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The Legal Argument Game of LEGAL RELATIONS

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Contents

Introduction

1. The Language of LEGAL RELATIONS (LLR) is a representation language for expressing rules and arguments in the legal domain. [Allen & Saxon 1997] The fundamental legal conceptions of Wesley N. Hohfeld, one of the foremost legal philosophers of the 20th Century, provide the first giant step in the development of the LEGAL RELATIONS Logic (LRL) that underlies LLR.[Hohfeld 1913] LRL is an extension, enrichment, and formalization of the eight fundamental legal conceptions that Hohfeld viewed as "the lowest common denominators of legal discourse that could be used to describe every possible legal state of affairs and every change in such states. [Allen 1995, 1996; Allen & Saxon 1995] This robustness is actually achieved by LRL, along with its capacity to represent every possible legal rule as well as every possible legal argument.

2. The Legal Argument (LA) Games of LEGAL RELATIONS are part of a series of games and puzzles designed to facilitate learners becoming fluent in LRL. [Allen & Saxon 1997] There are a total of nine LA Games, three different varieties, each at three different levels as summarized in Figure 1.

Figure 1. The Varieties and Levels of the Nine Legal Argument Games

Levels / Varieties	A. Basic	B. Deontic	C. Wild_Cards
1. Fundamental	Fundamental_Basic	Fundamental_Deontic	Fundamental_Wild_Cards
2. Enriched	Enriched_Basic	Enriched_Deontic	Enriched_Wild_Cards
3. More_Enriched	More_Enriched_Basic	More_Enriched_Deontic	More_Enriched_Wild_Cards

3. In this article we present various accounts of the Fundamental_Deontic Legal Argument Game 1B to illustrate the nature of these LA games. First the official rules that define the LA Game 1B are set forth; next is a sketch of the LA Game 1B. This is followed by a brief summary of it. Then, in the Appendix will be found an example match of LA 1B which is described in full detail, including an account of each player's strategy in making each move.

4. These LA games, along with other games and puzzles that deal with the acquisition of fundamental reasoning skills are being developed at a site on the Internet called THINKERS ALLIANCE at **http://thinkers.law.umich.edu**. The LA games are at this URL with the suffix **/files/Leg_Arg.htm** . Eventually, the THINKERS ALLIANCE site will have available practice matches in all the games and examples of the puzzles with interactive capability for interested learners to test their skills and facilities for making appointments to play matches with others around the world in any of the games.

5. ## Official Rules that Define the Games

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A. **Goal Rule**

On your shake, you must set a Goal by moving sufficient of the generated Resources to the Goal section of the playing mat. The Goal must express a DUTY of the player who is the defendant to do something for the player who is the plaintiff (goal-setter) or some equivalent of such a DUTY. Plaintiff indicates that the Goal has been completed by saying "Goal."

Comments

1. The Goal is the conclusion of an argument. A Solution is a set of premises from which the specified Goal can be deduced by means of the rules of inference, constraints, and definitions of the Fundamental_Deontic LA Game of LEGAL RELATIONS. The plaintiff must set a Goal.

2. In The Fundamental_Deontic LA Game the Goal must be an expression equivalent to the declaration of a RIGHT of the player who is the plaintiff that the defendant do something. In more advanced versions the Goal is allowed to be the declaration of any LEGAL RELATION.

3. The Goal is not changed after it has been set in The LA Games.

B. **Move Rule**

After the Goal has been set, play progresses in a clockwise direction. When it is your turn to play, you must either challenge or transfer zero or more Resources from the remaining pool of Resources to one or more of the Forbidden, Permitted, or Essential Sections (F, P or E) of the Playing Mat.

Comments

1. Plaintiff's move consists of any one of the following four options:

    1. transfer a maximum of any five Resources to F, P, or E, OR

    2. shift one Resource from F, P, or E to F, P, or E, AND transfer a maximum of any three Resources to F, P, or E, OR

    3. shift two Resources from F, P, or E to F, P, or E, AND transfer a maximum of any one Resource to F, P, or E, OR

    4. make a challenge.

2. Defendant's move consists of any one of the following two options:

    1. transfer a maximum of any three Resources to F, P, or E, OR

    2. make a challenge.

3. By their moves, the players shape the Solution.

C. **Solution Rule**

For the plaintiff a Solution is a set of premisses from which the Goal may be deduced by means of the rules of inference, constraints, and definitions of The LA Game. For the defendant a Solution is a set of premisses from which the NEGATION of the Goal can be deduced. In attempting to build a Solution:

1. **you must not use any of the Resources in the Forbidden section; AND**

2. **you may use as many of the Resources in the Permitted section as you like; AND**

3. **you must use all of the Resources in the Essential section in an essential manner; AND**

4. **on an A-claim challenge or a C-claim challenge that stems from a previous A-claim**

violation (see the Flubbing Rule below), you may use the combination of transfers and shifts that the next player can transfer on her turn; AND you may insert parentheses and commas wherever you want to put them.

Comments

1. Since several Resources may be the same, it is possible to have a DUTY in Forbidden which must not be used in the Solution at the same time that there is a DUTY in Essential which must be used.

2. That each Resource in Essential must be used in an essential manner means that it cannot be so that a premiss in which that Resource is used can be deleted from the set of premisses offered as a Solution and the Goal still be deduced from the remaining premisses without that deleted premiss. In other words, an Essential Resource must be used in a premiss essential (in the set of premisses offered as a Solution) for reaching the Goal.

D. **D. Flubbing Rule**

You have flubbed, if your move violates the A-claim or the C-claim that you are making when you make a move.

1. **A-claim: If possible, I am [A]voiding by this move allowing a Solution to be built with the Resources that the next player can transfer or shift on her move.**

2. **C-claim: I [C]annot correctly challenge on this turn. The prior Mover did not flub.**

Comments

1. The A-claim means that you make an A-flub if you make a move that [A]llows a Solution to be built with the Resources that the next player can transfer or shift on her turn.

