

How to make a gunky Spritz

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Abstract: In its simplest form, a Spritz is an aperitif made with (sparkling) water and (white) wine. A ‘gunky Spritz’, as I will call it, is a Spritz in which the water and the wine are mixed *through and through*, so that every proper part of the Spritz has a proper part containing both water and wine. In the literature on the notion of location the possibility of mixtures like a gunky Spritz has been thought of as either threatening seemingly intuitive locative principles, or as requiring the position of multiple primitive locative relations. In this paper I present a new theory of location which assumes as primitive only the notion of pervasive location and show that it can account for the possibility of gunky Spritz in an intuitive and adequate way.

1. Introduction

A perfect *Spritz Veneziano* is easy to make. You just need to mix one part sparkling water, one part white wine, and one part bitter liqueur. Then you add a couple of ice cubes, a slice of either lemon or orange (depending on the chosen liqueur), an olive, and you’re done. *Salute!* On the contrary, a *gunky Spritz* appears to pose some significant problems. These, however, don’t concern its main ingredients—which are the same as those for a *Spritz Veneziano*—but instead the rather peculiar way they *mix*. For simplicity’s sake, let’s forget about the ice, the slice of lemon (or orange), and the olive. Suppose, furthermore, that you just want to make a ‘white’ gunky Spritz, with only sparkling water and white wine, and let’s also forget about the bubbles of gas in the water and suppose that both the water and the wine are homogenous substances. In order to make the perfect (white) gunky Spritz you first need a special *gunky glass*, that is, a glass enclosing a gunky region of space (where a region of space is ‘gunky’ if and only if each of its proper subregions has proper subregions). Then you need some *gunky water* and some *gunky wine*, that is some quantities of water and wine such that each of their proper parts has proper parts. Once you have the gunky glass, the gunky water and the gunky wine, you pour equal parts of water and wine in the glass until it is completely filled. *Salute?* Not quite. In order for a Spritz to be a gunky Spritz the water and the wine have to mix *through and through*. This means that they don’t have to be just *juxtaposed*, with drops of wine rubbing shoulders with drops of water. Nor do they have to be *transformed*. A gunky Spritz is not a new substance obtained by the transformation of water and wine. In order for a Spritz to be a gunky Spritz *every part* of the Spritz must contain *both* (and *just*) water and wine. The question is, thus: is it *possible* to mix a gunky Spritz?

The general question behind the possibility of gunky Spritz is not new in the contemporary debate on theories of location.¹ It is discussed, among others, by Daniel

¹ Parsons (2007: footnote 4) credits Shieva Kleinschmidt as the first one to introduce this problem in the contemporary debates on theories of location.

Nolan (2006), Josh Parsons (2007), and more recently by Matt Leonard (2014). In particular, Leonard (2014) has argued that the extant theories of location, assuming just one primitive locative relation, cannot express the possibility of the kind of mixture characterizing a gunky Spritz.

In this paper I will argue that friends of both gunky Spritz and ideologically parsimonious theories of location should not worry. In fact, I will present a novel theory of location that, although taking only the notion of *pervasive location* as primitive, seems to be perfectly able to account for the possibility of gunky Spritz. As I will show, although the theory I will expose doesn't validate many principles featuring the notion of exact location that are central to the system Parsons (2007) labelled 'S@', it validates very similar principles concerning the notion I will call 'maximal omnipresence'. I will, thus, conclude that friends of Parsons's S@ can have their gunky Spritz and drink it too, as my theory of location makes gunky Spritz possible while also accounting for the intuitive appeal of S@'s principles.

