

# Analysis of Telling, Believing and Truth

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By Dennis J. Darland

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## Definition of Telling

I've been thinking about the "telling" relation. (In trying to understand opacity.) My idea is:

S1 tells S2 that R(a, b, c) at t (i.e. tells(S1,S2,R, a, b, c))

=df  $(\exists w_m)(\exists x_m)(\exists y_m)(\exists z_m) (\exists w_p)(\exists x_p)(\exists y_p)(\exists z_p) (\exists w_m2)(\exists x_m2)(\exists y_m2)(\exists z_m2)$

$m\_symbol\_1r(S1,t,w_m,R) \& m\_symbol\_0r(S1,t,x_m,a) \& m\_symbol\_0r(S1,t,y_m,b) \& m\_symbol\_0r(S1,t,z_m,c)$

$\& p\_symbol\_1r(S1,t,w_m,w_p) \& p\_symbol\_0r(S1,t,x_m,x_p) \& p\_symbol\_0r(S1,t,y_m,y_p) \& p\_symbol\_0r(S1,t,z_m,z_p)$

$\& says(S1,t,w_p,x_p,y_p,z_p)$

$\& hears(S2,w_p,x_p,y_p,z_p)$

$\& p\_symbol\_1r(S2,t,w_m2,w_p) \& p\_symbol\_0r(S2,t,x_m2,x_p) \& p\_symbol\_0r(S2,t,y_m2,y_p) \& p\_symbol\_0r(S2,t,z_m2,z_p)$

$\& m\_symbol\_1r(S2,t,w_m2,R) \& m\_symbol\_0r(S2,t,x_m2,a) \& m\_symbol\_0r(S2,t,y_m2,b) \& m\_symbol\_0r(S2,t,z_m2,c)$

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Here

- S1 is the teller
- S2 is the person told
- R(a,b,c) is the fact S1 is telling to S2

- $w_m$  is a mental symbol for R (for S1) at time t
- $x_m$  is a mental symbol for a (for S1) at time t
- $y_m$  is a mental symbol for b (for S1) at time t
- $z_m$  is a mental symbol for c (for S1) at time t
- $w_p$  is a physical (shared) symbol for R (for S1 and S2) at time t
- $x_p$  is a physical (shared) symbol for a (for S1 and S2) at time t
- $y_p$  is a physical (shared) symbol for b (for S1 and S2) at time t
- $z_p$  is a physical (shared) symbol for c (for S1 and S2) at time t
- $w_{m2}$  is a mental symbol for R (for S2) at time t
- $x_{m2}$  is a mental symbol for a (for S2) at time t
- $y_{m2}$  is a mental symbol for b (for S2) at time t
- $z_{m2}$  is a mental symbol for c (for S2) at time t
- $m\_symbol\_1r(S,t,w_m,R)$  is a relation between subject S at time t between a mental idea  $m_w$  and relation R
- $m\_symbol\_0r(S,t,x_m,a)$  is a relation between subject S at time t between a mental idea  $m_x$  and object a

In the simplest cases a  $m\_symbol$  relation is an association of a mental idea  $x_m$  and physical object a, typically produced through experience.

- $p\_symbol\_1r(S,t,w_m,w_p)$  is a relation between subject S at time t between a mental idea  $m_w$  and physical symbol  $p_w$
- $p\_symbol\_0r(S,t,x_m,x_p)$  is a relation between subject S at time t between a mental idea  $x_m$  and physical symbol  $x_p$

In the simplest cases a  $p\_symbol$  relation is an association of a mental idea  $x_m$  and a word  $p_x$ (existing physically).

- $x_{m2}$  is a mental symbol for a (for S2) at time t
- $y_{m2}$  is a mental symbol for b (for S2) at time t

- $z\_m2$  is a mental symbol for  $c$  (for  $S2$ ) at time  $t$

Suppose Tom tells George that Cicero denounced Catiline.

This is analyzed as:

=df  $(\exists w\_m)(\exists x\_m)(\exists y\_m)(\exists z\_m) (\exists w\_p)(\exists x\_p)(\exists y\_p)(\exists z\_p) (\exists w\_m2)(\exists x\_m2)(\exists y\_m2)(\exists z\_m2)$

&  $m\_symbol\_1r(TOM,t,w\_m,denounced)$  &  $m\_symbol\_0r(TOM,t,x\_m,Cicero)$  &  $m\_symbol\_0r(TOM,t,y\_m,Catiline)$

&  $p\_symbol\_1r(TOM,t,w\_m,w\_p [the\_sound\_denounced])$  &  $p\_symbol\_0r(TOM,t,x\_m,x\_p [the\_sound\_Cicero])$  &  $p\_symbol\_0r(TOM,t,y\_m,y\_p [the\_sound\_Cataline])$

&  $says(TOM,t,w\_p,x\_p,y\_p)$

&  $hears(GEORGE,w\_p,x\_p,y\_p)$

&  $p\_symbol\_1r(GEORGE,t,w\_m2,w\_p [the\_sound\_denounced])$  &  $p\_symbol\_0r(GEORGE,t,x\_m2,x\_p [the\_sound\_Cicero])$  &  $p\_symbol\_0r(GEORGE,t,y\_m2,y\_p [the\_sound\_Cataline])$

&  $m\_symbol\_1r(GEORGE,t,w\_m2,R)$  &  $m\_symbol\_0r(GEORGE,t,x\_m2,a)$  &  $m\_symbol\_0r(GEORGE,t,y\_m2,b)$  &  $m\_symbol\_0r(TOM,t,z\_m2,c)$

So called opacity is a result of that although Cicero = Tully, it may be that  $p\_symbol\_0r(GEORGE,x\_m2,x\_p [the\_sound\_Cicero])$  is true, it may be false that  $p\_symbol\_0r(GEORGE,x\_m2,x\_p2 [the\_sound\_Tully])$ .