2. The C-claim means that once a flub is made, every subsequent move is a flub because every subsequent Mover could have [C]orrectly challenged. Since only the most recent flub may be challenged, the C-claim makes it possible to win by laying a trap: make a deliberate flub, and as soon as the next player moves, challenge him for failing to challenge you.

3. If a Mover by her move makes an A-flub, and then makes a C-flub challenge of the next player's move and sustains the Burden of Proof for that challenge, she makes a successful Bold Challenge, the highest-scoring play possible in the LA Game. She scores 18 for the successful Bold Challenge.

4. Bold Challengers deserve such high scores for laying the trap by knowingly making the A-flub and taking the risk that other players will detect their flub and challenge. Of course, they also benefit by the high score when they do so unknowingly and recover quick enough to challenge the next Mover.

E. **Challenge Rule**

Whether or not it is your turn, you may at any time challenge the other player who has just

completed a move. You do so by saying "challenge," and specifying which kind of flub you think the Mover has made. The move of setting a Goal is completed when the Mover says "Goal." The move of transferring Resources to Forbidden, Permitted, or Essential is completed when the last of the Resources is transferred. Prior flubs are insulated by later ones; therefore, you cannot challenge any player except the one who has just completed his play.

Comment

A challenge cannot be retracted once a player has said "challenge."

F. Burden of Proof Rule

After a challenge, the Burden of Proof is upon the Challenger to show that there is a Solution under the constraints imposed by the moves made. If there has not been a challenge before all of the Resources have been transferred to the Forbidden, Permitted, or Essential sections, then the Burden of Proof is upon the plaintiff to show that there is a Solution to the Goal. The Burden of Proof is sustained by writing a Solution on a sheet of paper or entering it into the computer within the specified time limit (usually one or two minutes).

Comments

1. A Solution must, of course, satisfy the conditions imposed by the Solution rule and the previous plays of the Resources into the Forbidden, Permitted, or Essential sections.

2. The Burden of Proof will always be upon the Challenger.

G. Correctness Rule

After a challenge, a player is Correct if and only if:

1. he has the burden of proving the existence of a Solution, AND he sustains it by writing the Solution, OR

2. he does not have the Burden of Proof (the other player has it), AND the other player does not sustains that Burden of Proof.

H. Scoring Rule

Whether or not there been a challenge,

1. **Challenger scores 18 if Challenger is Correct on a Bold* Challenge, and Challenger scores 10 if Challenger is Correct on another kind of challenge, AND**

2. **Mover scores 10 if Mover is Correct, AND**

3. **if anyone is incorrect, then he scores 6.**

4. **(* A Bold Challenge is a C-challenge of the move immediately following a move that was an A-flub by the Mover who made the A-flub.)**

Comment

> The effect of this scoring rule is that one of the two players scores 6, and the other scores either 10 or 18.

I. **Stalling Rule**

At any time any other player can call "stall" on the player who is

1. **deciding to set a Goal, or**

2. **deciding whether to move a Resource or to challenge, or**

3. **trying to build a Solution.**

The stalling player then has some specified time (usually one to two minutes) to complete what she is doing. If she fails to meet the deadline, she loses one point, and another limited time period begins. If she fails to meet the second deadline, she loses another point; and so on.

(See also Appendix A - The Rules of Inference, Constraints, and Deontic LEGAL RELATIONS Definitions)

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6. Given these rules that define the LA Game of LEGAL RELATIONS, the mental activities that players of these games engage in during play include

   1. the formulation of premisses from the alphabet of resources that are generated for each match from which the plaintiff's claim (the Goal) can be inferred by

   2. arguments constructed using

   3. specified inference rules, constraints, and definitions, in such a way that

   4. all essential resources are used, no forbidden resources are used, and (possibly) some permitted resources are used in specifying a Solution from the premisses formulated. The rules of inference, constraints, and definitions that guide players' formulations are set forth in Appendix A.

Sketch of Legal Argument Game 1B

Resources	Limitations	Legal Argument
DUTY NO_RIGHT PRIVILEGE RIGHT DISABILITY IMMUNITY POWER LIABILITY CONDITIONAL DONE_BY DONE_FOR IF LS NEGATION OBLIGATORY c1 c2 c3 p1 p2 p3 p4 s1 s2 s3 s4 x1 x2	Forbidden Permitted Essential	Premiss 1 + Premiss 2 + Premiss 3 + ... Premiss n = Solution

		: Conclusion (Goal)

7. Plaintiff uses Resources to set the Goal, which is the conclusion of an argument. The Goal is an expression equivalent to plaintiff's claim of defendant's DUTY to do something for plaintiff.

8. Then, the players take turns transferring Resources to one or more of the Limitations sections until somebody (1) challenges or (2) the Resources are all transferred -- at which time the Burden of Proof is on one player to show that a Solution can be built from resources in Permitted and Essential.

9. The sustaining of the Burden of Proof (or failure to do so) determines the scoring and ends the match.

Brief Summary of The Legal Argument Game 1B

Starting

10. In The LA Game the first player starts by using some of the Resources to set the Goal. The Goal is a statement that expresses a DUTY or the equivalent of a DUTY, and it will use from 4 to 7 Resources.

11. The Goal is the conclusion of an argument; a Solution is a set of premises from which the specified Goal can be deduced by means of the rules of inference and definitions of the LA Game. For example, plaintiff might set the Goal of "DUTY(s1,p1,p2)", which says that defendant_p2 has a DUTY to plaintiff_p1 to see to it that state_of_affairs_s1 is so. (Note that the expression in abbreviated notation is written in the order: DUTY that s1 be so for p1 of p2.)

