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Diving into the Wreck:
Embodied Experience in the Interpretation of Allegory

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Abstract

Diving into the Wreck:
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Lacey Okonski

Allegory refers to a narrative that can be interpreted to reveal an additional layer of symbolic meaning beyond what appears on the surface. More specifically, an *embodied allegory* is created when the target domain is never explicitly mentioned and the source domain draws upon embodied concepts. For example, the poem, "Diving Into the Wreck," by Adrienne Rich, describes a scuba diver going down to explore a wrecked ship. Although the poem describes the diverse, specific actions, it also invites an allegorical interpretation in which the investigation of a wrecked ship symbolically represents one person's look back at a past failed romantic relationship. The present studies investigate whether ordinary readers are capable of inferring allegorical messages when reading Rich's poem and how they might do so. Two studies prompted participants to think of the poem in a literal way (as though the poem is about scuba diving), in a particular metaphoric way (as though the poem is about a failed relationship), in a general metaphoric way (as though the poem has multiple valid meanings), or with no prompt (in a control condition participants saw no prompt). In general, the data suggests that participants could interpret the allegorical messages in the Rich poem, not through abstract, disembodied processes, but rather through embodied simulations. These results are considered in relationship to current theories in cognitive science on conceptual metaphor and allegory. I argue that allegorical interpretation is not limited to formal analyses done by literary scholars. Instead, the embodied simulations that are a fundamental trait of human

cognition drive allegorical interpretation. The same resources used to reason about action and perception are used to comprehend both everyday language as well as poetic instances of allegory.

Keywords: allegory, conceptual metaphor theory, embodied simulation, literary response

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An Introduction to Embodied Allegory

Life is filled with many journeys. There are the physical kinds that we encounter when we travel and also more abstract journeys where we monitor our progress in a variety of other domains. When Robert Frost was at the beginning of his career as a poet he spent much time walking through the forest with his dear friend, Edward Thomas. On these long walks they would sometimes discuss where their lives were heading, their hopes and aspirations as unknown writers, and which way they should walk next. It is rumored that Frost wrote one of the most famous poems of our time, "The Road Not Taken," to gently poke fun at his friend's moments of indecision during these walks that Frost himself called "talks-walking" (Hollis, 2011). Sadly, Thomas took this poem and its allegorical message very seriously. In a moment of decisiveness, Thomas enlisted for the war and was subsequently killed in a battle in France. Read the poem below and take special note of how a mundane activity like going for a walk can have strong psychological effects when it is used as a symbolic tool in an allegorical context:

> Two roads diverged in a yellow wood,
> And sorry I could not travel both
> And be one traveler, long I stood
> And looked down one as far as I could
> To where it bent in the undergrowth;
>
> Then took the other, as just as fair,
> And having perhaps the better claim,
> Because it was grassy and wanted wear;
> Though as for that the passing there
> Had worn them really about the same,
>
> And both that morning equally lay
> In leaves no step had trodden black.

Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.

In this poem, the metaphorical journey theme comes alive because of the specificity, elaboration, and attention to detail, which invites readers to consider a symbolic message beyond a simple story about taking a walk through the woods. This metaphorical message could be about a job, about a relationship, about buying a house, about going on a diet, or about making decisions in life more generally. How do ordinary readers understand that the poem is allegorical when there is no mention of the larger symbolic theme?

Allegory Interpretation

"Allegoresis is our imaginative projection into other minds and worlds, and is 'cognitive' precisely because much abstract cognition is inherently embodied and imaginative."

(Gibbs, 2011)

There is a popular folk notion that many people simply aren't gifted at poetic interpretation because they cannot understand linguistic symbolism. Frost once commented on having access to these literary gifts when he said: "It's only if you're good at it that I'm talking to you. If you haven't been, I don't want you to be let in on any figures I ever made, don't want any teacher to let you in on me." (Frost, 1953). Frost might be quite right that some scholars are able to do a more nuanced analysis

of the poem, yet his embodied allegory remains one of America's most loved poems (Kettle, 2001). Robert Pinsky's "Favorite Poem Project[1]" caught the attention of over 18,000 Americans (with an impressive age range of 5-97 years old). These ordinary people submitted video readings and explanations about their favorite poems and Robert Frost's "Road Not Taken" came in first place. This overwhelming popular response to the Frost poem suggests that many people enjoy reading this poetic allegory and find its symbols accessible. In spite of Frost's idealization of his audience, and contrary to the popular notion that average people can't understand poetry, this allegory has proven accessible to ordinary readers. Yet the actual interpretation of allegory still remains a mysterious process.

Some empirical work has shown that people can use their embodied knowledge to understand allegory. Participants in one study read one of two allegorical poems: Robert Frost's "The Road Not Taken" and Maxine Kumin's "Ars Poetica: A Found Poem" (Gibbs & Boers, 2005). Each participant wrote out their interpretations for each three-line segment of the poem, and afterward wrote out their understanding of the complete poem. An analysis of these written protocols showed that participants frequently understood the metaphorical and allegorical meaning of the poems. For instance, one participant interpreted the Frost poem first in terms of the literal surface meaning and then metaphorically: "The traveler, in making this tough decision, contemplates for a long time which path to follow. This could be interpreted as a struggle or challenge in one's life, where one must decide which is the better path or way to go" (ibid). Participants rarely included personal,

[1] http://www.favoritepoem.org/project.html

idiosyncratic information in their interpretations. These data suggest that participants were quite good at tapping into the allegorical themes implied by the embodied imagery contained in the poems.

In another study that focused on embodied allegory (Gibbs & Blackwell, 2012), participants were asked to read the following allegorical story, taken from a contemporary novel, where a poet/author likens his writer's block to climbing an insecure ladder:

"I wish I could spill forth the wisdom of twenty years of reading and writing poetry. But I am not sure I can... Now it's like I'm on some infinitely tall ladder. You know the way that old aluminum ladders have the texture, that kind of not too appealing roughness of texture, and that kind of cold gray color? I'm clinging to this telescoping ladder that leads up into the blinding blue. The world is somewhere very far below. I don't know how I got here. It's a mystery. When I look up I see people climbing rung by rung. I see Jorie Graham. I see Billy Collins. I see Ted Kooser. They're all clinging to the ladder too. And above them, I see Auden, Kunitz. Whoa, way up there. Samuel Daniel, Sara Teasdale, Herrick. Tiny figures clambering, climbing.

"The wind comes over, whsssew, and its cold, and the ladder vibrates, and I feel very exposed and high up. Off to one side there's Helen Vendler, in her trusty dirigible, filming our ascent. And I look down and there are many people behind me. They're hurrying up to where I am. They're twenty-three-old energetic climbing creatures in their anoraks and goggles, and I'm trying to keep climbing. But my hands are cold and going numb. My arms are tired to tremblement. It's freezing, and it's lonely, and there's nobody to talk to. And what if I just let go? What if I just loosened my grip, and fell to one side, and just — ffffshhhoooooww. Let go.

"Would that be such a bad thing?"
(Baker, 2009)

Participants were then asked to answer a series of 10 questions, nine of which were about specific phrases from the poem describing climbing the ladder and one question asking people to describe their own bodily sensations when they were reading the poem. For example, when asked to "Please describe what an 'infinitely tall ladder' refers to or represents" 62% of participants described the poet's path to

success, the poet's job as a never ending journey, or where the end is never in sight. When participants were asked to reason about why the poet/editor was trying to climb the ladder, 45% of the replies indicated that he was trying to become a great poet or to reach the status of a great poet in heaven. The poet was clinging to the ladder because, according to the participants in this study, he realized that it never ends, that he was not really going anywhere, and that it is hard to achieve success as a poet (25%) or because he had not yet reached his full potential as a poet and was fearful of losing his career, knowledge and creativity (23%). Participants also answered 3 questions about metaphorically interpreting the importance of poets based upon their vertical positions on the ladder. They answered two forced choice questions about which poet was more famous: 1. Graham or Auden 2. Kooser or Kunitz? Participants showed a high proportion of agreement that Auden (91%) and Kunitz (95%) were the more famous poets. A third question asked participants a how they knew which poet was more famous and many participants (79%) noted that the poet's respective positions on the ladder was indicative of how famous they are so that the poets who were higher on the ladder were also further up. The data also showed that participants interpreted Helen Vendler to be filming the ascent because she is a filmmaker, documentarian of some sort (36%), or a critic (32%) and that the other people on the ladder were other poets, the next generation of poets, or poets who had not yet been defeated (89%). Finally, participants interpreted "loosening his grip" and possible "falling to one side" as references to writing the introductory essay (32%) or giving up writing the introductory essay (16%).

These data show that participants were able to construct allegorical interpretations with some consistency. Climbing upwards and pondering what might happen if the author would fall off of the ladder were mapped, respectively, onto the allegorical acts of becoming a famous poet and possibly giving up on that endeavor while encountering writer's block. Participants in this experiment could easily decide who the more famous poets were, not because they had prior knowledge, but because they all have the fundamental ability to reason about abstract concepts in a metaphorical way. They embraced embodied source domains like verticality to infer underlying metaphorical themes like UP IS GOOD and UP IS MORE which were consistent with their interpretations that the more famous poets are further up on the ladder and also with the idea that if the poet can climb higher he can achieve more success.

At the end of the questionnaire, participants were asked to explicitly reflect on any bodily sensations they experienced when reading the passage. Participants indicated a high agreement of physiological reports (45% mentioned a physical property of the ladder, 41% mentioned the fear of the height or the potential of falling) and a moderate agreement of emotional feelings associated with the passage (feeling lonely, anxious, stressed out).

These data reflect the overall ability to understand the surface meaning about the physical experience of what it is like to climb a scary ladder, and recognize the abstract meaning in which climbing the ladder is a parallel to success in one's writing career. Participants showed coherence in the way they interpreted the embodied features of the ladder (e.g. verticality), consistency in the types of embodied

simulations they were having (e.g. being scared of falling on a shaky ladder) and consistency in the associated feelings these embodied situations were likely to evoke (a sense of fear, stress, or anxiety). Even if some of the participants were not always able to verbalize the particular embodied elements they were using in order to create their abstract allegorical interpretations, they still showed implicit knowledge of the metaphorical mappings between the difficulties of ladder climbing and success/failure in one's career.

Language Comprehension and Embodied Simulation

The fact that participants in the previously mentioned studies were able to tap into some of the embodied elements and abstract meanings when reading literature supports the idea that they are using embodied simulations to infer allegorical meanings. Embodied simulation refers to the idea that "we understand language by simulating in our minds what it would be like to experience the things that language describes" (Bergen, 2012, p. 13). Even when people are not engaging in overt action, they automatically and imaginatively employ their bodily resources to create an interpretation of a given text or speech sample (Gibbs, 2006).

Psycholinguistic and cognitive neuroscience research provides evidence in support of this idea. For example, one study presented people with sentences such as "The carpenter hammered the nail into the wall." After reading the sentence, participants were shown a picture of an object, such as a nail or elephant, and asked to quickly judge whether that object was mentioned in the sentence. Of course, people quickly say, "yes" to the picture of a nail and "no" to the elephant. The primary interest, however, was with speeded responses to the nail picture, depending on

whether it was shown in a horizontal or vertical orientation. Research indicates that people, on average, were faster to make their "yes" decisions when the picture was in the same spatial orientation as implied by the sentence they just read (Stanfield & Zwaan, 2001). Thus, people are faster to say "yes" when the picture showed the nail in the horizontal orientation than when it was shown upright, or in the vertical position. However, when people first read the sentence "The carpenter hammered the nail into the floor," they were faster, on average, to say "yes" to the nail picture that presented it in a vertical position than when seen in the horizontal orientation. This pattern of results suggests that participants are simulating the implied orientation of objects when they are interpreting sentences.

In a similar study, Zwaan and colleagues found that when participants read sentences about an eagle in a nest they were quicker to verify an eagle with its wings tucked. Likewise when they read a sentence about an eagle in the sky participants were quicker to verify an eagle with its wings spread (Zwaan, Stanfield, & Yaxley, 2002). Once again, people are simulating the shapes of objects when they process language. These results suggest that simulations are dynamic because participants do not prefer any depictions of a nail or eagle equally, they prefer the depictions of the nail and the eagle that match the linguistic context that they just read. In this way, simulations are dynamic and context sensitive. The context provides nuanced information and these contextual details are incorporated in simulations. People do not access static representations of "eagle" or "nail" concepts in their mental lexicon, they create specific simulations based on the details of their current linguistic contexts.

In a similar line of inquiry, cognitive neuroscience researchers tested to see whether action verbs create body specific neural simulations (Hauk, Johnsrude & Pulvermueller, 2004). Participants were asked to engage in a passive reading task. Hemodynamic response was collected using event related fMRI. Participants showed increased activation in the motor and premotor cortex in body specific areas when they read body specific action verbs so that when they read words like "lick" the areas showing increased hemodynamic response overlapped with the areas of the motor and premotor area which were previously determined to control mouth related action. This experiment illustrates that simply reading a word can activate embodied simulations even when the body itself is not in action. Previous, entrenched knowledge of the body in action contributes to people's embodied understandings of action verbs.

This brief sample of studies is representative of a new trend in cognitive psychology to view language comprehension as a multi-modal, constructive process that relies on embodied simulations as a means of semantic grounding (Bergen, 2012; Gibbs, 2006). Traditional theories of language comprehension posit that language is an amodal, modular process (Fodor, 1983). Still, the question remains: How do people create embodied simulations for abstract, metaphorical language? Some scholars have rejected the embodied simulation view of language understanding because they doubt that people can ever create embodied simulations of language referring to abstract events (Mahon & Caramazza, 2008; McGlone, 2007; Rakova, 2006).

In contrast, cognitive linguistics research has demonstrated that metaphoric language, rather than being a deviant, indirect way to communicate, reflects an embodied way to ground abstract concepts (Gibbs, 2006; Lakoff & Johnson, 1999). The embodied, experiential domain, also known as a *source domain*, helps structure the usually more abstract, and difficult to define *target domain*. Imagining what it is like to walk through the woods serves as an embodied source domain to better understand the more abstract target domain of life and our life decisions. This systematic process, where the facts about a physical source domain (e.g. a physical journey through the forest) are applied to an abstract target domain (e.g. decisions about how to proceed in life) to create a complex set of metaphorical entailments is known as source-to-target domain mapping. For example, having two paths on a physical journey can create a moment of indecision if you do not know which path leads to the desired destination. This can be mapped onto difficult life decisions because having two options can be like choosing between paths and having difficulty knowing which choice will lead to a better outcome can be a lot like not being able to see where each path leads. The physical limitations of not being able to explore both paths at once and not being able to visually see where each path leads are mapped onto other more abstract mental struggles that one might have in life. People often note that their love relationships "aren't going anywhere," that they "are having a rough time," or that "they might go their separate ways." These concrete elements of a journey allow speakers to talk about abstract topics in a structured way.

Several lines of experimental research support the claim that people can readily draw embodied source-to-target domain mappings when interpreting

metaphorical language. For example, in one set of studies, participants heard one of the two following stories about either successful or difficult romantic relationships (Gibbs, 2013):

> Story A: Successful Relationship
>
> Imagine that you are a single person. A friend sets you up on a blind date. You really like this person and start dating a lot. ***Your relationship was moving along in a good direction***. But then it got even better. The relationship felt like it was the best you ever had. This continues to this day. No matter what happens, the two of you are quite happy together.
>
> Story B: Difficult Relationship
>
> Imagine that you are a single person. A friend sets you up on a blind date. You really like this person and start dating a lot. ***Your relationship was moving along in a good direction***. But then you encounter some difficulties. The relationship did not feel the same as before. This lasted for some time. No matter how hard you two tried, the two of you were not getting along.

Both stories referred to the embodied metaphor "Your relationship was moving along in a good direction*,"* which was motivated by the embodied conceptual metaphor RELATIONSHIPS ARE JOURNEYS. This conceptual metaphor utilizes the embodied activity of taking a journey through time and space to describe the source domain of love relationships. After reading one of these stories, participants were blindfolded and asked to walk, or imagine walking, to a tennis ball, 40 feet away, while thinking about the story they just heard. Results showed that those who heard the successful relationship story walked (15.7 sec) and imagined walking (11.4 sec), longer than did people who heard the unsuccessful story (12.8 sec and 9.5 seconds respectively).

When participants heard metaphorical stories about successful relationships they implicitly imagined that the people involved in the relationship moved in similar trajectories, travelled further, and travelled in a straighter line causing them to walk faster as if they too were on a smooth, successful trajectory.

These differences were not found when people heard non-metaphorical stories in which the statement "Your relationship was moving along in a good direction," was replaced with "Your relationship was becoming very important to you," an expression that does not imply the same kind of embodied movement. It appears, then, that people are simulating the physical, embodied information associated with the source domain when understanding the linguistic instantiations of conceptual metaphors in a discourse context. The activation of the source domain JOURNEY changed the way participants walked or imagined walking while they were still thinking about the story. Those who were simulating a more challenging journey did not walk or imagine walking as far as those who were simulating a smoother trajectory.

Another test of the embodied simulation hypothesis examined people's speeded understanding of metaphorical phrases such as "grasp the concept" (Wilson & Gibbs, 2007). Participants first learned to associate particular symbols with particular bodily actions. For example, when they saw the symbol (") they learned to produce a grasping movement. After this training phase, participants then sat in front of a computer, saw an icon, enacted the action, and then were presented with a metaphoric statement to understand as quickly as possible. The results showed that making, or imagining making, a relevant body action (e.g., a grasping motion)

facilitated the time it took people to read and understand the metaphorical statements. Even if people are unable to physically grasp a concept, engaging in relevant body actions primes the construction of an embodied simulation to infer the metaphorical meaning of "grasp the concept." Neuroscience work also showed activation in the motor system of participants' brains when they read both literal (e.g., "grasped the stick") or metaphorical (e.g., "grasped the idea") statements (Desai et al., 2012), which offers additional evidence that embodied simulations may be the foundation of our understanding of metaphorical meanings.

These results further suggest that metaphor comprehension is embodied and dynamic. Not only are embodied neural resources activated when metaphorical phrases are accessed as the neuroscience results suggest (ibid.), but this also indicates that there is a dynamic relationship between bodily experiences, mental simulation, and metaphorical comprehension. Real and imagined bodily movements prime metaphor comprehension. It is not the case that the participant discretely activates the conceptual metaphor only once they read the metaphor with no influence from previous context. Their enactment or their imagined enactment of related bodily action primes them to understand the metaphor and increases the fluidity with which they can engage in metaphoric language processing. Again this work suggests that simulations associated with metaphoric thought are not static, discrete representations that we access the same way every time. Rather, context plays a crucial role in the embodied simulation process.

These experimental results suggest that embodied conceptual metaphors play an important role in people's interpretation of metaphorical language. Still, how do

people infer metaphorical meanings for language that does not explicitly mention a target concept? Once again, there is no reference to life or life decisions more generally in the Frost poem. Can people still construct embodied metaphorical simulations to interpret allegorical texts? My thesis explored this question through four main experimental studies. These studies specifically examined three different empirical hypotheses.

