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*1. Introduction*

In this paper we discuss the use of the Hamblin/Mackenzie Formal Dialectic (HMFD) for the classical/non-classical debate about the status of contradictions and of non-trival inconsistent theories. Some of the central issues have been addressed in (Mackenzie and Priest 1990), and we discuss their stance.

It will be argued that the Mackenzie-Priest stance poses difficulties for the classical viewpoint. These are difficulties which have to do with debating the questions. In a discussion of the difficulties about the debate, argument will be presented which is deeply pessimistic about the resolution of these debate difficulties. The question for us is, "How can the argument continue? Can such profound difference be amenable to rational or reasonable argument?"

We begin by setting out a HMFD system in a condensed form, with focus on the features which are salient to the question of the debate. The system contains certain restrictions which are classical in nature. These restrictions give HMFD an apparently strong bias against dialetheism.

We consider how the HMFD restrictions work in practice, and see if they need to be modified so as to better serve the debate about dialetheism without begging the question. In this context, we consider some comments of (John Woods 1997) about both the argument against disjunctive syllogism and the well known set theory paradox in the Russell-Frege correspondence.

The comments were made in response to a dialogue system presented in (Girle "Belief Sets and Commitment Stores" 1997).

*2. Hamblin/Mackenzie Formal Dialectic* (HMFD)

There are many formal dialogue systems. (We note in passing: Barth and Martens 1984, Hamblin 1970, Mackenzie 1979, 1984, Walton 1984, and Walton and Krabbe 1995.) Despite differences between the systems, they have several things in common.

There are four main elements in most dialogue-logics. First, there is interaction between dialogue participants – the minimal case being two participants. The

interaction is represented in the obvious way as a sequence of locution events. The dialogue-logic also has syntactic stipulations concerning the types of locutions with which the logic will deal. The locutions include: statements, responses of various sorts, questions of various kinds, and withdrawals. Locutions are used by the participants in a dialogue to form a sequence of locution events. In setting out a dialogue we number locutions to indicate their order in the dialogue. These numbers are somewhat like the numberings of formulas in a proof.

The second element is a set of commitment stores, one for each participant in the sequence. Commitment stores are neither deductively closed nor necessarily logically consistent. The third element is a set of Commitment Store Rules. Each participant's commitment store is added to and subtracted from according to what statements, questions, answers and withdrawals are used by participants in the dialogue, subject only to the rules. For example, there may be a rule that if a participant asserts that P, then P is added to everyone's commitment store. If anyone disagrees, then they must explicitly deny P. Such a condition gives expression to the notion that we mostly believe what people say. A participant's commitment store does not have to be logically consistent. Its logical consistency becomes an issue only if the other participants in the dialogue detect prima face logical inconsistency and demand that the inconsistency be resolved. We return to the question of prima face inconsistency later.

The fourth element is a set of Interaction Rules to stipulate the legal sequence of locution events. For example, a question of the form "Why do you believe that P ?" must be followed by the reasons, or premises, from which one is to draw the conclusion that P, or a denial that one believes that P. These rules immediately make the dialogue into a joint activity. Breach of the rules indicates a failure in the joint activity. A joint activity need not be a co-operative activity. It can be competitive. For example, it can be mutually counter-persuasive, where each participant is trying to persuade the other of a proposition contrary to their present belief.

We set out some of the rules for the dialogue-logic, DL3 (Girle 1997), which is based on the systems DL (Girle 1993), DL2 (Girle 1994), and BQD (Mackenzie 1979, 1984). For DL3 there are just twoparticipants, X and Y. In setting out rules below we will use S for the speaker and H for the hearer. There are nine sorts of locutions allowed: statements of three kinds, declarations, withdrawals, tf-questions, wh-questions, challenges, and resolution demands.

* The categorical statements are statements such as P, not P, P and Q, P or Q, If P then Q and statements of ignorance (I do not know whether or not P). The last is abbreviated to \(*i P.* The reactive statements are grounds (Because P), abbreviated toP.
* The logical statements are immediate consequence conditionals such as: If P and P implies Q, then Q.
* A term declaration is the utterance of some term, say t.
* The withdrawal of P is of the form I withdraw P, I do not accept P, not P, or I no longer know whether P. The first and second are abbreviated as \(mi P.
* The tf-questions are of the form Is it the case that P?, abbreviated to P ?.
* The wh-questions are of the form What (when, where, who, what, which) is an (the) F ?. The strict logical form is (Qx)Fx, where Q is the interrogative quantifier, and for each such formula there will be an associated statement (Ex)Fx. (Mackenzie 1987)
* A challenge is of the form Why is it supposed to be that P?, abbreviated to Why P?.
* The resolution demands are of the form Resolve P.