12. The Resources are the following words (or their abbreviations as shown in enclosed parentheses) and alpha-numeric characters, which are made available by the program:

   a. Some of these Resources represent LEGAL RELATIONS, namely: DUTY, NO_RIGHT, PRIVILEGE, RIGHT, DISABILITY, IMMUNITY, LIABILITY, POWER, and CONDITIONAL (COND) when combined with a LEGAL RELATION.

   b. Some represent propositional connectives: IF and NEGATION (NEG).

   c. Some represent action operators: DONE_BY (D2) and DONE_FOR (D4).

   d. One represents a deontic operator: OBLIGATORY (O).

   e. Some represent conditions: c1, c2, and c3.

   f. Some represent persons: p1, p2, p3, and p4.

   g. Some represent states of affairs (i.e., propositions about states of affairs): s1, s2, s3, and s4.

   h. And finally, some represent exercises of POWER: x1, and x2.

Playing and Ending

13. After the Goal is set, the players take turns transferring the Resources to the Forbidden [F], Permitted [P], or Essential [E] sections until (a) somebody precipitates the ending of the match by Challenging or (b) all of the Resources have been transferred to F, P, or E. On their turns, players can either move or challenge. Defendant's move consists of transferring up to three Resources to the F, P, or E sections. Plaintiff's move consists of transferring up to five Resources or substituting a shift for a pair of transfers (or two shifts for two pairs of transfers), where a shift is removing a Resource already allocated to F, P, or E and putting it in one of the other sections. What players should do on their turn to avoid making flubs that will get them challenged is the following:

> If the previous move allows a Solution on the next move,
>
>> the player whose turn it is should make an A-flub challenge,
>
> but otherwise,
>
>> if the previous Mover could have correctly challenged,
>>
>>> a. the player whose turn it is should make a C-flub challenge,
>>>
>>> but otherwise,
>>>
>>> b. it is safe to move, and the player whose turn it is should move.

14. If a player makes a move to the Playing Mat, he is claiming that two things are true, and there are consequences if either of his claims are false.

  a. By making a move the Mover is claiming about the situation in which he moves and after the move: That's right, and there is no Solution on the next move.

   1. By claiming "That's right" the Mover is asserting the C-claim, that is: because the previous move was not a flub, I [C]annot correctly challenge on this turn.

   2. By claiming "there is no Solution on the next move" the Mover is asserting the A-claim: I am [A]voiding by this move, allowing a Solution to be built on the next move.

  b. If either of the Mover's claims are false, then he has flubbed.

   1. For making a false C-claim he makes a C-flub.

   2. For making a false A-claim he makes an A-flub.

  c. By Challenging, the Challenger is saying to the Mover:

   1. (C-flub) You could have correctly [C]hallenged (and should have) instead of *moving*.

   2. (A-flub) Your move has [A]llowed a Solution on the next move.

Playing Mat

Forbidden	Permitted	Essential
The Resources played in this section MUST NOT be used in the set of premisses offered as a Solution.	The Resources played in this section MAY, but NEED NOT, be used in the set of premisses offered as a Solution.	The Resources transferred into this section MUST be used in an essential way in the set of premisses offered as a Solution. (A Resource is used essentially if and only if the conclusion can no longer be deduced from the remaining premisses when the premiss in which that Resource is used is deleted from the set of premisses offered as a Solution.

15. If a player challenges, he is declaring that the Mover has flubbed. The Challenger has the Burden of Proof to show that the Mover flubbed.

    a. The Challenger can sustain that Burden of Proof by writing a Solution that shows that the Mover flubbed. The other player (other than the Mover) is the one who can challenge.

    b. Upon declaration of a C-flub the Challenger must show that there was a Solution with the limitations imposed by the moves that had been made when the prior A-flub occurred.

    c. Upon declaration of an A-flub the Challenger must show that there is a Solution on the next move with the limitations imposed by the moves already made.

    d. If the Challenger is plaintiff, the Solution is to the Goal set; if the challenger is defendant, the Solution is to the NEGATION of the Goal set.

    e. If the match ends because all Resources have been transferred to the Playing Mat, plaintiff has the Burden of Proof to show that there is a Solution to the Goal.

Winning and Scoring

16. A player wins (and scores 18 or 10 points) if

    1. she has the Burden of Proof and sustains it, or

    2. she does not have the Burden of Proof, and nobody who has the burden sustains it;

otherwise, a player loses (and scores 6 points).

Summary of Scoring at the End of the Match

Score of the Player Who	Where Player with the Burden of Proof	
	Does Sustain it	Does NOT Sustain it

Has Burden of Proof on a Bold* Challenge	18	6
Has Burden of Proof on a Regular Challenge	10	6
Does NOT Have the Burden of Proof	6	10

* A C-flub challenge of the move immediately following an A-flub move.

Conclusion

17. The Legal Argument Game of LEGAL RELATIONS has been sketched briefly and then described more completely, and the official rules that define the game have been set forth in complete detail. The definitions of both the deontic and CONDITIONAL LEGAL RELATIONS together with both the assumed and some derived rules of inference and definitions that are used in the reasoning in the LEGAL RELATIONS Language have been presented (Appendix A). The strategies and course of play of the game is illustrated in a play-by-play account of a pair of sample matches of the LA Game (Appendix B).

18. As increasing numbers of workers in the legal domain become fluent in the comprehensive and precisely-defined LEGAL RELATIONS Language, the effects upon legal discourse and legal literature will unfold in step with the increasing fluency. The LA Game is one of a variety of games and puzzles that are now available as a means for accelerating the process of becoming fluent in this language. These will be available at the Internet site: **http://thinkers.law.umich.edu/files/Leg_Arg.htm**

19. The stimulation of the motivation of law students, practicing lawyers, rules drafters, judges, legal scholars, and other toilers in the legal vineyards to achieve such fluency in the LEGAL RELATIONS Language will evolve as more examples of the usefulness of LRL are made public:

     ○ For law students, pictorial representations of LRL analysis of appellate court opinions to deepen their understanding of the implications and limitations of the courts' decisions

     ○ For practicing lawyers, more comprehensive and precise tools for structurally interpreting important legal documents, such as their own professional liability insurance policies

     ○ For rules drafters, a means of checking the ambiguity in the logical structure of regulations, statutes, constitutions, corporate by-laws, contracts, and other sets of legal rules to help assure that such ambiguity is deliberate, rather than inadvertent

     ○ For appellate court judges, to craft written opinions that precisely express the structure, scope, and limits of their decisions

     ○ For legal scholars, a tool for the more precise and comprehensive analysis and expression of legal doctrine for benefit of students and others

     ○ Finally, for those other toilers who are seeking to build computer systems to assist the legal profession, a representation language for expert and other systems whose expressive power covers all of legal discourse.

