# Bouletic/Deontic Modality, Liberalism and Social Choice

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## 1. Decision Maker in Bouletic Modality

The state of *wanting something* reflects personal preference and involves personal decision making. In that sense, wanting act follows the Condition of Liberalism. The condition of Liberalism is that, no matter how other people oppose, personal decisions can be made on certain matters. A weak Condition of Liberalism à la Sen (1970, 1979) is that each individual is entirely decisive in the social choice over at least a pair of alternatives. It is that everyone has a say on something no matter what other people think.

(1) Condition L (Liberalism)

For each individual $i$, there is at least one pair of alternatives, say $(x, y)$, such that if this individual prefers $x$ to $y$, then society should prefer $x$ to $y$, and if this individual prefers $y$ to $x$, then society should prefer $y$ to $x$.

(Sen 1970)

In actuality, what we want may not come out due to restrictions, but wanting something is a liberal act.

To put things in the possible world semantics (Lewis 1973, among others), in the best possible worlds for a decision maker, her wants are fulfilled. Her want-worlds are the subset of the worlds where her wants are fulfilled. The meaning of the sentence (1a) is expressed as in (1b) which says that, in all the accessible worlds which accord with Mary's wants at world $w_c$, she watches a movie.

(2) a. Mary wants to watch a movie.

b. $\forall w.[\text{BOUL}_m(w)(w_c) \rightarrow \text{watch-a-movie}(m,w)]$

(m: Mary, w: world, $w_c$: actual world, $\text{BOUL}_x$: bouletic accessibility relation of the individual x)

## 2. Decision Making

### 2.1 Bouletic Modality

From the perspective of decision making, the wanter is the only person involved with the wishes. If the speaker *I* is the agent of wanting to watch a movie, the speaker is the single decision maker regarding her preference, as shown in (1). If the first person plural subject *we* wants something unanimously, the group members including the speaker are the decision makers as in (2).

(3) a. I want to watch a movie (Others do not want to).

b. decision maker = {I}

(4) a. We want to watch a movie.

b. decision maker = {I, group member}

Even though others may want something contrary to the wanter, the wanter's desire remains unaffected, as in (1).

(5) a. Dee wants to wear blue even though you want her to wear yellow.

b. decision maker = {Dee}

c. $\text{bP}_d\text{y} \wedge \text{yP}_y\text{b} \rightarrow \text{bPy}$

(b: blue, y: yellow, d: Dee, y: hearer, $\text{xP}_i\text{y}$: x is strictly preferred to y by i)

### 2.2 Decision Maker in Deontic Modality

In contrast, the decision maker of deontic modals such as *must, should*, and *ought to* differs from the attitude holder. Traffic laws are imposed on public by the lawmakers: therefore, the decision makers are not drivers but a lawgiver, as shown in (1). If a teacher decides that Mary should submit a homework, the instructor is the decision maker of the deontic modal, in (2). The decision that Mary should study Spanish may be imposed due to the linguistic situation of people in Guatemala in (3).

(6) a. We should follow traffic lights.

b. decision maker = {x: lawmaker(x)}

(7) a. Mary should submit her homework.

b. decision maker = {x: instructor-of-Mary(x)}

(8) a. Mary should study Spanish. Otherwise she will not be able to communicate in Guatemala.

b. decision maker $=/=$ {Mary}
= {X⊆people in Guatemala}

### 2.3 Self-decision

The decision maker of deontic modals can also be an attitude holder herself. In (1), the schedule was imposed on the speaker herself: therefore, the law-maker is the speaker.

(9)  a. I should stop playing video games now and start studying. I have to stick to the schedule I made. I want to graduate in three years.

b. decision maker = {speaker}

c. $\forall w[w \in DEON_s(w_c) \rightarrow study(s)(w)]$

Thus, in use of deontic modals, decision makers can be someone else other than the attitude holder or the sentential subject. In case of bouletic modals, decision maker is a wanter.

## 3. Previous Analyses

Relevantly, in linguistic literature, van der Auwera & Plungian (1998) classify participant-internal and participant-external modality. According to them, ability modal like *can* and necessity modals such as *need* are participant-internal in that the ability and necessity originates in the participants.

(10)  a. Mary can make movies.

b. Mary needs to eat breakfast.

On the other hand, deontic and goal-oriented modality is participant-external. The chairperson and the teleological goal decide the possibility and necessity in (1) respectively.

(11)  a. You may be seated.

b. To go to Disney Land, you should take this train.

Even though van der Auwera & Plungian (1998) exclude volition or bouletic modality from the core of modality, bouletic modality appears to be participant-internal. In (1), the desire originates in the attitude holder *Mary* and the speaker respectively.

(12)  a. Mary wants to play the piano.

b. I want to play the violin.

## 4. Incorporating Decision Makers

Now that bouletic and deontic modals depend on decision makers, the accessibility relations between possible worlds depend on decision makers. When the group preference is involved as in (2), the group members' social decision is reflected.

