

*Assertions, Denials  
Questions, Answers  
& the Common Ground*

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THE UNIVERSITY OF  
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## *My Aim*

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To better understand the speech acts  
of *assertion* and *denial*, their  
relationships to *other* speech acts,  
and connections between speech acts  
and logical notions, including  
the sequent calculus.

## *My Prompt*

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I want to revisit some themes  
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I want to revisit some themes  
(and expand on some of the claims)  
from “Multiple Conclusions.”

*Also, you invited me to this workshop.*

*I had to have something to say,  
and you seem like the best audience for this.*

## *My Focus*

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The behaviour of two kinds of speech acts:

- (1) *polar (yes/no) questions,*
- and (2) *justification requests.*

## *My Plan*

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Assertion and Denial

Polar Questions

Positions and Rules

Justification Requests

# ASSERTION AND DENIAL

## *Multiple Conclusions*

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$$X \succ Y$$

Don't *assert* each member of X  
and *deny* each member of Y.

## *Structural Rules*

$$\frac{X, A \succ A, Y \quad Id}{X \succ Y} \quad \frac{X \succ A, Y \quad X, A \succ Y}{X \succ Y} Cut$$

These rules govern assertion and denial *as such*.

# *Defining Rules for Logical Concepts*

$$\begin{array}{c} \frac{X, A, B \succ Y}{X, A \wedge B \succ Y} \wedge Df \quad \frac{X \succ A, B, Y}{X \succ A \vee B, Y} \vee Df \quad \frac{X \succ A, Y}{X, \neg A \succ Y} \neg Df \quad \frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow Df \\ \\ \frac{X \succ A(n), Y}{X \succ \forall x A(x), Y} \forall Df \quad \frac{X, A(n) \succ Y}{X, \exists x A(x) \succ Y} \exists Df \quad \frac{X, Fa \succ Fb, Y \quad X, Fb \succ Fa, Y}{X \succ a = b, Y} = Df \end{array}$$

*Terms & conditions:* the singular term  $n$  (in  $\forall/\exists Df$ ) and the predicate  $F$  (in  $=Df$ ) do not appear below the line in those rules.

These rules can be understood as *definitions* of the concepts they introduce (below the double line).

See (Scott 1974), (Došen 1980, 1989), (Restall 2019).

*In appealing to norms governing assertion...*

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... I was wading into a pre-existing literature  
about assertion. A *very large* literature.

## *Norms for Assertion*

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It is fruitful to think of assertion  
as an act governed by *norms*.

## *For me: Production Norms*

---

Aim to say what is *true*!

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Aim to say what is *true*!

Only say what you *know*!

## *For me: Production Norms*

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Aim to say what is *true*!

Only say what you *know*!

Be prepared to *back it up* when requested!

## *For you: Consumption Norms*

---

The hearer is entitled to re-assert.

## *For you: Consumption Norms*

---

The hearer is entitled to re-assert.

You can refer back to the asserter  
to *vouch for* the assertion.

## *For us: Our Common Ground*

---

To assert is to bid for the content asserted  
to be added to the **COMMON GROUND**,  
the body of information that  
we (together) take for granted.

## *Stalnaker on Common Ground*

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*To presuppose something is to take it for granted, or at least to act as if one takes it for granted, as background information as common ground among the participants in the conversation. What is most distinctive about this propositional attitude is that it is a social or public attitude: one presupposes that  $\phi$  only if one presupposes that others presuppose it as well.*

— “Common Ground” *L&P*(2002)

## *What is the relationship between Assertion and Denial?*

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In “Multiple Conclusions”, I said little beyond the claim that assertion and denial are incompatible (in some sense).

This does not help distinguish denial from retraction, or from other speech acts.

*Let's address this issue...*

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... by examining polar questions,  
and their answers,  
in the light of our background  
interest in assertion and its norms.

# POLAR QUESTIONS

*Is it the case that p?*

---

This is a distinct speech act  
with its own norms.

*Is it the case that p?*

---

This is a distinct speech act  
with its own norms.

It raises an *issue*.

*There are two ways to settle the issue*

---

*Yes*

*There are two ways to settle the issue*

---

*Yes      No*

## *The two ways clash*

---

If I say *yes* and you say *no*  
to some polar question  $p?$ ,  
then we **DISAGREE**.

That is, we take *different* positions on  $p$ .

## *The two ways clash*

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If I say *yes* and you say *no*  
to some polar question  $p?$ ,  
then we **DISAGREE**.

