

# Sorensen's Disappearing Act: A Response

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Roy Sorensen (2006, 2008) has described a scenario, which he calls 'the Disappearing Act', and introduced a puzzle based upon that scenario, which we will refer to as 'the Disappearing Act Puzzle'. Furthermore, in Sorensen 2008, he offers a solution to this puzzle. Here we argue against Sorensen's solution and offer our own.

The Disappearing Act can be described as follows. (See our reproduction of Sorensen (2006)'s Figure 1 below.) At  $t_1$ , a solid cone is suspended beneath a light source and casts a shadow as a result. To the left of this shadow, there is a perfectly black brick whose size and shape are exactly the same as the shadow's.<sup>1</sup> Then, at  $t_2$ , the brick is slid into the region occupied by the shadow at  $t_1$ .

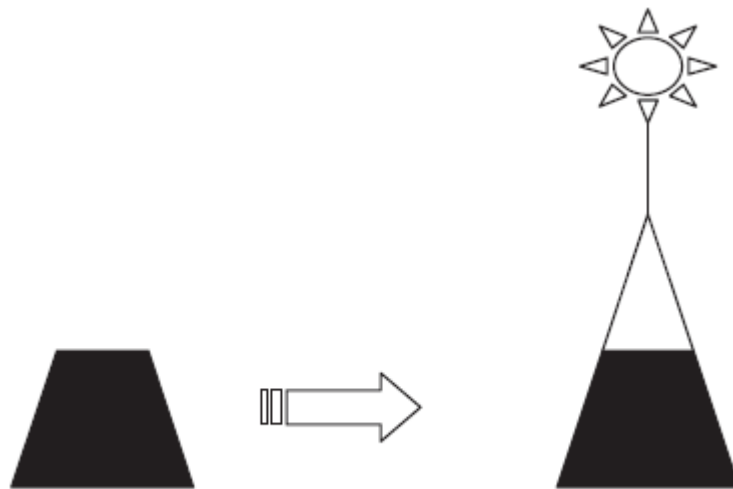


Figure 1

The Disappearing Act Puzzle concerns the situation of someone observing the Disappearing Act at  $t_2$ . This puzzle can be formulated as a set of inconsistent statements, as follows:

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<sup>1</sup> Following Sorensen, we take the cone's shadow to be a three-dimensional entity located between the suspended cone and the floor.

1. An observer of the Disappearing Act sees something underneath the cone at  $t_2$ .
2. If (1), then either an observer of the Disappearing Act sees a shadow, sees the brick, or sees some other entity underneath the cone at  $t_2$ .
3. An observer of the Disappearing Act does not see a shadow underneath the cone at  $t_2$ .
4. An observer of the Disappearing Act does not see the brick underneath the cone at  $t_2$ .
5. An observer of the Disappearing Act does not see some other entity underneath the cone at  $t_2$ .

Since they are inconsistent, a solution to the Disappearing Act Puzzle will involve a denial of at least one of these five statements.

Sorensen's solution is to deny statement (3). According to Sorensen, 'the shadow was hollowed out, not destroyed' when the brick was moved into place at  $t_2$  (2008: 73). So, he claims, there is a very thin shadow that surrounds the brick at  $t_2$ . Because it is shrouded by this hollow shadow, an observer of the Disappearing Act does not see the brick at  $t_2$ . However, she does see the shadow, since it is not obscured by any object.

But Sorensen's solution fails. Since (as stated in the description of the Disappearing Act) the brick occupies at  $t_2$  the region occupied by the shadow at  $t_1$ , there is no room for the thin shadow Sorensen claims to exist. There would be room if, for instance, the shadow at  $t_1$  was topologically closed and the brick was topologically open. But the brick and the shadow must have the same topological features. Although a topologically open brick can be the same size and shape as a topologically closed shadow, such a brick cannot be slid into the region occupied by such a shadow, for topologically open objects cannot occupy topologically closed regions.

Thus, we reject Sorensen's solution; an observer does not see a shadow underneath the cone at  $t_2$ . But we agree with Sorensen that an observer sees something underneath the cone. We

also agree that an observer does not see the brick; after all, no light reaches the brick at  $t_2$ . Since statement (2) is obviously true, we accept statements (1)-(4) and reject (5); an observer of the Disappearing Act sees some other entity under the cone at  $t_2$ . In particular, we claim that she sees an absence of light.

Sorensen offers two objections to solutions that deny statement (5). One of these objections relies on ‘a principle of qualitative parsimony: Do not multiply absences beyond necessity’ (2008: 68). Sorensen argues that postulating an absence of light beneath the cone at  $t_2$  that is not a shadow violates this principle. For one who does so is committed to two types of absences: shadows and the sort underneath the cone at  $t_2$ .

But our solution to the Disappearing Act Puzzle violates Sorensen’s principle only if that principle bars one who postulates a certain type of absence from postulating a super-type of that type. However, one should not be barred from doing so. For instance, given that one has already postulated an absence of air within a chamber, one should not be barred from also postulating absences of air. After all, every absence of air within a chamber is also an absence of air. Similarly, one who postulates shadows should not be barred from also postulating absences of light, since every shadow is also an absence of light.

Sorensen’s other objection to solutions that deny (5) is that the absence of light underneath the cone at  $t_2$  ‘is clearly due to the same mechanism that produces shadows; the cone is *blocking* the light’ (2006: 321). Here he seems to be suggesting that every absence of light that is produced by an object blocking light is a shadow. So, since the absence of light underneath the cone at  $t_2$  is produced by the cone blocking light, that absence is a shadow. Thus, it is not statement (5) of the Disappearing Act Puzzle that is false, but rather statement (3).

However, we deny that every absence of light that is produced by an object blocking light is a shadow. Consider a solid sphere upon which a bright light is shining. There is an absence of light in the filled interior of this sphere. But, although this absence is produced by the surface of the sphere blocking the light, it is not a shadow. Similar remarks apply to the absence of light underneath the cone at  $t_2$  in the Disappearing Act. Although this absence of light is produced by the cone blocking light, it is not a shadow. For, although it is possible for absences of light to be colocated with material objects, it is not possible for shadows to be. Thus, since the absence of light underneath the cone at  $t_2$  is colocated with the brick, it is not a shadow.

We conclude that Sorensen's solution to the Disappearing Act Puzzle fails because there is no room for a shadow underneath the cone once the brick is slid into place. Moreover, we claim that the correct solution is to hold that an observer of the Disappearing Act sees an absence of light underneath the cone at  $t_2$ , but that this absence of light is not a shadow. Thus, *contra* Sorensen, it is not statement (3) that is false; it is statement (5).

### References

Sorensen, R. 2006. The Disappearing Act. *Analysis* 66: 319-25.

Sorensen, R. 2008. *Seeing Dark Things: The Philosophy of Shadows*. Oxford: Oxford University Press.