IN DEFENCE OF 'SATISFACTION-LOGIC' OF COMMANDS

The word 'command' is used to mean what is conveyed by an imperative, that is, by an expression of the form 'X, do a!'. The distinction between 'imperative' and 'command', thus, is analogous to the distinction between 'sentence' and 'proposition'.

Since Mally's seminal work in 1926, a number of attempts have been made to construct a formal logic of commands/imperatives. Four major systems have been developed so far, namely by : Hare;[1] Hofstadter and McKinsey[2] (based on Carnap's language 1 or R); von Wright[3] (based on the logic of 'necessary', 'possible', and 'contingent'); and Alf Ross,[4] Rescher,[5] Castaneda,[6] and Kenny[7] (modelled on the truth-functional logic of propositions). The present paper is directed towards the last type of approach and attempts to demonstrate that the values of 'satisfaction' and 'violation' of a command are the only value which can appropriately be substituted for the 'truth' and 'falsity' of propositions. In the course of the discussion, some of the important inadequacies of Rescher's system will be brought out and necessary modifications suggested. The central concern is not to defend Rescher's system as a whole but to justify his choice of 'satisfaction' as the truth-surrogate.

II

For anyone who is trying to construct a logical system for commands, based on the truth-functional logic of propositions, the most critical task is to find an alternative for 'truth' and 'falsity'. The choice naturally depends, to a large extent, on the characteristic or function of truth/falsity emphasized in the criterion designed to evaluate the possible alternatives. In the literature three functions of 'truth' have been identified :

(a) truth is what a valid indicative inference preserves;

(b) because of a special relation between asserting a proposition (that is, the speech-act) and the truth of the asserted proposition, it is *logically inconsistent* to assert two mutually contradictory propostions; and

(c) the logical relations are defined in terms of the truth-value relations.

Depending on their personal preferences, different writers have emphasized different requirements. Kenny, Castaneda, and Alf Ross, place maxium emphasis on (a); Hare along with those interested in developing a logic of commanding (that is, the speech-act)[8], on (b); and Rescher and von Wright on (c). I shall in the following sections examine these requirements briefly and see how 'satisfaction' fares on each.

III

The purpose of a valid indicative inference is preservation of truth. Similarly, it is demanded, that the proposed substitute for 'truth' must be able to accord the purpose of command/imperative inference. As practical inferences are conceived to be a subclass of command inferences, the value chosen must be that which practical inferences aim to preserve. Since there is no agreement with regard to the aim of practical inferences, there is, consequently, no agreement with regard to the proper substitute for 'truth'. However, the dis-satisfaction with the proposal of 'satisfaction' as a substitute for truth is widespread. It is generally agreed that the purpose of practical inferences is not merely to ensure that if the premise commands are satisfied then the conclusion command has also been satisfied. This criticism of 'satisfaction' however, is misconceived as it rests on an unacceptable assumption.

The demand that the proposed substitute for 'truth' must provide the purpose of practical inference is based on two fundamental assumptions :

(1) that there are command inferences; and

(2) that practical inferences are a sub-class of the command inferences.

(1) is more basic than the (2) for the latter presupposes the former. (1), however, is untenable for the following reason.

An inference[9] is roughly a process wherein one accepts or tries to establish a conclusion on the basis of certain premises which too one accepts (categorically or tentatively) or acknowledges to be true, and which are seen to be related to the conclusion in a particular manner. This element of justification, the fact of establishing or trying to establish the conclusion, is one of the most important features of an inference.

There is general agreement that accepting a proposition means (atleast partly) believing it to be true, and in a like manner, establishing a proposition is to show that the proposition is true. Inference, therefore, in such cases becomes a process wherein one accepts/establishes the truth of a proposition on the basis of the truth of certain others because the truth of the former is seen to be related to that of the latter. Difficulties arise when we introduce an inference that contains commands as premises and conclusion. Since commands are neither true nor false, what is it that we are trying to establish/accept through a command inference? What does it *mean* to say 'establish a command' or 'accept a command' apart from establishing/accepting *that* the command is — (issued, contextually proper etc.)?