Hypothesis 1: The Traditional View

Just as Frost hypothesized that average people aren't good at interpreting symbols (1953) psychologists have traditionally suggested that people are generally poor at constructing simple logical analogies (Gick & Holyoak, 1983). Only when people are given blatant clues can they construct the analogical relationships that are necessary to map the surface meaning of allegorical text to the deeper symbolic relationships. Based on their experimental studies, Gick and Holyoak conclude, "It is thus no easy matter to spontaneously notice an analogy between two superficially dissimilar situations, even in our highly simplified experimental paradigm." If constructing logical analogies is the basis for metaphor comprehension (Miller, 1979), then ordinary people should not be good at interpreting allegory. This position is also consistent with many theories of literary interpretation, which maintain that only skilled readers should be capable of understanding complex texts with diverse symbolic and aesthetic messages.

Hypothesis 2: The Conceptual Metaphor View

This hypothesis suggests that people should be capable of understanding allegorical messages given their tacit knowledge of conceptual metaphors.

Conceptual metaphors are cognitive devices responsible for networks of metaphor used frequently in everyday language and this idea has been supported by linguistic evidence (Lakoff & Johnson, 1980). For example, people often talk about love as a journey (where is this relationship going? We are going through a rough time.), anger as heated fluid in a container (I'm pissed off. She looks like she is going to explode.), and sadness as being oriented down (I'm feeling so depressed. What is bringing you down?). The presence and ubiquity of these mundane metaphors organized around embodied themes is widely recognized by metaphor scholars, even opponents of conceptual metaphor theory (McGlone, 2007). In contrast to the traditional assumptions of metaphor as a disembodied, rhetorical device, there have been a variety of empirical findings that suggest that embodied conceptual metaphors are activated during metaphoric thought processes. The results described earlier from Gibbs (2012) and Wilson & Gibbs (2007) provide such empirical support that people are influenced by conceptual metaphors when they process metaphorical language. Participant's bodily actions were primed by linguistic instantiations reflecting the underlying conceptual metaphor LOVE IS A JOURNEY (Gibbs, 2012). Conversely, participant's bodily actions, when they matched the action implied by a metaphoric phrase, facilitated comprehension (Wilson & Gibbs, 2007).

This evidence suggests that conceptual metaphors are not merely linguistic. Conceptual metaphors are not isolated or idiosyncratic but rather they are systematic expressions that reflect underlying, systematic, embodied, metaphorical concepts (Lakoff & Johnson, 1980). Instead of being dead, these are the metaphors that we

"live by" (ibid.) reflecting a mode of thought "used constantly and automatically, with neither effort nor awareness" (Lakoff, 1993).

According to Conceptual Metaphor Theory (henceforth CMT), participants should be able to understand the metaphoric interpretation of the allegorical poem by automatically accessing a single conceptual metaphor in a very coarse manner: complete activation or no activation at all. Secondly, metaphorical themes should be clearly organized around one single conceptual metaphor at a time. Participants should easily access embodied concepts in their reasoning about the allegorical poem by activating one conceptual metaphor at a time, activating the mapping pattern that is characteristic of CMT: a one-to-one correspondence from target to source domain.

Hypothesis 3: The Embodied Simulation View

CMT has been criticized by many metaphor scholars as being too singular and prescriptive. One critic referred to this theory as "the barren pigeonholing of metaphor" (Tsur, 1999). In other words, it encourages stock responses to metaphorical discourse and ignores the nuances of context. Two other potentially problematic issues have also been noted: The first is the singularity assumption or the assumption that "single conceptual metaphors underlie the meaning of individual statements" (Gibbs & Santa Cruz, 2012, p. 301). The second is the discreteness assumption that "complete conceptual metaphors are accessed and then 'turned off' when applied to understanding verbal metaphoric utterances" (ibid).

The embodied simulations view takes a dynamic perspective to metaphorical comprehension so that conceptual metaphors are not discretely stored, pre-assembled source-to-target mappings that are accessed the same way every time. Instead,

allegorical interpretation arises from ongoing simulations that are freshly constructed each time a person engages in metaphoric thought. This view can be summarized as follows: "We do not first understand the poem through abstract, purely symbolic means and then react to this (i.e., emotionally and aesthetically). Rather, allegory emerges from simulation processes, and is "soft assembled" in the moment of experience depending on state of person, environment and task" (Gibbs, 2011). In contrast to the traditional perspective, this view asserts that humans naturally have an *allegorical impulse* whereby they relate abstract concepts to enduring embodied experiences. Furthermore, in contrast to CMT, these metaphorical mappings are assembled in the moment of experience (i.e. soft assembly) instead of accessing the exact same conceptual knowledge, as if it were a static chunk of information.

Here I argue that the embodied simulations, custom-made during the interpretation of an allegorical poem, are creative, nuanced, and soft assembled in the moment. Although there may be enduring metaphoric themes, such as LOVE IS A JOURNEY, as suggested by previous empirical work (Gibbs, 2012), more work is needed to look at the way that metaphorical thought emerges in nuanced ways. If this metaphorical thought does rely on embodied simulations, participants should engage in allegorical interpretations of the whole poem, but they may not necessarily organize their interpretations around pre-fabricated conceptual metaphors, one at a time. Participants should show evidence of multiple partially activated, source domains that work dynamically instead of displaying a one-to-one source-to-target mapping pattern. Second, participants should construct a coherent narrative of the entire poem so that, instead of a single conceptual metaphor being activated one at a

time, participants are able to construct a blend of source domains that enables them to describe different aspects of the narrative and simultaneously contributes to the overall, emergent, allegorical interpretation.

The Studies

To test these hypotheses, four studies were conducted. Participants read the following poem:

Diving into the Wreck

by Adreinne Rich

First having read the book of myths,
and loaded the camera,
and checked the edge of the knife-blade,
I put on the body-armor of black rubber
the absurd flippers
the grave and awkward mask.
I am having to do this
not like Cousteau with his
assiduous team
aboard the sun-flooded schooner
but here alone.

There is a ladder.
The ladder is always there
hanging innocently
close to the side of the schooner.
We know what it is for,
we who have used it.
Otherwise
it is a piece of maritime floss
some sundry equipment.

I go down.
Rung after rung and still
the oxygen immerses me
the blue light
the clear atoms
of our human air.
I go down.

My flippers cripple me,
I crawl like an insect down the ladder
and there is no one
to tell me when the ocean
will begin.

First the air is blue and then
it is bluer and then green and then
black I am blacking out and yet
my mask is powerful
it pumps my blood with power
the sea is another story
the sea is not a question of power
I have to learn alone
to turn my body without force
in the deep element.

And now: it is easy to forget
what I came for
among so many who have always
lived here
swaying their crenellated fans
between the reefs
and besides
you breathe differently down here.

I came to explore the wreck.
The words are purposes.
The words are maps.
I came to see the damage that was done
and the treasures that prevail.
I stroke the beam of my lamp
slowly along the flank
of something more permanent
than fish or weed

the thing I came for:
the wreck and not the story of the wreck
the thing itself and not the myth
the drowned face always staring
toward the sun
the evidence of damage
worn by salt and sway into this threadbare beauty
the ribs of the disaster
curving their assertion
among the tentative haunters.

This is the place.
And I am here, the mermaid whose dark hair
streams black, the merman in his armored body.
We circle silently
about the wreck
we dive into the hold.
I am she: I am he

whose drowned face sleeps with open eyes
whose breasts still bear the stress
whose silver, copper, vermeil cargo lies
obscurely inside barrels
half-wedged and left to rot
we are the half-destroyed instruments
that once held to a course
the water-eaten log
the fouled compass

We are, I am, you are
by cowardice or courage
the one who find our way
back to this scene
carrying a knife, a camera
a book of myths
in which
our names do not appear.

Like the Robert Frost poem utilized in previous work, "Diving into the Wreck" is an embodied allegory. Instead of walking through a forest and selecting what path to take, the embodied, surface meaning of this poem is about a single scuba diver embarking on a downward voyage into the dark sea to explore a wrecked ship. This lends itself not only to journey imagery but also to other aspects of the voyage like verticality and visibility. There is nothing in the poem that forces an allegorical reading, yet it is often interpreted in an allegorical manner. Adrienne Rich, well known for her feminist themes, weaves a complex tale with an androgynous protagonist looking back on a wreck that might symbolize disaster, trauma, or a voyage ended prematurely. Although this poem contains many familiar literary tropes—the hero, the quest, the search for treasure—it also captures a sense of trauma rather than victory at the end as she simultaneously appears to be the diver who keeps returning to the same scene as well as a drowned corpse, a water eaten log, and a fouled compass.

Rich's Diving Into the Wreck is notably more complex than Frost's The Road Not Taken. While Frost's poem is 4 stanzas with clear, simple language, Rich's poem consists of 10 stanzas entangled with various complex twists and turns that are more challenging to interpret upon a casual read. The reader must take note of many details and carefully weave them together to create an interpretation that can work globally for the entire poem and locally so that the details, stanza by stanza, line, by line, make sense within the framework of the overall interpretation. For example, the protagonist emphasizes certain items of importance such as a book of myths, a camera, and a knife. She claims to be both male and female. She compares the

wreck to "ribs of disaster curving their assertion among tentative hunters." These details are quite complex and ostensibly require more effort to process as compared to the simpler style utilized by Frost.

Many literary critics have looked beyond the surface of this poem to find allegorical interpretations that criticize old myths about gender.[2] Related interpretations include confronting disaster as a survivor and not a victim (Whitman, 1975), an exploration of female fantasy set in primal waters (Milford, 1975), and self-recognition, personal change, mythologizing and suppression of difficult emotions for an androgynous protagonist (Nelson, 1981). Yet, the poem is not limited to feminist interpretation. It could easily be about a failed relationship, the loss of a loved one, or a childhood trauma. Many interpretations use the embodied symbols set forth by Rich to find relevant, grounded ways of constructing allegorical meanings. The imagery used in this poem can even be applied metalinguistically to allegory itself: the reader must dive into the poem and search below the surface meaning of the scuba dive, go through these poetic obstacles, to find the deeper symbolic meaning. The hidden treasure amongst the wreck makes the awkward journey worth the dive into the deep, dark world of literary interpretation.

The Explicit Primes

The hypotheses were tested by offering participants different primes to frame how they understand the poem in particular ways. In one condition, the prime suggests the "literal" interpretation of the poem as a scuba adventure. Participants

[2]See: http://www.english.illinois.edu/maps/poets/m_r/rich/wreck.htm for excerpts from published analyses of "Diving into the Wreck"

were given the following instructions: “This poem is about a person going scuba diving to explore a sunken wreck.” This prompt encourages readers to look only at the surface value of the poem. Under the traditional view, this condition should be the easiest condition for participants to make some sense of the poem because they are not required to make abstract inferences about what the deeper symbolic meaning of the poem might be. Still, it will be interesting to see if participants spontaneously infer allegorical meanings despite the instructions to attend to literal aspects of the poem.

In a second prompt condition, the participants were given the idea that the poem is about a failed relationship. Participants read the following prompt: “The poem is about a person reflecting back on a failed romantic relationship.” Under the CMT view, this should be the easiest condition under which to interpret the poem because participants are primed with a singular conceptual metaphor LOVE RELATIONSHPS ARE JOURNEYS. If metaphorical processing is singular and discrete, then participants should do very well in this condition given that they are provided the target domain, which would facilitate the target-to-source mapping.

In a third condition, participants were encouraged to consider multiple meanings by reading the following instruction: “Poetry can often convey several different meanings that you should be open to understanding.” This condition suggests that more than one mapping may be appropriate when interpreting the poem and it overtly recognizes the validity of multiple interpretations of this poem without forcing an interpretation strategy. In allowing more freedom to interpret the poem in a variety of ways, this prompt is also the most challenging. It acknowledges

additional meaning but gives the participant no additional clues as to what that additional meaning might be. According to the traditional view, participants will perform poorly in this condition. With no specific interpretation suggested, the allegorical meaning will be challenging because the amodal analogies and schemas will be difficult to generate spontaneously. Under CMT, this prompt should be less effective than the prompt where a metaphorical interpretation is supported by giving the participants the target domain because providing the target domain of a failed relationship should facilitate the one-to-one mapping process between a failed relationship and a scuba journey. However, if CMT critics are correct, this prompt might allow for more varied metaphorical interpretations whereas the failed relationship prompt might encourage a more singular perspective.

In a fourth control condition, participants are asked to read the poem with no explicit instructions about how they should interpret the poem. There are no suggestions that the poem should be interpreted literally, as in the scuba condition. Likewise, there are also no suggestions that the poem had additional metaphorical meaning(s), as there was in the failed relationship condition and the multiple meanings condition. This condition was implemented to see what participants infer when left to their own devices in the absence of any suggestions and to provide a baseline from which to compare the interpretations elicited from the other prompts. Furthermore, this baseline condition reflects the most natural reading condition: an absence of priming before reading. Yet in many cases students and scholars do not approach a poem of this caliber without some preconceived notions: introduction from a literature teacher/colleague, popular interpretations, knowledge about the

author, or scholarly interpretations. Even so this condition reflects how many readers might read the poem, as a first reflection without any prior knowledge.

Analysis of Global Interpretation Style

Two research assistants coded narrative data in three stages. Before each of these analyses, the two analysts coded a subset of data to synchronize coding styles. Following this, the analysts coded the entire data set independently. Finally, after the data was reviewed several times independently, the analysts met to discuss any discrepancies. For example, should "the wreck" always be coded as instances of the source domains "verticality" and "wholeness"? Although the term "wreck" has a downward trajectory linking it to the source domain verticality and a broken aspect linking it to the source domain "wholeness," we decided not to include this unless it was elaborated further. We took a conservative approach, in this instance, since it was used in the title and participants often used it in a generic way.

Participant's interpretation style is an important predictor based on the three hypotheses. First we wanted to see what global interpretations participants were able to create under various conditions. In Stage 1, the data was analyzed for overall interpretation strategies to determine if participants were able to articulate metaphorical, literal or partly allegorical interpretations of the poem. Responses were rated as being metaphorical if the participants embraced a non-scuba diving interpretation as the main theme of the poem and this theme was clearly articulated. For example, responses that interpreted the poem as being about self-discovery, a break up, or remembering a traumatic event were coded as metaphorical. Literal responses included interpretations that described the poem as being about scuba

diving only. Responses that took a literal overall approach but contained metaphorical or allegorical elements were coded as "literal plus." The third category, a group or responses referred to as "literal plus" were defined by responses not adopting a clear global metaphorical interpretation but still articulating additional local symbolic meanings in the poem.[3]

This third possibility found in the global response data occurred when there was no global metaphorical interpretation of the poem in it's entirety yet there were metaphorical/allegorical themes embedded in the response. These allegorical themes were hard to code as being metaphorical. Ostensibly they could be about scuba diving. However, they were also too allegorical to lump in with the literal responses. One could argue that these instances were hyper-literal or pre-metaphorical but they all contained very similar metaphorical themes to the responses coded as having a metaphorical global interpretation style. These "Literal Plus" interpretations were coded as such because, although they never clearly stated that the poem was about something other than scuba diving, they did include allegorical elements. This method was used so that the data could be coded conservatively, including only the clearly metaphorical global interpretations in the metaphorical category, without overlooking the allegorical and metaphorical instances contained in the literal plus responses.

Consider the following literal plus response from Study 4:

"I believe that the poem does talk about a man seeking knowledge of a shipwreck. He enjoys the way it feels to adventure into the deep waters and submerge not only his body but his soul to the ocean. He wanted to be certain that the wreck was actually a

[3] See appendix for examples of different global response types.

wreck and not just a myth. Then there is confusion whether or not he is saying that he was a person apart of the wreck living and searching for his sense of self and following a myth that was never actually written because it was all in his head. Or he is simply just searching a wreck and becomes fascinated with it."

In this allegorical response the participant never clearly mentions what exactly diving to the wreck symbolizes in a clear metaphorical way, but this response does show allegorical elements with strong metaphorical potential. The protagonist is said to be seeking knowledge, submerging his body and soul, being a part of the wreck, and searching for his sense of self. A scuba diver cannot literally chase after knowledge since knowledge is abstract. They could not literally submerge their soul or become one with a sunken vessel or find themselves. These are all metaphorical components in the answer. Yet because the participant does not name a clear metaphorical target domain (such as linking these activities to "a failed relationship" or "reflecting on a negative event from your past") this response was coded as literal plus.

The possibility remains open that the participant is approaching the act of scuba diving as an allegorical activity in itself, filled with meaning and magic, and the metaphors refer to this complex bodily experience. Another possibility is that the participant, if given a longer amount of time to ponder the poem, may have been able to articulate a fully metaphorical response. Part of the magic of allegory is that the target domain is not mentioned even amidst an atmosphere ripe with potential metaphorical meanings. The many allegorical responses that this data set uncovered evade being categorized as either literal or metaphorical, instead they seem to have a glimmer of metaphorical potential. A very strict protocol was followed about the

distinction between literal or metaphorical responses and the literal plus responses reflected those that included elements of between-ness or both-ness.

Regardless of what prompt participants were given, it is still interesting to see what strategies they used in their explanations. Do these responses show very little embodied imagery and spell out formal analogies, as the traditional view would predict? Do these responses show organization based upon a single conceptual metaphor and map out only the elements within the poem that fit in with that singular metaphor? Or do these responses show evidence that participants were engaging in a multimodal, mixed metaphor approach as they attempted to interpret the narrative of the entire poem in all of its complexity? The approach that a participant takes towards the poem may have a strong relationship with their interpretation strategy. For example, those who chose to interpret the poem at its surface value may have more in common with the other literal oriented interpretations than they do with the other participants that saw their specific prompt.

Source Domain & Mini-Allegory Analysis

In Stages 2 and 3 of coding the narrative data, the responses were coded to show the types of allegorical themes that were found in the metaphorical and literary plus interpretations. A global interpretation shows which participants explicitly articulated a metaphorical interpretation but these global impressions miss some of the nuances and complexities found in the details of the responses. These nuances, or mini-allegories are instead found at the word, sentence, and paragraph level. A sentence-by-sentence analysis was used to highlight the pervasiveness of allegorical description in the various response types. While some participants may not have

overtly recognized a global metaphorical theme they may have implicitly incorporated these mini-allegories into their responses via metalinguistic metaphors (e.g., "diving into the poem") or metaphors pertaining to the act of scuba diving ("being lost but wanting to be found").

In Study 1 and Study 2 we conducted a source domain analysis using a data centered approach so that instead of trying to force the allegorical language into a one-to-one, source-to-target mapping, we analyzed the data by the presence of language that could be categorized into the seven most pervasive metaphoric themes that were noted in preliminary data analysis: journey, visibility, verticality, discovery, wholeness, containment, and isolation. This approach proved to be suitable for the highly allegorical data and the analysts were able to code in this way successfully with a high degree of consistency. We evaluated the data sentence by sentence to determine whether each sentence contained elements from one or more of the 7 source domains.

Many participants' metaphorical and allegorical sentences had multiple different source domains that seemed to be at least partially abstract in the context. Consider the following example:

"So, to me, the metaphoric aspect of his journey are a trip into his own mind, meditation, or something like it, seeking to reflect on events that have passed and opportunities that have gone by, struggling not to get lost in his own deep desires, but gain something valuable by connecting to a part of himself he often ignores or doesn't have access to" (Study 2, Multiple Meanings Group).

