

# Metaphysical Grounding

## On How To Explain Explanation

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## 2 Kinds of Explanations in Metaphysics (Fine 2015)

- (1) Explaining **what** something is → **essence** of something
- (2) Explaining **why** something is → **metaph. ground** of something

2 kinds of **why**-explanations:

- (a) **causal**
- (b) **metaphysical**

*Why is there a philosophy talk happening right now?*

- (a) Because the STV invited Michi, who accepted ... (causal expl.)
  - (b) Because there are people engaged in activities that constitute a philosophy talk. (metaphysical explanation)
- (b) is a **grounding explanation** of the fact that a philosophy talk is happening right now.

# The Plan for the Talk

## (1) What-Explanation of Metaphysical Grounding

- 1.1 What is Grounding?
- 1.2 How To Use Grounding In Philosophy
- 1.3 Logical Form of Grounding Statements
- 1.4 The Structural Form of Grounding?
- 1.5 Grounding and Related Notions

## (2) Why-Explanation of Metaphysical Grounding

- 2.1 What is the Ground of Grounding?
- 2.2 Litland's Zero-Grounding Account (ZGA) (Litland forthcoming)
- 2.3 An Objection to (ZGA)
- 2.4 Litland's Reply to the Objection
- 2.5 Criticism of Litland's Reply

# 1.1 What Is Grounding?

## Grounding and explanation

3 possible positions:

- (1) Grounding is metaphysical explanation.
- (2) Grounding and metaphysical explanation come apart but grounding tracks metaphysical explanation. (Rodriguez-Pereyra 2005, Schaffer 2016)
- (3) Grounding does not pertain to metaphysical explanation.

# 1.1 What Is Grounding?

## Grounding and explanation

3 possible positions:

- (1) Grounding is metaphysical explanation.
- (2) Grounding and metaphysical explanation come apart but grounding tracks metaphysical explanation. (Rodriguez-Pereyra 2005)
- (3) Grounding does not pertain to metaphysical explanation.

To say that  $x_1, x_2, \dots$  ground  $x$  just is to say that  $x_1, x_2, \dots$  (metaphysically) explain  $x$ . (cf. Litland forthcoming, 3)

# 1.1 What Is Grounding?

Many philosophers hold that grounding is a **primitive notion**.

- Grounding cannot be analyzed in terms of other notions.
- There is no reductive what-explanation of grounding.
- Particularly, grounding cannot be fully and reductively analyzed
  - in terms of supervenience,
  - modal entailment,
  - ontological dependence
  - or any other dependence relation.
- Note, that grounding is primitive is subject of debate.
- Note that this is **not the thesis that grounding is not grounded**. (Philosophical analysis and metaphysical grounding are distinct.)

# 1.1 What Is Grounding?

Many philosophers hold that grounding is a **primitive notion**.

How can we explain a **primitive notion**?

- by **examples** how philosophers use the notion of grounding (1.1)
- by talking about how grounding can be put to **use** in phil. (1.2)
- by clarifying the **logical structure** of grounding claims (1.3)
- by investigating the **structural principles** governing ground (1.4)
- by **comparing** grounding to other related notions (1.5)

# 1.1 What Is Grounding?

Grounding is an **explanatory notion**.

Examples:

- Normative facts are **based on** natural facts.
  - It is **in virtue of** having neurophysiological properties that I have mental properties.
  - What **accounts for** the existence of a complex whole is the existence and arrangement of its parts.
  - A set is ontologically **less fundamental** than its members.
  - This action is wrong **because** it is done with the sole intention to harm other people.
- ‘in virtue of’, ‘because’ (non-causal), ...



# 1.1 What Is Grounding?

Grounding is an **explanatory** notion.

Examples:

- The fact that the apple is green and round obtains **in virtue of** the fact that it is green *and* the fact that it is round.
- $(p \wedge q)$  is true **because**  $p$  is true and  $q$  is true.
- The fact that  $p$  holds **explains why**  $(p \vee q)$  holds.
- That MW is human **grounds** that MW is human or feline.
- The fact that this ball is red is **grounded in** the fact that it is crimson.

## 1.2 How To Use Grounding In Philosophy

- We can formulate philosophical positions in terms of grounding.
- This might help us clarifying and evaluating these positions.

### Examples:

(P) The mental is grounded in the physical.

(N) Normative facts are grounded in natural (non-norm.) facts.

(E) Modality is grounded in essences.

There are other dependence relations... Why grounding?

Grounding is explanatory!

# 1.2 How To Use Grounding In Philosophy

Grounding depicts the layered structure of the world

- A grounded entity is said to be **less fundamental** than its ground.
- The ground of an entity is **ontologically prior** to the entity it grounds.
- Grounding structures reality hierarchically from fundamental facts to increasingly derivative facts. (see also well-foundedness)

Metaphysical Foundationalism (MF)

Every fact is either fundamental or **grounded** in fundamental facts.

# 1.2 How To Use Grounding In Philosophy

## Grounding and Fundamentality

- So, grounding is intimately linked to fundamentality.
- Many hold that this is so much so, that the following principle (F) holds:  
  
(F) A fact  $f$  is **fundamental** iff it is **ungrounded**;  
and  $f$  is **non-fundamental** (derivative) iff it is **grounded** (in some other facts  $f_1-f_n$ ).
- Fundamental facts are those, which are not grounded.
- Non-fundamental facts are those that are grounded.

# 1.2 How To Use Grounding In Philosophy

Grounding depicts the layered structure of the world

Metaphysical Foundationalism (MF)

Every fact is either fundamental or **grounded** in fundamental facts.

(MF) is the thesis that grounding is **well-founded**.

Well-foundedness (WF)

[\(see also Appendix 1\)](#)

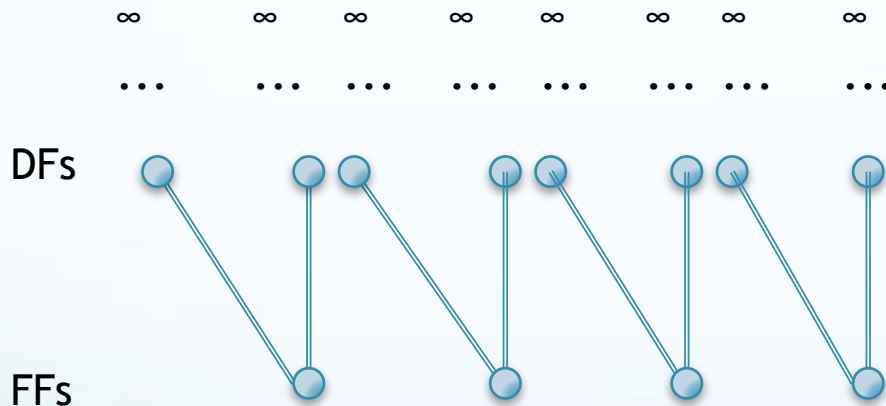
(WF) Every derivative (non-fundamental) fact (DF) is ultimately (fully) grounded in some fundamental fact(s) (FF).