2. On mixing gunky water and gunky wine

In his seminal 'Theories of Location' Parsons (2007) presents two influential theories of location which he labels 'S@' and 'S@_o'. S@ takes as primitive the notion of *exact location* ('@'), while S@_o takes as primitive the notion of *weak location* ('@_o').² This is how Parsons glosses on the notions of *weak*, *entire*, *pervasive* and *exact location*:

Let us say that I am *weakly located* in my office iff I am in my office in the weakest possible sense: iff my office is not completely free of me. I should count as weakly located in my office when I am sitting at my desk, when I am reaching an arm out of the window, or when I am reaching an arm in the window from the street outside. Let us say that I am *entirely located* in my office iff I am in my office and I am not anywhere outside my office; that is, iff I am in my office and everywhere outside my office is completely free of me. I am entirely in my office when I am sitting at the desk, but not when I am reaching an arm in or out of my window. Let us say that I pervade, or am *pervasively located* in, any place none of which is free of me. I don't ever pervade my office, but I do pervade the region exactly occupied by my left big toe. Finally, I am *exactly located* anywhere that I am both entirely and pervasively located. My exact location is like my shadow in substantial space. (Parsons 2007: 203)

In Parsons's two systems the locative notions that are taken to be derivative are defined as follows:³

Definitions—System S@

- | | | |
|-----|---|-------------------------------|
| (1) | $x@<r =_{df} \exists s(x@s \wedge s \leq r)$ | Entire Location(S@) |
| (2) | $x@>r =_{df} \exists s(x@s \wedge r \leq s)$ | Pervasive Location(S@) |
| (3) | $x@_o r =_{df} \exists s(x@s \wedge s \circ r)$ | Weak Location(S@) |

² See Gilmore (2018: section 2.1) on the question of which location relation is fundamental.

³ Throughout the paper ' $x \leq y$ ' stands for ' x is part of y ' and ' $x \circ y$ ' for ' x overlaps with y ' (where overlap is defined as 'sharing a part'). ' xx ', ' yy ', ' zz ', are plural variables and ' $x < yy$ ' stands for ' x is one of the yy '.

Definitions—System $S@_o$

- (4) $x@<r =_{df} x@_o r \wedge \forall s(x@_o s \rightarrow r \circ s)$ **Entire Location($S@_o$)**
(5) $x@>r =_{df} \forall s(r \circ s \rightarrow x@_o s)$ **Pervasive Location($S@_o$)**
(6) $x@r =_{df} \forall s(r \circ s \leftrightarrow x@_o s)$ **Exact Location($S@_o$)**

Parsons regards both **Exactness** (a theorem of $S@$) and **Functionality** (a theorem of $S@_o$)⁴ as good principles of a theory of location:

- (7) $\exists r(x@_o r) \rightarrow \exists r(x@r)$ **Exactness**
(8) $(x@r \wedge x@s) \rightarrow r = s$ **Functionality**

However, he also takes the possibility of what Nolan (2006) calls ‘Stoic gunk’ (of which a gunky Spritz would be an instance) as a serious threat to **Exactness**

The Nolanian Stoic believes in a gunky space in which every region is continuous, and that water and wine are themselves made out of homogeneous gunky matter. A blend of water and wine is such that every subregion of the region in which the blend is exactly located contains some water and some wine [...]. That is to say, after the wine and water are mixed, the wine is entirely located in the exact location of the blend, and weakly located in every subregion of the exact location of the blend, but does not pervade any such region. It follows from this that after blending, the wine is weakly located in all the regions that the blend is weakly located in, but has no exact location. The wine is so scattered and discontinuous that it will not exactly fit any of the continuous regions of Nolanian space. [...] if Nolanian Stoic blends are coherent, Exactness is not a conceptual truth (Parsons 2007: 208).

As Leonard (2014) has efficaciously argued, however, the possibility of a gunky Spritz is actually *not* expressible given the definitions employed in $S@$ and $S@_o$. Recall, in fact, that, as stated in the passage just quoted, in order to have a gunky Spritz the following must be the case:

- (9) Neither the water nor the wine have an exact location
(10) Neither the water nor the wine pervade any region of space
(11) Both the water and the wine are weakly located at every subregion at which their blend is exactly located

However, (9)-(11) form an inconsistent triad given both ways of defining the relevant locative notions. Consider, first, the set of definitions given in $S@$. According to (11), the wine has some weak location. However, it follows in this case from (3) that the wine has also an exact location, thus contradicting (9). Instead, according to the definitions