In this example, the participant begins with an explicit recognition of the metaphorical elements and an explicit "journey" theme. Then the participant specifies the journey is a "trip" into the speaker's "own mind" which immediately

evokes another metaphorical theme: containment. Here the protagonist is metaphorically going on a trip into his own mind to "reflect," The act of reflection suggests visual elements that suggest he is taking a figurative trip into his own mind as if it were a container filled with memories as objects that he can look at or reflect upon. These "events" and "opportunities" have already "passed" the protagonist, metaphorically, so he must look back at the events that have "gone by". He then "struggles not to get lost in his own deep desires." This relates back to the metaphoric journey theme and specifically a difficult part of the journey where he is encountering obstacles. Verticality, yet another source domain, is blended to create the metaphorical obstacle: "deep desires." Subsequently he gains "something valuable" as if he has valuable treasures hidden inside of himself waiting to be discovered.

This example demonstrates the challenge in mapping out one-to-one relationships between sources and targets. Multiple source domains work together in metaphorical and allegorical ways as the participant works to interpret the poem. Source domains are not always neatly separated but rather they work together in clusters. For example, when an obstacle is being discussed in the journey metaphor, the downward aspect of the verticality theme might be partially activated and the dark aspect of the visibility theme might also be partially activated as is the case in the following phrase: "He went into the deep dark ocean of love to explore, but it didn't work out for them" (Study 2, Control Group). This concise sentence evokes a sense of depth, visibility/lighting, containment and journey in fewer than 20 words.

Studies 1-4

All four studies used the Rich poem as a stimulus and the same three primes were used to encourage participants to focus on the surface meaning, a particular metaphorical meaning, or multiple meanings as well as a fourth control condition where they were not primed. These primes will be henceforth referred to as *explicit primes* because these primes explicitly suggest how a participant is to interpret the Rich poem while subsequent studies introduce other implicit primes that tacitly influence the participant's interpretation. In Study 1, participants read the explicit prime and then read the Rich poem. Participants were then asked to explain the meaning of the poem in as much detail as possible in an open-ended question (i.e., narrative response), similar to that done in Gibbs and Boers (2005). As will be shown below, the preliminary data from Study 1 suggests that people are indeed capable of interpreting allegory in a meaningful way and that they interact with the metaphorical themes in a very dynamic way that eludes analysis of source-to-target mappings in a singular or discrete way.

In Study 2 participants were introduced to an additional task, which served as an *implicit prime*. Participants read one of the explicit primes, read the poem, and then gave their ratings on 14 statements that were related to embodied literary experiences and 3 statements that were related to allegorical interpretation style. Participants were then asked to explain the meaning of the poem in as much detail as possible in an open-ended narrative response. While the explicit priming is a between subjects design so that each participant sees only one of the four prompts, the implicit priming is implemented in a within subjects design so each participant

across conditions completes the exact same Likert scale[4] items before formulating their narrative interpretations. This study shows an even greater propensity towards complex, figurative and allegorical interpretations and a lower rate of simplistic, literal explanatory style suggesting that considering the embodied literary experience questionnaire increased the participant's allegorical impulse as evidenced by the narrative responses.

Participants in Study 3 were exposed to a different implicit prime: we asked participants about their embodied simulations during the reading of the poem (prior to collecting their narrative responses) priming them to think more consciously about imagery or simulations they may have experienced. They answered two open-ended questions prompting self-reports about imagining the enactment of the embodied action in the poems as well as an open-ended question asking them to explain the meaning of the poem in as much detail as possible. The motivation for this change in the study design is that Study 3 provides more details about the embodied simulations that participants experienced while reading the poem by including two additional narrative questions regarding the imagined actions people may have experienced while reading the poem and it also explores how embodied simulation reflection specifically primes participants before they interpret the poem. Data analysis suggests that participants were successful at interpreting the poem in an allegorical way and did so through embodied explanations. In addition, responses to the embodied simulation narrative questions suggest that many participants are engaging in

[4] A Likert scale is a rating scale often used in psychological research to assess a participant's level of agreement or disagreement with a statement along a symmetric range of responses. This measure is often seen as a more sensitive option than presenting participants with a forced choice binary decision about whether they agree or disagree.

embodied simulations and that they explicitly report simulations beginning at specific places in the poem. Study 3 results show a relationship between the explicit and implicit prime so that participants who engaged in simulation were more likely to craft a figurative response in the relationship condition than in any other condition.

Studies 1-3 showed many metaphorical and allegorical responses and few literal responses. Study 4 sought to strengthen the scuba priming to see if the rate of literal responses could be increased with a stronger prime. Extended stories, crafted to read like magazine articles, were created to be compatible with the scuba explicit prime and the failed relationship explicit prime. The results of study 4 suggest that strengthened primes caused an increase in allegorical responses in the scuba condition and also an increase in metaphorical responses in the failed relationship condition, but no increase in literal interpretations.

Study 1

First, participants were asked to read the poem prefaced with one of three primes (literal, metaphorical, or multiple meanings) or with no prime (control condition). Participants were explicitly urged to interpret the poem as being about scuba diving, about a failed relationship, or to examine the multiple possible meanings that the poem may have. In addition to the 3 explicit primes we also included a control group in order to establish a baseline of how participants read the poem in the absence of explicit prompting to take on a particular type of interpretation. Then participants were asked to explain the poem's meaning in as much detail as possible.

Method

Participants

Sixty-four Psychology students at UC Santa Cruz participated in the study (42 females and 22 males), who received partial course credit for their participation in the experiment. A signed informed consent was obtained from all participants prior to the start of the experiment.

Materials

The poem was presented on a computer in a private experiment room. Participants read the poem and then completed the rest of the 4-page questionnaire. The questionnaire was presented in a Microsoft Word document. They typed out their responses to the narrative prompt in the word document.

Stimuli & Design.

Participants were informed that this study examines people's understanding of poetry. Then they were asked to complete two tasks in a one-hour time slot.

First, they were asked to read the poem with one of four prompts. They were encouraged to read the poem slowly so they could answer the subsequent questions regarding the poem. Then they read the prompt and the poem at their own speed. This was a between subjects variable so that any participant would see only one prompt:

1. Control Condition (Control): No prompt

   N= 14

2. Surface Meaning Condition (Scuba): "This poem is about a person going scuba diving to explore a sunken wreck."

   N=17

3. Open-Ended Metaphorical Interpretation Condition (Multiple Meanings): "Poetry can often convey several different meanings that you should be open to understanding."

   N=16

4. Specific Metaphorical Interpretation Condition (Failed Relationship): "The poem is about a person reflecting back on a failed romantic relationship."

   N=17

Results

The global interpretation strategy data will be presented first as it reveals the global approach that participants adopted when crafting their responses. A paired z test was conducted to compare the proportions for each prime by global interpretation strategy.[5] Table 1 shows the proportions of global interpretation styles for each of the three primes and for the control condition.

Global Interpretation Data

Table 1

Study 1: Explicit Priming Proportion Data				
	Control (N = 14)	**Scuba** (N = 17)	**Relationship** (N = 17)	**Multiple** (N = 16)
Metaphorical	57 %	59 %	88%	44%
Literal Plus	36 %	35 %	6%	38%
Literal	7 %	6 %	6%	19%

[5] See Appendix Section C for a complete table of paired comparison z tests for proportions by group

The main finding from this study is that participants do not use a literal interpretation strategy as a default when approaching an allegorical text. Instead, it was found that just over 90% of participants used a literal plus or metaphorical approach when explaining the meaning of the poem showing that the vast majority of responses contained allegorical elements. In the control condition, where participants did not read any interpretation suggestions only a single participant interpreted the poem as being strictly literal and every other participant produced responses that were explicitly metaphorical or that contained metaphorical themes.

Consider this response from a participant who was in the control group, "This poem is literally and superficially about a deep-sea diver scoping out a sunken ship. It is also about discovering something that was never intended to become the way it eventually became- such as a sunken ship was never meant to end up on the bottom of the ocean. In a way, I suppose it's also about finding the truth." In spite of the fact that this participant was not primed to think of the poem beyond the surface level they immediately articulated a distinction between the "literal" topic of the poem and an additional layer of meaning. They note that it could also be about discovering something in unintended circumstances or about finding the truth. This evidence reinforces Hypotheses 2 and 3 and argues against Hypothesis 1, which would predict that participants in the control condition with no priming whatsoever would have a hard time drawing metaphorical inferences from a complex allegorical poem.

In the scuba condition, where participants are explicitly urged to take a literal interpretation, only 1 participant adopted a strictly literal approach to the poem while every other participant was able to articulate the metaphorical symbolism of the poem

or they implicitly recognized the symbolism by using allegorical language in their response. This manipulation (although created to encourage literal responses) did not increase the tendency to adopt a strictly literal interpretation of the poem. Paired z tests revealed that there were no significant differences in the proportions of literal responses from any group of participants, regardless of what prompt they read. Consider the following comments from a participant who was urged to think about the surface meaning of the poem, "However, beneath the surface the poem is about exploring new, unknown experiences on your own and learning from them, essentially being your own teacher but at the same time being a student. These unknown experiences can help a person grow and learn how to rely on themselves and no one else." Even though this participant was explicitly primed to interpret the poem in terms of the surface value they still proceed to dig deeper and articulate a metaphorical interpretation.

Under Hypothesis 1, we would predict a majority of short, simple, literal responses, especially in the group of participants explicitly primed to think the poem was a simple poem about scuba diving. Instead, this type of literal response is the exception and not the rule. In fact, the responses that articulate one or more metaphorical theme seemed to be a much more typical response type even after reading the scuba prime. This finding suggests that allegorical interpretation is not a special mode of cognition that requires abstract, logical symbol manipulation but rather, allegorical interpretation utilizes a fundamental propensity of human cognition: metaphorical thought.

The data from study one results also reveal a second main finding, suggesting that an explicit metaphorical prime may increase people's ability to interpret metaphorical meaning but also may hinder the range of responses a participant will ponder. In the relationship condition, participants read a prompt that suggested the poem was about a failed relationship to prime participants to facilitate a metaphorical interpretation of the poem. Again, there was only a single participant who adopted a strictly literal interpretation of the poem. However, unlike in the other three conditions, these participants were more likely to adopt a singular metaphorical interpretation (88%). Consider the interpretation of the following participant who was exposed to the failed relationship prime, "A person is reminiscing and revisiting an old relationship and they are unsure of what to expect. He/she attempts to revisit old thoughts to see how things happened/unfolded and see what caused the wreck/fall out in the relationship. Everything that once had life and thrived in the relationship is now gone. The actual 'wreck' that he visits can be viewed as the relationship. At the end, he/she then makes it seem like he/she is the bigger person for having revisit the relationship and trying to pinpoint what went wrong." This explanation is representative of the responses that the failed relationship prime elicited: singular, metaphorical, and focusing on a failed relationship.

In spite of possible pigeonholing effects, the metaphorical failed relationship prime did have advantages. Paired z tests, conducted to compare differences in proportions, supported this finding. The failed relationship prompt yielded significantly higher metaphorical responses compared to the control condition ($z = 1.97$, $p<0.01$) and significantly higher metaphorical responses compared to the

multiple meanings condition ($z = 2.71$, $p<0.001$). The failed relationship prompt also yielded a higher proportion of metaphorical responses when compared to the scuba diving prompt but this difference was only marginally significant ($z=1.93$, $p=0.05$). None of the other primes were significantly different when compared for the metaphorical responses. Likewise, the failed relationship prime yielded fewer literal plus results than the control condition ($z = -2.10$, $p<0.05$), the scuba prime ($z = -2.12$, $p<0.05$), or the multiple meanings prime ($z = -2.22$, $p<0.05$). These results suggest that the failed relationship prompt did yield a greater proportion of metaphorical responses and a lesser proportion of literal plus responses compared to the other primes.

The conceptual metaphor prompt primed participants, with few exceptions, to make a singular metaphorical interpretation. It could be that these effects were two-fold: First, participants who might have otherwise made an allegorical interpretation may have had an easier time articulating the metaphorical connection, often adopting the interpretation that was given in the prompt; likewise participants who may have had multiple or unique interpretations of the poem may have been more likely to adopt the singular explanation that they read as a prime. Thus it facilitated articulating a global, coherent metaphorical interpretation but it may have also pigeonholed the participants from thinking of multiple possible interpretations. Although giving participants this prime may have pigeonholed their responses to some extent, it is important to also note the efficacy of using a conceptual metaphor prompt. This prime did offer participants an advantage that helped them to interpret

the source domain elements in the poem. This pattern of results is consistent with CMT and it yielded a rich set of allegorical themes throughout these responses.

The condition that urged participants to consider multiple meanings yielded the highest proportion of literal responses with 3 participants who wrote responses that fell into this category (this was not significantly different when compared to the other primes). Again, the majority of responses still fell into the metaphorical or literal plus category. This prime did not significantly differ by global interpretation strategy from the scuba or control group.

Source Domain Data

In spite of a few literal responses, the overall finding that participants often use allegorical/metaphorical interpretation strategies is bolstered by an analysis of the embodied source domains used to craft participant's responses. The nuances of dynamics that drive the vast majority of high-level cognition are not available for introspection. Even though some participants did not explicitly state a singular metaphorical global interpretation of the poem, there were embodied source domain elements and allegorical themes found in every metaphorical or literal plus response. Due to the fact that these embodied elements were not always directly related to the abstract elements that they symbolized, they were sometimes used more loosely to craft an allegorical tone. At times, the sentences would slip from literal to allegorical to metaphorical. This build up creates an allegorical ambiance indirectly between scuba diving and other more abstract ideas. This was very hard to code in the data but we were able to overcome these difficulties by first coding for the source domain elements and then coding for the allegorical themes among each source domain.

Source domains refer to the embodied experiences that can be experienced directly (e.g. the sights, sounds, movement patterns, and environmental aspects of an actual scuba dive) or they can be used to ground metaphorical concepts (e.g. darkness as a visual metaphor, a metaphorical journey into a damaged psyche, etc.). To conduct a source domain analysis we took a data driven approach. As the responses were often not in the form of a clear one-to-one metaphor mapping (i.e. explicitly stating that the scuba journey was a metaphor for a failed relationship or that the coldness indicated loneliness) it was sometimes hard to cleanly map a particular source domains to a particular target domain.

Instead we engaged in 2 stages of coding for the source domain. First, we analyzed each sentence in the data set to see whether a particular source domain was present. The top 7 source domains that contributed to the metaphorical themes in the narrative data were found to be journey, visibility, verticality, discovery, containment, isolation, and wholeness[6]. Table 2 displays the proportion of sentences that included at least one element from these 7 themes by prime type and the overall proportion of each source domain in the entire data set:

Table 2

Study 1: Participants Use of Source Domains by Prompt Type

Condition	Journey	Visibility	Verticality	Discovery	Containment	Isolation	Wholeness
Scuba	42%	27%	22%	34%	45%	23%	33%
Failed Relationship	47%	29%	28%	14%	47%	9%	41%
Multiple Meanings	58%	21%	24%	25%	50%	13%	29%
Control	46%	44%	34%	35%	38%	11%	31%
Overall	47%	27%	27%	26%	45%	14%	34%

[6] See appendix for examples from the data for each of the seven source domains.

Journey was found to be the most prevalent source domain amongst the responses. This highly generative figurative theme was found in 47% of all sentences analyzed and was used extensively regardless of prime. One participant making use of this theme stated, "If I take it a bit figuratively, then it could be symbolizing or otherwise referencing *a person's journey in life (or perhaps that of humanity overall…*)." The italicized segments highlight the source domain elements utilized in the response. Themes relating to journey like this were found sprinkled throughout the data set highlighting the dominance of the journey related imagery used in interpreting this poem. Containment was another popular source domain as noted by this participant, **"**The poem projects feelings of drifting away or dying, with the author's *description of aloneness and imagery of being submerged in water."* Again the italicized portion highlights the containment elements as well as a sense of verticality and isolation. The least frequently mentioned source domain was isolation mentioned in only 14% of all sentences analyzed. Although participants may use journey elements more frequently than isolation elements in constructing their responses, these 7 source domains were used with a high degree of consistency regardless of which prime a participant read before crafting their responses and even in cases of literal or literal plus responses. While an individual participant may not use every element in every sentence, they certainly make use of a subset in nearly every response. This high degree of consistency found in the responses, suggests that these embodied elements are primed by the poem. They are active cognitive devices that provide the necessary conceptual structures participants need to construct both literal and allegorical meanings in crafting their responses.

While participants in a particular condition may prefer certain source domains to others, all 7 metaphoric themes were utilized frequently. These results support the idea that participants were using dynamic strategies to access metaphoric thought and it casts doubt upon the idea that participants might be accessing metaphors singularly or discretely with clean, neat one-to-one source-to-target mappings. Rather the meaning appears to be emerging from the ability to engage multiple source domains simultaneously. These emergent themes are explored further in the mini-allegory analysis below.

Mini-Allegory Data

The most prevalent mini-allegory themes and the overall proportion of sentences with each mini-allegory are listed below in Table 3 by source domain.

Table 3

Study 1 Mini-Allegory Proportion Data	
Source Domain	Mini-Allegories
Journey	Search/Exploration (34%) Progress/Impediments (19%) Time (13%) Downward Journey (7%) Inner Journey (6%)
Verticality	Negative Affect (33%) Depth (24%) Positive Affect (12%) Obstacles (11%) Repression (3%)
Visibility	Search (45%) Lighting (20%) Contemplation (17%) Appearances (11%)
Containment	Immersion (22%) Hidden Objects (15%) Knowledge Acquisition (11%) Inner journeys (10%) Time (8%) Fullness (3%)
Discovery	Loss (18%) Authenticity (15%)

	Knowledge (13%) Memory (9%) Protection/Coping (3%)
Wholeness	Broken (14%) Parts/Subcomponents (4%)
Isolation	Negative Outcomes (30%) Positive Outcomes (15%)

In Stage 2 of the source domain analysis, each sentence was analyzed for allegorical themes.[7] Participants constructed mini-allegories to support their interpretations of the poem as a whole. Mini-allegories have been previously noted in other discourse settings as a way to tap into larger allegorical themes (Gibbs, Okonski & Hatfield, 2013). For example, there were themes within verticality that showed the ways that participants were allegorically interpreting the downward and upward movement from the poem in various ways. Some participants noted a sense of failure or a damaged psyche/inner-self associated with downward vertical expressions while others used verticality as an obstacle where you might "fall" in love or feel the need to "get over it fast" after being hurt in a relationship. These nuanced patterns that helped to structure the source domain can be organized into mini-allegories.