- There must be “a realm of basic facts which provide the ultimate metaph. grounding for all the derivative facts”. (Cameron 2008, 8)
- If we had endless dependence, “being would be infinitely deferred, never achieved”. (Schaffer 2010, 62)

# 1.2 How To Use Grounding In Philosophy

## 3 'pictures' of the structure of the world

Metaphysical Foundationalism (MF)

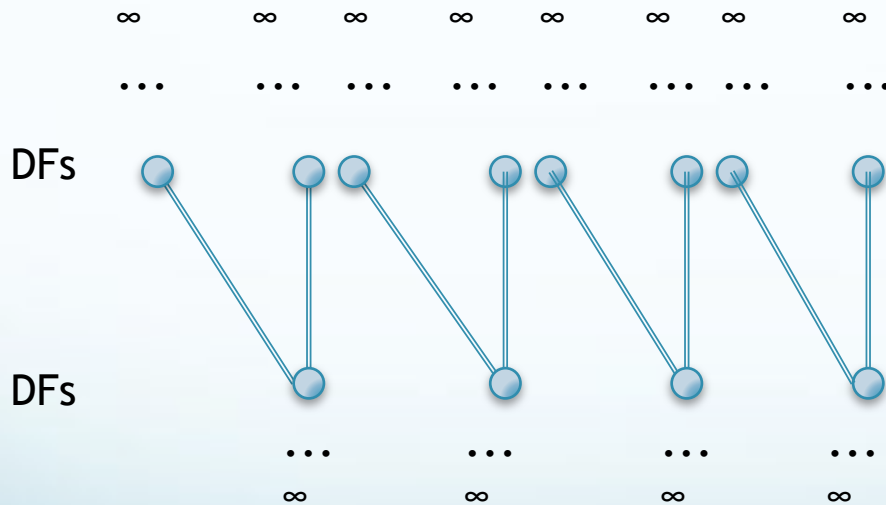


(MF) There is a realm of FFs in which all DFs are ultimately grounded.

# 1.2 How To Use Grounding In Philosophy

## 3 'pictures' of the structure of the world

Metaphysical Infinitism (MI)



(MI) There are no FFs. Every fact is grounded, i.e. derivative. Grounding chains do not terminate.

# 1.2 How To Use Grounding In Philosophy

## 3 'pictures' of the structure of the world

Metaphysical Infinitism (MI)

Analogy...



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Metaphysical Infinitism (MI)

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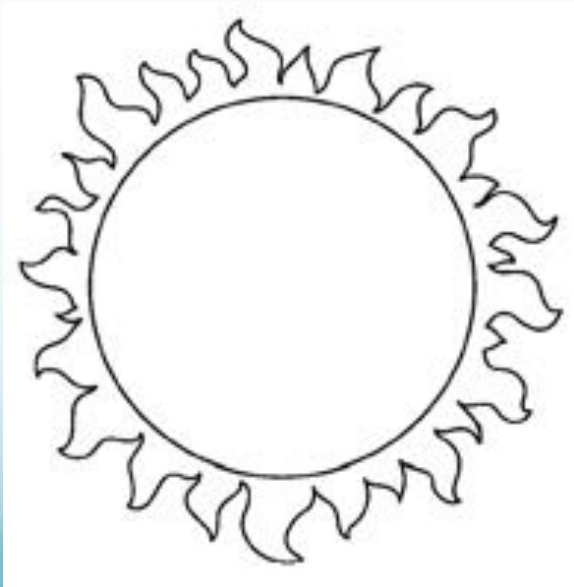


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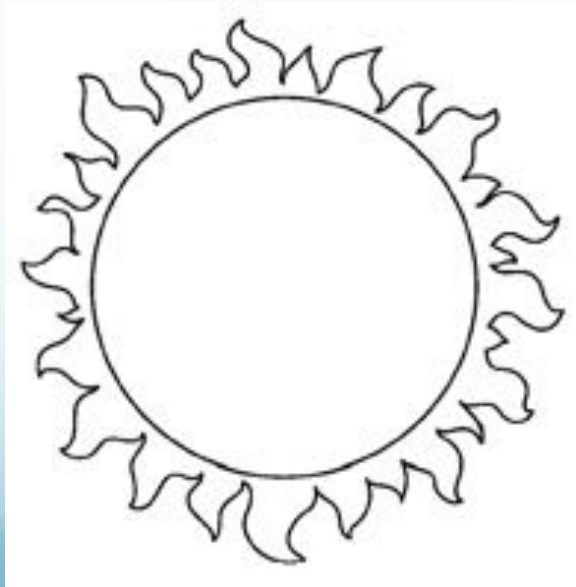


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Analogy...

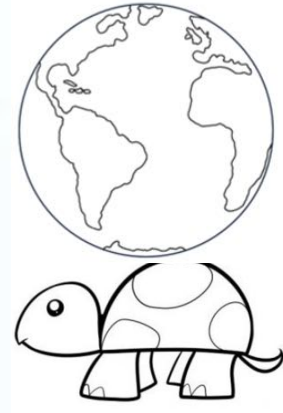


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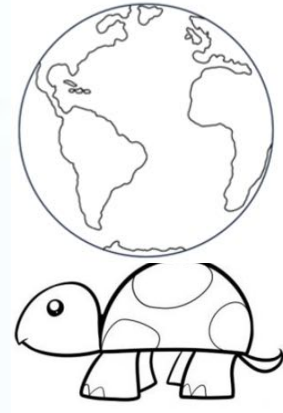


# 1.2 How To Use Grounding In Philosophy

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Metaphysical Ininitism (MI)

Analogy...



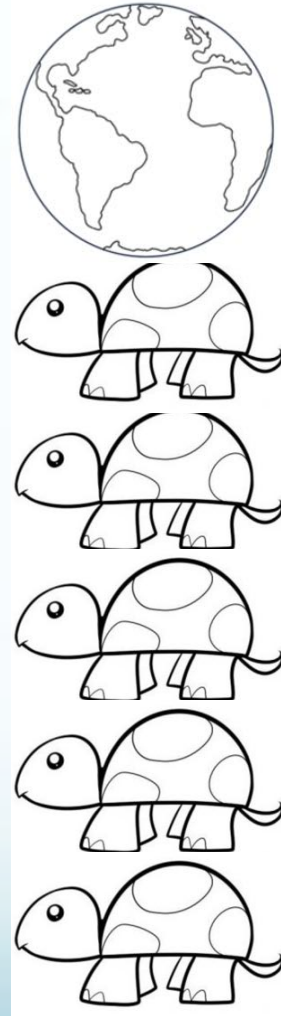
# 1.2 How To Use Grounding In Philosophy

## 3 'pictures' of the structure of the world

Metaphysical Infinitism (MI)

Analogy...

“It’s turtles all the way down!”