20. For those who are inclined to get started on this precise and comprehensive language for law in the ever-more-technological 21st Century — a language that can precisely and completely:

   o describe every possible legal state of affairs,

   o account for every possible change from one legal state to another, and

   o represent every possible set of legal rules and every possible legal argument

   — now is the time to begin the playing and solving and learning. Challenge us to play a match of the LA Game!

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Appendix A

The Rules of Inference, Constraints, and Deontic LEGAL RELATIONS Definitions

A. The Five Rules of Inference of the Legal Argument Game

In the basis of the Logic of LEGAL RELATIONS the following five rule schemata of inference are assumed. Each of these may be used by players in The LA Games. They are all of the form:

A, ... N ----* S. This is an abbreviated way of saying: From the statements A through N, it is valid to infer statement S.

There are four elements in the presentation of each rule schema (hereafter, called rules) below:

(1) the name of the rule	(2) an explanation of the name
(3) statement of the rule in notation	
(4) statement of the rule in text.	

Rules:

D2o:	Out-rule for the DONE_BY operator
D2(s,p) ----* s	
From "The state_of_affairs_s is brought about by (i.e., DONE_BY) person_p", it is valid to infer "The state_of_affairs_s is so".	

IFo:	Out-rule for the IF operator
IF(r,s), r ----* s	
From "IF the state_of_affairs_r is so, the state_of_affairs_s is so" and "The state_of_affairs_r is so", it is valid to infer "The state_of_affairs_s is so".	

NEG-NEGo:	Out-rule for double NEGATION
NEG(NEG(s)) ----* s	
From "IT IS NOT SO THAT IT IS NOT SO THAT the state_of_affairs_s is so", it is valid to infer "The state_of_affairs_s is so".	

POWERoD2oLRi:	The out-out-in-rule for the exercise of a POWER

POWER(D2(x,p),LR)), D2(x,p) ----* LR
From "Person_p has the POWER to create LEGAL_RELATION_LR by exercising that POWER" and "Person_p exercises that POWER (exercise_x of that POWER is DONE_BY Person_p)", it is valid to infer "The LEGAL_RELATION_LR is so".

CONDITIONALoLRi:	Out-in-rule for the CONDITIONAL operator
CONDITIONAL(c,LR), c ----* LR	
From "The CONDITIONAL (upon fulfillment of condition_c) LEGAL_RELATION_LR is so" and "Condition-c has been fulfilled, i.e., c is so", it is valid to infer "LEGAL_RELATION_LR is so".	

From these five rules two others can be derived that are used frequently in the play of the LA Game to infer some LEGAL RELATION from the legally determined exercise of a POWER or the legally determined fulfillment of the condition of a CONDITIONAL LEGAL RELATION. These are the POWERoD2oD2IFoLRi and CONDITIONALoD2IFoLRi rules.

POWERoD2oD2IFoLRi:	The out-out-out-in-rule for the exercise of a POWER
POWER(D2(x,p),LR), D2(s,p), D2(IF(D2(s,p),D2(x,p)),LS) ----** LR.	
From POWER(D2(x,p),LR) and D2(s,p) and D2(IF(D2(s,p),D2(x,p)),LS), it can be derived that it is valid to infer LR.	

In other words, given (1) that person_p has the POWER to create LEGAL_RELATION_LR and (2) that state_of_affairs_s is DONE_BY person_p and (3) that the legal system determines that IF state_of_affairs_s is DONE_BY person_p THEN the exercise of POWER is DONE_BY person_p, it can be derived that it is valid to infer (4) that the LEGAL_RELATION_LR is created.

CONDITIONALoD2IFoLRi:	Out-out-in-rule for the CONDITIONAL operator
CONDITIONAL(c,LR), s, D2(IF(s,c),LS) ----** LR.	
From CONDITIONAL(c,LR) and s and D2(IF(s,c),LS), it can be derived that it is valid to infer LR.	

In other words,, given (1) that CONDITIONAL_LEGAL_RELATION_LR (conditioned upon fulfillment of condition_c) is so and (2) that state_of_affairs_s is so and (3) that the legal systems determines that IF state_of_affairs_s is so, THEN condition_c is fulfilled, it can be derived that it is valid to infer (4) that LEGAL_RELATION_LR is created.

The two similar derivations of this pair of derived rules are shown in Figure 2.

Figure 2. Proofs of Two Derived Rules of Inference

POWERoD2oD2IFoLRi	CONDITIONALoD2IFoLRi
1 POWER(D2(x,p),LR) suppose	1 CONDITIONAL(c,LR) suppose
2 D2(s,p) suppose	2 s suppose
3 _ D2(IF(D2(s,p),D2(x,p),LS) suppose	3 _ D2(IF(s,c),LS) suppose
4 IF(D2(s,p),D2(x,p) 3,D2o	4 IF(s,c) 3,D2o
5 D2(x,p) 4,2,IFo	5 c 4,2,IFo
6 LR 1,5,POWERoD2oLRi	6 LR 1,5,CONDITIONALoLRi

B. Constraints

In the reasoning in the LA Games there are also a pair of constraints upon what can be assumed as premisses. These constraints are what make the reasoning involved these games in accord with legal reality— specifically, in accord with the jurisprudence of legal realism. The two constraints are about what can be assumed as a premiss; they are the following:

1. s_to_c Constraint

IF_connections between s and c are relationships of a type that occur between factual particulars and the general conditions of LEGAL RELATIONS. Thus, IF(s,c) is a legal characterization. Such characterizations are determined (i.e., DONE_BY) the legal system (and only by the legal system); they cannot be *assumed* as premisses of a legal argument in the LA Games.. Thus, players of the LA Games cannot assume IF(s,c) as a premiss. If they need IF(s,c) in their argument, what they must assume is that the legal system determines IF(s,c), that is, D2(IF(s,c),LS).