Mini allegories may incorporate more than one source domain. For example, inner journey is a blend of 2 source domains: containment and journey. These mini-allegories sometimes relate to one or more targets, but they do not do so in isolation. They emerge in conjunction with the other source domains and in addition to the other within-source domain mini-allegories. For example, the following participant noted: "The poet is descending into their damaged psyche to examine the failed

[7] This analysis was based on whether each sentence contained at least one instance of a source domain being used in an allegorical or metaphoric context in the overall data set. There were 377 sentences considered overall in this analysis. See the appendix for a full set of examples from the data of each mini allegory.

relationship. ” This contains both a downward journey and an inner journey simultaneously (these are both mini-allegories from the source domain “journey”) and it also reflects multiple source domains working in conjunction because it contains verticality, containment and journey elements simultaneously.

Some source domains had a richer set of mini-allegories to structure them, making the use of the element more flexible to multiple interpretations. For example, participants who spoke figuratively about the journey source domain often incorporated this into their response in one of six ways: as a search or exploration, in terms of progress or impediments that might be encountered along the voyage, using metaphors about time as if you can travel through time, in terms of a downward journey (a blend with the vertical source domain), or an inner journey (a blend with the containment source domain). Other source domains had fewer mini-allegories associated with metaphorical elements in the responses. Wholeness, for example, was mainly structured by only two mini-allegory themes: broken elements and parts/subcomponents.

Table 4 displays the overall proportions of responses containing mini-allegory in Study 1. The multiple meanings prime elicited responses that contained mini-allegory over 80% of the time and the other conditions elicited responses with mini-allegory over 90% of the time. This represents a huge proportion of the data. The vast majority of participants included at least some allegorical elements when writing out their interpretations.

Table 4

Study 1: Explicit Priming Mini-Allegory Proportion Data				
Mini-Allegory	**Control** (N = 14)	**Scuba** (N = 17)	**Relationship** (N = 17)	**Multiple** (N = 16)
Yes	93%	94%	94%	81%
No	7%	6%	6%	19%

The strong tendency to rely on embodied imagery, as evidenced by the source domain data and the mini-allegory data, in conjunction with pervasive allegorical and metaphorical interpretations, suggests that participants engaged in embodied simulations as they were interpreting the poems additional meanings. The ubiquitous presence of embodied source domains is further evidence that participants are not utilizing an abstract, disembodied mode of thought in this task. This casts further doubt on Hypothesis 1, the traditional view that conceptualizes metaphorical processes to be special, abstract, and disembodied. Instead, these results show that embodied conceptualizations are a common strategy in interpreting metaphorical discourse. This pattern of results also suggests that there was not just one conceptual metaphor activated but rather there was blend of source domains being utilized across the different prompt types.

Conclusions

This study sets up an important baseline, which will aid in the interpretation of studies 2-4. Because the rate of allegorical and metaphorical interpretation was so high in this study it is worthwhile to note how the global interpretation strategy distribution varies from study to study. When participants see the poem without any

priming whatsoever (as in the control condition of Study 1) we can expect few strictly literal responses, the majority of responses being classified as literal plus or with a metaphorical interpretation. This low rate of strictly literal responses suggest that participants do not necessarily need additional priming to make complex metaphorical mappings after reading an allegorical poem. A huge proportion of participants alluded to deeper meanings in the literal plus and metaphorical responses and few adopted a strictly literal interpretation.

This pattern of results does not support traditional theories of metaphor cognition. If traditional theories of metaphor were correct there would be a pattern of literal analysis even when participants were given explicit priming to facilitate the metaphorical interpretation (such as the failed relationship prime). Instead the data shows the exact opposite pattern of results. The participants were able to articulate allegorical and metaphorical responses in every condition at a very high rate. Even in the conditions where participants had no clues to the metaphorical meaning (control condition) or when they were explicitly prompted to consider the literal interpretation (as in the scuba condition) participants were still more likely to construct an allegorical or literal interpretation.

The results found in Study 1 support the CMT view of metaphor cognition to some extent. The failed relationship prime that was created to promote a conceptual metaphor interpretation of the poem did show an overall increase in metaphorical responses with 88% of the responses utilizing a singular metaphorical general interpretation strategy (all the other conditions fell below 60% for metaphorical responses). This prime was strong enough to redistribute participants who may have

otherwise articulated an allegorical response to instead articulate a singular metaphorical response. These findings support the idea that conceptual metaphors are devices with cognitive advantages. Participants who were urged to think of the sunken ship as a failed past relationship were able to draw upon their rich embodied knowledge around journeys and their previous experience with metaphorical love journeys to interpret the poem metaphorically.

Yet, these results also suggest that all of the assumptions of CMT may not be completely correct, particularly with respect to the singularity and discreteness assumptions. The prevalence of mini-allegories suggests that participants do not think about metaphors discretely or singularly but instead they blend various mini-allegories to make sense of such a complex poem. This strategy seemed to help participants unite their more global interpretation with their localized interpretations based on individual symbols or stanzas from the poem.

These results taken together with the source domain analysis suggest that while conceptual metaphors are powerful cognitive devices, there are much more complex mapping dynamics that cannot be explained with a singular, discrete metaphor. Instead, participants seem to blend various source domains to create a global interpretation of the complex poem they were given to interpret.

Study 2

In the second study, participants were exposed to the same explicit primes suggesting a particular interpretation strategy as was used in Study 1. They were also exposed to an implicit prime where they were asked to rate a series of statements that measured embodied literary response ratings on a four-point Likert scale. These

items were implemented to urge participants to tap into their subjective literary reactions, their narrative responses, and their embodied simulation processes that they may have experienced during the reading of the poem. Given the results from Study 1, which showed pervasive use of embodied source domains to construct allegorical interpretations, tapping into these literary responses should yield even more robust allegorical and metaphorical responses from participants.

First, participants were asked to read the poem prefaced with one of three explicit primes (literal, metaphorical, or multiple meanings) or with no prime (control condition) just as in Study 1. A second task was added to implicitly prime participant's consideration of their embodied and subjective literary reactions to help them process the poem more deeply before writing out their answers. The literary response task involved reading a series of statements and rating them along a 4-point Likert scale (where 0 = "strongly disagree with this statement" and 4 = "strongly agree with this statement"). Participants were asked to rate 17 statements[8]. A series of 3 items were designed in order to assess individual interpretation strategies: allegorical meaning, surface meaning, and multiple meaning interpretations. For example, the surface meaning question explicitly assessed the degree to which a participant simulated the source domains in the poem in a literal, scuba context by asking them to rate their level of agreement or disagreement with the following statement: "While reading the poem, I understood that the poem referred to actual experiences with scuba diving." An additional series of 14 questions were adapted from previous research on embodied literary experiences (Kuiken et al., in press).

[8] See Appendix section for the exact items that participants were asked to rate in each experiment

These questions primed embodied elements that related to physical experiences and embodied simulations during reading the poem such as: awareness of the body (bodily self-awareness), feeling sensations similar to the protagonist in the poem (intimacy with character), feeling your sense of self spread beyond your body (loss of self boundaries), experiencing evocative imagery (evocative imagery), or feeling absorbed in the story (narrative immersion). Other questions primed more abstract/subjective responses that might be experienced while reading the poem. These items included, self-awareness of thoughts and feelings (cognitive self-awareness and emotional self-awareness), beginning to understand something that could not be put into words (inexpressible realization), feeling a sense of empathy for the protagonist (empathy towards character), better understanding autobiographical past events (self perceptual depth), understanding more about the difficulties in life (existential awareness), and experiencing wonder or feeling uneasy (wonder and disquietude, respectively). These are examples of abstract, subjective literary responses that participants might experience while they engage in allegorical interpretation.

In Part 3 of Study 2, participants were asked to give open-ended narrative responses. They were given the instructions: "Please now write out in your own words what you believe to be the poem's meaning. Please feel free to write as much as you would like." This question was designed to allow participants to explain the poem's meaning using any metaphor, analogy, source domain, or other personal, idiosyncratic strategy of their choice to explain the meaning of the poem.

If the traditional view of metaphor is correct, this prime that emphasizes the embodied and subjective reactions to the poem should not facilitate metaphorical interpretations because under the traditional view, embodied concepts are suppressed in order to reject a literal interpretation and the abstract meaning is then embraced in an amodal, disembodied way (Searle, 1979; Grice, 1975). Conversely, if the conceptual metaphor approach or embodied simulation approach is correct, then both the embodied literary responses and the subjective literary responses should prime even richer allegorical interpretations.

Method

Participants

Thirty-four Psychology students at UC Santa Cruz participated in the study (29 females and 5 males). They received partial course credit for their participation in the experiment. A signed informed consent was obtained from all participants prior to the start of the experiment.

Materials

The poem was presented on a computer in a private experiment room. Participants read the poem and then completed the rest of the 8-page questionnaire presented in a Microsoft Word document. They were asked to use the highlighting tool to highlight the numbers on the Likert scales so that if they strongly agreed with a particular statement they would highlight the "4" on the Likert scale provided just below the question. They typed out their responses to the narrative prompt in the word document.

Stimuli & Design

Participants were informed that this study examines people's understanding of poetry. Then they were asked to complete three tasks in a one-hour time slot.

First, they were asked to read the poem with one of four prompts. They were asked to read the poem slowly so they could answer the subsequent questions regarding the poem. Then they read the prompt and the poem at their own speed. This was a between subjects variable so that any participant would see only one prompt:

1. Control Condition (Control): No prompt

   N=9

2. Surface Meaning Condition (Scuba): "This poem is about a person going scuba diving to explore a sunken wreck."

   N=8

3. Open-Ended Metaphorical Interpretation Condition (Multiple Meanings): "Poetry can often convey several different meanings that you should be open to understanding."

   N=8

4. Specific Metaphorical Interpretation Condition (Failed Relationship): "The poem is about a person reflecting back on a failed romantic relationship."

   N=9

Second, participants were asked to give their ratings for the 17 Likert scale items. Finally, participants wrote out their narrative responses. The ratings and

narrative items were within subjects as all participants were asked to respond to both the ratings and the narrative questions.

Results

The global interpretation strategy data will be presented first as it reveals the global approach that participants adopted when crafting their responses. A paired z test was conducted to compare the proportions for each prime by global interpretation strategy. Table 5 shows the proportions of global interpretation styles for each of the three primes and for the control condition.

Global Interpretation Data

Table 5

Study 2: Literary Response Prime Proportion Data				
	Control (N = 8)	**Scuba** (N = 9)	**Relationship** (N = 8)	**Multiple** (N =9)
Metaphorical	75 %	100 %	100 %	100 %
Literal Plus	25 %	0 %	0 %	0 %
Literal	0 %	0 %	0 %	0 %

Compared to Study 1, participants showed an even stronger tendency to interpret the poem allegorically and metaphorically across all conditions. Regardless of what prompt they read, all of the participants (100%) interpreted the poem with allegorical elements (literal plus) or fully articulated the greater metaphorical meaning (metaphorical). For example, one participant who was prompted to read this poem literally as if it were just about a scuba dive concluded, "The poem may also refer to the idea that the narrator did not follow the life path that he intended, and that

his life ended up being the wreck. The poem could suggest that he was trying to find his way back or trying to find where he made the mistake that led him along this different path." These results are representative of the responses from the scuba condition. Every participant who was prompted to consider the poem in this literal way went on to interpret the poem metaphorically (100%). This supports Hypotheses 2 and 3 that claim that participants should be able to reason metaphorically and interpret the poem, even if they are not prompted to interpret the poem metaphorically, because much of cognition is metaphorical.

In the control condition, participants were still able to extract metaphorical themes (75%), as exemplified by this response "The poem is obviously discussing a scuba diving experience, in which the narrator is looking for something in the depths of the ocean. But, in a deeper, not so obvious way, the poem is referring to the soul-searches individuals go on through life." There were no participants who interpreted this poem literally although there were a few responses (25%) that were coded as literal plus that were not explicitly developed into a metaphorical interpretation. The following is an example of a response coded as literal plus, which alludes to metaphorical meaning but does not explicitly articulate a metaphorical interpretation about what the greater meaning of the poem is: "The poem was very metaphorical and can be used to discuss or explain many experiences in life, including scuba diving or something in every day life. It was a very deep poem that could just be about scuba diving, but it depends on how you view it personally. Anyone can take the words and apply it to whatever they are feeling or experiencing at the time." This response explicitly notes the metaphorical nature of the poem and contains several

metaphorical instances of source domains: it describes the poem as being "deep" which includes verticality and containment and suggests that the interpretation depends on "how you view it" which references visual elements.

Yet, these metaphors are metalinguistic. They describe the reading of the poem and do not explain what exactly the scuba trip might allegorically symbolize. Even metalinguistic metaphors or metaphors used to discuss scuba diving itself are still indicative of allegorical modes of thought and show the pervasive priming that can occur when participants are exposed to a complex, embodied, allegorical poem. The fact that these allegorical themes are sprinkled throughout responses reflect the powerful implicit priming that sometimes accompanies full blown metaphorical responses and sometimes work more allegorically in literal plus responses.

Participants who were explicitly given a target domain (i.e. a failed relationship) also performed very well (100% had fully developed metaphorical interpretations). Those who read this prompt were not more likely to interpret the poem allegorically than in other conditions, but they were more likely to interpret the poem as being only about a failed relationship (75%) as was the case when the following participant wrote, "I feel like the beginning of the poem refers to the person who has just experienced a tough break up with a long time partner. This is the first time they are exploring their true feelings about the break up, past the surface understanding that it hurt them emotionally."

The multiple meanings condition was hypothesized to be the most challenging because it suggested that there are multiple layers of meaning without any clues about which target domains might be appropriate. Yet, even when participants were

prompted to think about the multiple meanings of the poem in this open-ended way, they were still highly successful (100% noted metaphorical interpretations). One participant summarized their interpretation of the allegory as follows, "The setting of the dark water, the paradox of feeling conscious yet unconscious, powerful yet powerless, comfortable yet alien and out of place, seems to set the tone for reflection on other thing(s) than the activity at hand. The discovery of the wreck seems to represent revisiting something that's already been lost, exploring a literal shipwreck providing a way to go back over the remains and memories of a wrecked relationship as externally and objectively as possible." Considering the subjective and embodied literary response items seemed to have helped participants overcome the difficulties and pressures that accompany such an open ended prime.

Paired comparison z tests were performed to determine if there were any statistically different proportions when comparing participants' global interpretation style by response type[9]. These tests yielded no significant differences in response type suggesting that regardless of the explicit prime that a group of participants saw they yielded very similar proportions of metaphorical, literal and literal plus global interpretations. Participants seemed to detect the allegorical nature of this poem, regardless of the prompt, and this finding was even stronger than the narrative results from Study 1. Allegorical themes were utilized in every response so that they could explain the poem in its entirety. This data does not support the traditional notion that people perform poorly at such metaphoric reasoning. They seemed to perform quite well even when they were explicitly encouraged to accept the literal surface meaning

[9] See Appendix Section C for a complete table of paired comparison z tests for proportions by group

of the poem. This strengthens the findings from Study 1 that the traditional view is inadequate to explain the trends in this data.

Providing participants with a single target domain in the prompt did not necessarily offer an advantage over participants who received open-ended prompts. If interpreting the poem as allegorical was reliant upon a single conceptual metaphor being discretely activated, the failed relationship prime should have offered a clear advantage. This was clearly not the case, at least when participants were primed by the literary response items. Providing participants with a targeted prompt (as in the scuba and failed relationship condition) did seem to limit their interpretations. They did not consider multiple interpretations as much as the participants in the open ended conditions. Critics of CMT might be right that priming with conceptual metaphors encourages stock responses (Tsur, 1999). In some ways, offering this prime was actually limiting instead of productive. These results do not support Hypothesis 2, that participants discretely access prefabricated conceptual metaphors one at a time.

Participants across primes displayed an *allegorical impulse* in every group. They displayed the ability to take the unmapped source domains and create a coherent narrative by grounding and repurposing the embodied features (Gibbs, 2011). The idea that allegorical interpretation is an impulse seems particularly apt in analyzing this data because even when the poem was explicitly marked as literal in the scuba condition, participants were still invited to unpack the metaphoric meanings below the surface. This was true for every condition[10]. This pattern of results suggests that this allegorical impulse is indeed a very strong cognitive propensity and best supports

[10] See Appendix for example responses from participants in each condition

Hypothesis 3, that we utilize dynamic simulations to engage in metaphorical thought. The literary response items helped to facilitate our participant's allegorical impulse and further process the poem's additional meaning. After interacting with the implicit prime, there were no significant differences in proportions of metaphorical or literal plus response rates across the 4 conditions.

Source Domain Data

Table 6 displays the proportion of sentences that included at least one element from these 7 themes by prime type and the overall proportion of each source domain in the entire data set:

Table 6

Study 2: Participants Use of Source Domains by Prompt Type							
Condition	Journey	Visibility	Verticality	Discovery	Containment	Isolation	Wholeness
Scuba	37%	42%	43%	45%	28%	15%	30%
Failed Relationship	40%	38%	31%	27%	48%	8%	23%
Multiple Meanings	69%	31%	44%	50%	72%	14%	28%
Control	37%	32%	22%	34%	39%	17%	22%
Overall	42%	35%	33%	38%	43%	13%	24%

Participants consistently referred to embodied imagery in the poem when crafting their interpretations. They used the source domains found in the poem as allegorical themes in their responses shifting from the literal use of the source domain to the abstract themes that constituted their allegorical interpretations. The main themes found the data were identical to the themes in Study 1: journey, visibility, verticality, discovery, containment, wholeness, and isolation. Table 6 shows the proportion of participants who used each source domain at least once in their

response[11]. Although there are some preferences to utilize a particular source domain depending upon prompt type, there is also some consistency in that, regardless of prompt type, participants utilized multiple source domains in their responses. For example, while participants in the control group were less likely to use isolation imagery (17%), they still used it to some extent and showed higher rates of using journey (37%), visibility (32%), discovery (34%), and containment (39%). Source domain reference was the most consistent for journey and containment, suggesting that these are important explanatory devices utilized widely when conceptualizing the poem's allegorical meaning. Participants were likely to incorporate several source domains in crafting their allegorical interpretations although they don't use every source domain in every sentence. This allows them to blend source domains dynamically, within the sentence and across the response.

Consider, for example, the following sentence, "He dove into the relationship and swam around, but it all seems very sad, which can be applied to the relationship that failed." This participant blends together multiple source domain elements with multiple target domains. Source domains include journey, verticality, and containment and this blend is presented in conjunction with feelings of sadness and failure. This is a complex mapping that can best be accounted for by an embodied simulation approach where metaphorical meanings can be soft assembled on the fly to create nuanced meanings using multiple source domains.

Mini-Allegory Data

[11] This analysis was based on whether each sentence contained at least one instance of a source domain being used in an allegorical or metaphoric context in the overall data set. There were 178 sentences considered overall in this analysis.

The most prevalent mini-allegory themes and the overall proportion of sentences with each mini-allegory are listed below in Table 7 by source domain.