# 1.2 How To Use Grounding In Philosophy

## 3 'pictures' of the structure of the world

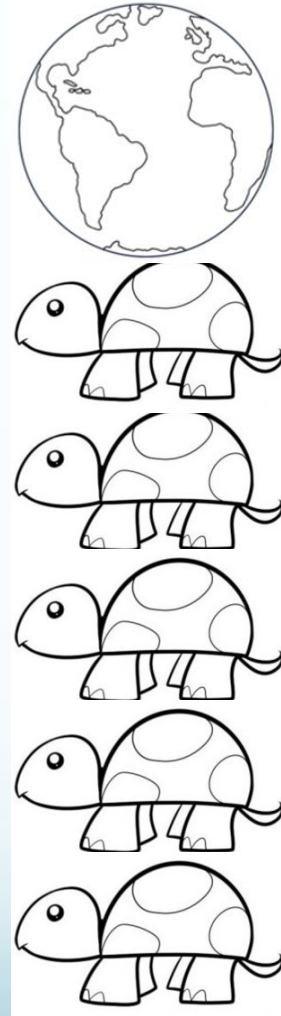
Metaphysical Ininitism (MI)

Analogy...

“It’s turtles all the way down!”

Question: Which theory is crazier?

- the 1-turtle theory
- the 3-turtle theory
- the infinite-turtle theory



# 1.2 How To Use Grounding In Philosophy

## 3 'pictures' of the structure of the world

'Flatworldism' (FW)

FFs



(FW) There are only FFs. The world does not have a layered but a flat structure.



# 1.2 How To Use Grounding In Philosophy

## Metametaphysics & Metaontology

- The task of metaphysics is **not** to say what exists. (contra Quine)
- The task of metaphysics is to say **what grounds what**. (Schaffer 2009)
- I.e. to say what is fundamental and what is derivative.
- I.e. to say **what exists on the fundamental level**.
- The world has a layered structure.
- Metaphysics is to unravel this hierarchical structure.
- I.e. metaphysics is to show what grounds what.

# 1.3 Logical Form of Grounding Statements

Grounding can be **full** or **partial**.

- That  $p$  obtains **and** that  $q$  obtains is a **full ground** for the fact that  $(p \wedge q)$  obtains.
- That  $p$  obtains is a **partial ground** for the fact that  $(p \wedge q)$  obtains.

Following Fine (2012), I use ‘ $\llcorner$ ’ for full and ‘ $\llcorner$ ’ for partial ground.

- $x_1, x_2, \dots \llcorner y$
- $x_1, x_2, \dots$  **fully ground**  $y$ ;  $x_1, x_2, \dots$  **fully explain**  $y$  (metaphysically)
- $y$  is **fully grounded** in  $x_1, x_2, \dots$ ;  $y$  is **fully explained** by  $x_1, x_2, \dots$

# 1.3 Logical Form of Grounding Statements

(Pr) versus (Op)

**Predicationalism (Pr)** takes grounding to be a **relation** ...

- among *facts*:  $[x_1], [x_2], \dots < [y]$
- or among *propositions*:  $\langle x_1 \rangle, \langle x_2 \rangle, \dots < \langle y \rangle$
- or among *objects*:  $A_1, A_2, \dots < B$

**Operationalism (Op)** has it that grounding is a **connective**, connecting *sentential expressions*.

# 1.3 Logical Form of Grounding Statements

## (Pr) versus (Op): Similarities

Many proponents of (Pr) and (Op) agree on the following:

- (1) Grounding is a **binary** (i.e. 2-place) relation/connection ...
- (2) ... between a (potential) **plurality** of entities (*ground(s)*) ...
- (3) ... and a **singular** entity (*grounded entity*).

Exceptions:

Jenkins (2011) and Schaffer(2012) reject (1), Dasgupta (2014b) rejects (3).

# 1.3 Logical Form of Grounding Statements

## Terminology

- ‘ $\Gamma < \phi$ ’ is a **grounding claim** or **grounding fact**, in which
- ‘ $\phi$ ’ is a **grounded entity**, and
- ‘ $\Gamma$ ’ is its **ground** (where  $\Gamma$  can be *plural*).

# 1.3 Logical Form of Grounding Statements

## (Pr) versus (Op): Examples

(Pr<sub>F</sub>) '[snow is white] < [it is true that snow is white]'

'The fact that snow is white **grounds** the fact that it is true that snow is white.'

'The fact that it is true that snow is white is **grounded in** the fact that snow is white.'

(Op) 'Snow is white < It is true that snow is white'

'It is true that snow is white **because** snow is white.'

# 1.3 Logical Form of Grounding Statements

## (Pr) versus (Op): Advantages

(Pr) Grounding facts can be formulated more **conveniently**.

Quantifying over facts, propositions, objects is easier than quantifying over sentential variables.

(Op) Avoids (problematic) **ontological commitment** to relations and facts viz. propositions.

→ Proponents of (Op) sometimes (unofficially) use (Pr) for convenience. I will do so too.

# 1.4 The Structural Form of Grounding

If grounding is an **explanatory notion**, grounding must have the same structural features as explanation.

IRREFLEXIVITY

$$\forall x \neg(x < x)$$

(No fact/proposition is a ground of itself.)

ASYMMETRY

$$\forall x \forall y \neg((x < y) \rightarrow (y < x))$$

(If x is a ground of y, y is no ground of x.)

TRANSITIVITY

$$\forall x \forall y \forall z (((x < y) \wedge (y < z)) \rightarrow (x < z))$$

(If x grounds y, and y grounds z, x grounds z.)

FACTICITY

$$\forall x \forall y ((x < y) \rightarrow (x \wedge y))$$

(Grounding connects only true propositions/obtaining facts.)

HYPERINTENSIONALITY

$$\forall x \forall y \forall z \neg(((x < y) \wedge \Box(x \leftrightarrow z)) \rightarrow (z < y))$$

$$\forall x \forall y \forall z \neg(((x < y) \wedge \Box(y \leftrightarrow z)) \rightarrow (x < z))$$

(Even if z is nec. equ. with x, z need not be a gr. for y, if x is.)

(Even if z is nec. equ. with y, z need not be gr. in x, if y is.)



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IRREFLEXIVITY

$$\forall x \neg(x < x)$$

(No fact/proposition is a ground of itself.)

Nothing can explain itself.

Challenges to IRREFLEXIVITY

- A characterization of grounding shouldn't rule out that there are self-explanatory states of affairs. (cf. Lowe 1998)
- The 2<sup>nd</sup>-order fact that some facts obtain is a ground of itself. (Bliss/Trogdon 2016)

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ASYMMETRY

$$\forall x \forall y \neg((x < y) \rightarrow (y < x))$$

(If x is a ground of y, y is no ground of x.)

The existence of Socrates explains the existence of {Socrates}, not vice versa.

Challenge to ASYMMETRY

- [[this fact obtains] obtains] < [this fact obtains]  
[this fact obtains] < [[this fact obtains] obtains] (cf. Bliss/Trogdon 2016)

## 1.4 The Structural Form of Grounding

If grounding is an **explanatory notion**, grounding must have the same structural features as explanation.

TRANSITIVITY

$$\forall x \forall y \forall z (((x < y) \wedge (y < z)) \rightarrow (x < z))$$

(If x grounds y, and y grounds z, x grounds z.)

This introduces the distinction betw.  
**mediate** and **immediate gr.:**

y is an immediate and z is a mediate  
ground of x.