2. D2(s,p)_to_D2(x,p) Constraint

Similarly, IF_connections between D2(s,p) and D2(x,p) are of a type that occur between the factual particulars of what some specified person has done and whether having done so constitutes an exercise of his POWER to create a LEGAL RELATION -- another legal characterization that is only DONE_BY the legal system. They, also, cannot be *assumed* as premisses of a legal argument. Players of the LA Games cannot assume IF(D2(s,p),D2(x,p)) as a premiss. If they need IF(D2(s,p),D2(x,p)), what they must assume is that the legal system determines IF(D2(s,p),D2(x,p)), that is, D2(IF(D2(s,p),D2(x,p)),LS).

These rules of inference and constraints, in combination with the definitions presented next, are the concepts players use in reasoning about ways to reach their Goals in playing the LA Games.

C. Definitions of the Deontic (UNCONDITIONAL) and CONDITIONAL LEGAL RELATIONS

1. Definitions of Deontic LEGAL RELATIONS

In the Basic variety of LA Games there are four deontic LEGAL RELATIONS that do not explicitly use a deontic operator. Each of these is logically equivalent to each of the others:

DUTY(sk,pi,pj)	Person_pj has a DUTY to person_pi to do sk.
RIGHT(sk,pj,pi)	Person_pi has a RIGHT that person_pj do sk.
NEG(PRIVILEGE(NEG(sk),pi,pj))	IT IS NOT SO THAT person_pj has a PRIVILEGE with respect to person_pi to do NOT sk.
NEG(NO_RIGHT(sk,pj,pi))	IT IS NOT SO THAT person_pi has a NO_RIGHT that person_pj do sk.

where i and j are different numerals from 1 to 4, and k is also a numeral from 1 to 4.

In the Deontic variety of LA Games a fifth equivalent expression of a deontic LEGAL RELATION is possible, one that uses the deontic operator, O, namely:

O(D2(D4(sk,pi),pj))	IT IS OBLIGATORY THAT (sk be DONE_FOR person_pi) be DONE_BY person_pj.

The equivalence of these five deontic LEGAL RELATIONS result from the following four definitions:

DUTYdf: DUTY(sk,pi,pj) =df O(D2(D4(sk,pi),pj))

RIGHTdf: RIGHT(sk,pi,pj) =df O(D2(D4(sk,pj),pi))

PRIVILEGEdf: PRIVILEGE(sk,pi,pj)) =df NEG(O(D2(D4(NEG(sk),pi),pj)))

NO_RIGHTdf   NO_RIGHT(sk,pi,pj)) =df NEG(O(D2(D4(sk,pj),pi)))

There are three other sets of five equivalent deontic LEGAL RELATIONS that can be derived from these four definitions. All four sets are summarized in Figure 3 below.

2. Definitions of Capacitive and Other CONDITIONAL LEGAL RELATIONS

CONDITIONAL LEGAL RELATIONS are of two types: capacitive and other. The capacitive-type are POWER or POWER-equivalent LEGAL RELATIONS or their NEGATIONS that are associated with changes in legal state that are brought about by states of affairs DONE_BY legal persons (agentive). The other-type of CONDITIONAL LEGAL RELATIONS are associated with changes in legal states that are brought about by states of affairs that are NOT DONE_BY legal persons (nonagentive).

Figure 3. Four Sets of Five Equivalent First-Level Deontic LEGAL RELATIONS

DUTY(s,pi,pj) RIGHT(s,pj,pi) O(D2(D4(s,pi),pj)) NEG(NO_RIGHT(s,pj,pi)) NEG(PRIVILEGE(NEG(s),pi,pj))	NEG(DUTY(s,pi,pj)) NEG(RIGHT(s,pj,pi)) NEG(O(D2(D4(s,pi),pj))) NO_RIGHT(s,pj,pi) PRIVILEGE(NEG(s),pi,pj)
DUTY(NEG(s),pi,pj) RIGHT(NEG(s),pj,pi) O(D2(D4(NEG(s),pi),pj)) NEG(NO_RIGHT(NEG(s),pj,pi)) NEG(PRIVILEGE(s,pi,pj))	NEG(DUTY(NEG(s),pi,pj)) NEG(RIGHT(NEG(s),pj,pi)) NEG (O(D2(D4(NEG(s),pi),pj))) NO_RIGHT(NEG(s),pj,pi) PRIVILEGE(s,pi,pj)

There are four capacitive LEGAL RELATIONS for which there are definitions and two sets of four equivalent capacitive LEGAL RELATIONS.

POWERdf: POWER(D2(x,p),LR) =df NEG(LR) & Ss(B(D2(s,p))&
                  (IF(D2(s,p),(D2(IF(D2(s,p),D2(x,p)),LS)&LR))))

"Person_p has POWER to create LEGAL_RELATION_LR." is equal to by stipulated definition:

> "1. LEGAL_RELATION_LR is NOT so, AND
> 2. there is some state_of_affairs_s such that,
>
>> A. it is naturally possible for state_of_affairs_s to be DONE_BY person_p, AND
>> B. IF   1. state_of_affairs_s is DONE_BY person_p
>>   THEN 2. the legal system_LS will treat that s being DONE_BY p as an exercise_x of
>>> POWER DONE_BY person_p to create LEGAL_RELATION_LR,
>> AND

3. LEGAL_RELATION_LR is created".

The notational abbreviation: POWER(p,LR) =ab POWER(D2(x,p),LR)
is also available in LA Games (and similarly for the other capacitive LEGAL RELATIONS). Note also that time relationships are left implicit here in the LEGAL RELATIONS Language. However, in the Logic of LEGAL RELATIONS underlying LRL time relationships are explicitly taken into account.
[See Allen & Saxon 1986, 1991]

LIABILITYdf: LIABILITY(LR,D2(x,p) =df POWER(D2(x,p),LR)

"LEGAL_RELATON_LR has LIABILITY of being created by person_p" is equal to by stipulated definition:

      "Person_p has POWER to create LEGAL_RELATION_LR."