Table 7

Study 2 **Mini- Allegory Proportion Data**	
Source Domain	Mini-Allegories
Journey	Search/Exploration (38%) Progress/Impediments (34%) Time (20%) Downward Journey (19%) Inner Journey (18%)
Verticality	Negative Affect (42%) Depth (39%) Positive Affect (25%) Obstacles (17%) Repression (17%)
Visibility	Search (49%) Lighting (19%) Contemplation (27%) Appearances (16%)
Containment	Immersion (20%) Hidden Objects (20%) Knowledge Acquisition (20%) Inner journeys (18%) Time (13%) Fullness (12%)
Discovery	Loss (22%) Authenticity (49%) Knowledge (48%) Memory (18%) Protection/Coping (16%)
Wholeness	Broken (54%) Parts/Subcomponents (42%)
Isolation	Negative Outcomes (43%) Positive Outcomes (39%)

Source domains were polysemous in the sense that they were used in various ways represented by the various mini-allegories. For instance, visibility can be used in multiple ways. One instance is demonstrated by the following responses, "I think people are afraid of digging and *looking back into their past* because they're afraid of the issues that remain buried and unresolved." This participant used the visual source

domain to conjure up a metaphorical visual search. Visual search mini allegories constituted 49% of all the sentences that contained visual elements. Yet another way to use visual elements metaphorically is demonstrated by this response, "In both cases the thing he is discovering is buried deeply and is in a dark place that takes much courage to go alone." In this instance the participant uses the lighting conditions both on a literal and on a metaphorical level as the protagonist must gather their courage go to a "dark place." Lighting condition mini allegories constituted 19% of all the sentences that contained visual elements.

These nuances suggest that participants did not activate generic conceptual metaphors singularly or discretely, they consistently used the top 7 source domains and blended them to create nuanced mini-allegories in crafting responses. Table 8 displays the overall proportions of responses containing mini-allegory in Study 2. Every single participant included mini-allegories in their interpretation of the poem.

Table 8

Study 2: Literary Response Prime Mini-Allegory Proportion Data				
Mini-Allegory	**Control** (N = 9)	**Scuba** (N = 8)	**Relationship** (N = 8)	**Multiple** (N = 8)
Yes	100%	100 %	100%	100%
No	0%	0%	0%	0%

These results suggest that participants did not discretely activate one conceptual metaphor at a time. They accessed embodied, metaphorical concepts frequently and consistently but they did so in a dynamic way that is characterized by the mini-allegories that they used instead of mapping out one source to one target.

This indicates that there are nuanced, context specific simulations of the source domain where different metaphoric themes are blended in order to make sense of this complex poem in it's entirety.

Participants constructed mini-allegories to support their interpretations of the poem as a whole. The same mini-allegory themes from Study 1 were found in this data set. This finding very much challenges Hypothesis 1 and Hypothesis 2. The traditional view would not have predicted this type of rich metaphorical entailments to arise so consistently in the data. Instead this hypothesis would expect great difficulty articulating the meanings behind the poem. These results also call into question CMT because although they suggest some consistency with regards to the metaphorical regularities found in the data, the complexity and nuance of these mini-allegory themes are better explained by a dynamical account of metaphorical cognition. Once again we see that in order to explain and conceptualize a very complex poem participants utilized embodied metaphorical themes but they did so in a nuanced way via mini-allegory, not via formal logic nor via singular and discrete metaphor activation.

Study 3

The results from Study 2 suggest that the embodied and subjective literary experiences have a strong priming effect on subsequent interpretations and yield more metaphorical interpretations across conditions. In Study 3, we sought to further explore the embodied literary responses in particular. The same poem and the same 4 prompts were taken from study one, but we added several questions to assess

embodied simulations experienced while reading the poem. Then we asked the participants to explain the meaning of the poem:

1. Did you imagine yourself diving at any point while you were trying to understand the poem?
2. If you answered yes, what sensations did you imagine? Please describe in as much detail as possible.
3. Please now write out in your own words what you believe to be the poem's meaning. Please feel free to write as much as you would like.

This exercise worked as a device to gain insight about participant's awareness of simulations experienced while reading the poem as well as an implicit prime to test the idea that elaborating on embodied simulations directly after reading the poem may facilitate metaphorical thought modes which in turn might prime metaphoric responses.

Participants were randomly assigned to one of the four explicit primes that suggested an overall interpretation strategy (control, scuba diving, failed relationship, or multiple meanings). They read the explicit prime, read the poem, completed the embodied simulation questionnaire and then wrote out their interpretations of the poems meaning.

Method

Participants

52 Psychology students at UC Santa Cruz participated in the study (46 females and 6 males). They received partial course credit for their participation in the experiment. A signed informed consent was obtained from all participants prior to the start of the experiment.

Materials

The poem was presented on a computer in a private experiment room. Participants read the poem and then wrote out their response to one open ended question. The questionnaire was presented in a Microsoft Word document. They typed out their responses to the narrative prompt in the word document.

Stimuli & Design

Participants were informed that this study examines people's understanding of poetry. Then they were asked to complete three tasks in a one-hour time slot.

First, they were asked to read the poem with one of four prompts. They were asked to read the poem slowly so they could answer the subsequent questions regarding the poem. Then they read the prompt and the poem at their own speed. This was a between subjects variable so that any participant would see only one prompt:

1. Control Condition (Control): No prompt

   N= 13

2. Surface Meaning Condition (Scuba): "This poem is about a person going scuba diving to explore a sunken wreck."

   N= 13

3. Open-Ended Metaphorical Interpretation Condition (Multiple Meanings): "Poetry can often convey several different meanings that you should be open to understanding."

   N= 13

4. Specific Metaphorical Interpretation Condition (Failed Relationship): "The poem is about a person reflecting back on a failed romantic relationship." N= 13

Second, they answered the three questions about the nature of their imagined sensations while reading the poem. Finally, they were asked to explain the poem's meaning in as much detail as possible.

Results

The global interpretation strategy data will be presented first as it reveals the global approach that participants adopted when crafting their responses. A paired z test was conducted to compare the proportions for each prime by global interpretation strategy. Table 9 shows the proportions of global interpretation styles for each of the three primes and for the control condition.

Global Interpretation Data

Table 9

Study 3: Simulation Priming Proportion Data				
	Control (N = 13)	**Scuba** (N =13)	**Relationship** (N =13)	**Multiple** (N = 13)
Metaphorical	64 %	54 %	100 %	77 %
Literal Plus	29 %	38 %	0 %	23 %
Literal	7 %	8 %	0 %	0 %

The main finding from Study 3 was the tendency for participants to construct allegorical and metaphorical reactions to the poem, regardless of prompt. Overall only two participants in the entire experiment constructed a strictly literal

interpretation of the poem. Nearly 3 out of every 4 participants in this experiment constructed a metaphorical explanation in this study (74%). One participant from the group who read the scuba prime wrote:

> "I believe that the poem is about someone who has done or experienced something awful in his life and is either literally returning to where it happened or continues to play the event in his mind. He sounds really sullen and even regretful and describes his surroundings with a lot of dark imagery. I think that the actual act of diving down to the wreck is him, in a way, facing the darkness in his life or reliving it and it seems like this is something he does regularly or at least enough to be a veteran at it. I think that it's sort of torturous yet beautiful for the speaker in the sense that it brings him some sort of peace or comfort."

This response shows some of the same metaphorical themes noted in the previous data sets. A literal and/or figurative trip returning to the place where tragedy struck, dark imagery in conjunction with negative emotions, the downward journey to face the darkness invoking multiple metaphorical themes at once, and the image of the veteran which is not a common metaphorical theme but is apt to help set the metaphorical scene for this interpretation nonetheless. Again, even in the scuba condition where participants are explicitly urged to be satisfied with a surface level analysis of the poem, they nearly always tap into the allegorical and metaphorical possibilities. Participants who adopt a strictly literal interpretation were found to be the exception and not the rule.

Paired comparison z tests[12], conducted to compare proportions of the types of global interpretation strategies utilized by the participants in the 4 conditions, revealed that the failed relationship prime elicited a greater proportion of metaphorical responses than the control condition ($z = 2.47$, $p<0.05$) or the scuba prime ($z = 2.88$, $p<0.01$) and a lower proportion of literal plus responses than the control condition ($z = -2.16$, $p<0.05$) or scuba condition ($z = -2.57$, $p<0.05$). There were no significant differences amongst the groups for the rate of literal responses and the multiple meanings prime did not yield significantly different proportions from any of the other groups for any response type. These results confirm the efficacy of the combination of the metaphorical prompt and the embodied simulation priming in eliciting metaphorical responses.

Embodied Simulation Data

A second main finding from Study 3 was that many participants reported experiencing embodied simulations and/or imagery when reading the poem. The data collected from the additional simulation questions revealed a high degree of consistency in having these experiences while reading the poem, having the introspection to be able to report these experiences, and being able to note exactly when the onset of these imaginative experiences began in the poem. The following participant is a very typical example of the self-reports obtained in this experiment: "It happened right after the awkward phase of going down the ladder and into the water. I felt being engulfed by the water all around me, the cold particularly. Also the blacking out before realizing the mask helps to breathe, almost a suffocating feeling."

[12] See Appendix Section C for a complete table of paired comparison z tests for proportions by group

This participant from the control condition notes that the simulations happen while going down the ladder and then goes on to explain details about temperature, the proprioceptive experience of being in the water, blacking out, breathing, and suffocating as sensations imagined while reading the poem. Note that this very same onset was found in many other responses, including the following participant who read the failed relationship prime prior to reading the poem: "I imagined myself submerging into the water in a careful manner and cautiously letting go of the last rung of the ladder and releasing myself into all of this dark, blue, black, cold emptiness."

Participants seem to start the imagined sensations while going down from the ladder, noting various visual and proprioceptive sensations from releasing into the water, the darkening light conditions and the increasingly cold temperatures. Table 10 displays the proportions of participants who reported having imagined sensations while reading the poem.

Table 10

Study 3 **Self-Reported Imagined Sensations**				
Imagined Scuba Diving	Scuba	Failed Relationship	Multiple Meanings	Control
Yes	69%	85%	85%	92%
No	31%	15%	15%	8%

As indicated in Table 10, self-reports of experiencing sensations while reading the poem (or perhaps more aptly referred to as embodied simulations) were quite frequent. The scuba group had the lowest report of simulations at a proportion of 69% of participants stating that they did experience some simulations, the

metaphorical primes both elicited a proportion of 85% of participants reporting such simulations, and the control group had the highest proportion of participants reporting such simulations with 92% of all participants. This suggests that being primed in a literal way does not necessarily prompt you to imagine the actions described in the poem to a greater extent as the control and figurative primes actually elicited higher rates of self-reported simulations. Paired comparison z tests were conducted to compare the proportion of participants who reported imagining sensations while reading the poem.[13] These tests revealed no significant differences reaffirming that participants in every group reported a high degree of embodied simulation in this study.

Table 11

Study 3: Simulation Onset Location			
Onset Location	Stanza 1: Scuba Gear	Stanza 2-4: Ladder & Water Immersion	Generic Diving Responses
Proportion	22%	69%	9%

Table 11 displays the onset location for self reported simulation in Study 3. Note that there is a high degree of consistency, not at the very start of the action in the poem in Stanza 1 but rather at the moment where the protagonist goes down the ladder and immerses in the water in Stanzas 2-4. Assuming that simulations are not available for conscious inspection, this would lead participants to be unsure of where the imagined sensations began. Unsure or eager to please participants might report simulation onset when the protagonist first acts in the poem (putting on the scuba gear

[13] See appendix for a complete table listing the results of the paired comparison z tests.

in stanza 1), they might report generic responses, or they might report random onset locations. Yet only 22% of participants report the first stanza as a starting place and only 9% of participants report generic diving responses.

Furthermore, the data shows that 69% of all participants who claimed they were aware of imagining sensations while reading the poem specifically noted simulation onset between Stanzas 2-4. Paired comparison z tests were performed to reveal that the proportion of participants who reported onset of simulations at Stanzas 2-4 was significantly higher than the proportion of participants who reported onset from Stanza 1 ($z= 3.77$, $p<0.000$) or generic responses ($z = 4.87$, $p<0.000$). This shows a remarkable degree of consistency and specificity regarding the onset location and it also reveals a remarkable ability to introspect about these cognitive processes as they unfold. These results certainly suggest that embodied simulations are present and, although they are dynamic (they are not completely full blown from the start to the finish and they vary by prompt), they do display remarkable consistency.

The pattern of results in Study 3 directly contrasts Hypothesis 1, the traditional view of metaphor cognition. The traditional view of language processing assumes that language is amodal predicting that participants don't simulate embodied experiences while reading poetry. Yet, many of the participants in this experiment report that they do experience simulations. Under this view metaphors are stored amodally as a literal gloss translation instead of deriving their meanings from embodied grounding and as such participants who craft metaphorical responses should suppress literal meanings not activate them. Yet this data reveals that most participants produced literal plus or metaphorical responses and most participants also

reported experiencing embodied simulations while reading the poem. These results strongly favor Hypothesis 2, CMT, and Hypothesis 3, the embodied simulation approach to metaphor cognition.

Mini-Allegory

Table 12 displays the overall proportions of responses containing mini-allegory in Study 3. Every single participant who was exposed to a metaphorical prime (failed relationship or multiple meanings) included mini-allegories in their interpretation of the poem and the participants who were in the control group or read the scuba prime did so over 90% of the time. This shows remarkable consistency in participants tapping into the allegorical meanings that ground the poem's meanings in embodied source domains.

Table 12

Study 3: Simulation Priming Mini-Allegory Proportion Data				
Mini-Allegory	**Control** (N = 14)	**Scuba** (N = 13)	**Relationship** (N = 14)	**Multiple** (N = 13)
Yes	93%	92%	100%	100%
No	7%	8%	0%	0%

Conclusions

The results showing that the embodied simulation prime was especially effective when presented in conjunction with the failed relationship prime suggest that there may be a productive relationship between the prime intended to evoke a common conceptual metaphor (LOVE RELATIONSHIPS ARE JOURNEYS) and the activity requiring participants to take a moment to reflect upon their embodied

simulations. These results speak to the instrumental role that embodied cognition plays in metaphorical thought and allegorical interpretation. Instead of suppressing literal meaning to think about failed relationship metaphors in an amodal way, participants use this embodied simulation task to creatively aid in metaphorical and allegorical tasks. CMT asserts that a substantial way that people conceptualize abstract language is through embodied grounding and these results are consistent with the idea that conceptual metaphors are productive cognitive devices that rely heavily on deeply entrenched embodied source domains.

However, CMT falls short of explaining these results in their entirety. The deeply entrenched source domains necessary to interpret this poem must be crafted in dynamic ways that can only be explained by Hypothesis 3, the Embodied Simulation view of metaphor cognition. The descriptions of simulations during the reading of poem do not show that participants began simulation right at the start of the poem, activated a single conceptual metaphor, and continued full simulation until the end of the poem. Instead, participants seem to have a gradual onset of the simulations that often peaks at the second stanza where the protagonist is going down the ladder. They blend various source domains to create an allegorical ambiance, often switching from sentence to sentence, or even within sentence, from literal language, to metaphorical language, to allegorical language, to metalinguistic diving metaphors that describe exploring the poem itself, to the allegorical symbolism that might be experienced in the actual act of scuba diving. Indeed the poem is so complex that imaginative, dynamic simulations are necessary to construct an explanation that can accommodate local and global interpretations. The static activation of a single

metaphor would not suffice. Although embodied source domains and the metaphorical failed relationship prime clearly offer cognitive advantages, these are utilized and described in dynamic way supporting Hypothesis 3.

Study 4

The previous results showed very few participants who chose to adopt a strictly literal interpretation of the poem and one possible account for these results is that the scuba prime was too weak. To rule out this possibility, participants were exposed to stronger primes. This experiment sought to push people even further towards a literal interpretation by providing them with a magazine article about the literal act of scuba diving in order to increase the implicit priming of the poem's surface meaning. In the scuba condition, participants were primed with a story about scuba diving that was modified from an online article used to promote scuba diving tourism. This same article was modified in critical places to create a version that would relate to the metaphorical prompt about relationships. The article was carefully modified so that the syntax and word choice remain almost identical except for key phrases where the second article would instead present metaphorical language describing online dating using scuba imagery.[14]

For example, in the scuba article participants would read sentences that related to scuba diving such as: "There's nothing that matches diving into the reef for combining relaxation, fascination and exhilaration all in one activity." In the relationship article, the participants would see a nearly identical sentence modified to relate to dating: "There's nothing that matches diving into love for combining

[14] See appendix for the entire extended prime articles.

relaxation, fascination and exhilaration all in one activity."

Participants were told that they would be participating in two separate studies, the first would examine reader's understandings of magazine articles and the second would examine reader's understanding of poems. Then they read and answered a few questions about the so-called magazine article before beginning the poem task. Following the article task participants always read a matching explicit prime: participants who read a scuba article also read a scuba prime before reading the poem and those that read a dating article also read a failed relationship prime before reading the poem. Finally, participant's narrative responses were collected as they explained the poem in as much detail as possible.

Method

Participants

Sixty-six Psychology students at UC Santa Cruz participated in the study (44 females and 22 males). They received partial course credit for their participation in the experiment. A signed informed consent was obtained from all participants prior to the start of the experiment.

Materials

The poem was presented on a computer in a private experiment room. Participants read the poem and then wrote out their response to one open ended question. The questionnaire was presented in a Microsoft Word document. They typed out their responses to the narrative prompt in the word document.

Stimuli & Design.

Participants were informed that they would participate in two studies: one that examines people's understanding of magazine articles and another that examines people's understanding of poetry. Then they were asked to complete two tasks in a one-hour time slot.

First, they were asked to read the magazine article and answer 4 statements about the passage and rate them on a 7-point Likert scale, as follows[15]:

1. While reading the scuba story, I felt very engaged.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

2. While reading the scuba story, I began to think of scuba diving as exciting.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

3. While reading the scuba story, I began to think of scuba diving as dangerous.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

4. After reading the scuba story, I am more likely to consider scuba diving in the future.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

The second task was to read the poem with one of two prompts. They were asked to read the poem slowly so they could answer the subsequent questions

[15] Participants who read the online dating article rated nearly identical questions that related to online dating, for example, they might rate how likely they are to try online dating after having read the article.

regarding the poem. Then they read the prompt and the poem at their own speed. This was a between subjects variable so that any participant would see only one prompt:

1. Surface Meaning Condition (Scuba): "This poem is about a person going scuba diving to explore a sunken wreck."

   N= 33

2. Specific Metaphorical Interpretation Condition (Failed Relationship): "The poem is about a person reflecting back on a failed romantic relationship."

   N= 33

Results

The global interpretation strategy data will be presented first as it reveals the global approach that participants adopted when crafting their responses. A paired z test was conducted to compare the proportions for each prime by global interpretation strategy. Table 13 shows the proportions of global interpretation styles for the two primes.

Global Interpretation Data

Table 13

Study 4: Extended Primes Proportion Data		
	Scuba (N = 33)	**Relationship** (N =33)
Metaphorical	42 %	91 %
Literal Plus	52 %	3 %
Literal	6 %	6 %

In the scuba condition, only 2 of the participants took a strictly literal interpretation. More than half of the participants took a literal plus interpretation and nearly half of the participants still adopted a metaphorical interpretation. The rate of literal interpretations does not appear to be noticeably higher than in previous studies in spite of the increased priming. Additionally, the rate of literal responses is exactly equal to the failed relationship condition where 2 out of the 33 participants noted a strictly literal interpretation of the poem. However, it does appear that more responses fell into the literal plus category rather than taking an explicit metaphorical interpretation.