⁴ More precisely, **Functionality** follows from (6) and the following theorem of Minimal Extensional Mereology:

(MEM) $\forall z(x \circ z \leftrightarrow y \circ z) \rightarrow x = y$

(see Parsons 2007: 228-9).

given in $S@_o$ we have that an object x pervades a region r just in case every region overlapping r is a region at which x is weakly located. Suppose, then, that R_b is the region at which the blend is exactly located and that R_b overlaps some region s . By the definition of gunky Spritz, any subregion of R_b contains both water and wine. Therefore, s is not completely free of the wine, and hence is a region at which the wine is weakly located. By generalization, every region overlapping R_b is a region at which the wine is weakly located. By **Pervasive Location**($S@_o$) it follows, therefore, the wine pervades R_b , thus contradicting (10).⁵

One may think that the conclusion to be drawn from Leonard’s objection is that (10) shouldn’t be taken to be a necessary condition for a gunky Spritz. Instead, the suggestion continues, in the case of a gunky Spritz, one should say that the water and the wine are weakly located at every subregion of R_b and pervade R_b without having an exact location.⁶ Unfortunately, however, this option is also at odds with both $S@$ and $S@_o$. According to $S@$, nothing can pervade a region of space without having an exact location. Instead, given $S@_o$, it follows from (5) and (6) that, if an entity x pervades R_b without having an exact location, then there is some region s such that (i) x is weakly located at s and (ii) s doesn’t overlap R_b . Therefore, in this case we would have that the water and the wine must be weakly located also *outside* of R_b , and thus, out of the gunky glass containing the Spritz, so to speak. But why shouldn’t it possible to make a gunky Spritz without spilling the water and wine? Consider, furthermore, that (10) seems to have the ring of plausibility to it, at least *prima facie*. A gunky Spritz is made of one part wine and one part water; say, 100cl of each, resulting in 200cl of Spritz. How could, then, a quantity of 100cl of wine (or water) pervade—and, thus, *fill—by itself* a 200cl glass?

As Leonard (2014) claims, one way to express the possibility of a gunky Spritz may be that of taking *both* weak and exact location as primitives. However, regardless of whether this option can be ultimately successful,⁷ the moral of our story seems to be that gunky Spritz cannot possibly quench the thirst of location theorists that don’t have a taste for multiple primitive locative notions. As I will argue in what follows, however, appearances prove to be deceptive in this case.

3. A new theory of location

I will assume as primitive the notion of pervasive location and take an entity x to pervade a region r ($x@_>r$) just in case no subregion of r is free of x . Furthermore, I will take the predicate ‘@>’ for pervasive location to be *multigrade* on the object position and, thus,

⁵ See Leonard (2014: 313).

⁶ Many thanks to an anonymous referee for this Journal for pressing me on this objection.

⁷ According to Leonard (2014), admitting multiple primitive locative notions seems to force one to accept the existence of brute necessary connections between them. Consider, in fact, the following principle concerning the interplay of exact and weak location:

$$(12) \quad \exists r(x@r) \rightarrow \exists r(x@_o r) \quad \text{Exact-Weak}$$

Exact-Weak strikes one as a highly plausible principle concerning weak and exact location. However, as Leonard (2014) argues, if both exact and weak location are primitive notions there seems to be no way to make **Exact-Weak** part of the system except for simply postulating its truth as a brute metaphysical necessity (see Leonard 2014: 314-5).

allow for the possibility that a plurality xx of objects *collectively pervade*, or (as I will say) *fill*, a certain region r , even if none of them pervades, or fills, r by itself:⁸

$$(13) \quad xx@>r \wedge \sim \exists x(x < xx \wedge x@>r)$$

In general, the notion of collective pervasive location can be informally glossed by saying that a plurality xx of entities collectively pervade a certain region r just in case no part of r is free of all of the xx and each of the xx ‘contributes’ to fill r . Consider, for instance, two objects A and B exactly occupying two disjoint regions of space r_1 and r_2 , respectively. From the fact that A fills r_1 it doesn’t follow that r_1 is filled by A *and* B *taken together*, as B has nothing to do, so to speak, with the fact that r_1 is a filled region of space. Plural pervasive location is, thus, *non-monotonic*, in the sense that from the fact that a plurality xx of entities collectively pervade r it doesn’t follow that for *every* y , the xx *and* y collectively pervade r .