Each locution event is represented in the formal representation of a dialogue in an ordered triple of a number, an agent and the agent's locution. The number is the number of an event in the dialogue sequence. For example, the statement P uttered at the nth step in the dialogue by X is represented as X, P. We also allow for justification sequences. They are four-tuples consisting of the antecedent of a conditional, the conditional, its consequent, and a challenge of the consequent. For example: If P then Q, Q, Why Q? We set out some of the rules of DL3, with comments on their significance and operation.

There are seven Commitment Store Rules. We set out three:
(C1) Statements : After an event S, P, where P is a statement, unless the preceding event was a challenge, P goes into the commitment stores of both participants.
(It is assumed that everyone agrees with statements unless and until they deny them or withdraw them. The inclusion of the full ordered pair is so that there is a record in the commitment store of thehistorical order of the locutions included.)
(C2) Defences : After the event S, P, when: Why Q? and Q are in the speaker's commitment store, the justification sequence : If P then Q, Q, Why Q?, and P and If P then Q go into the commitment stores of both participants.
The challenge: Why Q? is removed from the commitment stores of both

participants.

(If someone gives reasons for a statement Q, then the reason, its assumed conditional connection, and exactly what is justified go into the commitment stores of both participants. This allows us to keep track of why statements are in the commitment stores.)

(C4) Challenges : After the event S, Why P?, the challenge, Why P?, goes into the commitment stores of both participants.

If P is not in the hearer's commitment store then: P goes into the hearer's commitment store.

If P is in the speaker's commitment store, it is removed.

If the P is present in the speaker's commitment store as part of a justification sequence, the justification sequence is removed.

(Although it might seem strange to put P into the hearer's commitment store, the hearer can withdraw it or deny it (see (v)(a) below and C3 above).

Also, if P is in the speaker's commitment store it is withdrawn because, if the speaker has no problem about the statement, the challenge should not have been issued. It should be noted that this is not an altogether unproblematic explanation. The speaker might want to discern whther or not the hearer has reasons for asserting P other than the speaker's.

Further details of other Commitment Store rules are set out in the table below.

There are eight Interaction Rules. We set out five in detail. The rest are summarised, in some sense, in the table below.

(i) Repstat : No statement may occur if it is in the commitment stores of both participants.

This rule prevents vain repetition and helps stop begging the question. From an everyday rhetorical perspective it is unrealistic, but in the ideal dialogue it is appropriate.

(ii) Imcon : A conditional whose consequent is an immediate consequence of its antecedent must not be withdrawn.

(iii) LogChall : An immediate consequence conditional must not be withdrawn.

(These rules, (ii) and (iii), prevent the withdrawal or challenge of logical principles. These are the focus of our attention later in this paper.)

(v) Chall : After S, Why P? the next event must be , H, Q, where Q is either

(a) a withdrawal or denial of P, or

(b) the resolution demand of an immediate consequence conditional whose

consequent is P and whose antecedent is a conjunction of the statements to which the challenger is committed, or
(c) a statement of grounds acceptable to the challenger.

We require, at this point, a definition of what an acceptable statement of grounds is: A statement of grounds, Because P, is acceptable to participant S iff either P is not under challenge by S, or if P is under challenge by S then there is a set of statements to each of which S is committed and to none of which is S committed to challenge, and P is an immediate modus ponens consequence of the set. This definition is discussed at length in Mackenzie [1984]. (When the challenge is issued, the person challenged can either (a) deny any adherence to P, or (b) throw the challenge back to the challenger by pointing out that the challenger is committed to P, or (c) give a reason acceptable to the challenger).

| S Locution at Step n | S Store | H Store | H Response |
|---|---|---|---|
| categorical statement: P | +P | +P | |
| reactive statement: R | +R | +R | |
| | +If R then S | +If R then S | |
| | +... Why S?= | +... Why S?= | |
| | -Why S? | -Why S? | |
| turn declaration: τ | +Pτ | +Pτ | at some later point Pτ or − Pτ |
| withdrawal -P | -P | | |
| withdrawal -(Qx)Px | -(Qx)Px | -(Qx)Px | |
| | -(∃x)Px | -(∃x)Px | |
| if question: P? | -P | | one of P, −P, iP or -P |
| wh question: (Qx)Px | +(∃x)Px | +(Qx)Px | one of s, −(∃x)Px, i(∃x)Px or |
| | | +(∃x)Px | -(∃x)Px |
| challenge: Why S? | -S | +S | one of acceptable R or −S or -S |
| | +Why S? | +Why S? | or a resolution demand as in (v) |
| resolution: Resolve P | +P | +P | withdraw part P or state part P |
| | +Resolve P | +Resolve P | as in (vii) |