DISABILITYdf: DISABILITY(D2(x,p),LR) =df NEG(POWER(D2(x,p),LR))

"Person_p has DISABILITY to create LEGAL_RELATON_LR" is equal to by stipulated definition:

      "IT IS NOT SO THAT Person_p has POWER to create LEGAL_RELATION_LR."

IMMUNITYdf: IMMUNITY(LR, D2(x,p)) =df NEG(POWER(D2(x,p),LR))

"LEGAL_RELATON_LR has IMMUNITY of being created by person_p" is equal to by stipulated definition:

      "IT IS NOT SO THAT Person_p has POWER to create LEGAL_RELATION_LR."

From these four definitions there are two sets of four equivalent deontic LEGAL RELATIONS that can be derived. Both sets are summarized in Figure 4.

Figure 4. Two Sets of Four Equivalent Higher-Level Capacitive LEGAL RELATIONS

POWER(D2(x,p),LR)	NEG(POWER(D2(x,p,)LR))
LIABILITY(LR,D2(x,p))	NEG(LIABILITY(LR,D2(x,p)))
NEG(DISABILITY(D2(x,p),LR))	DISABILITY(D2(x,p),LR)
NEG(IMMUNITY(LR,D2(x,p)))	IMMUNITY(LR,D2(x,p))

CONDITIONALdf: CONDITIONAL(c,LR) =df NEG(LR) & Ss(B(s) & IF(s,D2(IF(s,c),LS)&LR))

"There is a CONDITIONAL_LEGAL_RELATION_CLR that LEGAL_RELATION_LR will be created by the fulfillment of condition_c." is equal to by stipulated definition:

"1. LEGAL_RELATON_LR is NOT so, AND
2. there is an state_of_affairs_s such that

      A. it is naturally possible for state_of_affairs_s to occur, AND
      B. IF   a. state_of_affairs_s occurs,
        THEN   b. the legal system will treat the occurrence of state_of_affairs_s as fulfilling condition_c, AND
             c. LEGAL_RELATON_LR is created."

Armed with these definitions, rules of inference, constraints, and derived equivalencies we are ready to examine some examples of the play of some matches of a LA 1B Game between a plaintiff and a defendant in some detail.

Appendix B

Example of the Play of Some Matches of the Legal Argument Game

Match 5A

Resources:

DUTY RIGHT IMMUNITY LIABILITY LIABILITY COND COND D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D4 D4 D4 IF IF LS LS LS NEG NEG O O
c1 c1 c2 c2 c3 c3 p1 p1 p1 p1 p2 p2 p2 p2 p3 p3 p3 p3 p3 p3
s1 s1 s1 s2 s2 s3 s3 s3 s4 s4 s4 x1 x1 x2 x2 x2

Goal: DUTY(s3,p2,p3)

The 66 resources generated for Match 5A are shown above with four of them underlined to indicate that they were selected by the first player (plaintiff) to set the Goal of DUTY(s3,p2,p3). There are forms for matches of the LA Game that can be downloaded from the Internet site for the LA Game like Match 5A above. When these forms are printed out, they provide materials for a paper and pencil version of the LA Game to be played between two players. The moves of the players can be written into a summary table provided like the one below.

After the Goal is set by the plaintiff, it is the defendant's turn to respond by transferring up to three of the Resources to one of the three specified sections on the playing mat: the Forbidden section, the Permitted are or the Essential section. In Match 5A defendant seeks to force plaintiff to build a fourth-level Solution (one that uses three capacitive operators and, thus, many more resources than are available in the Resources section) by transferring IMMUNITY, LIABILITY, and LIABILITY from the Resources into the Essential section. His objective in doing so is to prevent the plaintiff from being able to construct a set of premises from which the Goal can be inferred. He indicates this Move 1 by underlining the Resources that are being transferred and writing them in the Essential column of Row 1.

Summary of Play after Goal is Set

Move	Forbidden	Permitted	Essential
1 2		IMMUN* RIGHT IF LS	IMMUN LIAB LIAB
3 4		LIAB* COND* O	COND COND O
5 6		D4* D4* x2	D4 D4 D4
7 8		c1* c1 LS NEG	c1 c2 c3
9 10		x1* x1 IF c2	x1 x2 x2
11 12		c3* c3 D2 D2	s1 s1 s1
13 14		D2 D2 D2 D2 D2	p1 p1 p1
15 16		s1* s2 s2 s3	s4 s4 s4
17 18	D2 D2 D2	Challenges, A-flub s4* p1 p2 p3	

The response of the plaintiff to defendant's Move 1 is to shift the IMMUNITY from the Essential section to the Permitted section and transfer RIGHT, IF, and LS from the Resources to the Permitted section. (Recall that plaintiffs can transfer the equivalent of five resources, where 1 shift = 2 transfers.) Her aim is to reduce the level of the Solution to a third-level one (by shifting IMMUNITY) and to make available for use in her Solution the RIGHT, IF and LS. She indicates her Move 2 by underlining the shifted IMMUNITY (in Essential) and the transferred RIGHT, IF, and LS (in Resources) and writes the four of them in the Permitted column of Row 2. She also adds * to IMMUNITY to indicate that it was shifted.