I will assume that there are two main ways in which a plurality of entities can collectively fill a region of space. According to the first—more standard—way, the fact that the xx collectively fill r can be traced back to facts concerning singular pervasive location. In this case, the xx collectively fill r because r is part of the fusion of all the regions at which each of the xx is exactly located and r overlaps each of such regions (see, for instance, Figure 1). The second, non-standard, way of collectively filling a region is, instead, *irreducible* to facts about singular location and happens when no subregion of r is free of *any* of the xx and yet r is *not* part of the fusion of the exact locations of the xx . When this is the case, the fact that the xx collectively fill r is an *irreducibly plural* locative fact.

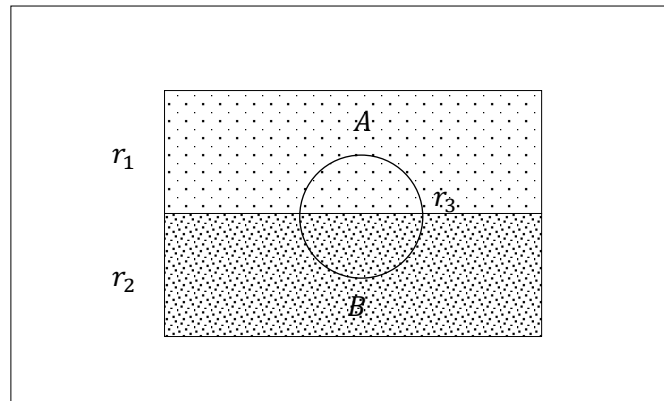


Figure 1

A is exactly located at r_1 . B is exactly located at r_2 .
 r_3 is part of the fusion of r_1 and r_2 . A and B collectively fill r_3

Irreducibly plural pervasive location is what happens in the case of a gunky Spritz. The gunky water and the gunky wine *collectively* fill the gunky glass (or better: the region r that is enclosed by the glass), so that neither the water nor the wine fill the glass *by themselves*. Only the gunky Spritz fills the glass by itself. However, not only do the wine and the water collectively fill r , they also collectively fill every subregion of r .

⁸ On multigrade predicates, see Oliver and Smiley (2004).

Also, there is no subregion of r that is filled only by water or only by wine. In a gunky Spritz the water and the wine are, thus, mixed *through and through*.

On the background of a classical mereology of regions of space—entailing, thus, that that space is not ‘junky’ (or ‘knuggy’; see Parsons 2007: 209), and thus, that there is a maximal region of space that is the fusion of every region—I will say what follows:⁹

(i) an entity x *helps fill* a region r if and only if there is some plurality of entities yy such that the yy collectively fill r and x is one of the yy :

$$(14) \quad x@_{>}^p r =_{df} \exists yy (yy@_{>} r \wedge x < yy) \quad \textbf{Partial Pervasive Location}$$

(ii) x is *omnipresent* at a region r if and only if x helps fill every subregion of r :

$$(15) \quad xPr =_{df} \forall s (s \leq r \rightarrow x@_{>}^p s) \quad \textbf{Omnipresence}$$

(iii) x is *maximally omnipresent* at a region r if and only if x is omnipresent at r and r is the biggest region containing r at which x is omnipresent (more precisely: if and only if x is omnipresent at r and, for every region s , if x is omnipresent at s and s has r as a part, then s is identical to r):

$$(16) \quad xMr =_{df} xPr \wedge \forall s ((xPs \wedge r \leq s) \rightarrow r = s) \quad \textbf{Max. Omnipresence}$$