That is, we take *different* positions on  $p$ .

There is no *shared* position  
incorporating both of our answers.

*Other responses don't settle the issue*

---

Other responses, like

*Other responses don't settle the issue*

---

Other responses, like

*maybe*

*Other responses don't settle the issue*

---

Other responses, like

*maybe · I don't know*

*Other responses don't settle the issue*

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Other responses, like

*maybe · I don't know · I think so*

*Other responses don't settle the issue*

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Other responses, like

*maybe · I don't know · I think so*

are acceptable responses to p?,

*Other responses don't settle the issue*

---

Other responses, like

*maybe · I don't know · I think so*

are acceptable responses to p?,

but they don't answer the question.

They don't settle the issue of p.

## *Settling answers are assertions*

---

A *yes* or a *no* to  $p?$  counts as an assertion.

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A *yes* or a *no* to  $p?$  counts as an assertion.

(Either answer is governed by all of the assertion norms we've seen.)

*What does a “no” to p? assert?*

---

Presumably  $\neg p$ .

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However, I prefer to think of  
a *yes* to  $p?$  as ruling  $p$  *in*,  
and a *no* to  $p?$  as ruling  $p$  *out*.

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This way, we can distinguish practices  
where the *issues* are closed under negation  
and those with more limited expressive resources.

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where the *issues* are closed under negation  
and those with more limited expressive resources.

(Nothing important hangs on this distinction.)

## *Common Ground*

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Think of this as part of the *conversational scoreboard*.  
There are also our public *individual* commitments,  
the questions under discussion, and much more.

## *Denial and Retraction*

---

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ELOISE: No, he is in the kitchen.

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**PARTIAL ANSWER**

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ABELARD: Astralabe is in the study.

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**WEAK DENIAL**

ABELARD: Is Astralabe in the study?

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**STRONG DENIAL**

ABELARD: Is Astralabe in the study?

ELOISE: \*No, he is *either* in the kitchen *or* the study.

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**PARTIAL ANSWER**

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- To *strongly deny p* is to bid to add p to the *negative common ground*.
- To *weakly deny p* is to *block* the addition of p to the *positive common ground*, or to bid for its *retraction* if it is already there.

## *Strong and Weak Denial, and the Common Ground*

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- Strong *or* weak denials of p are appropriate responses to an assertion of p, because the assertion of p is a bid to add p to the positive common ground.

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- Strong *or* weak denials of  $p$  are appropriate responses to an assertion of  $p$ , because the assertion of  $p$  is a bid to add  $p$  to the positive common ground.
  
- A strong denial of  $p$  is one way to settle the question  $p?$  — this is generally an appropriate response.

## *Strong and Weak Denial, and the Common Ground*

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- Strong *or* weak denials of p are appropriate responses to an assertion of p, because the assertion of p is a bid to add p to the positive common ground.
- A strong denial of p is one way to settle the question p? — this is generally an appropriate response.
- A weak denial of p is not generally an appropriate response to the polar question p?, as the polar question does not place p in the positive common ground, and the question is inappropriate if p is already in the positive common ground, so there is no p to block or retract.

## *Strong and Weak Denials, and Strong and Weak Assertions*

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- **WEAK ASSERTION:** retract (or block) from the negative common ground.

## *Strong and Weak Denials, and Strong and Weak Assertions*

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- **STRONG DENIAL:** add to the negative common ground.
- **STRONG ASSERTION:** add to the positive common ground.
- **WEAK DENIAL:** retract (or block) from the positive common ground.
- **WEAK ASSERTION:** retract (or block) from the negative common ground. — “Perhaps p.”

*That's one way to understand the relationship  
between assertion and denial, and how to  
distinguish strong denial  
from other negative speech acts.*

## *One Consequence*

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The common ground  
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*Abelard is being tutored by Eloise in geometry. He is reasoning about a triangle with interior angles of  $40^\circ$ ,  $60^\circ$  and  $80^\circ$ . He adds up the angles, and notices that they sum to  $180^\circ$  ...*

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**ABELARD:** The interior angles of triangles add up to 180°.

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**ABELARD:** The interior angles of triangles add up to 180°.

**ELOISE:** No. The interior angles of *this* triangle add up to 180°. Can you prove the general case?

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**ABELARD:** The interior angles of triangles add up to 180°.

