. Of course the inability of deriving a judgment is also possible.

But what is the relationship between our subjective perception of a group and the code of behavior that prevails among the members of that group? Tools of economic analysis have something to contribute to our understanding of the problem. In fact, our subjective perception of a group can be seen as an aggregation problem. To see this, take some group, e.g., Turkish citizens, and a certain attribute, e.g., smoking. Some of the members of the group do and some do not possess this attribute and a judgement such as “Turks do smoke” is an aggregation of individual attributes into a social one. So we can speak of a *perception function* that maps individual behaviors into a subjective perception of the society.

To express these concepts more formally, take a finite set N of individuals with $\#N \geq 2$, to which we refer as a *group*. There is an attribute which the members of the group may or may not possess. We refer to $\beta_i \in \{1, -1\}$ as the *behavior* of $i \in N$, which is interpreted as possessing the attribute when $\beta_i = 1$ and not possessing the attribute when $\beta_i = -1$. We write

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$B = \{-1, 1\}^N$ for the set of *behavior profiles*. There is an observer¹ who looks at the group which exhibits a behavior profile $\beta = (\beta_1, \dots, \beta_{\#N}) \in B$. Not necessarily all members of the group are visible to the observer. We write $V \subseteq N$ for the members of the group that are visible to the observer. An observer who sees $V \subset N$ is aware of the existence of the unobserved $N \setminus V$. We rule out the possibility of “wrong observation”, i.e., the behavior of every visible member of the group is observed as it truly is. We let $B_V = \{-1, 1\}^V$ stand for the set of behavior profiles of the observable members. The observer has a subjective perception of the group as a function of the behavior profile he is able to observe, which we express through a (*subjective*) *perception function* $\psi_V : B_V \rightarrow \{1, 0, -1\}$. So given any set $V \subseteq N$ of observed members and any prevailing behavior profile $\beta \in B_V$ of these observed members, we write $\psi_V(\beta) = 1$ when the observer globally perceives the group as possessing the attribute in question. Similarly, we write $\psi_V(\beta) = -1$ when the observer globally perceives the group as not possessing the attribute in question and $\psi_V(\beta) = 0$ refers to the observer’s inability of reaching a global perception of the group. We refer to the case $V = N$ as *perfect observation* and to $V \subset N$ as *imperfect observation*. Under perfect observation, we write ψ_N without subscript.

What kind of perception functions are used? We approach the problem axiomatically by considering the cases of perfect and imperfect observation separately.

¹To avoid confusion, we assume that the observer is not a member of the group.