After the first two moves have been made, six additional ones of the Resources have been transferred to the playing mat. To indicate these transfers each of the six are underlined so that the state of the Resources that confronts the defendant as he prepares to make Move 3 is the following:

Resources:

DUTY RIGHT IMMUNITY LIABILITYLIABILITY COND COND D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D4 D4 D4 IF IF LS LS LS NEG NEG O O c1 c1 c2 c2 c3 c3 p1 p1 p1 p1 p2 p2 p2 p2 p3 p3 p3 p3 p3 p3 s1 s1 s1 s2 s2 s3 s3 s3 s4 s4 s4 x1 x1 x2 x2 x2

The play continues in this manner with defendant making the odd-numbered moves and the plaintiff making the even-numbered moves until one of the players challenges or the Resources have all been transferred. The motivation of the players for each move made for Moves 3 through 18 is described in detail below.

Move 3. Defendant continues to seek to elevate the level of the Solution by transferring COND and COND, to essential, forcing a fifth-level Solution; he also seeks to force the use of the deontic operator O in the Solution by transferring it to Essential.

Move 4. Plaintiff responds by shifting LIABILITY and COND from Essential to Permitted, reducing the level of Solution that must be built to a third-level one, and prevents defendant from forcing even further use of deontic operators by transferring the only remaining O from Resources to Permitted.

Move 5. Defendant seeks to force the use of two extra 'D4's by transferring D4, D4, and D4 to Essential.

Move 6. Plaintiff responds by shifting two of the 'D4's from Essential to Permitted, thereby eliminating the forced use of the two extra 'D4's, and transfers one of the 'x2's from Resources to Permitted to prevent defendant from forcing the use of extra 'x2's.

Move 7. Defendant seeks to force plaintiff to use extra 'c's by transferring c1, c2, and c3 to Essential.

Move 8. Plaintiff eliminates the forced use of c1 shifting it from Essential to Permitted, prevents defendant from forcing the use of the remaining c1 and NEG by transferring them from Resources to Permitted, and transfers LS from Resources to Permitted to be available for use in a Solution.

Move 9. Defendant seeks to force the use of extra 'x's by transferring x1, x2, and x2 to Essential.

Move 10. Plaintiff eliminates the forced use of x1 by shifting it from Essential to Permitted, prevents defendant from forcing the use of the remaining x1 by transferring it to Permitted, and transfers IF and c2

from Resources to Permitted to be available for use in a Solution.

Move 11. Defendant seeks to force the use of extra 's1's by transferring s1, s1, and s1 to Essential.

Move 12. Plaintiff eliminates the forced use of c3 (from Move 7) by shifting it from Essential to Permitted, prevents defendant from forcing the use of the remaining c3 by transferring it to Permitted, and transfers D2 and D2 from Resources to Permitted to be available for use in a Solution.

Move 13. Defendant seeks to force the use of extra 'p1's by transferring p1, p1, and p1 to Essential.

Move 14. Plaintiff is aware that he can use all three of the 'p1's in a Solution that involves POWER and that he will need many 'D2's for such a Solution; so, he transfers five 'D2's from Resources to Permitted to make them available for use in a Solution.

Move 15. Defendant seeks to force the use of extra 's4's by transferring s4, s4, and s4 to Essential.

Move 16. Plaintiff eliminates the forced use of the extra s1 (from Move 11) by shifting it from Essential to Permitted, prevents defendant from forcing the use of an extra s3 by transferring it from Resources to Permitted, and transfers s2 and s2 from Resources to Permitted to make them available for use in a Solution (but also blocking their being used by defendant to force use of extra 's2's in the Solution.

At this stage of the play after Move 16, the state of the Resources is as follows:

Resources:

DUTY RIGHT IMMUNITY LIABILITYLIABILITYCONDCONDD2D2D2D2 D2 D2 D2 D2 D2
D2 D2 D4D4 D4IFIFILS LS LS NEG NEG OO
c1 c1 c2 c2 c3 c3 p1p1p1 p1 p2 p2 p2 p2 p3 p3 p3 p3 p3
s1 s1 s1 s2 s2 s3 s3 s3 s4 s4 s4 x1 x1 x2 x2 x2

The 50 underlined resources have been transferred to the playing mat, and only the following 16 resources are available for further transfer: D2 D2 D2 D2 LS NEG p1 p2 p2 p2 p3 p3 p3 p3 p3 s3.

Move 17. Defendant seeks to prevent plaintiff from getting available 'D2's needed for building Solutions of higher levels by transferring D2, D2, and D2 to Forbidden.

Move 18. Plaintiff challenges, declaring that defendant by his last move has made an A-flub; his move allows the plaintiff to achieve a Solution on her next move.

On this kind of challenge the plaintiff has the Burden of Proof to show that a Solution can be built by virtue of her next move. She indicates that her move will consist of shifting the extra s4 (of Move 15) from Essential to Permitted and transferring p1, p2, and p3 from Resources to Permitted.

She then writes as her Solution the following five premisses:

1. LIABILITY(COND(c2,O(D2(D4(s3,p2),p3))),D2(x2,p1))

2. D2(s1,p1)

3. D2(IF(D2(s1,p1),D2(x2,p1)),LS)

4. D2(IF(s4,c2),LS)

5. s4

   using all 14 of the following resources in Essential: LIABILITY COND O D4 c2 x2 x2 s1 s1 p1 p1 p1 s4 and s4. She also had available in Permitted the following 16 other resources used in the five premisses: IF LS LS IF c2 D2 D2 D2 D2 D2 D2 D2 s3 p1 p2 p3.