**ELOISE:** No. The interior angles of *this* triangle add up to 180°. Can you prove the general case?

Eloise here seems to block from the common ground (weakly deny) a *logical consequence* of claims in the common ground (the axioms of geometry), for the same kinds of reason we accept for other weak denials.

This would be impossible if the common ground was simply a set of worlds.

## *Logical Consequence and Strong or Weak Denial*

---

If  $X \succ Y$  is derivable,  
then it's out of bounds  
to *strongly assert* each member of  $X$   
and *strongly deny* each member of  $Y$ .

## *Logical Consequence and Strong or Weak Denial*

If  $X \succ Y$  is derivable,  
then it's out of bounds  
to *strongly assert* each member of  $X$   
and *strongly deny* each member of  $Y$ .

But this example shows that  
it *need not* be out of bounds to  
*strongly assert* each member of  $X$   
and *weakly deny* each member of  $Y$ .

## *Positions*

---

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$X, A \succ A, Y$

If  $X \not\succ Y$  then  $[X : Y]$  is *available*.

## *A Word on Cut*

$$\frac{X \succ A, Y \quad X, A \succ Y}{X \succ Y} \textit{Cut}$$

## *A Word on Cut*

$$\frac{X \succ A, Y \quad X, A \succ Y}{X \succ Y} \text{Cut}$$

In any available position  $[X : Y]$ , if one way to settle  $A?$  is *not* available, then the other way to settle it *is* available.

POSITIONS  
AND RULES

## *Defining Rules*

$$\frac{X, A, B \succ Y}{X, A \wedge B \succ Y} \wedge Df$$

$$\frac{X \succ A, B, Y}{X \succ A \vee B, Y} \vee Df$$

$$\frac{X \succ A, Y}{X, \neg A \succ Y} \neg Df$$

$$\frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow Df$$

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$$\frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow Df$$

These are kinds of *definitions*, showing how to treat assertions or denials of the *defined* concept in terms of the assertions or denials of their components.

## *Derivations*

$$\frac{\frac{\neg p \succ \neg p}{\succ p, \neg p} \neg Df}{\succ p \vee \neg p} \vee Df$$

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$$\frac{\neg p \succ \neg p}{\succ p, \neg p} \neg Df \qquad \frac{p \succ p}{p, \neg p \succ} \neg Df$$
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$$\frac{}{\succ p \vee \neg p} \vee Df \quad \frac{p \wedge \neg p \succ}{p \wedge \neg p \succ} \wedge Df$$

$$\frac{p, q \vee r \succ p \wedge q, q \vee r}{p, q \vee r \succ p \wedge q, r, q} \vee Df \quad \frac{p \wedge q, q \vee r \succ p \wedge q, r}{q, p, q \vee r \succ p \wedge q, r} \wedge Df$$

---

$$\frac{p, q \vee r \succ p \wedge q, r}{p, q \vee r \succ (p \wedge q) \vee r} \vee Df$$
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## *Sequent Derivations aren't exactly Proofs*

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- › (Where is the *conclusion* in  $p \vee q \succ p, q?$ )

## *Sequent Derivations aren't exactly Proofs*

- They don't have the same *shape* as proofs.
- (Where is the *conclusion* in  $p \vee q \succ p, q$ ?)
- A endsequent  $X \succ A$  doesn't tell you to *infer A from X* — it merely tells you to not assert all members of  $X$  and deny  $A$ .

## *Let's make this problem sharp*

“Well, now, let’s take a little bit of the argument in that First Proposition—just *two* steps, and the conclusion drawn from them. Kindly enter them in your note-book. And in order to refer to them conveniently, let’s call them *A*, *B*, and *Z* :—

(*A*) Things that are equal to the same are equal to each other.

(*B*) The two sides of this Triangle are things that are equal to the same.

(*Z*) The two sides of this Triangle are equal to each other.

Readers of Euclid will grant, I suppose, that *Z* follows logically from *A* and *B*, so that any one who accepts *A* and *B* as true, *must* accept *Z* as true ?”

“Undoubtedly ! The youngest child in a High School—as soon as High Schools are invented, which will not be till some two thousand years later—will grant *that*.”

“And if some reader had *not* yet accepted *A* and *B* as true, he might still accept the *sequence* as a *valid* one, I suppose ?”

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The Tortoise never asserts *A* and *A* → *Z* while denying *Z*,  
but he doesn’t accept *A* and *A* → *Z* as a reason for *Z*.