We can compare these results with the relationship condition. Again, we see that only 2 participants took a strictly literal interpretation. One single participant took an allegorical interpretation and the vast majority of participants took a singular metaphorical approach (91%). These results show an increase in literal plus responses for those that were primed with a scuba story and a scuba prime. A paired z test to compare this to the proportion obtained using the metaphorical prime revealed that this difference was highly significant ($z = 4.42$, $p<0.001$). Likewise, the participants that read a matched article about online dating and then saw the failed relationship prime showed a higher proportion of metaphorical responses. A paired comparison z test revealed that this relationship was also highly significant ($z = 4.18$, $p<0.001$).

Study 4 tested whether we could strengthen the literal priming and obtain a greater proportion of literal answers. Yet still only 6% of the participants in the scuba condition provided strictly literal responses. This was not statistically different from

the proportion of literal responses obtained with the metaphorical primes. In fact, the metaphorical prime yielded an identical rate of literal responses and this was an extremely low proportion compared to the proportion of participants who elected to use literal plus or metaphorical interpretations. However, we did see a rise in literal plus responses from participants in the scuba condition. The scuba prime in Study 1 yielded a rate of about 35% of the responses with literal plus interpretations while Study 4 yielded a rate of about 52% of the responses with a literal plus interpretation. The increased literal priming did not increase the rate of strictly literal responses although it did decrease the likelihood that participants would take an explicitly metaphorical interpretation and increased the likelihood that they would take a literal plus perspective. These results were found to be statistically significant. In this way, the priming seemed to work to inhibit full-blown metaphorical interpretations but it still did not yield a higher rate of literal responses.

Did the strengthened dating priming increase the strength of the failed relationship prime? The extended failed relationship prime did increase metaphorical responses compared to the scuba condition. The most common response in this condition focused on the failed relationship scenario given in the prime as exemplified by this participant's response:

" 'there is a ladder….I go down.. I crawl like an insect…there is no one to tell me when the ocean will begin'
^ may be about how one works hard to build a relationship up (up the ladder) but no one ever told them that the relationship may not last forever, the love may sink (down the ladder). The person will be let down, appear weak (like an insect)
'first the air is blue, and then it is bluer, then green, then black'
^ at first the love seemed perfect then it gradually got worse and worse
'whose breast still bear the stress'
^person still in much pain"

This participant takes a singular metaphorical approach to the poem, embraces the failed relationship prime, and very clearly maps out the source domain elements from the poem and the metaphorical entailments of how they relate to a failed relationship. These types of responses underline the strength of the failed relationship prime in that participants do seem to have clearer metaphorical mappings under this condition. Being given this metaphorical interpretation strategy lessens the cognitive demands of both adopting a unique interpretation and also mapping out the meaning of the specific actions from the poem in a very limited amount of time. The strength of these responses provide some support for CMT yet the nuances and blending of the source domain to create mini-allegories suggest more complex dynamics are going into the cognitive process to make these interpretations work both globally for the entire poem as well as line by line.

Mini-Allegory

Table 14 displays the overall proportions of responses containing mini-allegory in Study 3. Participants included mini-allegories in their interpretation of the poem and the participants over 94% of the time, regardless of whether they saw the scuba primes or the relationship primes. Thus, even when we strengthened the prime to elicit greater proportions of literal responses we still find that participants are incorporating mini-allegory in their responses. This trend was confirmed in all four studies. Mini-allegories are ubiquitous elements when interpreting an embodied allegorical poem. This suggests that participants are not conducting a literal gloss translation of the poem without tapping into the embodied meanings behind the

metaphor. Instead they are using source domains and mini-allegories in nearly every response in every experiment.

Table 14

Study 4: Extended Primes Mini-Allegory Proportion Data		
Mini-Allegory	**Scuba** (N =33)	**Relationship** (N =33)
Yes	94%	94%
No	6%	6%

Conclusions

The main finding from Study 4 is that the extended prime in the scuba condition was effective at pushing participants towards literal plus interpretations rather than full-blown metaphorical interpretations but it still did not increase strictly literal responses. The failed relationship extended prime did not serve to increase metaphorical responses as there were already very high rates of metaphorical responses, this may be due to a ceiling effect. These results again disconfirm the traditional theories that suggest literal thought is the primary mode of cognition, that language is abstract and amodal, and that analogical reasoning is a purely formal task that the average person struggle with. Instead these results confirm once again that the human mind is a metaphorical, creative system that easily articulates complex relationships and analogies when they are grounded in embodied knowledge. Even when participants are extensively primed to think about scuba in another task and then they are again primed to approach the poem by considering its surface value, they still display a very strong allegorical impulse.

Discussion

The study of embodied metaphor in everyday language and its pervasive role in thought has been a revolutionary force sparking a great interest in embodied cognition that has spread beyond linguistics to all of cognitive science (Lakoff & Johnson, 1980; Gibbs, 2006; Barsalou, 2008). Although metaphor studies have become increasingly popular, very little research has focused on embodied allegory. This series of studies that investigates participant's interpretations of a very complex allegorical poem gets to the heart of themes pervasive in metaphor research.

Lakoff has long been criticized for the circular reasoning used in supporting CMT: people use metaphors in language because they think metaphorically and the evidence that they think metaphorically is that they use metaphor in language. Allegory is a special case of metaphorical language where the metaphor is completely implied. As such, participants can be primed to think metaphorically without any explicitly metaphorical stimuli. The source domains are given and often elaborated in such detail and specificity that, as evidenced by the data collected here, the vast majority of participants are drawn to interpret the poem using allegorical themes. These themes are sprinkled throughout their responses and blended to make sense of the complexities of the poem, even when there is no given source-to-target mapping as might be expected in traditional metaphor research.

The mini-allegories that emerged from these themes constituted the building blocks to interpret the poem as a whole. Under every priming condition, participants made use of mini-allegories extensively. This prevalence of multiple metaphorical themes being used in a single response casts doubt on the idea that people access

metaphors singularly and discretely. Instead it suggests that participants consider a variety of complexities when weaving together their interpretations. It also alludes to the fact that not every participant took a singular interpretation. Even those who had an explicitly articulated, metaphorical global interpretation often referred to the polysemy of the source domains and incorporated mini-allegories in addition to the main theme.

The poem that inspired these studies is far more complex than previous metaphor stimuli and also more complex than the poems used in previous allegory research such as the Robert Frost poem. The data collected from open-ended responses to this complex stimulus reflects an increased complexity and highlights the spectrum of language use that participants have at their disposal from literal to allegorical to metaphorical. Allegorical thought and language holds a special in-between place that floats back and forth from the literal embodied source domains to the abstract target domains without fully committing to either side. Analyzing these responses was a particular challenge as the allegorical nature of the responses evaded clear categorization as *either* metaphorical *or* literal. They seldom showed a clear one-to-one mapping between a particular source to a particular target. Instead the dynamics and fluidity of the mapping patterns came to life as allegorical constellations crafted from selecting a subset of mini-allegories. This action creates an allegorical ambiance that serves as a bridge from the literal to the metaphorical. The strategy of many to many mappings allowed participants to tackle such a complex interpretation task. It should be recognized that metaphorical meaning takes place on a continuum, often with many ambiguous cases.

The results from the control condition in Study 1 are of particular importance as they reflect the most natural conditions for reading the poem: with no priming whatsoever. When readers appreciate a poem from home or when literary scholars take a critical approach to a poem they are not provided with a pre-formulated interpretation. Instead they approach it on their own without such priming. The prevalence of metaphorical responses and literal plus responses that contained allegorical and metaphorical elements even with such a complex stimulus and even with absolutely no prompting reveals a great deal about cognition. This finding alone builds on previous research looking at allegorical cognition and supports the idea that humans are symbolic creatures endowed with an allegorical impulse to connect enduring embodied experiences with abstract concepts. Hypothesis 1, which suggests a literal default mode of thought, was clearly not supported by any of the studies presented here and this was also not the case even when participants completed the task in the absence of any priming whatsoever.

In fact, even when explicitly primed to think of the poem via its surface value, as a poem simply about a scuba trip, many participants were still drawn to full or partial metaphorical explanations. Study 4 sought to strengthen literal primes and increase the proportion of literal responses. While this was partly successful in increasing the literal plus responses there was still a very low rate of strictly literal responses and a nearly unanimous tendency to include mini-allegorical themes inspired from the source domain descriptions given in the poem. The difficulty in eliciting strictly literal responses, even given the strengthened primes in study 4, reaffirms the strength of the allegorical impulse.

The overall efficacy of the failed relationship prime, and it's increased advantages when combined with a brief reflection on embodied simulations experienced while reading through the poem, provide convincing evidence that metaphorical thought is deeply rooted in embodied cognition. Mary Gick and Keith Holyoak (1983), based on the data they had available at the time, assumed that participants have a very hard time making sense of analogies, even with obvious clues. This data demonstrates that even in the absence of obvious clues participants can still interpret embodied allegory (as in the control condition from Study 1) and furthermore, when they are given metaphorical clues these impulses become even stronger. Other traditional views of language assume that the default mode of cognition is literal, that metaphors are simply understood as paraphrased literal expressions stored amodally in the mental lexicon. Yet these results reveal the pervasive use of metaphorical language and the additional advantage of reflecting back on embodied simulations (as in Study 3) or reflecting on embodied and subjective literary responses (as in Study 2). Traditional theories are incapable of explaining the data collected in these four studies.

The multiple meanings prompt that suggested the poem may have multiple interpretations and urging participants to remain open to considering these various possibilities seemed to overwhelm participants when presented without any implicit primes, as in Study 1. This explicit prime led participants in Study 1 to display a lower proportion of full blown metaphorical interpretations and an increased proportion of literal plus or strictly literal interpretations compared to the other primes. This was not the case in Studies 2 and 3 where participants were also

implicitly primed with the literary response task or the embodied simulation reflection task.

Taken together these results may have pedagogical implications for strategies to introduce students to complex poetry. A notoriously difficult subject, poetry sometimes frustrates teachers and leaves many students to enter adulthood feeling as if they lack the mysterious ability to correctly interpret the complex symbols. Some participants even wove this narrative of self-doubt into their responses noting that they were never "good at poetry" or conversely that their skills as a literature major would "finally pay off". The data collected from these studies can be applied in a pedagogical context to help craft strategies to better introduce poetry, informed by effective cognitive strategies and supported by empirical evidence. Using such strategies could increase the quality and ease of interpretation of even very complex poems and as a result also increase a sense of self-efficacy that students will take beyond the classroom.

In particular, giving a specific metaphoric prompt might be a successful strategy for students who are very early stage learners or are in need of extra scaffolding to interpret the poem. A wealth of second language acquisition research has shown that explicitly introducing learners to metaphorical themes can greatly increase their metaphorical language abilities (Boers, 2000; Csabi, 2004, Littlemore, 2006). The results presented above extend this finding to native language studies and suggest that giving participants a prompt reflecting an enduring metaphorical theme to help them interpret a complex poem provides cognitive advantages.

Yet, if the goal is not simply to have students think metaphorically but to go beyond and explore the polysemy of various metaphorical possibilities, as with more advanced students of poetry, teachers may want to avoid forcing a singular metaphorical interpretation and instead opt to give students activities that prime them to think independently about their own embodied and subjective literary reactions and experiences after reading the poem. The strong results from Studies 2 and 3 support the idea that these activities stimulate allegorical impulses, aid in metaphorical interpretations, and increase the richness of the complex tapestry created by participants expertly weaving together various subsets of mini-allegories to form a coherent global explanation. This strategy might allow the students to avoid being pigeon-holed by one forced metaphorical interpretation while still providing some cognitive scaffolding to help them craft structured, grounded interpretations of what could be a very intimidating task.

Overall, participants displayed a dominant allegorical impulse, the tendency to interpret the poem allegorically. Very rarely did participants take a literal minded-approach and interpret the poem as a scuba tale. The tendency to interpret the poem allegorically was so strong that there was a ceiling effect because, regardless of prompt type, all but 6% of participant's responses (12 out of 218 participants from studies 1-4 wrote strictly literal responses) were categorized as literal plus or metaphorical interpretations. This finding was remarkable because it supports the idea that participants intrinsically possess an allegorical impulse. The source domain analysis suggested that there were some preferences for source domains by prompt

type but also a general trend to consistently use the 7 source domains in every condition.

Finally, source domains were used in dynamic ways supporting Hypothesis 3. There didn't seem to be one-to-one, source-to-target mappings revolving around a singular conceptual metaphor. Instead, in an allegorical context, there is a network of partially articulated source domains that work together to create an *allegorical ambiance,* like a constellation of partially developed source domains that cluster together in meaningful ways. The allegorical interpretation emerges from this momentary soft-assembly so that there is not just a set of arbitrary scuba details but a purposeful, symbolic tale with deeper meanings woven into the embodied details. The analysis of mini-allegories further supported this notion that participants are using multiple source domains and multiple mini-allegories to create an allegorical ambiance derived from dynamic, embodied cognitive tendencies. Rather than mapping out metaphorical relationships in a linear fashion, meaning emerged from participant's construction of their own allegorical ambiance via mini-allegories and multiple source domain references.

It is also worth recognizing that the highly prevalent literal plus responses that were allegorical in nature may serve to acknowledge the complexity of the concrete source domain experience through describing that experience allegorically. Many times the source domain is explained as such a simple, basic, easy to describe experience that it can be articulated without conscious effort. Yet this data reveals how the simple source domain elements like "up" or "dark" can be woven into a very complex physical experience. Part of the challenge of unpacking Rich's poem is in

integrating the many details of the source domain to comprehend the overall experience. There is a beauty and richness to this experience alone. While there is a strong cognitive tendency to structure abstract target domains via embodied source domains perhaps it is time to acknowledge that this relationship is more dynamic than previously expected. At times the source domain may be highly complex and partly understood via abstract target domains. There may be a much stronger tendency to use the source domain to conceptualize the target but this relationship may not be strictly unidirectional.

In conclusion, this work provides data that helps broaden the scope of current empirical work. Metaphors are so generative that they can be hard to capture in a laboratory setting, both in terms of creating figurative stimuli and also in terms of measuring participant's linguistic responses to such language. Several decades of scholarship focusing on metaphor suggest that figurative thought shapes much of cognition, yet there has been little focus on extended forms of metaphor in the literature. There are certainly benefits to running clean, controlled studies yet there are still many questions that cannot be addressed by noting participants responses to isolated, sanitized metaphors. How do people reason metaphorically when they experience allegorical interpretations in extended, richer contexts? How do mixed metaphorical themes work together, build upon each other, and blend in meaningful ways? How do people respond differently to language that was created by poets who are focused on imagery, style, and aesthetics rather than laboratory stimuli that was created to cleanly isolate single metaphorical themes? How do participants appreciate the source domain itself as a complex and allegorical experience? More

research needs to be done to study people's complex, messy, beautiful interpretations to uncover these complex, embodied, interpretative processes.

The four studies presented in this thesis build upon and extend the existing literature by looking at how people utilize embodied simulation in abstract language processing when presented with an extended, complex allegorical poem. These results help provide a glimpse into the world of metaphor cognition, to move beyond crudely asserting that a single conceptual metaphor is activated, and reveal the mapping dynamics that flexibly accommodate multiple metaphoric themes as the cognitive system works towards interpreting a complex allegorical poem. Traditional theories of metaphor cognition and CMT are inadequate to explain the data presented in this dissertation on embodied allegory. This is undeniable evidence that metaphorical cognition is much more dynamic than previously suspected.

Appendix

A. Below is a table listing the different categories of global interpretation and responses that fell within each category.

Table 1
Overall Interpretation Strategy: Coding Examples

Interpretation Strategy	Examples From Study 1	Brief Description
Literal	"But when the author said "I am she I am she" I thought about something sexual and it didn't make sense with the poem I mean it makes sense with shakespeare but not with this poem. So I stopped went back and re-read the story and figured out that the poem isnt tricking you its telling you exactly what is happening. The scuba diver is exploring a ship wreck and is taking pictures about it and its describing their experience."	This participant saw the failed relationship prime and thought about various romance themed interpretations but in the end they explicitly reject the validity of a figurative interpretation (as noted in this excerpt). Explicit rejections were coded as having an overall literal interpretation strategy.
	"Oh man, I have never been a fan of poetry. Sorry for butchering this lol. So there's the book of myths which could be some sort of document that tells about the sinking of a ship or something that has occurred in the ocean. A man who is a diver has gone to find the wreckage and I'm guessing he is searching for mermaids, or proof that they have once lived in the ocean, and maybe some lost treasures. Not sure if he's alluding to dead bodies in the ocean, but it seems like it >> so maybe he encountered some bodies on the dive down. Seems like he talks about a sunken ship towards the end in which he is a survivor coming back to examine the wreckage."	This participant (who was in the multiple meanings group) describes the surface level of the poem: the book of myths is possibly a ship document, there is a diver whose goal is looking for mermaids or treasure, the other dark imagery may be a reference to seeing dead bodies on the way down. Poems that seemed to be mostly about the physical act of scuba diving were coded as literal.
Literal Plus	"This individual may be participating in underwater deep sea diving, going into the depths of the ocean to explore and observe the remains of what may have been a major car or plane wreckage. I imagine that the accident had taken place quite some time ago, and ancient artifacts are all that remain. He/she mentions the "book of myths", so it seems as though he/she is chasing a legend or an underwater mystery, and becomes "one" with the sea creatures in the process."	This participant from the control condition gives mostly literal descriptions of the poem but then at the end there is a metaphor for the act of scuba diving itself as though it were becoming one with all the sea creatures. Responses that made the act of scuba diving a metaphorical, allegorical, deeply symbolic act were coded as allegorical.
Metaphorical (Singular Theme)	"I believe that this poem is detailing the thoughts that one has after a relationship fails. At the beginning of the poem, the narrator is preparing to go into his own mind to reevaluate the relationship. He climbs down a ladder into the depths of the ocean, where his thoughts go from pleasant to dark. As he reaches the wreck, the narrator sees how the ship was on a set path but	This participant from the failed relationship group used the failed relationship interpretation as a metaphorical theme that unifies their entire response. They don't explore other interpretations. Responses that used one coherent metaphorical

	was stopped. Now it is only erroding down at the bottom of the ocean. Most people in a serious relationship have some sort of ending in mind, typically marriage. Perhaps, the narrator's relationship was on this course but things got in the way. As time passes, the ship is being worn down by the salt of the ocean. This could be the relationship losing prevalance in the narrator's mind. The narrator doesn't seem as occupied with the relationship itself, but more of how it ended and what is left of it after everything has been said and done."	theme in their response were coded as being metaphorical.
Metaphorical (Multiple Themes)	"I believe that the poem is about a lonley man. Maybe grieving from the death of a loved one or maybe going through heartbreak. The wrecked ship might be a metaphor for his wrecked or broken heart. He is exploring the shipwreck just as he is exploring himself at this moment. He is going underwater to find himself and to take him away from reality. I think in the end, he realizes that it is only life and that eventually he will move on."	This participant was a part of the multiple meanings group. They note two possible interpretations of the poem. The first possibility is that the narrator is grieving from the death of a loved one. The second possible interpretation is that the narrator is going through heartbreak. Responses that articulate multiple metaphorical explanations for what the narrator might be describing other than just a scuba dive were also coded as metaphorical responses.