This problem of assigning a meaning to the phrase 'establish/accept a command' is entirely different from the problem of determining whether or when a command entails another. In the literature, however, the two are rarely distinguished. Hare, for example, posits that since the logical relations hold by virtue of the meanings of the sentences and not by virtue of their truth-value relationships, the fact that commands are neither true nor false poses no serious threat to the possibility of command inference. Similarly, Alf Ross contends :

"—truth and falsity are not the only possible indefinables of a deductive logical system and — imperatives are not, therefore, precluded beforehand from being constituent parts of a logical inference". (op. cit. 59)

Thus it has not generally been recognised that even if there are entailment relations among commands, the possibility of command *inferences* is still an open question. The latter, as has already been contended, can be granted only when we have a meaning for the phrase 'establish/accept a command' which is distinct from the assertion *that* a command is being issued etc. To find an analogue of truth will not, as Edgley[1] thinks, suffice to show the possibility of such inferences; this analogue of truth must also not render the establishing of a command a mere assertion.

Hare suggests that 'assenting' to a command is akin to 'accepting' a proposition. This implies that in a command inference we assent to certain commands on the basis of certain others which we have already assented to. This suggestion, however, loses all

its plausibility once we take into consideration Hare's concept of assent.

To Hare 'assenting' to a command means doing what is commanded when the occasion arises, provided that the person is physically and psychologically capable of performing the act. In the light of this concept of 'assent', let us now consider the following (so called) command inference:

'John, shoot all the traitors!'

'Peter is a traitor.'

'Therefore, John, shoot Peter!'

If John assents to the first premise, on the above concept, he will shoot all the traitors, including Peter if Peter is actually a traitor. It is consequently, unnecessary for John to further assent to the conclusion command—he has already fulfilled it. The possibility of an *inference* is, thus, straight way ruled out.

A different concept of 'assent' is suggested by Gauthier.[11] He avers that :

"—a man may assent to an imperative as *justified*, whether

or not he acts on it or even considers acting on it". (63)

We may characterize command inference, then, as a process in which we accept the justifiability of a command on the basis of its relationship to other commands which we have already acknowledged as justified. This argument too becomes unhelpful as soon as we analyse the claim of the justifiability of a command. If the linguistic expression 'the command is justified' is itself an imperative, then the problem has not been solved; it has only been shifted one step further. On the other hand, if this expression is a descriptive judgement, then it has no relevance for the present discussion. An inference from the justified character of an imperative/command to that of another, will be a straightforward indicative inference.

An acceptable interpretation of the phrase 'accept/establish a command', thus, is lacking in the literature. The possibility (and existence) of the command/imperative inferences, therefore, is doubtful. The demand that the suggested value must provide the purpose of practical and command inferences, consequently, is premature rather unjustified, and may be disregarded for the present.

IV

The second requirement, emphasized by Hare runs as follows : If two propositions are logically contradictory—cannot be true together — then it is logically inconsistent for someone to assert both, at the same time and in the same respect. Similarly, it is demanded, that whatever be the chosen substitute for 'true', if it renders two commands contradictory then it must be *logically inconsistent* for a person to issue both at the same time, to the same person, and in the same respect.   This is the gist of the 'speaker-commitment' demand.

The demand of 'speaker-commitment', however, seems to rest on a misconception.   To assert a proposition is to make a claim for the truth of the proposition.   Consequently, if a person asserts two propositions which cannot (logical cannot) be true together then he *is* being *logically* inconsistent.   In the case of commands, therefore, if we wish to maintain a similar position then we must concede that : (a) two contradictory commands cannot both be 'x', where 'x' is the value in terms of which contradiction is defined; and (b) to issue a command, say, 'p and q' is to claim that both p and q are x. But what can this 'x' be which one is ascribing to the command issued? According to Hare to command is to tell someone to do something.   However, what is the relationship between telling someone to do 'a' and the act 'a', Hare does not tell us.   The neustic is an indefinable in his theory.