(iv) x is *exactly located* at r if and only if x fills r and r is the biggest region containing r that is filled by x (more precisely: if and only if x fills r and, for every region s , if s is filled by x and has r as a part, then s is identical to r):

$$(17) \quad x@r =_{df} x@_{>} r \wedge \forall s ((x@_{>} s \wedge r \leq s) \rightarrow r = s) \quad \textbf{Exact Location}$$

(v) x is *entirely located* at r if and only if there is some region s such that x is maximally omnipresent at s and s is part of r :

$$(18) \quad x@_{<} r =_{df} \exists s (xMs \wedge s \leq r) \quad \textbf{Entire Location}$$

(vi) x is *weakly located* at r if and only if there is some region s such that x is maximally omnipresent at s and s overlaps r

$$(19) \quad x@_o r =_{df} \exists s (xMs \wedge s \circ r) \quad \textbf{Weak Location}$$

(vii) the xx are *all in* r just in case each of the xx helps fill some subregion of r

$$(20) \quad xxINr =_{df} \forall x (x < xx \rightarrow \exists s (s \leq r \wedge x@_{>}^p s)) \quad \textbf{All-In}$$

⁹ The requirement that the space not be junky is needed to validate the principle according to which and entity x fills some region of space only if it has an exact location. For some discussion of the possibility of junky space see Parsons (2007: 209).

(viii) the xx cover r if and only if every subregion of r is such that some of the xx helps fill it:

$$(21) \quad xxCOVr =_{df} \forall s (s \leq r \rightarrow \exists x (x < xx \wedge x@_{>s})) \quad \text{Cover}$$

(ix) the xx are *all pervasively in* a plurality ss of regions just in case each of the xx fills some of the ss :

$$(22) \quad xxIN_{>ss} =_{df} \forall x (x < xx \rightarrow \exists s (s < ss \wedge x@_{>s})) \quad \text{All-P-In}$$

(x) the xx *pervasively cover* a plurality ss of regions if and only if each of the ss is filled by some of the xx :

$$(23) \quad xxCOV_{>ss} =_{df} \forall s (s < ss \rightarrow \exists x (x < xx \wedge x@_{>s})) \quad \text{P-Cover}$$

Furthermore, I will assume the following three axioms. According to the first, if a region r is the fusion of some regions ss and the xx are all pervasively in the ss and also pervasively cover the ss , then the xx collectively fill r (' $f(ss)$ ' stands for 'the fusion of the ss '):¹⁰

$$(24) \quad \exists ss (xxIN_{>ss} \wedge xxCOV_{>ss} \wedge r = f(ss)) \rightarrow xx@_{>r} \quad \text{Axiom 1}$$

According to the second, a plurality xx of entities fill a region r only if the xx are all in r and cover r .

$$(25) \quad xx@_{>r} \rightarrow (xxINr \wedge xxCOVr) \quad \text{Axiom 2}$$

According to the third, if x fills a region r , then x fills each of its subregions:

$$(26) \quad x@_{>r} \rightarrow \forall s (s \leq r \rightarrow x@_{>s}) \quad \text{Axiom 3}$$

Axiom 1 takes care of the standard cases of plural pervasive location, as the one depicted in Figure 1 (just consider the plurality of the 'northern' and 'southern' hemispheres of r_3). Instead, according to **Axiom 2**, a plurality of entities xx fill a region r only if the xx are all in r and cover r . The standard case of collective pervasive depicted in Figure 1 clearly complies with this requirement. In that case, r is part of the fusion of the exact locations of the xx (which guarantees that the xx cover r) and overlaps each of their exact locations (which guarantees that the xx are all in r). However, **Axiom 2** is also compatible with the non-standard case of collective pervasive location, according to which we have that the xx collectively fill *every* subregion of r :

$$(27) \quad xx@_{>r} \wedge \forall s (s \leq r \rightarrow xx@_{>s})$$

¹⁰ I assume here that x is the fusion of the yy if and only if (i) the yy are all parts of x , and (ii) every part of x overlaps some of the yy . Notice that classical mereology (which I am assuming to hold for regions of space) guarantees not only that the fusion of the ss exists, but also that it is unique.