S Locution at Step n S Store H Store
H Response

**S Locution at Step n S Store H Store H Response**

(vi) Resolve : The resolution demand in S, Resolve whether P can occur only if either
(a) P is a statement or conjunction of statements which is immediately inconsistent and to which its hearer is committed, or
(b) P is of the form If Q then R and Q is a conjunction of statements to all of which its hearer is committed, and R is an immediate
consequence of Q, and the previous event was either , H, I withdraw P or , H, Why R? (The rule above opens the way for keeping statements consistent).

We set out the key points in a Rule Operation Table. There are rows for each of the speaker's, S, locutions. There are two commitment store columns for the resultant entries to the speaker's, S, and hearer's, H, commitment stores. We use

plus and minus to indicate what is being added to or subtracted from the commitment stores of speaker and hearer. There is a column for any required next locution from the hearer.

There are three points to note.
First, commitment stores contain much more than just categorical statements. They contain relevant portions of the dialogue content. Questions and challenges are important parts of that content.
Second, a participant's commitment store does not have to be logically consistent. Its logical consistency becomes an issue only
if the other participants in the dialogue detect prima face logical inconsistency and demand that the inconsistency be resolved.
Third, some of the allowed responses are more complex than can be fitted into the box in the table. Detail will be found in (Girle
1997).

The table shows constraints the logic imposes on a dialogue. They impose a discipline, but can allow utterly inconsequential debates (see Stewart-Zerba and Girle 1993).

*3. The Disjunctive Syllogism Debate*
There is a well known classical principle called ex falso quodlibet (Anything follows from a contradiction).
((P & – P) – Q)
There is also the classically valid argument form called Disjunctive Syllogism:
(P V Q)
– P
So: Q

A great deal of ink has been expended by non-classical logicians in arguing that Disjunctive Syllogism is not valid. The argument nearly always begins with the standard proof of ex falso quodlibet. It is argued that ex falso quodlibet is invalid, and that Disjunctive Syllogism is sufficient to enable the proof to go through. So, something is seriously wrong with Disjunctive Syllogism.

The standard proof is as follows:
** 1. (P & -P) Assumption
* 2. P 1, Simplification

* 3. (P V Q) 2, Addition
* 4. -P 1, Simplification
* 5. Q 3, 4, Disjunctive Syllogism

6. ((P & -P) – Q) 1 – 5, CP

Step 5 is supposedly the key.
Even though it is clear that Disjunctive Syllogism is not alone sufficient for ex falso quodlibet, and even though some might argue that Addition is more questionable, that is not the point of what is to be considered here. It does not matter which step we take to be the most vulnerable, any will do. If we agree that there is a "bad step" somewhere, we can look at each of them. And in each case we have a real problem on our hands.

John Woods has used the dialogue logic set out above to show that we can hardly begin to debate this situation.

The Rule is:
(vii) Resolution : After the event S, Resolve whether P the next event must be , H, Q, where Q is either
(a) the withdrawal of one of the conjuncts of P, or
(b) the withdrawal of one of the conjuncts of the antecedent of P, or
(c) a statement of the consequent of P.

(a) does not apply, because the statement at issue is a conditional. As for (b), R is not able to withdraw any of the conjuncts of the antecedent without, eventually, have to repudiate the whole proof. As for (c), R will be forced acknowledge that Q.

It might be asked, "Why does R not withdraw or deny the conditional: If (P V Q) and – P, then Q ?"

The reason is that the conditional is an immediate consequence conditional. And there are two crucial Rules concerning such conditionals:
(ii) Imcon : A conditional whose consequent is an immediate consequence of its antecedent must not be withdrawn.
(iii) LogChall : An immediate consequence conditional must not be withdrawn.

John Woods points out: We might think that the dispute now moves to the question of whether DS is a principle of logic. That is not an askable challenge

until it is established that DS is not a rule of logic. Girle's rules oblige us not to challenge DS unless it is invalid.

But its invalidity is precisely what [the participants] are deadlocked over. The present result easily generalizes. DL3 is unable to resolve any disagreement about any "logical principle". What can be done? We turn to suggestions from (Priest and Mackenzie

1990).