Alf Ross,[12]   unlike Hare, asserts that the imperative '**X**, do a!' means 'X's doing, a, so it ought to be'.   To command is to make a claim of the 'validity' of the action commanded.   Given Ross's conception of imperatives and the act of commanding, if now contradiction is defined in terms of the 'validity' of the commands, perhaps it would be logically inconsistent to issue two mutually contradictory (in this sense) commands.   But then, on this conception, commanding is no longer different from asserting as the claim of the 'validity' of a command is only to make a statement about one's own psychology.   In fact whatever interpretation be given to 'x', if commanding is conceived as *ascribing* 'x' to the command, it is difficult to imagine how commands can retain their distinctive 'imperative' character.   Hare, thus, is faced with a dilemma.   Either commanding is only a sub-class of the speech-

act of asserting, in which case no logic of imperatives/commands is needed. Or, commanding is unique but there is no *logical* inconsistency involved when a person issues both the commands simultaneously, namely, 'X, do a' and 'X, do not do a'.

For the above reason, Hare's contention that it is logically inconsistent to issue two commands at the same time, etc., when they cannot be satisfied together, seems unjustified. That some inconsistency is present in such cases cannot be denied. However, this inconsistency is not logical and thereby, not analogous to that involved in asserting two mutually contradictory propositions. It is more like 'contextual' or 'pragmatic' inconsistency though not exactly similar to 'logical oddness'. The difference between the three types of inconsistencies is as follows :

Where one asserts 'that p and not-p', the logical contradiction holds between the propositions p and not-p. This contradiction renders the claim of their joint truth (that is, the assertion) logically inconsistent.

When one asserts 'p but I do not believe that p', the logical contradiction holds between the *contextual implicant* of the assertion 'that p' and the other half of the assertion itself, namely, 'I do not believe that p'. This renders his utterance 'logically odd'.

When one issues the command 'p and not-p', his utterance presupposes (or, perhaps, pragmatically implies) that both commands, namely, 'p' and 'not-p' can be satisfied together — a possibility which is ruled out by logic. The logical contradiction thus, holds at the level of *presupposition* (or the pragmatic implication) of the command. This case, therefore, is entirely different from the first where the contradition is at the level of the *content* of the claim itself.

The absence of *logical* inconsistency in issuing two commands which cannot be satisfied together, however, does not entitle us to disregard the demand of 'speaker-commitment' totally. As has been already pointed out, even if there is no logical inconsistency in such cases yet they are not perfectly consistent either. Hence, if a certain chosen value renders two commands contradictory and yet a person who issues them both simultaneously is intuitively perfectly consistent, then we must suspect the criterion. Taking

this stand we may reformulate the 'speaker-commitment' demand as follows :

'Whatever value be chosen, it must be such that a person cannot consistently (in a contextual sense) issue two contradictory commands'.

Contextual inconsistency, though not sufficient to establish the contradiction, is nevertheless, necessary for it.

From this point of view, 'satisfaction' is a week substiute for 'truth'. In several cases, on satisfaction-logic two commands are logically contradictory and yet the person who issues them jointly appears to be perfectly consistent. To take the frequently debated instance, consider the following :

(1) 'If you have read the book, come and see me!'
(2) 'Read the book!'
(3) 'Come and see me!'

In 'satisfaction-logic' (1) and (2) jointly entail the third. A person who satisfies the first two cannot fail to satisfy (3). Yet a person who issues the first two is not committed to the third in the sense that if he commands (1) and (2) and the denial of (3), then he is being inconsistent. That he is not so committed is evident from the fact that if he adds one more proposition to the set, namely 'You have not read the book', he can consistently command 'Do not come and see me!' Had (1) and (2) committed him to (3), the addition of an assertion would not have made the joint utterance of (1), (2) and the denial of (3) consistent.

Again, on satisfaction-criterion the proposition 'p' entails the command 'p', and yet a person who asserts the first but denies the second cannot be said to be inconsistent in any sense. To say 'You are doing 'a' but do not do 'a!' is perfectly consistent. These observations, however, do not imply that the value of 'satisfaction' must be abandoned, or, that it is totally inadequate. They only necessitate the formulation of rules which can restrict such unwanted entailments. Two such rules have been suggested by Hare[13] and Clarke[14] but both have been found to be either too restrictive or too lenient.[15] Treating logical connectives as connectives between 'themes' of commands rather than commands themselves, and following Rescher's analysis of commands, I propose the following rules :

(i)   In the case, where the entailment is dependent on the
      recurrence of a command or proposition, in each of its
      essential occurrence a command must occur as a com-
      mand and a proposition as a proposition.   This excludes
      such entailment as 'p'/'p' !