## *Permission to assert is not enough*

---

Notice: establishing *permission* to assert  $Z$   
(cf. Dave Ripley's talk at this workshop)  
isn't enough to diagnose *this* problem.

Recognising that the Tortoise is *permitted* to assert  $Z$   
is nice, but it doesn't answer the Tortoise's question.

# JUSTIFICATION REQUESTS

## *What is a justification request?*

**ABELARD:** Astralabe is in the kitchen.

**ELOISE:** *Really?*

**ABELARD:** I saw him there five minutes ago.

**ELOISE:** OK.

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**ELOISE:** *Are you sure?* He's been in the study with me for the last half hour.

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**ABELARD:** Astralabe is in the kitchen.

**ELOISE:** *Really?*

**ABELARD:** I saw him there five minutes ago.

**ELOISE:** Yes, but he was in the study two minutes ago.

## *Justification Requests and Norms for Assertion*

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We should *expect* the need for justification requests given the commitments and entitlements involved in assertion.

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If I give you permission to ask *me* to vouch for my assertion you should be able to call me on it.

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---

We should *expect* the need for justification requests given the commitments and entitlements involved in assertion.

If I give you permission to ask *me* to vouch for my assertion you should be able to call me on it.

That's a JUSTIFICATION REQUEST.

## *What is a justification request?*

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This reason is another assertion [or denial] which must be *granted*, (added to the common ground) in order for the request to be met.

Granting the given reason is *necessary* but not *sufficient* for satisfying the justification request.

## *Definitions and Justification Requests*

**ACHILLES** So ... this is an *equilateral* triangle.

**TORTOISE** I'm sorry, I don't follow, my heroic friend. I've not heard that word before: what does '*equilateral*' mean?

**ACHILLES** Oh, that's easy to explain. '*Equilateral*' means having sides of the same length. An *equilateral* triangle is a triangle with all three sides the same length.

**TORTOISE** OK. That sounds good. You may continue with your reasoning.

**ACHILLES** Well, as I was saying, the sides of this triangle are all one cubit in length, so it is an equilateral triangle.

**TORTOISE** Perhaps you will forgive me, Achilles, but I still don't follow. I grant to you that the sides of this triangle all have the same length. I fail to see, however, that it *follows* that it is an equilateral triangle. Could you explain why it is?

## *Definitions and Justification Requests*

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If I accept the definition  $A =_{\text{df}} B$ ,  
then I should accept granting A as meeting  
a justification request for the assertion of B  
and ruling out A as meeting a justification  
request for B's denial and *vice versa*.

A failure to accept this is a sign  
that I have not mastered the definition.

## *Justification Requests and Defining Rules*

What goes for a definition of the form  $A =_{df} B$   
can also go for *defining rules*:

$$\frac{X, A, B \succ Y}{X, A \wedge B, \succ Y} \wedge Df$$

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It is a mistake to grant  $A$  and grant  $B$   
and to look for something more to discharge  
a justification request for an assertion of  $A \wedge B$ ,  
if you take  $\wedge Df$  as a *definition*.

## *Justification Requests and Defining Rules*

$$\frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow^{Df}$$

## *Justification Requests and Defining Rules*

$$\frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow Df$$

It is a mistake to rule A in and rule B out  
and to look for something more to discharge  
a justification request for a denial of  $A \rightarrow B$   
if you accept  $\rightarrow Df$  as a definition.

## *Justification Requests, Defining Rules and Derivations*

A *little* more work is required to show why granting  $A$  and  $A \rightarrow Z$  is enough to meet a justification request for  $Z$ 's assertion.

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Consider this *focussed* derivation:

$$\frac{A \rightarrow Z \succ A \rightarrow Z}{A \rightarrow Z, A \succ Z} \rightarrow Df$$

- Read the *premise* as telling us that in a position in which  $A \rightarrow Z$  is already ruled in, we have an answer to the justification request for  $A \rightarrow Z$ 's assertion.

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- Read the *premise* as telling us that in a position in which  $A \rightarrow Z$  is already ruled in, we have an answer to the justification request for  $A \rightarrow Z$ 's assertion.
- Then applying  $\rightarrow Df$  we see why we have an answer to the request concerning  $Z$ 's assertion, in a context in which  $A \rightarrow Z$  and  $A$  have both been ruled in. (In granting  $A \rightarrow Z$  and  $A$  we have settled  $Z$  positively. Its denial is ruled out, since to assert  $A$  and deny  $Z$  amounts to denying  $A \rightarrow Z$ .)