Note that we need transitivity to formulate  
**(MF) as grounding thesis.**

For challenges to TRANSITIVITY see e.g. Schaffer (2012).

## 1.4 The Structural Form of Grounding

If grounding is an **explanatory notion**, grounding must have the same structural features as explanation.

Challenge to TRANSITIVITY (See Schaffer 2012; Trogon 2013)

(a) [the ball is dented in a particular way]

(b) [the ball has a certain determinate shape]

(c) [the ball is more-or-less spherical]

(c) is grounded in (b)

(b) is grounded in (a)

but (c) is not grounded in (a)

## 1.4 The Structural Form of Grounding

If grounding is an **explanatory notion**, grounding must have the same structural features as explanation.

FACTICITY

$$\forall x \forall y ((x < y) \rightarrow (x \wedge y))$$

(Grounding connects only true propositions/obtaining facts.)

People who take a factive notion of grounding to be basic might still accept a derivative non-factive notion of grounding.

For an account that takes a non-factive notion of grounding to be basic, see Litland (forthcoming).

## 1.4 The Structural Form of Grounding

If grounding is an **explanatory notion**, grounding must have the same structural features as explanation.

HYPERINTENSIONALITY       $\forall x \forall y \forall z \neg(((x < y) \wedge \Box(x \leftrightarrow z)) \rightarrow (z < y))$   
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(Even if z is nec. equ. with x, z need not be a gr. for y, if x is.)  
(Even if z is nec. equ. with y, z need not be gr. in x, if y is.)

- (1) [Socrates exists] < [{Socrates} exists]
- (2)  $\Box([Socrates\ exists] \leftrightarrow [\{Socrates\}\ exists])$
- (3) Thus, [{Socrates exists}] < [Socrates exists]
- (4)  $\neg([\{Socrates\}\ exists] < [Socrates\ exists])$
- (5) Contradiction! Therefore grounding is hyperintensional.

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(Even if z is nec. equ. with x, z need not be a gr. for y, if x is.)  
(Even if z is nec. equ. with y, z need not be gr. in x, if y is.)

- (1) [Socrates exists] < [{Socrates} exists]
- (2)  $\Box([{\text{Socrates}} \text{ exists}] \leftrightarrow [{\text{Socrates}} \text{ exists} \wedge \text{every tree is a tree}])$
- (3) So, [Socrates exists] < [{Socrates} exists  $\wedge$  every tree is a tree]
- (4)  $\neg([{\text{Socrates}} \text{ exists}] < [{\text{Socrates}} \text{ exists} \wedge \text{every tree is a tree}])$
- (5) Contradiction! Therefore grounding is **hyperintensional**.

# 1.5 Grounding and Related Notions

## Grounding (G) and Supervenience (S)

Supervenience is a relation between two sets of properties:

B-properties (*high-level p.*) *supervene on* A-properties (*low-level p.*)

(S) B-properties *supervene on* A-properties iff it is **not possible** that two things differ with respect to their B-properties without also differing with respect to their A-properties.

(McLaughlin/Bennett 2014)

- Supervenience is **reflexive**.
- (S) holds true also if B-properties and A-properties coincide.
- If explanation is **irreflexive**, supervenience is **not explanatory**.
- Thus, grounding is better suited for a job that requires an explanatory notion than supervenience.



# 1.5 Grounding and Related Notions

## Grounding (G) and Truth-Making (TM) (Fine 2012)

- Both determine what accounts for what.
- TM relates a **worldly entity** (fact, state of affairs) to a **representing entity** (statement, proposition) such that the **existence** of the worldly entity guarantees the **truth** of the representing entity.
- G holds between **entities of the same type** (e.g. facts).
- So, TM claims cannot be **chained**, G claims can.

Transitivity of G:  $\forall x \forall y \forall z (((x < y) \wedge (y < z)) \rightarrow (x < z))$

Transitivity for TM?  $\forall x \forall y \forall z (((x \rightarrow y) \wedge (y \rightarrow z)) \rightarrow (x \rightarrow z))$

If  $x$  makes  $y$  true,  $y$  is a representing entity and thus not fit to make  $z$  true!

# 1.5 Grounding and Related Notions

**Grounding (G) and Truth-Making (TM)** (Fine 2012)

Is there a way to restore the possibility of chaining for TM?

- (1) The existence of  $[p]$  makes true  $\langle q \rangle$ .
- (2) The truth of  $\langle q \rangle$  accounts for the existence of  $[q]$ .
- (3) The existence of  $[q]$  makes true  $\langle r \rangle$ .
- (4) Thus, existence of  $[p]$  makes true  $\langle r \rangle$ .

The bridge-principle (2) is at odds with the basic idea of TM, because it claims that a representing entity accounts for a worldly entity.

# The Plan for the Talk

## (1) What-Explanation of Metaphysical Grounding

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- 1.5 Grounding and Related Notions?

## (2) Why-Explanation of Metaphysical Grounding

- 2.1 What is the Ground of Grounding?
- 2.2 Litland's Zero-Grounding Account (ZGA) (Litland forthcoming)
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- 2.4 Litland's Reply to the Objection
- 2.5 Criticism of Litland's Reply

## 2.1 What is the Ground of Ground?

Sider (2011) argues for the following principle:

PURITY Fundamental truths only contain fundamental notions.

A **fundamental notion** is a notion that **carves reality at its joints**.

- Grounding claims connect non-fundamental truths with fundamental truths (or less fund. facts with more fund. facts).
- Thus, by PURITY, **grounding facts are not fundamental**.
- Remember (F):  
A fact  $f$  is **fundamental** iff it is **ungrounded**; and  $f$  is **non-fundamental** (derivative) iff it is **grounded** (in some facts  $f_1-f_n$ ).
- So, by (F), **grounding facts must be grounded**.

[\(See Appendix 2 for a discussion of Sider's arg. against grounding.\)](#)

## 2.1 What Is the Ground of Grounding?

Refuting Sider's argument has shown that in principle it is possible to ground grounding without violating well-foundedness.

Question: If  $[q] < [p]$ , what grounds  $[[q] < [p]]$ ?

In virtue of what do grounding facts hold?

Bennett (2011), deRosset (2013):  $[[q] < [p]]$  is grounded in  $[q]$

Dasgupta (2014a):  $[[q] < [p]]$  is grounded in the essence of  $[p]$

Litland (forthcoming):  $[[q] < [p]]$  is zero-grounded (where ' $<$ ' is non-factive gr.)

## 2.1 What Is the Ground of Grounding?

Question: What grounds grounding facts?  
In virtue of what do grounding facts hold?

Natural Answer (cf. Dasgupta 2014a, Fine 2012)

(C) [event  $e$  contains people engaged in conference-conducive activities]  $<$  [ $e$  is a conference]

Why is it that [event  $e$  contains people engaged in conference-conducive activities] makes it the case that  $e$  is a conference?

- A natural answer involves **facts about what it is to be a conference.**
- It lies in the **essence of being a conference** that an event is a conference if it contains people engaged in conference-conducive activities.

## 2.1 What Is the Ground of Grounding?

Question: What grounds grounding facts?  
In virtue of what do grounding facts hold?