B. Source Domain Definitions and Examples:

Journey (N=75)

The mention of a metaphorical or literal voyage sometimes focusing in on the source,

the path, or the goal of the metaphorical journey

"If one is not completely at peace and certain of themselves, it is **difficult to embark on a journey of self** without becoming uneasy or vulnerable."

"I feel that this poem is meant to unite people; to show that we have all been **down that path** where you get hurt in a relationship."

"Being submerged underwater can be **an exciting adventure** but it is also dangerous and frightening."

Visibility (N=63)

The mention of visual experiences such as lighting conditions, color changes, or

visual searches

" I also think this poem is about aging about becoming old, **looking** weather beaten

towards the sun."

"The setting of **the dark water**, the paradox of feeling conscious yet unconscious, powerful yet powerless, comfortable yet alien and out of place, seems to set the tone for **reflection** on other thing than the activity at hand."

"He **sees** the wreck, and **sees** himself in it."

Verticality (N=59)

The mention of an upward, lifted element or trajectory or a downward, grounded

element or trajectory

"The poem is obviously discussing a scuba diving experience, in which the narrator is looking for something **in the depths of the ocean**. But, **in a deeper, not so obvious wa**y, the poem is referring to the soul-searches individuals go on through life. "

"This **came up** more when he saw other characters, people, **down below** in the ship who had died and identified him as them and vice versa."

"In the beginning, the diver is hesitant and feels **weighed down** by the flippers and armor, which could be a metaphor for their feelings of hesitation."

Discovery (N=67)

The finding, coming across, or uncovering of a metaphorical or literal object

"Personally I viewed this poem as using scuba diving **to find** a mystical abandoned ship as a metaphor for **discovering truth** in ones life for themself rather than accepting public opinion and homogenized views of reality to be valid."

"The protagonist has to prepare and transform himself to enter it, and when he does **he finds** the relics of times gone by, things that lie still, forgotten, old and rotting, yes, but **with much of value barely hidden beneath**."

"Now as he dives down **to uncover the wreck**, he is finding that he becomes someone else, or a part of someone else that appears to have been a part of the wreck."

Containment (N=76)

The mention of being inside or out. People or objects can be inside or outside of a particular concept and abstract concepts are sometimes inside or outside of the person.

"Instead of solely **being in the story**, alive people tell the story."

"He **dove into the relationship and swam around**, but it all seems very sad, which can be applied to the relationship that failed."

"So, to me, the metaphoric aspect of his journey are a trip **into his own mind**, mediation, or something like it, seeking to reflect on events that have passed and opportunities that have gone by, **struggling not to get lost in his own deep desires**, but gain something valuable by connecting to a part of himself he often ignores or doesn't have access to."

Isolation (N=23)

Referring to either the person or the couple, the participant mentions being socially or physically isolated or united with others.

"It's so difficult to fathom the vastness of the ocean, so it's even more scary to explore it all **alone**."

"Scuba diving is thrilling to do every so often, but **underwater in the dark with only one other person is not a place you want to be for too long**."

"**We can't make the journey with anyone but ourselves**, and once we arrive at the destination deep within ourselves, **we have to face the truth alone**."

Wholeness (N=43)

The whole/part distinction or the in tact/broken distinction

"Or maybe even **a small piece of ourselves**, our inner child or dreamer, locked away to be protected from the harsh realities of the seemingly peaceful world outside."

“I feel like the longer you put off exploring or undercover what you don’t know, the harder it will be, and **the more broken the remnants of the wreck** will be as well.”

“The protagonist is essentially “diving down” into themselves and to explore their

broken heart.”

C. Paired comparison Z tests for proportion differences between groups: Studies 1-4

Study 1: Explicit Priming Z Tests for Proportion Differences Between Groups (Paired Comparisons)				
Interpretation	Prime 1	Prime 2	Z Score	P Value
Metaphorical	Control (57%)	Scuba (59%)	-0.09	0.93
		Relationship (88%)	-1.97	0.048*
		Multiple (44%)	0.73	0.47
	Scuba (59%)	Relationship (88%)	-1.93	0.052
		Multiple (44%)	0.87	0.38
		Control (57%)	0.09	0.93
	Relationship (88%)	Multiple (44%)	2.71	0.007**
		Scuba (59%)	1.93	0.052
		Control (57%)	1.97	0.048*
	Multiple (44%)	Control (57%)	-0.73	0.47
		Scuba (59%)	-0.87	0.38
		Relationship (88%)	-2.71	0.007**
Literal Plus	Control (36%)	Scuba (35%)	0.02	0.98
		Relationship (6%)	2.10	0.04*
		Multiple (38%)	-0.10	0.92
	Scuba (35%)	Relationship (6%)	2.12	0.03*
		Multiple (38%)	-0.13	0.90
		Control (36%)	-0.02	0.98
	Relationship (6%)	Multiple (38%)	-2.22	0.02*
		Control (36%)	-2.10	0.04*
		Scuba (35%)	-2.12	0.03*
	Multiple (38%)	Control (36%)	0.10	0.92
		Scuba (35%)	0.13	0.90
		Relationship (6%)	2.22	0.02*
Literal	Control (7%)	Scuba (6%)	0.14	0.89
		Relationship (6%)	0.14	0.89
		Multiple (19%)	-0.93	0.35
	Scuba (6%)	Relationship (6%)	0	1
		Multiple (19%)	-1.13	0.26
		Control (7%)	-0.14	0.89
	Relationship (6%)	Multiple (19%)	-1.13	0.26
		Control (7%)	-0.14	0.89
		Scuba (6%)	0	1
	Multiple (19%)	Control (7%)	0.93	0.35
		Scuba (6%)	1.13	0.26
		Relationship (6%)	1.13	0.26
The numbers in parentheses are the proportions of each response type found in Study 1 *p < 0.05, **p<0.01, ***p<0.001 Prime 1 & Prime 2 indicate the order the data was entered to compute the z score so if the data from the scuba prime was entered first this would be noted under the column titled “Prime 1”				

Study 2: Literary Response Prime Z Tests for Proportion Differences Between Groups (Paired Comparisons)				
Interpretation	Prime 1	Prime 2	Z Score	P Value
Metaphorical	Control (75%)	Scuba (100%)	-1.60	0.11
		Relationship (100%)	-1.51	0.13
		Multiple (100%)	-1.60	0.11
	Scuba (100%)	Relationship (100%)	0	Not Sig.
		Multiple (100%)	0	Not Sig.
		Control (75%)	1.60	0.11
	Relationship (100%)	Multiple (100%)	0	Not Sig.
		Scuba (100%)	0	Not Sig.
		Control (75%)	1.51	0.13
	Multiple (100%)	Control (75%)	1.60	0.11
		Scuba (100%)	0	Not Sig.
		Relationship (100%)	0	Not Sig.
Literal Plus	Control (25%)	Scuba (0%)	-1.60	0.11
		Relationship (0%)	1.51	0.13
		Multiple (0%)	-1.60	0.11
	Scuba (0%)	Relationship (0%)	0	Not Sig.
		Multiple (0%)	0	Not Sig.
		Control (25%)	1.60	0.11
	Relationship (0%)	Multiple (0%)	0	Not Sig.
		Control (25%)	-1.51	0.13
		Scuba (0%)	0	Not Sig.
	Multiple (0%)	Control (25%)	1.60	0.11
		Scuba (0%)	0	Not Sig.
		Relationship (0%)	0	Not Sig
Literal	Control (0%)	Scuba (0%)	0	Not Sig.
		Relationship (0%)	0	Not Sig.
		Multiple (0%)	0	Not Sig.
	Scuba (0%)	Relationship (0%)	0	Not Sig.
		Multiple (0%)	0	Not Sig.
		Control (0%)	0	Not Sig.
	Relationship (0%)	Multiple (0%)	0	Not Sig.
		Control (0%)	0	Not Sig.
		Scuba (0%)	0	Not Sig.
	Multiple (0%)	Control (0%)	0	Not Sig.
		Scuba (0%)	0	Not Sig.
		Relationship (0%)	0	Not Sig.

The numbers in parentheses are the proportions of each response type found in Study 2
*p < 0.05, **p<0.01, ***p<0.001
Prime 1 & Prime 2 indicate the order the data was entered to compute the z score so if the data from the scuba prime was entered first this would be noted under the column titled “Prime 1”

Study 3: Simulation Priming Z Tests for Proportion Differences Between Groups (Paired Comparisons)				
Interpretation	Prime 1	Prime 2	Z Score	P Value
Metaphorical	Control (64%)	Scuba (54%)	0.55	0.58
		Relationship (100%)	-2.47	0.01*
		Multiple (77%)	-0.72	0.47
	Scuba (54%)	Relationship (100%)	-2.88	0.004**
		Multiple (77%)	-1.24	0.21
		Control (64%)	-0.55	0.58
	Relationship (100%)	Multiple (77%)	1.91	0.056
		Scuba (54%)	2.88	0.004**
		Control (64%)	2.47	0.01*
	Multiple (77%)	Control (64%)	0.72	0.47
		Scuba (54%)	1.24	0.21
		Relationship (100%)	-1.91	0.056
Literal Plus	Control (29%)	Scuba (38%)	-0.54	0.59
		Relationship (0%)	2.16	0.03*
		Multiple (23%)	0.33	0.74
	Scuba (38%)	Relationship (0%)	2.57	0.01*
		Multiple (23%)	0.85	0.40
		Control (29%)	0.54	0.59
	Relationship (0%)	Multiple (23%)	-1.91	0.056
		Control (29%)	-2.16	0.03*
		Scuba (38%)	-2.57	0.01*
	Multiple (23%)	Control (29%)	-0.33	0.74
		Scuba (38%)	-0.85	0.40
		Relationship (0%)	1.91	0.056
Literal	Control (7%)	Scuba (8%)	-0.05	0.96
		Relationship (0%)	0.02	0.31
		Multiple (0%)	0.98	0.32
	Scuba (8%)	Relationship (0%)	1.06	0.29
		Multiple (0%)	1.02	0.31
		Control (7%)	0.05	0.96
	Relationship (0%)	Multiple (0%)	0	Not Sig.
		Control (7%)	-0.02	0.31
		Scuba (8%)	-1.06	0.29
	Multiple (0%)	Control (7%)	-0.98	0.32
		Scuba (8%)	-1.02	0.31

		Relationship (0%)	0	Not Sig.

The numbers in parentheses are the proportions of each response type found in Study 3
*p < 0.05, **p<0.01, ***p<0.001
Prime 1 & Prime 2 indicate the order the data was entered to compute the z score so if the data from the scuba prime was entered first this would be noted under the column titled "Prime 1"

Study 3: Imagined Sensations
Z Tests for Proportion Differences Between Groups
(Paired Comparisons)

Imagined Sensations	Prime A	Prime B	Z Score	P Value
Yes	Control (92%)	Scuba (69%)	1.49	0.14
		Relationship (85%)	0.61	0.54
		Multiple (85%)	0.61	0.54
	Scuba (69%)	Control (92%)	-1.49	0.14
		Relationship (85%)	-0.93	0.35
		Multiple (85%)	-0.93	0.35
	Relationship (85%)	Control (92%)	-0.61	0.54
		Scuba (69%)	0.93	0.35
		Multiple (85%)	0	1
	Multiple (85%)	Control (92%)	-0.61	0.54
		Scuba (69%)	0.93	0.35
		Relationship (85%)	0	1
No	Control (8%)	Scuba (31%)	-1.49	0.14
		Relationship (15%)	-0.61	0.54
		Multiple (15%)	-0.61	0.54
	Scuba (31%)	Control (8%)	1.49	0.14
		Relationship (15%)	0.93	0.35
		Multiple (15%)	0.93	0.35
	Relationship (15%)	Control (8%)	0.61	0.54
		Scuba (31%)	-0.93	0.35
		Multiple (15%)	0	1
	Multiple (15%)	Control (8%)	0.61	0.54
		Scuba (31%)	-0.93	0.35
		Relationship (15%)	0	1

The numbers in parentheses are the proportions of each response type found in Study 3
*p < 0.05, **p<0.01, ***p<0.001
Prime 1 & Prime 2 indicate the order the data was entered to compute the z score so if the data from the scuba prime was entered first this would be noted under the column titled "Prime 1"

Study 3: Onset Location Z Tests for Proportion Differences Between Groups (Paired Comparisons)			
Onset Location A	**Onset Location B**	**Z Score**	**P Value**
Stanza 1: Scuba Gear (22%)	Stanza 2-4 (69%)	-3.77	0.000***
	Generic (9%)	1.38	0.17
Stanza 2-4: Ladder, Water Immersion (69%)	Stanza 1 (22%)	3.77	0.000***
	Generic (9%)	4.87	0.000***
Generic Diving Responses (9%)	Stanza 1 (22%)	-1.38	0.17
	Stanza 2-4 (69%)	-4.87	0.000***
The numbers in parentheses are the proportions of each onset location found in Study 3 *p < 0.05, **p<0.01, ***p<0.001 Onset Location A & Onset Location B indicate the order the data was entered to compute the z score so if the data from the Stanza 1 was entered first this would be noted under the column titled "Onset Location A"			

Study 4: Extended Primes Z Test, Paired Comparisons				
Interpretation	Prime 1	Prime 2	Z Score	P Value
Metaphorical	Scuba (42%)	Relationship (91%)	-4.18	0***
Literal Plus	Scuba (52%)	Relationship (3%)	4.42	0***
Literal	Scuba (6%)	Relationship (6%)	0	1
The numbers in parentheses are the proportions of each response type found in Study 4 *p < 0.05, **p<0.01, ***p<0.001 Prime 1 & Prime 2 indicate the order the data was entered to compute the z score so if the data from the scuba prime was entered first this would be noted under the column titled "Prime 1"				

D. Source Domain & Mini-Allegory Examples

Study 1: The Top 7 Metaphorical Themes	
Source Domain	Example from Data
Journey (47%)	"If I take it a bit figuratively, then it could be symbolizing or otherwise referencing **a person's journey in life (or perhaps that of humanity overall**…)."
Visibility (27%)	"I believe that when he **blacks out** he **sees**/imagines a mermaid among the wreckage that he was **looking** for but instead of falling in love with her **he sees himself in her**; maybe a form of questioning his identity of who he is."
Verticality (27%)	"He spent lots of money on her (possibly a gold digger situation?) but then **the relationship came crashing down**, perhaps because of her death."
Discovery (26%)	"The poem at first serves as a straight forward reflection of sea diving; this sea diving serves as **a metaphor for finding the truth**."
Containment (45%)	**"**The poem projects feelings of drifting away or dying, with the author's **description of aloneness and imagery of being submerged in water"**
Isolation (14%)	"In the fourth stanza, he discusses how well the relationship had started out, but then the surroundings turn and change colors towards **a darker, more lonely ending."**
Wholeness (34%)	"I believe that the shipwreck is a metaphor for the **memories of the broken relationship.**"

Study 2: The Top 7 Metaphorical Themes	
Source Domain	Example from Data
Journey (42%)	"If one is not completely at peace and certain of themselves, it is **difficult to embark on a journey of self** without becoming uneasy or vulnerable."
Visibility (35%)	"The setting of **the dark water**, the paradox of feeling conscious yet unconscious, powerful yet powerless, comfortable yet alien and out of place, seems to set the tone for **reflection** on other thing than the activity at hand."
Verticality (33%)	"The poem is obviously discussing a scuba diving experience, in which the narrator is looking for something **in the depths of the ocean**. But, **in a deeper, not so obvious wa**y, the poem is referring to the soul-searches individuals go on through life."
Discovery (38%)	"Personally I viewed this poem as using scuba diving **to find** a mystical abandoned ship as a metaphor for **discovering truth** in ones life for themself rather than accepting public opinion and homogenized views of reality to be valid."
Containment (43%)	"He **dove into the relationship and swam around**, but it all seems very sad, which can be applied to the relationship that failed."
Isolation (13%)	"**We can't make the journey with anyone but ourselves**, and once we arrive at the destination deep within ourselves, **we have to face the truth alone**."
Wholeness (24%)	"The protagonist is essentially "diving down" into themselves and to explore their **broken heart**."

E. Mini-Allegories

Study 1: Mini-Allegories		
Source Domain	Mini Allegory	Example
Journey	Search/Exploration (34%)	"When he went searching for this ship that symbolized love, he found a mermaid with black hair."
	Progress/Impediments (19%)	"This poem seems to represent the struggle we endure as individuals going through different points in our lives and how such past and present experiences define who we are."
	Time (13%)	"The closing lines, "cowardice or courage" and "myths where our names do not appear" which reflect on the ways that people romanticize tragedy, and seek to find themselves in the past."
	Downward Journey (7%)	"As he/she submerges deeper in the water it begins to turn from blue to green to black symbolizing the progressive failure in their relationship, or what event eventually lead to the failure."
	Inner Journey (6%)	"The poet is descending into their damaged psyche to examine the failed relationship."
Verticality	Negative Affect (33%)	"The second stanza is about the climb that the relationship could have had through the relationship., where if the relationship goes well (there's a possibility it always can), then one can climb into a happier state, but otherwise, the only direction capable of going is down."
	Depth (24%)	"He climbs down a ladder into the depths of the ocean, where his thoughts go from pleasant to dark."
	Positive Affect (12%)	"He then dives down and feels like he is in a new world altogether and he is enveloped with the beauty and mystery of the deep sea."
	Obstacles (11%)	"It is also possible that he is talking about reflecting on the "wreck" that was the failed relationship and how it almost feels like he is disoriented and is trying to right himself again."
	Repression (3%)	"This poem seems to the depict identity of a person who not only sees himself as a man diving down into the deep sea but a mermaid who wishes to be set free."
Visibility	Search (45%)	"This poem is literally and superficially about a deep-sea diver scoping out a sunken ship."
	Lighting (20%)	"In addition, he sees the reality which later turns all black to him because he is dishearted and fed up with his life."
	Contemplation (17%)	"The camera may symbolize how certain episodes in a relationship can be captured and later evaluated and reflected upon."
	Appearances (11%)	"And how it is probably nothing like what he expected given his previous knowledge, and that to experience it for yourself is so different than observing from afar."
Containment	Immersion (45%)	"Once in the water, the diver emmerses himself in her findings, in the deep, black water that he refers to as "she", and in all the objects found in the ship."
	Hidden Objects (15%)	"When they describe the instruments that the diver brings it makes a clear contrast between the natural world of the ocean and the man-made things that have disturbed it (the wreck) and that are trying to uncover its secrets."