(ii) Where the entailment depends on the recurrence of a
      constitutent of a command (that is, the action variable,
      the condition variable etc.) the following must be true:

      (a) except for the 'condition variable', a constitutent
           which has a bound occurrence in one command,
           must appear as bound in all essential commands;
           if it occurs as free then it must occur as a command.

This excludes the entailments of 'You are doing a' from 'do either
a or b!; do not do a!'.   Or the entailment of 'do b!' from 'do
either a or b!; You are not doing a.'   At the same time, it allows
the entailment of 'if you are doing a, then do c!' from 'if you are
doing a, then do b!; 'if you are doing b then do c!'

      (b) the 'condition' of a command must occur in all
           essential members of the set either as a condition
           in some command, or as a proposition.

As a command only its denial can appear.   This rules out the
entailment of 'do b!' from 'if you are doing a then do b!; do a!'
At the same time it allows the entailment of 'you are not doing a'
from 'if you are doing a then do b!; do not do b!'

The above syntactical rules I believe, will provide the necessary
restrictions needed to satisfy the requirement of 'speaker-commit-
ent' (in the weaker sense).

V

The third requirement which the proposed substitute of 'truth'
is expected to fulfil is concerned with the logical properties of truth-
values.   Truth and falsity determine (in a truth-functional logic)
the logical relations among indicative sentences/propositions.
They are mutually exclusive and mutually exhaustive (we may
ignore intuitionism for the time being).   Two propositions which
are mutually contradictory *logically* cannot be true together, and
likewise it is *logically* impossible that a proposition p entails q.

and yet p is true and q false. Moreover, truth and falsity are objective values and, therefore, the contextual factors like who utters the sentence, or in what context etc. do not affect the logical properties of the sentences/propositions.

Keeping in mind these features of truth and falsity, it is expected, that the values substituted for truth be objective and context free. They should explain why commands 'open the door' and 'do not open the door', are logically contradictory when issued to the same person, at the same time and in the same respect. In other words, why both the commands cannot be assigned the same logical value.

From this point of view, the only suitable substitute for 'truth' seems to be 'satisfaction'. On this criterion alone the two commands, mentioned above, *logically* cannot have the same value. Other criteria like 'satisfactoriness' or 'validity' fail to satisfy this condition. The two commands in question, can be contradictory on the latter values only if it is assumed that the person issuing these commands does not have conflicting wishes, demands, or aims. But why should a person who desires the same door to be both open and not open, at the same time and in the same respect be considered to have inconsistent demands, or aims? The answer will have to be in terms of the impossibility of the joint satisfaction of these demands or aims. The value of 'satisfaction', thus, is more fundamental than 'validity' or 'satisfactoriness'.

Moreover, the number of contextual factors which have to be considered *logically* relevant are minimal in case of 'satisfaction'. The two commands under consideration, will be contradictory on this value even when they are issued by two different persons. For other criteria, however, the source of the command has to be the same. As for the addressee, it is a constraint for all.

Rescher in his system tacitly acknowledges the logical relevance of another factor, namely, what von Wright calls 'the condition of applicability'. The concept of 'bypassing' in his system incorporates this factor. He also explicitly admits the logical relevance of the contextual factor, namely whether or not the condition is under the control of the addressee. A pair of commands may be perfectly consistent if the 'condition' is within the human control. A logically similar pair of commands, however, may become inconsistent if the conditional clause refers to something beyond