Natural Answer: Grounding Essentialism (GE) (cf. Dasgupta 2014a, Fine 2012)

- (GE) A grounding fact holds (at least partially) in virtue of the **essence of the grounded entity**.
- (GE)  $([q] < [p]) \rightarrow [[q] < [p]]$  is (at least partially) grounded in some **essentialist fact [f] about [p]**.

Easy example:

- Why do  $[p]$  and  $[q]$  ground  $[p \wedge q]$ ?
- That lies in the essence of conjunction.

## 2.2 Litland's Zero-Grounding Account (ZGA)

- ‘<’ ... factive ground
- ‘ $\Rightarrow$ ’... non-factive ground
- Litland takes a non-factive notion of ground to be basic.

(ZGA) If  $(\Gamma < \phi)$ , then  $(\Gamma < \phi)$  is grounded in (i)  $\Gamma$  and (ii)  $(\Gamma \Rightarrow \phi)$ .

$(\Gamma \Rightarrow \phi)$  is *zero-grounded*.

(ZGA)  $(\Gamma, \Gamma \Rightarrow \phi) < (\Gamma < \phi)$

$\emptyset < (\Gamma \Rightarrow \phi)$

(ZGA) All non-factive grounding-claims are zero-grounded.



## 2.2 Litland's Zero-Grounding Account (ZGA)

### 2 Questions:

- What is zero-grounding?
- How is it to be made intelligible that all non-factive grounding claims are zero-grounded?

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

2 ways to understand the claim that  $\phi$  is grounded in nothing.

- $\phi$  is grounded in **nothing** ...  $\phi$  is not grounded at all
- $\phi$  is grounded in **Nothing** ...  $\phi$  is zero-grounded

Zero-grounding: If  $\phi$  is zero-grounded, then

- (i)  $\phi$  is **grounded** (and thus not fund.)
- (ii)  $\phi$  is **grounded in the empty set of sentences/facts**.

There is a number of sentences/facts in which  $\phi$  is grounded and that number is 0.

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy with sets: (Fine 2012, 47f)

`{ }Set-Builder{ }`

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy with sets: (Fine 2012, 47f)

INPUT (Elements)



{ }Set-Builder{ }



OUTPUT (Set)

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy with sets: (Fine 2012, 47f)

1, 2, 3, ...



{ }Set-Builder{ }



{1, 2, 3, ...}

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy with sets: (Fine 2012, 47f)

Socrates' Nose, Eiffel Tower, Gödel's Incompleteness Theorem



{ }Set-Builder{ }



{Socrates' Nose, Eiffel Tower, Gödel's Incompleteness Theorem}

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy with sets: (Fine 2012, 47f)

NO INPUT



{ }Set-Builder{ }

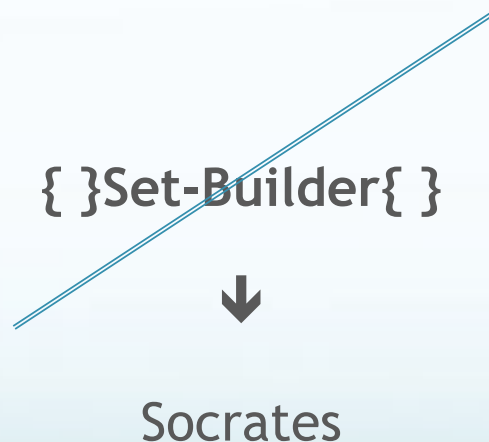


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## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy with sets: (Fine 2012, 47f)





## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy: The “Grounding Machine” (Litland forthcoming)

“Think of a machine generating truths from other truths. The machine is fed truths, churning out truths grounded in the truths it is fed. A truth is *ungrounded* if the machine never churns it out; a truth is *zero-grounded* if the machine churns it out when it is fed *no* input.” (Litland forthcoming, 8)

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

- When the GM is fed truths, it churns out truths that are grounded in the truths it is fed.
- A truth is **ungrounded** if the machine **never** churns it out.
- A truth is **zero-grounded** if the machine churns it out when it is fed **no input**.

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

INPUT (Truths/Facts/Statements  $\phi_1$ - $\phi_n$ )



<<Grounding Machine<<



OUTPUT (Truths/Facts/Statements grounded in  $\phi_1$ - $\phi_n$ )

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

$p, q$



<<Grounding Machine>>



$(p \wedge q)$

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

[x is crimson]



<<Grounding Machine<<



[x is red]

## 2.2 Litland's Zero-Grounding Account (ZGA)

What is zero-grounding?

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

NO INPUT



<<Grounding Machine<<



Zero-Grounded Truths

## 2.2 Litland's Zero-Grounding Account (ZGA)

All non-factive grounding claims are zero-grounded! (ZGA)

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

→ Why should the GM churn out  $\Gamma \Rightarrow \phi$  when fed no input?

“In terms of this picture, why would the machine give the verdict that  $\Gamma \Rightarrow \phi$  is zero-grounded if true? Think of it like this. When the machine is fed no input the machine, instead of remaining idle, ‘simulates’ the results of being fed various input. In simulating what happens when it is fed the propositions  $\Gamma$  the machine proceeds just as it would have if it in fact had been fed  $\Gamma$  as input. If, when running the simulation, the machine churns out  $\phi$ , *the machine ends the simulations and churns out  $\Gamma \Rightarrow \phi$* . Since the machine was fed no input this means that  $\Gamma \Rightarrow \phi$  is zero-grounded if true.” (Litland forthcoming, 8)

## 2.2 Litland's Zero-Grounding Account (ZGA)

All non-factive grounding claims are zero-grounded! (ZGA)

Analogy: The “Grounding Machine” (GM) (Litland forthcoming)

- Why should the GM churn out  $\Gamma \Rightarrow \phi$  when fed no input?
- When fed no input the GM simulates being fed input.
  - Eventually the GM simulates being fed  $\Gamma$ .
  - The GM starts a mechanism that operates on  $\Gamma$  and returns  $\phi$ .
  - If the GM is capable of running this simulation, it actually churns out  $\Gamma \Rightarrow \phi$  without being fed any input.
  - Thus,  $\Gamma \Rightarrow \phi$  is zero-grounded.



## 2.3 Objection to Litland's (ZGA)

All non-factive grounding claims are zero-grounded! (ZGA)

→ So, all non-factive grounding claims have the same explanation!

$$(1) \phi \Rightarrow (\phi \wedge \phi) \qquad (1^*) \emptyset < (\phi \Rightarrow (\phi \wedge \phi))$$

$$(2) \phi \Rightarrow (\phi \vee \phi) \qquad (2^*) \emptyset < (\phi \Rightarrow (\phi \vee \phi))$$

- According to (ZGA), (1) and (2) have the same ground ( $\emptyset$ ), i.e. the **same explanation**.
- Intuitively, (1) and (2) should have **different explanations**.
- The explanation of (1) should have to do with what  $\wedge$  is.
- The explanation of (2) should have to do with what  $\vee$  is.