In fact, if the xx fill every subregion of r , then they all clearly also help fill some subregion of r , and every subregion of r is such that some of the xx helps fill it. I will label this theory ' $xx@>S$ '.

Before moving further, it may be useful to consider the following objection to $xx@>S$:¹¹

Objection. Suppose that (i) A fills r_1 , (ii) B doesn't fill any part of r_1 , and that (iii) C is the mereological sum of A and B . C clearly fills r_1 . Therefore, A and B collectively fill r_1 . B helps, thus, fill r_1 . By generalization, every entity helps fill any filled region of space.

This argument relies implicitly on the following principle, according to which if the *fusion* of the yy fills a region, then the yy *collectively* fill that region:

$$(P?) \quad (x = f(yy) \wedge x@>r) \rightarrow yy@>r$$

However, not only (P?) is not a theorem of $xx@>S$, but what this objection actually shows is precisely that this is how it should be. Recall that according to the notion of pervasive location assumed by $xx@>S$ when a plurality of entities collectively pervade a region of space each of them 'gives its contribution', so to speak. Consider, then, again Figure 1 and suppose that A and B fuse a third entity C . C fills r_1 . However, it is clearly *not* the case that A and B taken together fill r_1 . B has nothing to do with r_1 , which is a region of space that is completely free of B . Therefore, in the scenario depicted in the objection, not only there is no pressure on the part of $xx@>S$ -theorists to accept that, since C fills r_1 , then also A and B taken together fill r_1 , but $xx@>S$ -theorists appear to be perfectly in position to deny that A and B taken together fill r_1 .

According to $xx@>S$, the situation described by (27) is what happens with water and wine in the case of a gunky Spritz. In a gunky Spritz neither the water nor the wine are able to fill by themselves the region r that is the interior of the gunky glass

$$(28) \quad \sim water@>r \wedge \sim wine@>r$$

However, not only they collectively fill the interior region of the glass, they also collectively fill each of its subregions, even if there is *no* region they are capable to fill by themselves:

$$(29) \quad (water, wine)@>r$$

$$(30) \quad \forall s(s \leq r \rightarrow (water, wine)@>s)$$

$$(31) \quad \sim \exists s(water@>s) \wedge \sim \exists s(wine@>s)$$

Given **Exact Location** it follows from (31) that neither the water nor the wine has an exact location:

$$(32) \quad \sim \exists s(water@s) \wedge \sim \exists s(wine@s)$$

¹¹ Many thanks to an anonymous referee for this Journal for pressing me on this objection.

However, we have from (30) that both the water and the wine are omnipresent at each subregion of r :

$$(33) \quad \forall s(s \leq r \rightarrow \text{waterPs} \wedge \text{winePs})$$

Therefore, assuming that r is the biggest region the water and the wine fill, it also follows from (30) and **Weak Location** that both the water and the wine are weakly located at every subregion of r :

$$(34) \quad \forall s(s \leq r \rightarrow \text{water@}_o s \wedge \text{wine@}_o s)$$

Notice, however, that since the Spritz fills r by itself and, as we are assuming, r is the biggest region filled by the Spritz, it follows from **Exact Location** that the Spritz is indeed exactly located at r

$$(35) \quad \text{Spritz@}r$$

As it is easy to check, (28)-(35) characterise exactly the situation described in the passage of Parsons (2007) quoted above concerning Nolan's (2006) 'Stoic gunk'.

4. Comparison with Parsons's @S

The first thing to notice is that, contrary to Parsons's @S, $xx@_>S$ actually entails **Functionality**. Suppose, for *reductio*, that x is exactly located at more than one region. By **Exact Location** x fills each of the regions at which it is exactly located. By **Axiom 1** x also fills their fusion.¹² Therefore, at least one of the regions at which x is exactly located is a proper part of a region that x fills, thus contradicting **Exact Location**.