(13)  a. Mary wants to watch a movie.

b. $\forall w.[BOUL_m(w)(w_c) \rightarrow watch\text{-}a\text{-}movie(m)(w)]$

(14)  a. We want to watch a movie.

b. $\forall w.[BOUL_{s,h}(w)(w_c) \rightarrow watch\text{-}a\text{-}movie(s,h)(w)]$

(s: speaker, h: hearer)

(15)  a. Mary should submit homework.

b. $\forall w.[DEON_i(w)(w_c) \rightarrow submit\text{-}homework(m)(w)]$

The deontically and bouletically accessible worlds may differ from each other, so that following example in (1a) is not contradictory.[1]

(16)  a. She ought to speak, but I do not want her to.

b. $\forall w.[DEON_s(w)(w_c) \rightarrow speak(m)(w)] \wedge \forall w.[BOUL_s(w)(w_c) \rightarrow \neg speak(m)(w)]$

Such incorporation of modal judges may be reminiscent of Stephenson (2007)'s analysis on epistemic modality, built on Lasersohn (2005) on predicates of personal taste such as *fun* and *tasty*.

(17)  a. That icecream might be tasty.

b. That icecream must be tasty.

(18)  a. $[\![must]\!]^{c:w,t,j} = [\lambda p_{<s,<ie,t>>}.\exists w',t',x.Epist_{w,t,j}: p(w')(t')(x) = 1]$

b. $[\![must]\!]^{c:w,t,j} = [\lambda p_{<s,<ie,t>>}.\forall w',t',x.Epist_{w,t,j}: p(w')(t')(x) = 1]$

(Stephenson 2007, 502)

c. $[\![that\ icecream\ must\ be\ tasty]\!]^{c:w,t,j} = 1$ iff $\forall w',t',x.Epist_{w,t,j}:$ kimchi tastes good at t' in w'

In addition to her analysis, I further claim that bouletic and deontic modals have decision makers. It is related to von Fintel (1999) who incorporates the wanter argument $\alpha$ (cf. Kratzer 1981, Heim 1992). (1) says that among the belief worlds of $\alpha$, all the worlds that maximally fulfill $\alpha$'s desire are p-worlds.

(19)  $[\![wants]\!]^{f,g}(p)(\alpha)(w) = True$ iff $\forall w' \in max_{g(\alpha,W)}(f(\alpha, w)): w' \in p$
'Among the worlds f ($\alpha$, w), the ones that maximally correspond to $\alpha$'s preferences in w are all p-worlds.'

## 5. Social Choice

Group decision is a social choice (Arrow 1963, Sen 1979, Chevaleyre et al. 2007). The social choice function SCF returns a single choice, which is going to a movie. The decision may not be unanimous but follows Pareto principle, in that when nobody has contrary preference, the mass decision agrees with individual's preferences.

(20)  a. decision makers I = {s, h, p}

b. alternatives $\chi$ = {go to movie, eat out, relax at home}

c. A profile, a vector of linear orders, or preference R = (R$_s$, R$_h$, R$_p$) $\in$ L($\chi$)$^3$

d. Social Choice Function SCW(L($\chi$)$^3$) = {go to movie}

Also Independence of Irrelevant Alternatives is adhered because the relative ranking between going to movie and other alternatives only matter to the group decision even with cyclicity.

(21)  a. mR$_s$eR$_s$h $\wedge$ mR$_h$eR$_h$h $\rightarrow$ mReRh

b. mR$_s$lR$_s$eR$_s$h $\wedge$ mR$_h$eR$_h$h $\rightarrow$ mReRh

Arrow's Social Welfare Function is not applicable here, because the ordering of *want* is not transitive. Subjective and personal preference ordering can be cyclic and intransitive as in (1).

(22)  a. I want to watch Jurassic World more than Star Wars. I want Star Wars than Mission Impossible but Mission Impossible to Jurassic World.

b. jRsRmRj

c. jRsRm $\nrightarrow$ jRm

Moreover, some elements in the domain may not be connected with preference relation. Some movies may not be compared with other movies. The following utterance is perfectly plausible.

(23) I like Jurrasic World better than Star Wars. I do not know about Mission Impossible.

*Want* is nonmonotonic, meaning that neither downward entailment nor upward entailment holds. In (1), even though the worlds of going to movie in rain or watching Jurassic World are the subsets those of going to movie, the desire to go to movie does not necessarily imply wanting to go to movie in rain or watching a specific movie.

(24)  a. I want to go to movie but I do not want to go to movie in rain.

b. I want to go to movie but I do not want to go to watch Jurassic World.

*Want* is not upward entailing either. The desire to watch a certain film does not always imply the preference to go to movie. The speaker may want to do other things in general but may go to a particular one of interest.

(25) I want to go to watch Jurassic World but I actually do not want to go to movie much.

On the other hand, the deontic modal *must* is monotone decreasing. There is no upward entailment, as shown in (1). You may be in need of vitamin C but other types. Asthma patients could be affected by tobacco smoke when BBQ smoke does not bother.

(26) I must take vitamin C $\nrightarrow$ I must take vitamins.

I should avoid D.

(27) I must avoid cigaret smoke $\nrightarrow$ I must avoid smoke.

Downward entailment seems to hold since (1) may be odd and the inference in (2) holds.

(28) ?I must take vitamins but I should not take vitamin D.

(29) I must avoid smoke. $\rightarrow$ I must avoid cigaret smoke.

## 6.  Conclusion

This paper argued that deontic/bouletic modals have decision makers and bouletic modal is participant-internal. Bouletic modality is intransitive, disconnected, nonmonotone, Pareto, and IIA. Due to the intransitivity of bouletic modality, Arrow's social welfare function does not work.

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