	Knowledge Acquisition (11%)	"However, beneath the surface the poem is about exploring new, unknown experiences on your own and learning from them, essentially being your own teacher but at the same time being a student."
	Inner journeys (10%)	"The poet is descending into their damaged psyche to examine the failed relationship."
	Time (8%)	"I think it might be about someone exploring their past life, or looking in on their past with remorse."
	Fullness (3%)	"I know that in the beginning it sounds more like a story than an actual poem, but as I read on, the words carried more meaning and were heavy and revealing."
Discovery	Loss (18%)	"The closing lines, "cowardice or courage" and "myths where our names do not appear" which reflect on the ways that people romanticize tragedy, and seek to find themselves in the past."
	Authenticity (15%)	"He had to get used to his surroundings and find his own path within the ocean, referring to life and how you must find your bearings to head out on the right path for you."
	Knowledge (13%)	"Having the woman be a mermaid rather than another human searching for love in a sunken ship, the poet might be saying that women are like unknown creatures to men."
	Memory (9%)	"They go back because they want to remember – though it is painful."
	Protection/Coping (3%)	"When they describe the instruments that the diver brings it makes a clear contrast between the natural world of the ocean and the man-made things that have disturbed it (the wreck) and that are trying to uncover its secrets."
Wholeness	Broken (14%)	"Looking upon the wreck he/she views the demise of their relationship; what once was is now sunken and destroyed at the bottom of the ocean."
	Parts/Subcomponents (4%)	"I am she: I am he" shows that the other person in the relationship is still apart of the author."
Isolation	Negative Outcomes (30%)	"He mentions that he's doing this alone, and I think that is to imply that there is a certain level of fear when you venture off alone."
	Positive Outcomes (15%)	"I feel that the poem was about this solo journey about diving deep and discovering something that is timeless, and mythical and the person was able to transcend themself into the story and that act, rather than being the do-er, the diver, he is a part of all the aspects of the myth."

Study 2: Mini-Allegories		
Source Domain	Mini Allegory	Example
Journey	Search/Exploration (38%)	"It is to be assumed that the narrator has been looking for a piece of information for a long time, and is attempting to recover said knowledge on this journey. "
	Progress/Impediments (34%)	"He was trying to find his way back or trying to find where he made the mistake that led him along this different path."
	Time (20%)	"Things have a way of catching up with you"
	Inner Journey (18%)	"Like diving deep into the ocean, you have to dig deep within yourself"
	Downward Journey (19%)	"He dove into the relationship and swam around, but it all seems very sad, which can be applied to the relationship that failed."
Verticality	Negative Affect (42%)	"Man, I can't write about this anymore, it's so depressing."
	Depth (39%)	"He went into the deep dark ocean of love to explore, but it didn't work out for them."
	Positive Affect (25%)	"Their body positioning of always looking toward the light brought back this sense of faith forever lost or death and always hoping or wishing for life."
	Obstacles (17%)	"In the beginning, the diver is hesitant and feels weighed down by the flippers and armor, which could be a metaphor for their feelings of hesitation."
	Repression (17%)	"A small part of ourselves, that we keep hidden and well protected in the very depths of our heart."
Visibility	Search (49%)	"I think people are afraid of digging and looking back into their past because they're afraid of the issues that remain buried and unresolved."
	Contemplation (27%)	"The poet feels melancholy to look at the reality of the break-up and feels very hurt"
	Lighting (19%)	"In both cases the thing he is discovering is buried deeply and is in a dark place that takes much courage to go alone"
	Appearances (16%)	"Daily, we must put on our armor to face the world (build ourselves up), dress in accordance to cultural norms, put on a "show," an identity"
Containment	Immersion (20%)	"Being submerged underwater can be an exciting adventure but it is also dangerous and frightening"
	Hidden Objects (20%)	"A small part of ourselves, that we keep hidden and well protected in the very depths of our heart."
	Knowledge Acquisition (20%)	"Overall, the poet strongly expresses how depressed the break up has made him or her feel in order to capture the truth behind the end of a relationship"
	Inner journeys (18%)	"The protagonist is essentially "diving down" into themselves and to explore their broken heart."
	Time (13%)	"They have the sense that it is a bad idea to look into the past, but they also know that it is good as well"
	Fullness 12%)	"The protagonist is realizing that the relationship wasn't as fulfilling as they originally believed"
Discovery	Authenticity (49%)	"Like diving deep into the ocean, you have to dig deep within yourself in order to learn who you truly are and sometimes you find things you'd never expect."

	Knowledge (48%)	"I think the diver in this poem is attempting to discover something unknown or uncover feelings that have been put to the back burner."
	Loss (22%)	"Societal norms contribute to this loss of self, and those who resist (either by courage or cowardice) find themselves in a place not deemed acceptable by such norms."
	Memory (18%)	"The poem seems to be about self-exploration, memory, and recovery."
	Protection/Coping (16%)	"I think people are afraid of digging and looking back into their past because they're afraid of the issues that remain buried and unresolved."
Wholeness	Broken (54%)	"The protagonist is essentially "diving down" into themselves and to explore their broken heart."
	Parts/Subcomponents (42%)	"To find the best parts of life, you have to go through the worst parts of it and you have to keep diving or keeping pushing to get there and not give up in the process."
Isolation	Negative Outcomes (43%)	"It's so difficult to fathom the vastness of the ocean, so it's even more scary to explore it all alone."
	Positive Outcomes (39%)	"Sometimes you have to do things alone, and the reason for whatever it is you're doing is often about personal fulfillment"

F. Below is a representative sample of responses from each prompt type (taken from Study 2). Note the recognition of metaphorical meaning in each example, regardless of prompt type:

Scuba Diving Prime

"The poem seems to be about self-exploration, memory, and recovery. While the author is literally exploring the ocean, the poem suggests that he is also exploring himself and possibly a repressed memory. It is very clear in the beginning of the poem that the narrator is very alone, and does not have anyone to rely on but himself and the three things he carried with him: a knife, a camera, and a book of myths. I thought that these three items were interesting. Why would the narrator choose these three specific items, especially the third. The camera for documenting his experience? The knife for protection? What is the book of myths? The memory in the poem takes the shape of "the wreck". This may mean that this memory or "wreck" was painful and damaging to the author. When the narrator describes the wreck, I got the sense that he was comparing it to a skeleton. This may suggest that the narrator lost someone close to some kind of accident. Now as he dives down to uncover the wreck, he is finding that he becomes someone else, or a part of someone else that appears to have been a part of the wreck. It almost seems as if the narrator was expecting this transformation because of the change in point of view throughout the poem. The poem may also refer to the idea that the narrator did not follow the life path that he intended, and that his life ended up being the wreck. The poem could suggest that he was trying to find his way back or trying to find where he made the mistake that led him along this different path" (A9).

Failed Relationship Prime

"I feel like the beginning of the poem refers to the person who has just experienced a tough break up with a long time partner. This is the first time they are exploring their true feelings about the break up, past the surface understanding that it hurt them emotionally. The protagonist is essentially "diving down" into themselves and to explore their broken heart. There are mentions of treasures still hidden within the wrecked ship, implying that the end of the relationship was not as emotionally exhausting as initially believed to be. Towards the end of the poem this attitude changes, almost as if the protagonist is realizing that the relationship wasn't as fulfilling as they originally believed.
The description of the journey down to the ship is the protagonist's reflection on their relationship as a whole, and the mermaid and merman are supposed to represent the couple whose relationship ended. The fairytale creatures might imply that the relationship was "magical" or trope-like in the beginning. It's interesting that the merman is described as "armored" whereas the mermaid's hair is the only thing given about her, but I think that might have to do with feelings that the protagonist is projecting about her relationship; maybe the other person in the relationship was more guarded and not open to talking about their feelings.
Finally, and the end I think the book of myths becomes a retelling of the relationship with names changed to protect the identities of the original people as well as changing aspects of the story to be more like a fairytale" (B3)

Multiple Meanings Prime

"My impression is that the poet took us along for a recounting of an experience that started off as just a scuba dive; the first stanza in particular seemed the least obviously analogous to a relationship, and I don't think the protagonist initially went out diving in order to explore his/her relationships or feelings. The setting of the dark water, the paradox of feeling conscious yet unconscious, powerful yet powerless, comfortable yet alien and out of place, seems to set the tone for reflection on other thing than the activity at hand. The discovery of the wreck seems to represent revisiting something that's already been lost, exploring a literal shipwreck providing a way to go back over the remains and memories of a wrecked relationship as externally and objectively as possible" (D1).

Control Group (no prime)

"The poem is obviously discussing a scuba diving experience, in which the narrator is looking for something in the depths of the ocean. But, in a deeper, not so obvious way, the poem is referring to the soul-searches individuals go on through life. The narrator repeatedly stresses how they are alone and unaccompanied on the dive trip. Though they are alone, the narrator seems to have an attitude of familiarity; they have

been in the situation before. It is to be assumed that the narrator has been looking for a piece of information for a long time, and is attempting to recover said knowledge on this journey.

The narrator describes a difference in atmosphere, even a difference in breathing. These abnormalities, that are being the depths of the ocean alone and changes in breathing, are ones that would usually make one uncomfortable, but the narrator claims to feel empowered by their mask. The mask is a symbol for self-esteem. A successful scuba diving trip is completely dependent on an oxygen mask and tank, as confidence is during a soul-search. If one is not completely at peace and certain of themselves, it is difficult to embark on a journey of self without becoming uneasy or vulnerable. Any other preparation that does not involve believing in oneself is useless, much like the unused loaded camera and knife mentioned twice.

In the conclusion of the poem, the narrator claims to be both a scuba diver and a mermaid. The mermaid is symbolic of the part the narrator had been searching for. They refer to the book of myths as to not containing evidence of either themselves or the mermaid, which means that what the narrator found was not what they had set out to discover, yet was equally fulfilling" (C7).

G. Literary response items from Study 2

Table 5: Literary Experience Items	
Embodied Literary Experiences	Items
1. *Loss of Self Boundaries*	"While reading the poem, my sense of self seemed to spread beyond my physical body."
2. Intimacy with Character	"While reading the poem, I felt myself doing what the protagonist in the poem was doing."
3. *Inexpressible Realization*	"While reading the poem, I began to understand something that could not easily be put into words."
4. *Self-Perceptual Depth 1*	"While reading the poem, I began to better understand something from my past."
5. *Evocative Imagery*	"While reading the poem, I experienced images that were very evocative."
6. *Wonder*	"While reading the poem, I experienced profound wonder."
7. *Disquietude*	"While reading the poem, I felt very uneasy."
8. *Bodily Self-Awareness*	"While reading the poem, I was very aware of my body."
9. *Emotional Self-Awareness*	"While reading the poem, I was very aware of how I was feeling."
10. *Cognitive Self-Awareness*	"While reading the poem, I was very aware of what I was thinking.

11. *Narrative Immersion*	"While reading the poem, I felt very absorbed in the story being told."
12. *Empathy Towards Character*	"While reading the poem, I felt great empathy for the protagonist in the poem."
13. *Existential Awareness*	"While reading the poem, I understood more about the difficulties in life."
14. *Allegorical Meaning*	"While reading the poem, I understood that the poem referred to experiences that have nothing to do with scuba diving."
15. *Surface Meaning*	"While reading the poem, I understood that the poem referred to actual experiences with scuba diving."
16. *Multiple Meanings*	"While reading the poem, I understood that the poem referred to actual experiences with scuba diving and to experiences that have nothing to do with scuba diving."
17. *Self-Perceptual Depth 2*	"While reading the poem, I felt that I was learning something new about life."

H. Extended Primes from Study 4

Scuba Diving:

"The phenomenally clear waters of The Bahamas are every diver's dream.

Some divers spend their lives primarily in search of three things: water, reefs and sea creatures.

Professional dive operators offer instruction from the most basic beginner "resort" lessons for those who just want to try diving, all the way through to advanced specialty diving courses. All of the training can be done from the comfort of warm waters, and it's all sanctioned by the world's top certifying agencies. Once you're done, you can immediately begin going on what are considered peak diving experiences.

Imagine flying over the edge of the Grand Canyon – not in a plane, but like Superman. That's the feeling you get when you dive into a warm, tropical ocean. One minute you can be floating at the top of this new world learning to navigate this beautiful new way of seeing everything. You're suspended over the abyss with a tingly feeling in your belly.

There's nothing that matches diving into the reef for combining relaxation, fascination and exhilaration all in one activity.

But if you aren't careful you may find that suddenly, the bottom drops into a black, cold, lonely abyss.

In spite of all the pleasures one might find in scuba diving it can also be a dangerous activity. For example, if your tank runs out of oxygen while you are in the depths of the ocean you run the risk of drowning. Another problem is that divers may become entrapped when they become unable to navigate out of an enclosed space. As you dive deeper you may begin to encounter even more pressure and less visibility making it harder and harder to safely find the surface to take a breather."

Online Dating:

"The phenomenally clear feelings of true love are every person's dream.

Some people spend their lives primarily in search of three things: love, commitment, and intimacy.

Professional date experts offer instruction from the most basic beginner "romance" lessons for those who just want to try dating, all the way through to advanced life partner courses. All of the training is done from the comfort of your warm living room, and it's all sanctioned by the world's top certifying agencies. Once you're done, you can immediately begin going on what are considered peak dating experiences.

Imagine flying over the edge of the Grand Canyon – not in a plane, but like Superman. That's the feeling you get when you dive into a warm, caring relationship. One minute you can be floating at the top of this new world learning to navigate this beautiful new way of seeing everything. You're suspended with a tingly feeling in your belly.

There's nothing that matches diving into love for combining relaxation, fascination and exhilaration all in one activity.

But if you aren't careful you may find that suddenly, the bottom drops into a black, cold, lonely abyss.

In spite of all the pleasures one might find in online dating it can also be a dangerous activity. For example, if your partner runs out of interest while you are in the depths of love you run the risk of drowning. Another problem is that partners may become entrapped when they become unable to break out of a bad date. As you dive deeper you may begin to encounter even more pressure and less visibility making it harder and harder to safely find the surface to take a breath.

References

Baker, N. (2009). *The anthologist*. New York: Simon & Schuster.

Barsalou, L.W. (2008). Grounded cognition. *The Annual Review of Psychology*, 59: 617-645.

Bergen, B. (2012). *Louder than words*. New York: Basic Books.

Boers, F. (2000). Metaphor awareness and vocabulary retention. *Applied Linguistics*, 21:4, 553-571.

Csabi, S. (2004). A cognitive linguistic view of polysemy in English and its implications for teaching. In *SOLA: Studies on Language Acquisition, Series: Cognitive Linguistics Second Language Acquisition, and Foreign Language Teaching*, 233-256. M. Achard, & S. Niemeier (eds.), Berlin, Germany: Mouton de Gruyter.

Desai, R.H., Conant, L.L., Binder, J.R., Park, H., & Seidenberg, M. (2013). A piece of the action: Modulation of the sensory-motor region by action idioms and metaphors. *Neuroimage*, 83, 862-869.

Fodor, J. A. (1983). *The modularity of mind*. Cambridge, MA: MIT Press.

Frost, R. (1959). *Being let in on symbols*. Downloaded from: http://midddigital.middlebury.edu/local_files/robert_frost/lectures_readings on 2/25/2014.

Frost, R. (1969). *The poetry of Robert Frost*. New York: Holt, Rinehart, and Winston.

Gibbs, R. & Blackwell, N. (2012). Climbing the ladder to literary heaven: A case study of allegorical interpretation of fiction. *Scientific Study of Literature,* 2:2, 199-217.

Gibbs, R., & Boers, E. (2005). Metaphoric processing of allegorical poetry. In Z. Maalej (Ed.), *Metaphor and culture*. Tunis, Tunisia: University of Manouba Press.

Gibbs, R. & Santa Cruz, M.J. (2012). Temporal unfolding of conceptual metaphor experience. *Metaphor and Symbol,* 27:4, 299-311.

Gibbs, R. (2006). *Embodiment and cognitive science*. New York: Cambridge University Press.

Gibbs, R. (2011). The allegorical impulse. *Metaphor and Symbol*, 26:2, 121-130.

Gibbs, R. (2013). Walking the walk while thinking about the talk: Embodied Interpretation of metaphorical narratives. *Journal of Psycholinguistic Research*, 42:4, 363-378.

Gibbs, R., Okonski, L., & Hatfield, M. (2013). Crazy, creative metaphors: Crazy metaphorical mind? *Metaphor and the Social World*, 3:2, 141-159.

Gick, M.L. & Holyoak, K.J. (1983). Schema induction and analogical transfer. *Cognitive Psychology,* 15, 1-38.

Grice, H.P. 1975. "Logic and conversation." In *Syntax and semantics: Vol 3. Speech Acts*, pp. 41-58. P. Cole and J. Morgan (eds.), New York: Academic Press.

Hauk, O., Johnsrude, I., & Pulvermueller, F. (2004). Somatotopic representation of action words in human motor and premotor cortex. *Neuron*, 41, 301-307.

Hollis, M. (2011). Edward Thomas, Robert Frost, and the road to war. *The*

Guardian.

Kettle, M. (2000). Americans choose the road not taken. *The Guardian.*

Kuiken, D., Campbell, P., & Sopcak, P. (in press). The experiencing questionnaire: Locating exceptional reading moments.

Lakoff, George (1993) The Contemporary Theory of Metaphor, in Andrew Ortony (ed.,) *Thought and Metaphor.* Cambridge: Cambridge UP (second ed.). 202-251.

Lakoff, G. & Johnson, M. (1980). *Metaphors we live by.* University of Chicago Press: Chicago.

Lakoff, G., & Johnson, M. 1999. *Philosophy in the flesh*. New York: Basic Books.

Littlemore, J.G.L. (2006). Metaphoric competence, second language learning, and communicative ability. *Applied Linguistics*, 27:2, 268-294.

Mahon, B.Z. & Caramazza, A. (2008). A critical look at the embodied cognition hypothesis and a new proposal for grounding conceptual content. *Journal of Physiology*, 102, 59-70.

McGlone, M. (2007). What is the explanatory value of a conceptual metaphor? *Language & Communication, 27*, 109-126.

Milford, N. (1975). *Adrienne Rich's Poetry.* New York: Norton and Company.

Miller, G.A. (1979). Images and models, similes and metaphors. In A. Ortony (ed), *Metaphor and Thought*. London/New York: Cambridge University Press.

Nelson, C. (1981). *Our last first poets: Vision and history in contemporary American poetry.* Chicago: The University of Illinois Press.

Rakova, M. (2006). The philosophy of embodied realism: A high price to pay? *Cognitive Linguistics*, 13:3, 215-244.

Searle, J. (1979). Metaphor. In A. Ortony (Ed.), *Metaphor and thought* (pp. 83-111). New York: Cambridge University Press.

Stanfield, R.A. & Zwaan, R.A. (2001). The effect of implied orientation derived from verbal context on picture recognition. *Psychological Science*, 12, 153-156.

Tsur, R. (1999). Lakoff's roads not taken. Downloaded from http://www.tau.ac.il/~tsurxx/Stock_Responses_New.html, on 2/25/2014.

Whitman, R. (1975). Diving in the wreck: History of disaster. *Harvard Magazine* (1975): 57-65.

Wilson, N.L. & Gibbs, R. (2007). Real and imagined body movement primes metaphor comprehension. *Cognitive Science*, 31, 721-731.

Zwaan, R.A, Stanfield, R.A., & Yaxley, R.H. (2002). Language comprehenders mentally represent the shapes of objects. *Psychological Science*, 13, 168-171.