## *Focussed Derivations and Justification Requests*

**SLOGAN:** A *derivation* of  $X \succ A, Y$  shows us how to meet a justification request for the assertion of  $A$  in any available position extending  $[X : Y]$ .

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A derivation of  $X, A \succ Y$  shows us how to meet a justification request for the denial of  $A$  in any available position extending  $[X : Y]$ .

(Note: it's the *derivation* that shows how to meet the justification request, not the mere validity of the sequent.)

## *Focussed Structural Rules*

$X, A \succ [A], Y$        $X, [A] \succ A, Y$

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# *Focussed Structural Rules*

$$X, A \succ [A], Y \quad X, [A] \succ A, Y$$

$$X, A \succ A, [B], Y \quad X, A, [B] \succ A, Y$$

$$\frac{X \succ [A], Y \quad X, A \succ [B], Y}{X \succ [B], Y} \textit{Cut}$$

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$$\frac{X, A, [A] \succ Y}{X, [A] \succ Y} W$$

$$\frac{X \succ A, [A], Y}{X \succ [A], Y} W$$

# *Swap*

$$\frac{\frac{X \succ A, B, Y \quad X, A \succ A, B, Y}{X \succ A, B, B, Y} Cut}{X \succ A, B, Y} W$$

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$$\frac{\begin{array}{c} X \succ A, B, Y \\ X, A \succ A, B, Y \end{array}}{\begin{array}{c} X \succ A, B, B, Y \\ X \succ A, B, Y \end{array}} \frac{}{Cut}$$

$$\frac{X \succ A, B, Y}{X \succ A, B, Y} Swap$$

## Focussed Defining Rules

$$\frac{X, \boxed{A}, B \succ Y}{X, \boxed{A \wedge B} \succ Y} \wedge Df$$

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$$\frac{X \succ \boxed{A}, B, Y}{X \succ \boxed{A \vee B}, Y} \vee Df$$

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$$\frac{X \succ \boxed{A}, Y}{X, \boxed{\neg A} \succ Y} \neg Df \quad \frac{X, A \succ \boxed{B}, Y}{X \succ \boxed{A \rightarrow B}, Y} \rightarrow Df \quad \frac{X, \boxed{A} \succ B, Y}{X \succ \boxed{A \rightarrow B}, Y} \rightarrow Df$$

# *Proof and Supposition*

$$\frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow Df \qquad \frac{X, A \succ B, Y}{X \succ A \rightarrow B, Y} \rightarrow Df$$

To prove  $A \rightarrow B$ , *rule A in* (suppose it) and prove B.

Or, *rule B out* (suppose it), and refute A.

## *A Focussed Derivation*

$$\frac{\frac{\frac{p \succ p, q}{\succ p, p \rightarrow q} \rightarrow Df \quad \frac{(p \rightarrow q) \rightarrow p \succ (p \rightarrow q) \rightarrow p}{(p \rightarrow q) \rightarrow p, p \rightarrow q \succ p} \rightarrow Df}{(p \rightarrow q) \rightarrow p \succ p, p} Cut}{(p \rightarrow q) \rightarrow p \succ p} W \\ \frac{(p \rightarrow q) \rightarrow p \succ p}{\succ ((p \rightarrow q) \rightarrow p) \rightarrow p} \rightarrow Df$$

This can be represented as a *dialogue*,  
meeting a justification request for  
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This can be represented as a *dialogue*,  
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(See the handout for a bad rendering of how such a dialogue could go.)

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- The making of an *inference* is a (possibly preemptive) answer to a justification request.
- A derivation of a sequent  $X \succ A, Y [X, A \succ Y]$  can be transformed into a *procedure* for meeting a justification request for an assertion of  $A$  [denial of  $A$ ] in any available position, appealing only what is granted in  $[X : Y]$ , and to the defining rules used in that derivation.

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- Derivations are one way we can *grasp* complex bounds and *enforce* them.
- The *negative* view of the bounds is seen in the clash between assertion and denial, and the *positive* view is found in the answers we can give to justification requests.
- Adopting *defining rules* is one way to be *very* precise about the norms governing the concepts so defined, combining *safety*, *univocity* and *expressive power*.

# THANK YOU!

[http://consequently.org/presentation/2019/  
assertion-denial-qa-common-ground-express](http://consequently.org/presentation/2019/assertion-denial-qa-common-ground-express)