# Inner and Outer Transport Theorems

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*In this paper I present an inner and two outer transport theorems found in Path Semantical Logic.*

The Inner Transport Theorem is a proof in Path Semantical Logic[1]:

```
∀ f : {and, fst, or, eq, rimply, imply, true₂} {
        (a, b, c) (A, B, C):
        a(A), b(B), c(C), f(a=b, a=c)  =>  f(A=B, A=C)
}
```

The Left Outer Transport Theorem is a proof:

```
∀ f, g : {and, fst, or, eq, rimply, imply, true₂} {
        (a, b, c) (A, B, C):
        a(A), b(B), c(C), f(a, b)=g(a, c)  =>  f(A, B)=g(A, C)
}
```

The Right Outer Transport Theorem is a proof:

```
∀ f, g : {and, fst, or, eq, rimply, imply, true₂} {
        (a, b, c) (A, B, C):
        a(A), b(B), c(C), f(a, b)=g(b, c)  =>  f(A, B)=g(B, C)
}
```

Here, the tuple `(a, b, c)` has level 1 and the tuple `(A, B, C)` has level 0.
The notation `a(A)` means `a=>A` where `A` is at a lower level.

The set `{and, fst, or, eq, rimply, imply, $true_2$}` are all functions that transports concretely[2].

## References:


[1] "Path Semantical Logic"
AdvancedResearch, reading sequence on Path Semantics
https://github.com/advancedresearch/path_semantics/blob/master/sequences.md#path-semantical-logic

[2] "Concrete and Abstract Transport"
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https://github.com/advancedresearch/path_semantics/blob/master/papers-wip/concrete-and-abstract-transport.pdf