## 2.4 Litland's Reply to the Objection

All non-factive grounding claims are zero-grounded! (ZGA)

→ So, all non-factive grounding claims have the same explanation!

$$(1) \phi \Rightarrow (\phi \wedge \phi)$$

$$(1^*) \emptyset < (\phi \Rightarrow (\phi \wedge \phi))$$

$$(2) \phi \Rightarrow (\phi \vee \phi)$$

$$(2^*) \emptyset < (\phi \Rightarrow (\phi \vee \phi))$$

Litland: Ambiguity of 'explanation':

In one sense (1) and (2) have the same explanation ( $\emptyset$ ).

In another sense they don't.

(1) and (2) are both zero-grounded, but in a **different way!**

## 2.4 Litland's Reply to the Objection

All non-factive grounding claims are zero-grounded! (ZGA)

→ So, all non-factive grounding claims have the same explanation!

$$(1) \phi \Rightarrow (\phi \wedge \phi)$$

$$(1^*) \emptyset < (\phi \Rightarrow (\phi \wedge \phi))$$

$$(2) \phi \Rightarrow (\phi \vee \phi)$$

$$(2^*) \emptyset < (\phi \Rightarrow (\phi \vee \phi))$$

Litland: (1) and (2) are both zero-grounded, but in a **different way**.

- Simulating being fed  $\phi$  the GM returns  $\phi \wedge \phi$ .
- Simulating being fed  $\phi$  the GM returns  $\phi \vee \phi$ .
- However, the **mechanisms** in each case are different ones.

Thus, (1) and (2) are both grounded *in*  $\emptyset$ , but *by* diff. mechanisms.

## 2.4 Litland's Reply to the Objection

All non-factive grounding claims are zero-grounded! (ZGA)

→ So, all non-factive grounding claims have the same explanation!

$$(1) \phi \Rightarrow (\phi \wedge \phi)$$

$$(1^*) \emptyset < (\phi \Rightarrow (\phi \wedge \phi))$$

$$(2) \phi \Rightarrow (\phi \vee \phi)$$

$$(2^*) \emptyset < (\phi \Rightarrow (\phi \vee \phi))$$

Litland: (1) and (2) are both gr. *in*  $\emptyset$ , but *by* diff. mechanisms.

→ What is a mechanism (in the GM)?

(1) is grounded *in*  $\emptyset$ , *by* the rule of conjunction-introduction.

(2) Is grounded *in*  $\emptyset$ , *by* the rule of disjunction-introduction.

## 2.4 Litland's Reply to the Objection

All non-factive grounding claims are zero-grounded! (ZGA)

→ So, all non-factive grounding claims have the same explanation!

(1) [x is crimson]  $\Rightarrow$  [x is red]

(2) [x is crimson]  $\Rightarrow$  [x is crimson  $\vee$  x is blue]

Litland: (1) and (2) are both gr. *in*  $\emptyset$ , but *by* diff. mechanisms.

→ What is a mechanism (in the GM)?

(1) is grounded *in*  $\emptyset$ , *by* a material rule concerning determinates and determinables.

(2) Is grounded *in*  $\emptyset$ , *by* the (formal) rule of disjunction-introduction.

## 2.4 Litland's Reply to the Objection

All non-factive grounding claims are zero-grounded! (ZGA)

→ So, all non-factive grounding claims have the same explanation!

$$(1) \phi \Rightarrow (\phi \wedge \phi)$$

$$(1^*) \emptyset < (\phi \Rightarrow (\phi \wedge \phi))$$

$$(2) \phi \Rightarrow (\phi \vee \phi)$$

$$(2^*) \emptyset < (\phi \Rightarrow (\phi \vee \phi))$$

Litland: (1) and (2) are both gr. *in*  $\emptyset$ , but *by* diff. mechanisms.

→ What is a mechanism (in the GM)?

For the GM to be able to process input (grounds) into output (grounded entities), it has to be programmed with the basic rules (formal and material) that make up the **structure of the world**. I.e. for the machine to be able to operate, it has to have **mechanisms**.

## 2.5 Criticism of Litland's Reply

All non-factive grounding claims are zero-grounded but each in a different way. (ZGA)

- If grounding is metaphysical explanation and if explanation is ambiguous, then grounding is ambiguous.
- Thus, on (ZGA) we are facing **2 different notions of grounding**:
  - ‘being grounded *in* ...’
  - ‘being grounded *by* ...’
- If 2 different non-factive grounding claims are both grounded *in*  $\emptyset$ , but each grounded *by* different rules (mechanisms), then the explanatory power lies in the 2<sup>nd</sup> notion of ground (‘grounded *by*’), since only it can explain that these 2 grounding claims are different.

## 2.5 Criticism of Litland's Reply

All non-factive grounding claims are zero-grounded but each in a different way. (ZGA)

- I contend that in case of grounding claims the 'grounded *by*' notion **does all the explanatory work** that is needed.
- The essential connection between a conjunction and its conjuncts that is expressed by the rule (mechanism) of conjunction-introduction **fully explains** why  $\phi \Rightarrow (\phi \wedge \phi)$  holds.
- Now, if there is a rule (mechanism) from  $\Gamma$  to  $\phi$ , then **this rule belongs to the essence of  $\phi$** . (cf. Litland forthcoming, 25)
- Thus, generally speaking, the essence of  $\phi$  fully explains why  $\Gamma \Rightarrow \phi$  hold.



## 2.5 Criticism of Litland's Reply

All non-factive grounding claims are zero-grounded but each in a different way. (ZGA)

- In other words:  $(\Gamma \Rightarrow \phi)$  is grounded *in* the essence of  $\phi$ .
- ‘grounded *in*’ since we only need one notion of ground.
- This means that we are **back to the natural view**.
- Thus, the **critical question** for (ZGA) is:  
**Why the detour via zero-grounding?**

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# Appendix 1: Well-Foundedness of Grounding

(MF) is the thesis that grounding is/should be well-founded.

- Intuitively, well-foundedness is the constraint there can be **no infinitely descending, non-terminating grounding chains**.
- There must be “a realm of basic facts which provide the ultimate metaph. grounding for all the derivative facts”. (Cameron 2008, 8)
- If we had endless dependence, “being would be infinitely deferred, never achieved”. (Schaffer 2010, 62)
- Analogy: Epistemic Foundationalism: If justification is endless nothing is justified.