$xx@_>S$ doesn't validate **Exactness**, as it is witnessed by the case of the water and the wine composing the gunky Spritz. However, it validates a very similar principle, which we may call '**Precision**', according to which if an entity has a weak location, then there is a region at which it is maximally omnipresent:

$$\textbf{Precision} \quad \exists r(x@_o r) \rightarrow \exists r(xMr)^{13}$$

Similarly, $xx@_>S$ clearly invalidates the bi-conditionals corresponding to Parsons's (1)-(3):

$$(36) \quad x@_<r \leftrightarrow \exists s(x@s \wedge s \leq r)$$

$$(37) \quad x@_>r \leftrightarrow \exists s(x@s \wedge r \leq s)$$

$$(38) \quad x@_o r \leftrightarrow \exists s(x@s \wedge s \circ r)^{14}$$

¹² In this case the relevant xx are the plurality of entities that are identical to x (which is an 'improper plurality' of entities).

¹³ **Precision** follows directly from **Weak Location**.

¹⁴ The water and the wine composing a gunky Spritz are counterexamples to the left-to-right directions of (36)-(38).

However, $xx@>S$ validates the corresponding principles featuring the notion of maximal omnipresence in place of exact location:

$$(39) \quad x@<r \leftrightarrow \exists s(xMs \wedge s \leq r)$$

$$(40) \quad x@>r \leftrightarrow \exists s(xMs \wedge r \leq s)$$

$$(41) \quad x@_o r \leftrightarrow \exists s(xMs \wedge s \circ r)^{15}$$

This should be a welcome result for friends of Parsons's system $@S$, as the notion of a maximal region of omnipresence and the notion of an exact location appear to be very close. Notice, in fact, that it follows from both the fact that an entity x is exactly located at a region r and the fact that x is maximally omnipresent at r that (i) the complement of r is free of x , while (ii) none of r 's subregions is free of x . Both in the case of exact location and maximal omnipresence we have, thus, that the region at which x is exactly located/maximal omnipresent is such that x can be found *everywhere inside* the region and *nowhere outside* of it, so to speak.¹⁶ It seems, thus, that **Precision** and (39)-(41) can adequately account for the intuitions behind **Exactness** and (36)-(38). Therefore, friends of Parsons's system $@S$ should find $xx@>S$ at least similarly appealing.

5. Conclusion

The possibility of the kind of mixture displayed by a gunky Spritz has been deemed to be problematic in the literature. Parsons (2007) sees in it a threat to **Exactness** and his system $@S$. Leonard (2014) takes it to be expressible only at the cost of accepting multiple primitive locative notions and brute metaphysical necessities. However, if what I have argued in this paper is on the right track, the theory of location that I have labelled ' $xx@>S$ '—which takes pervasive location as its only primitive notion—is perfectly able to both express the possibility of gunky Spritz and to validate principles like **Precision** and (36)-(38) which appear to be sufficiently close to the central principles of Parsons's $@S$. *Salute!*

References

- Gilmore, C. (2018). Location and Mereology. *The Stanford Encyclopedia of Philosophy* (Fall 2018 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2018/entries/location-mereology/>.
- Leonard, M. (2014). Locating Gunky Water and Wine. *Ratio* 27(3): 306-315.
- Nolan, D. (2006). Stoic Gunk. *Phronesis* 51(2):162-183.
- Oliver, A., and T. Smiley (2004). Multigrade Predicates. *Mind* 113: 609–81.
- Parsons, J. (2007). Theories of Location. *Oxford Studies in Metaphysics* 3: 201-32.

¹⁵ (39) and (41) follow directly from **Entire Location** and **Weak Location**. (40) follows from **Maximal Omnipresence** and classical mereology.

¹⁶ An important difference between a case of exact location and a case of maximal omnipresence is that only in the case in which x is exactly located at a region r it follows that x also fills r , while, as we have seen, x can be maximally omnipresent at r without filling it.