## Definition of Believing

Just because Tom tells George this doesn't imply Tom believes it.

In General,

I've been thinking about the "believing" relation. (In trying to understand opacity.) My idea is:

$S1$  believes that  $R(a, b, c)$  at  $t$  (i.e,  $believes(S1,R, a, b, c)$ )

=df  $(\exists w\_m)(\exists x\_m)(\exists y\_m)(\exists z\_m)$

$belief\_r(S1,t,w\_m,x\_m,y\_m,z\_m)$

& m\_symbol\_1r(S1,t,w\_m,R) & m\_symbol\_0r(S1,t,x\_m,a) & m\_symbol\_0r(S1,t,y\_m,b) & m\_symbol\_0r(S1,t,z\_m,c)

## Definition of Telling What You Believe

Telling something you believe is more than telling.

S1 tells S2 that R(a, b, c) at t (i.e. tells(S1,S2,R, a, b, c))

=df ( $\exists w_m$ )( $\exists x_m$ )( $\exists y_m$ )( $\exists z_m$ ) ( $\exists w_p$ )( $\exists x_p$ )( $\exists y_p$ )( $\exists z_p$ ) ( $\exists w_m2$ )( $\exists x_m2$ )( $\exists y_m2$ )( $\exists z_m2$ )

& m\_symbol\_1r(S1,t,w\_m,R) & m\_symbol\_0r(S1,t,x\_m,a) & m\_symbol\_0r(S1,t,y\_m,b) & m\_symbol\_0r(S1,t,z\_m,c)

& p\_symbol\_1r(S1,t,w\_m,w\_p) & p\_symbol\_0r(S1,t,x\_m,x\_p) & p\_symbol\_0r(S1,t,y\_m,y\_p) & p\_symbol\_0r(S1,t,z\_m,z\_p)

& belief\_r(S1,t,w\_m,x\_m,y\_m,z\_m)

& says(S1,t,w\_p,x\_p,y\_p,z\_p)

& hears(S2,w\_p,x\_p,y\_p,z\_p)

& p\_symbol\_1r(S2,t,w\_m2,w\_p) & p\_symbol\_0r(S2,t,x\_m2,x\_p) & p\_symbol\_0r(S2,t,y\_m2,y\_p) & p\_symbol\_0r(S2,t,z\_m2,z\_p)

& m\_symbol\_1r(S2,t,w\_m2,R) & m\_symbol\_0r(S2,t,x\_m2,a) & m\_symbol\_0r(S2,t,y\_m2,b) & m\_symbol\_0r(S1,t,z\_m2,c)

## Definition of Believing What You Hear

Telling something you believe is more than telling.

S1 tells S2 that R(a, b, c) at t (i.e. tells(S1,S2,R, a, b, c))

=df ( $\exists w_m$ )( $\exists x_m$ )( $\exists y_m$ )( $\exists z_m$ ) ( $\exists w_p$ )( $\exists x_p$ )( $\exists y_p$ )( $\exists z_p$ ) ( $\exists w_m2$ )( $\exists x_m2$ )( $\exists y_m2$ )( $\exists z_m2$ )

& m\_symbol\_1r(S1,t,w\_m,R) & m\_symbol\_0r(S1,t,x\_m,a) & m\_symbol\_0r(S1,t,y\_m,b) & m\_symbol\_0r(S1,t,z\_m,c)

& p\_symbol\_1r(S1,t,w\_m,w\_p) & p\_symbol\_\_0r(S1,t,x\_m,x\_p) & p\_symbol\_0r(S1,t,y\_m,y\_p) & p\_symbol\_0r(S1,t,z\_m,z\_p)

& says(S1,t,w\_p,x\_p,y\_p,z\_p)

& hears(S2,w\_p,x\_p,y\_p,z\_p)

& p\_symbol\_1r(S2,t,w\_m2,w\_p) & p\_symbol\_\_0r(S2,t,x\_m2,x\_p) & p\_symbol\_0r(S2,t,y\_m2,y\_p) & p\_symbol\_0r(S2,t,z\_m2,z\_p)

& m\_symbol\_1r(S2,t,w\_m2,R) & m\_symbol\_0r(S2,t,x\_m2,a) & m\_symbol\_0r(S2,t,y\_m2,b) & m\_symbol\_0r(S1,t,z\_m2,c)

& belief\_r(S2,t,w\_m2,x\_m2,y\_m2,z\_m2)

## Definition of True Belief

Just because Tom tells George this doesn't imply Tom believes it.

In General,

I've been thinking about the "tbelieving" relation. (In trying to understand opacity.) My idea is:

S1 believes that R(a, b, c) at t (i.e, believes(S1,R, a, b, c))

=df  $(\exists w_m)(\exists x_m)(\exists y_m)(\exists z_m)$

belief\_r(S1,t,w\_m,x\_m,y\_m,z\_m)

& m\_symbol\_1r(S1,t,w\_m,R) & m\_symbol\_0r(S1,t,x\_m,a) & m\_symbol\_0r(S1,t,y\_m,b) & m\_symbol\_0r(S1,t,z\_m,c)

& R(a,b,c)

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