*4. Suggestions*

Priest and Mackenzie point out that the Rules Imcon and LogChall give effect to a priori rules and principles. The immediate consequence conditionals to which they refer are conditionals which give effect to rules and principles which must be arrived at by some a priori method. If the method is classical, then we get Disjunctive Syllogism and ex falso quodlibet for free, no matter whether we want them or not. If the method is non-classical, then we don't get them. If the debate is between classical and non-classical logicians, questions are begged.

Priest and Mackenzie suggest that to deal with questions such as the question of what counts as a valid principle we should shift to a posteriori Rules. In other words, we should note what principles are accepted by people, or used by people in argument. These should become our principles.

In an a posteriori investigation, the immediate conditionals are simply a set of statements priveledged in the dialogue; and as such, they need not be regarded as logically valid by logicians, and it is even possible that they need not all be in conditional form. Equally, from this point of view an immediate inconsistency is simply a set of statements whose acceptance renders one liable to a resolution demand without further ado.

There is an immediate objection to this suggestion. The classicalist may well disagree with the "empirical" approach. We are trying to settle what the a priori Rules are. To move to a posteriori Rules pre-empts the debate, or shifts us to a different debate. There is really no direct way through this sort of objection.

We might suggest negotiations of some sort. Can a subset of valid argument schemas be agreed to, and those used for immediate consequence conditionals? To such a suggestion it might be responded that we can hardly settle questions of truth and necessity by negotiation. Of course, it is not only the classical logician who can play this game.

The sub-set of valid arguments is hardly likely to include any argument schemas unacceptable to the non-classical logician. There is a sense in which that

suggestion can be seen as a non-classical ploy.

## 5. True Contradictions

The problems with Disjunctive Syllogism fade into the background when we turn to one of the main doctrines of dialethicism. The claim is that some contradictions are true. They are, of course, also false. But the second value is no problem.

In particular, the traditional "paradoxes" of set theory are seen as the facts about set theory. The paradoxes are presented in (Priest 1995) as indelible signs that we have reached the limits of thought. True contradictions in set theory, philosophy, language, and many other areas of intellectual endeavour, show us that we are at the limits of thought, and of course, beyond the limits also.

John Woods presents the usual argument from set theory in terms of dialogue logic, and argues that the classical dialogue logic shows that the Russell set just does not exist.

We will not translate Woods' inimitable account into the formalities of dialogue logic. That task is left to the reader. We simply reproduce Woods' version of what he calls "Frege's Sorrow". Russell is S and Frege is H.

1. S: If R (the set of all non-self-membered sets) exists then R is a member of R and R is not a member of R.

2. H: Yes.

3. S: By the axioms we both accept, R exists.

4. H: Agreed.

5. S: So we're in trouble.

6. H: You can say that again.

7. S: Since our resolution rules tell us to drop a conjunct if a statement in our committment store is an immediate contradiction, let's drop "R is a member of R".

8. H: But there is also a rule about honouring immediate consequences of what's left, i.e., "R is not a memeber of R". The trouble is that "R is not a member of R" immediately restores "R ia a member of R"; and we're right back where we started.

9. S: Worse still, the rules drive us into and endless cycle of resolution and paradox rebirth.

10. H: Of course, there is no prospect under the rules of wriggling out of Excluded Middle, is there?

11. S: No; it's a principle of logic.

12. H: But look, S. You've shown that if R exists then R is a member of R and R is

not a memeber of R.

13. S: Unfortunately.

14. H: Now the consequent of that conditional is a logical falsehood, n'est ce pas.

15. S: Yes, and of course its negation is a logical truth.

16. H: Right, AND we can't give up that logical truth and we can't give up your fateful conditional.

17. S: Nor can we give up modus tollens, another principle of logic.

18. H: Which, together with the conditional and our logical truth produces as an immediate consequence the negation of its antecedent.

19. S: You mean, that R doesn't exist, after all?

20. H: Yip.

21. S: So arithmetic isn't toppling?

22. H: Yip

So ends the Woods dialogue. But, for the dialethicist, steps 10 and 11 are problematic, obviously. Priest would want to say that we should accept the consequences of our argument: R is a member of R and R is not a member of R.

Since the premises were true, both conjuncts of the feared conjunction are true also. If you believe that true premises and valid argument give true conclusions, then believe also that the contradiction is true.

But, for us the question becomes: How can we debate the status of excluded middle, and the truth of contradictions? We are, essentially, in the same situation as we were with Disjunctive Syllogism.

*6. Conclusion*

It looks as though the debate ceases, unless classical logicians are prepared to give way, and in that case the debate ceases anyway.

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