## An infinitely descending grounding chain

- $g$  is grounded in  $f_1$  is grounded in  $f_2$  is grounded in  $f_3 \dots \infty$

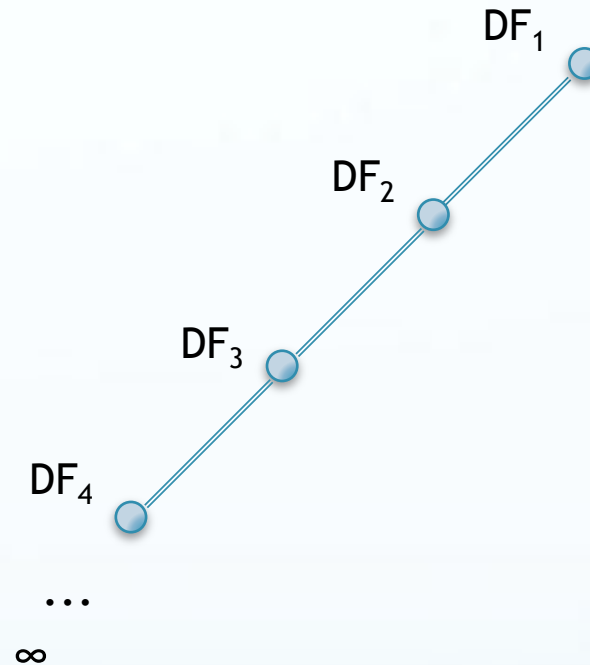
# Appendix 1: Well-Foundedness of Grounding

## Different versions of well-foundedness

- At least 3 different versions of well-foundedness ( $WF_1$ ,  $WF_2$ ,  $WF_3$ ) can be distinguished.
- These versions differ in strength.
- Dixon (2016) and Rabin/Rabern (2016) argue that ( $WF_3$ ) is the most adequate version of well-foundedness.
- ( $WF_1$ ) entails ( $WF_2$ ) entails ( $WF_3$ ), but not *vice versa*.
- To show that a theory  $T$  is in accord with ( $WF_3$ ), it suffices to show that  $T$  is in accord with ( $WF_1$ ). (see *Refutation of Sider's Argument*)
- But if  $T$  violates ( $WF_1$ ), it need not therefore violate ( $WF_3$ ).

# Appendix 1: Well-Foundedness of Grounding

## Infinately descending grounding chains

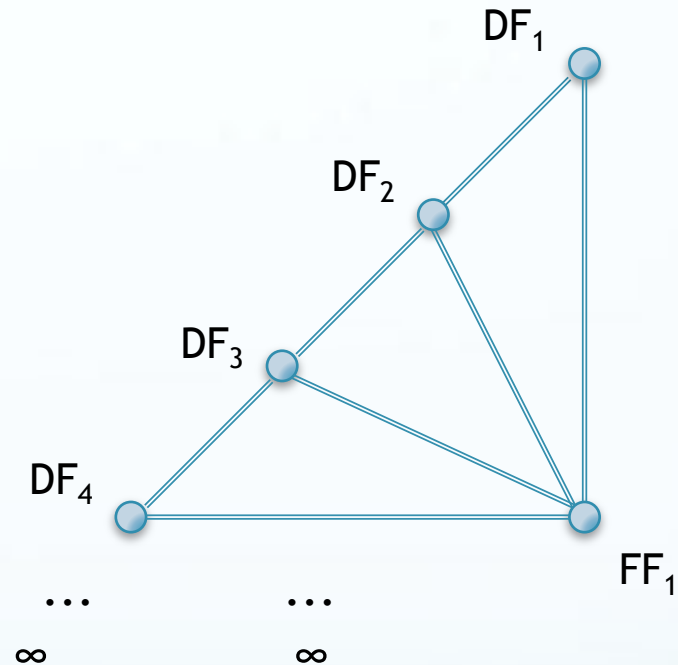


(WF<sub>1</sub>) There are no infinitely descending grounding chains.

(cf. Dixon 2016 and Rabin/Rabern 2016)

# Appendix 1: Well-Foundedness of Grounding

## Inf. descending gr. chains with a lower bound



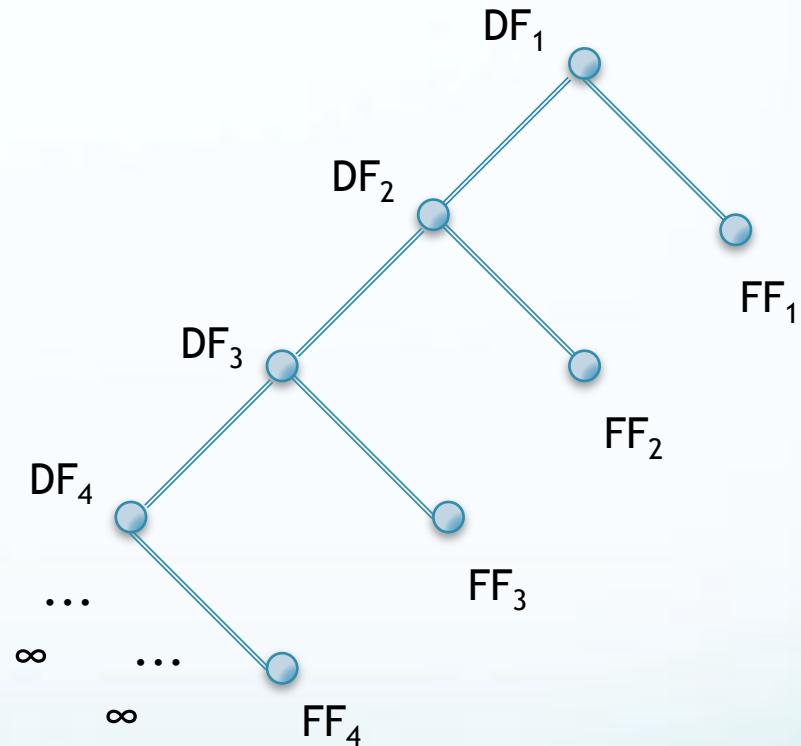
(WF<sub>2</sub>) There are no infinitely descending grounding chains without a lower bound.

(cf. Dixon 2016 and Rabin/Rabern 2016)



# Appendix 1: Well-Foundedness of Grounding

## Inf. descending gr. chains with a foundation



(WF<sub>3</sub>) There are no infinitely descending grounding chains without a foundation.

(cf. Dixon 2016 and Rabin/Rabern 2016)

# Appendix 1: Well-Foundedness of Grounding

## Different versions of well-foundedness

- Remember:  $(WF_1)$  entails  $(WF_2)$  entails  $(WF_3)$ , but not *vice versa*.

$(WF_3)$  Every non-fundamental fact  $x$  is fully grounded in some fundamental facts  $\Gamma$ . (Dixon 2016)

- To show that a theory  $T$  is in accord with  $(WF_3)$ , it suffices to show that  $T$  is in accord with  $(WF_1)$ . (see Appendix 2)
- But if  $T$  violates  $(WF_1)$ , it need not therefore violate  $(WF_3)$ .

# Appendix 2: Sider's Arg. Against Grounding

Sider (2011) argues:

- By PURITY, grounding facts are not fundamental and must be grounded.
- But if grounding facts are grounded, there will be another grounding fact, which must itself be grounded and so on ...  $\infty$
- Thus, grounding leads to a vicious infinite regress!

## Appendix 2: Sider's Arg. Against Grounding

Bennett (2011) presents Sider's argument in form of a **dilemma**:

- (1) Grounding facts are either fundamental or non-fundamental.
- (2) Grounding facts cannot be fundamental on pain of a violation of PURITY.
- (3) Grounding facts cannot be non-fundamental on pain of an infinite regress which would violate the well-foundedness of grounding.
- (4) Thus, grounding can neither be fundamental nor non-fundamental (i.e. grounded).
- (5) Therefore, grounding must be rejected.