human control. (see page 107). But why do we have to take into consideration all these factors? Rescher gives no justification. It is true that such considerations as that of the human control, are important when we are deciding the epistemic propriety of a command. There is, however, no need to include them in a logical system. As for the concept of 'bypassing' a command, if a conditional proposition can be regarded as true when its antecedent is false, why can we not regard a conditional command as 'satisfied' when its antecedent is false? In fact, once it is realised that 'satisfaction' means 'non-violated', just as 'true' in propositional logic means 'not-false' and not 'true' in the strict sense of the term, the 'paradox of implication' in case of commands will appear no more paradoxical than it does in case of propositions. If we define 'satisfaction' in this way, we can construct a two-valued logic of commands exactly analogous to the truth-functional logic of propositions. This isomorphism of the command logic with the propositional logic, in my opinion, further confirms the appropriateness of 'satisfaction' as a substitute for 'truth'. It can be taken as a weakness of the system only if it is assumed either that each type of language must have a *special* logic of its own, or, that the two-valued truth-functional logic is not a proper model for commands. Neither of these assumptions seems to have any ground.

In conclusion we may examine some of the repercussions of the foregoing discussion on the popularly held beliefs about the relationship between the logic of commands and moral reasoning. Historically, one of the most pressing reasons for developing imperative logic, has been its instrumental value for a theory of morality. A defense of the rational nature of 'morality' while preserving the prescriptive function of moral judgements (that is, the reputation of logical positivism) was seen to hinge upon the possibility of imperative inferences and imperative logic.

The earlier discussion suggests that there are no imperative/command inferences and also that there is no *logical* inconsistency in commanding both 'p and not-p' at the same time, to the same person, and in the same respect. As a result, a study of the logic of commands, that is, of the logical relations among commands, can *at the most* tell us when a person is (in a contextual sense) inconsistent. Unless moral reasoning is to be reduced to such considerations, the hope of finding a model of moral reasoning

in logic of commands is totally misplaced. This also explains why there has been so widespread discontentment with 'satisfaction-logic' of commands—it was expected to perform something which it cannot, because of the very nature of commands, perform.

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NOTES

1. R. M. Hare : *Language of Morals*, 1952, Oxford. also *Practical Inference*, 1971.

2. A. Hofstadter, and J. C. C. McKinsey : "On the Logic of Imperatives", *Phil. of Sc.*, 1939, 6 : 446-457.

3. G. H. von Wright : *Norm and Action*, 1963, London.

4. Alf Ross : "Imperatives and Logic", *Theoria*, 1941,7 : 53-71.

5. N. Rescher : *Logic of Commands*, 1966, London.

6. H. N. Castaneda: "Imperative Reasoning", *Phil. and Phen. Res.*, 1960-1961, 21:21-49.

7. A. J. Kenny : "Practical Inference", *Analysis*, 1966, 65-67.

8. See P. C. Nolan : "A Semantics Model for Imperatives", *Notre Dame J. of Formal Logic*, 1977, 79-84.K. Opalek : "On the Logical-Semantic Structure of Directives", *Logique et. Analyse*, 1970, 169-196. R. P. McArthur, and D. Welker : "Non-Assertoric Inference", *Notre Dame J. of Formal Logic*, 1974, 225-244. D. S. Clarke also emphasises this feature. See "Mood Constancy in Mixed Inferences", *Analysis*, 1970, 30:100-1 03

9. The word 'inference' is used to include both the private psychological process as well as argument, that is, the public activity.

10. Roy Edgley : *Reason in Theory and Practice*, 1969; London.

11. D. P. Gauthier : *Practical Reasoning*. 1963.

12. Alf Ross : *Directives and Norms*. 1968, London.

13. R. M. Hare : *Language of Morals*. 1952, Oxford.

14. D. S. Clarke : 'Mood Constancy in Mixed Inferences' *Analysis* 1970, 30:100-103.

15. See Clarke, op. cit. also P. T. Geach : 'Imperative and Deontic Logic' *Analysis*, 1958, 18.3 : 49-56.

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10. Roy Edgley : *Reason in Theory and Practice*, 1969, London.

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13. C. H. Hare : *The Language of Morals*, 1952, Oxford.

14. R. F. Clarke : *Moral Reasoning*, in *Mind*, Editor ? August, 1950, pp. 366-382.

15. See *Dialogue*, with other R. M. Hare : 'Some Alleged Differences between Imperatives and Indicatives', 1967, pp. 309-326.

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