   She then completes the proof to show that the conclusion, DUTY(s3,p2,p3), i.e., the Goal, can be deduced from the Solution by means of the rules of inference and definitions available,

6. POWER(D2(x2,p1),COND(c2,O(D2(D4(s3,p2),p3))))   1,LIABILITYdf

7. COND(c2,O(D2(D4(s3,p2),p3)))   6,2,3,POWERoD2oD2IFoLRi

8. O(D2(D4(s3,p2),p3))   7,5,4,CONDITIONALoD2IFoLRi

9. DUTY(s3,p2,,p3)   8,DUTYdf

Plaintiff has thus sustained her Burden of Proof on the challenge to show that a Solution can be built after her next move. She scores 10 for this match, and defendant scores 6. The match is over.

Now let us consider what might have happened under a different play of Match 5, that is, a play with the same set of Resources as those for Match 5A, but with some different moves by the players. (This, incidentally, illustrates that there can be many different plays with each of the sets of Resources that can be downloaded from the LA Game site.) Suppose (1) that in Match 5B, the same Goal is set as was set in Match 5A, and (2) that the first 16 moves were the same so that the state of the Resources just after Move 16 are the same as those shown above. It is defendant's turn, and this time he elects to pursue a different strategy at this stage.

Summary of Play after Goal is Set in Match 5B

Move	Forbidden	Permitted	Essential
1 : 16		Same as the first 16 moves in Match 5A.	

17: 18		p3* p3* p3	p3 p3 p3
19 20	D2	p3* p3* D2	p3 p3
21 22		s4* p2* p1	p2 p2 p2
23 24	pass	pass Challenges, A-flub p2*	pass

Move 17. Instead of transferring the three 'D2's to Forbidden, defendant seeks to force plaintiff to use extra 'p3's by transferring p3, p3, and p3 to Essential.

Move 18. Plaintiff responds by (a) shifting two of the 'p3's from Essential to Permitted, reducing the number of 'p3's that have to be used in the Solution and (b) transferring one of the remaining 'p3's from Resources to Permitted to prevent defendant from forcing her to use that one.

Move 19. Defendant seeks to force use of extra 'p3's by transferring p3, and p3 from Resources to Essential and to make unavailable a D2 that he thinks that Plaintiff might need by transferring D2 from Resources to Forbidden.

Move 20. Plaintiff responds by shifting two of the extra 'p3's from Essential to Permitted and transferring a D2 from Resources to Permitted to be available for use in a Solution.

Move 21. Defendant seeks to force the use of extra 'p2's by transferring p2, p2, and p2 to Essential.

Move 22. Plaintiff eliminates the forced use of an extra s4 (from Move 15) by shifting an s4 from Essential to Permitted and also eliminates the forced use of one of the 'p2's by the same kind of shift of a p2. She also makes available for use in the Solution the needed p1 by transferring p1 from Resources to Permitted.

Move 23. In analyzing the situation defendant realizes (a) that plaintiff does not need any of the remaining 'D2's for a Solution (so, there is no effective constraint imposed upon plaintiff by transferring any of them to Forbidden, Permitted, or Essential) and (b) that she also does not need the LS or NEG that remains nor will it help to try to force her to use the LS or NEG (so, there is no point in transferring either of them either). So, defendant passes, hoping that plaintiff (a) will not recognize that she can build a Solution after her next move and (b) will fail to challenge, and thus, enable him to challenge her C-flub failure to challenge his A-flub when she could have done so correctly.

Move 24. But plaintiff is not fooled. She challenges that there is an A-flub, that is, that after defendant's last move it is possible for plaintiff to build a Solution after her next move. She then proceeds to get rid of the last remaining extra p2 by shifting it from Essential to Permitted.

    Again she has the Burden of Proof on the A-flub challenge, and she constructs the same Solution and proof of it as occurred in Match 5A. She wins again in Match 5B, scoring 10 to defendant's 6.

However, at Move 23 when defendant passed, he failed to realize that he could have correctly made an A-flub challenge of Plaintiff's prior move. By simply transferring a D2 from Resources to Permitted, he could have reached the NEGATION of the plaintiff's Goal, that is NEG(DUTY(s3,p2,p3)). He then could have constructed the following Solution:

1. LIABILITY(COND(c2,NEG(O(D2(D4(s3,p2),p3)))),D2(x2,p2))

2. D2(s1,p1)

3. D2(IF(D2(s1,p1),D2(x2,p1)),LS)

4. D2(IF(s4,c2),LS)

5. D2(D2(s4,p2),p2)

This would use all 17 of the following resource that are still in Essential: LIABILITY COND 0 D4 c2 x2 x2 s1 s1 p1 p1 p1 s4 s4 p3 p2 and p2. There would also be available in Permitted the following other 18 resources used in the above Solution: NEG D2 D2 D2 D2 D2 D2 D2 D2 D2 IF IF LS LS c2 p2 p1 s3. The proof of the conclusion sought by defendant (i.e., NEG(DUTY(s3,p2,p3))) is the following:

6. POWER(D2(x2,p1),COND(c2,NEG(O(D2(D4(s3,p2),p3))))) 1,LIABILITYdf

7. COND(c2,NEG(O(D2(D4(s3,p2),p3))))   6,2,3,POWERoD2oD2IFoLRi

8. D2(s4,p2)   5,D2o

9. s4   8,D2o

10. NEG(O(D2(D4(s3,p2),p3)))   7,9,4,CONDITIONALoD2IFoLRi

11. NEG(DUTY(s3,p2,p3))   10,DUTYdf

After players have written out the proofs a few times, they will realize that the proofs are all similar; they all involve repeated applications of POWERoD2oD2IFoLRi and CONDITIONALoD2IFoLRi and definitions. That is why the writing of proofs is NOT required in sustaining the Burden of Proof. Only the writing of the Solution is required to sustain it.

By being careful and competent in his reasoning the defendant could have won Match 5B. A similar strategy will work for those who aspire to become fluent in the LEGAL RELATIONS Language. By carefully reading and following the play of these two matches of the LA Game, step-by-step through each match, such learners can get a good start on appreciating the nature and strategies of playing the LA Games. This, in turn, will enable them to then use the play of such games to enhance their fluency in the LEGAL RELATIONS Language.

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