## Appendix 2: Sider's Arg. Against Grounding

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- (2) Grounding facts cannot be fundamental on pain of a violation of PURITY.
- (3) Grounding facts cannot be non-fundamental on pain of an infinite regress which would violate the well-foundedness of grounding.
- (4) Thus, grounding can neither be fundamental nor non-fundamental (i.e. grounded).
- (5) Therefore, grounding must be rejected.

→ (3) is false! The fact that grounding is grounded does not violate the well-foundedness of grounding (Dasgupta 2014a, Dixon 2016, Rabin/Rabern forthcoming)

## Appendix 2: Refutation of Sider's Argument

**(3) Grounding facts cannot be non-fundamental on pain of an infinite regress which would violate the well-foundedness of grounding.**

**Thesis:**      **(3) is false!** The fact that grounding is grounded does not violate the well-foundedness of grounding (Dasgupta 2014a, Dixon 2016, Rabin/Rabern forthcoming)

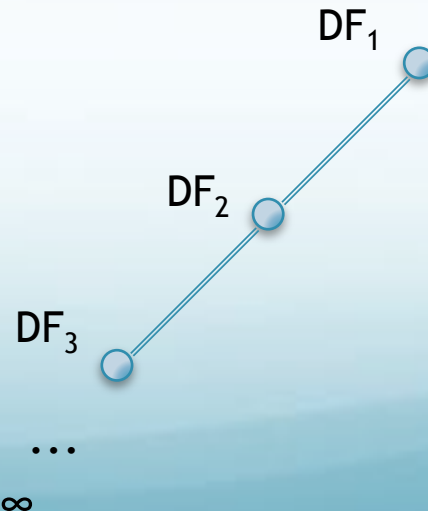
- This can be proved by showing that the claim that grounding is grounded does **not give rise to an infinitely descending chain of grounds.**

# Appendix 2: Refutation of Sider's Argument

(3) Grounding facts cannot be non-fundamental on pain of an infinite regress which would violate the well-foundedness of grounding.

**Thesis:** (3) is false! The fact that grounding is grounded does not violate the well-foundedness of grounding (Dasgupta 2014a, Dixon 2016, Rabin/Rabern forthcoming)

- This can be proved by showing that the claim that grounding is grounded does **not give rise to an infinitely descending chain of grounds.**



# Appendix 2: Refutation of Sider's Argument

(3) Grounding facts cannot be non-fundamental on pain of an infinite regress which would violate the well-foundedness of grounding.

How exactly does this infinite regress come about?

If grounding facts are themselves grounded, then every grounding fact produces another grounding fact: (I omit some square brackets for the sake of readability)

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*



## Appendix 2: Refutation of Sider's Argument

- (3) Grounding facts cannot be non-fundamental on pain of an infinite regress which would violate the well-foundedness of grounding.
- If we take grounding facts to be grounded, the result is an infinite series of grounding facts.
  - This infinite series, however, does **not** constitute an infinitely descending, non-terminating **grounding chain**. (cf. Dasgupta 2014a, 588)
  - To be precise, it does not constitute a grounding chain at all. (cf. Rabin/Rabern 2016)
  - Therefore the non-fundamentality of grounding is **not at odds with the well-foundedness** of grounding.
  - Thus, **Sider's premise (3) is false** and the grounding theorist can escape the dilemma.

# Appendix 2: Refutation of Sider's Argument

## (1) An infinitely descending grounding chain

- $[q < p]$  is grounded in some fact  $f_1$
- $f_1$  is grounded in some fact  $f_2$
- $f_2$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*

## (2) An infinite series of ground

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*

# Appendix 2: Refutation of Sider's Argument

## (1) An infinitely descending grounding chain

- $[q < p]$  is grounded in some fact  $f_1$
- $f_1$  is grounded in some fact  $f_2$  subject to chaining
- $f_2$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*

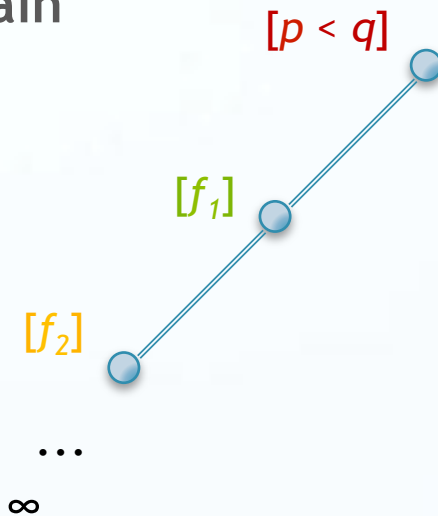
## (2) An infinite series of ground

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$  not subject to chaining
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*

# Appendix 2: Refutation of Sider's Argument

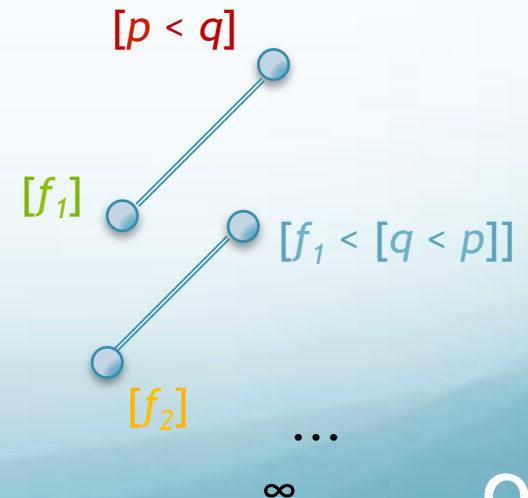
## (1) An infinitely descending grounding chain

- $[q < p]$  is grounded in some fact  $f_1$
- $f_1$  is grounded in some fact  $f_2$
- $f_2$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*



## (2) An infinite series of ground

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*



# Appendix 2: Refutation of Sider's Argument

## (1) An infinitely descending grounding chain

- $[q < p]$  is grounded in  $f_1$  is grounded in  $f_2$  is grounded in  $f_3 \dots \infty$

## (2) An infinite series of ground

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$  not subject to chaining
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*

# Appendix 2: Refutation of Sider's Argument

## (1) An infinitely descending grounding chain

- $[q < p]$  is grounded in  $f_1$  is grounded in  $f_2$  is grounded in  $f_3 \dots \infty$

→ In (1),  $[q < p]$  has a mediate ground in  $f_3$ .

→ In (2),  $[q < p]$  does not have a mediate ground in  $f_3$ .

## (2) An infinite series of ground

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$  not subject to chaining
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*

# Appendix 2: Refutation of Sider's Argument

## (1) An infinitely descending grounding chain

- $[q < p]$  is grounded in  $f_1$  is grounded in  $f_2$  is grounded in  $f_3 \dots \infty$

→ In (1),  $[q < p]$  does not have a 'finite ground'.

→ (2) leaves it open, whether or not  $[p < q]$  has a 'finite ground'.

## (2) An infinite series of ground

- $[q < p]$  is grounded in some fact  $f_1$
- $[f_1 < [q < p]]$  is grounded in some fact  $f_2$  not subject to chaining
- $[f_2 < [f_1 < [q < p]]]$  is grounded in some fact  $f_3$
- ... and so on *ad infinitum*