Introduction
As adult native speakers of English, our intuitions about the use of spatial prepositions are quick and sure. However, these intuitions involve attention to a variety of geometric and extra-geometric factors of the scenes we are describing (Coventry & Garrod, 2004; Feist & Gentner, 2003; Herskovits, 1986; Vandeloise, 2003). Although the role of geometric and extra-geometric factors in the meanings of many spatial terms has been receiving much attention, their role in the meaning of English at remains relatively understudied. In this paper, I describe two experiments which examined the factors involved in English speakers’ use and understanding of the preposition at.

Experiment 1
Experiment 1 examined the acceptability of at as a description of an existent scene. Participants were asked to rate the acceptability of at (embedded in sentences) as a description of Figure/Ground configurations in which the geometric and extra-geometric factors of proximity of the Figure and Ground (e.g., Herskovits, 1986; Miller & Johnson-Laird, 1976), contact, support (important, e.g., for in and on: Herskovits, 1986; Feist & Gentner, 2003), and canonicality of the Figure-Ground relation (Coventry & Garrod, 2004) were independently varied.

The results reveal that the acceptability of at is sensitive to proximity: at is rated more appropriate when the Figure and Ground are proximal (M = 4.25) than when they are not (M = 2.83), t(136) = 3.65, p < .0005. Further, if the Figure and Ground are proximal, at is rated as more appropriate if the Figure and Ground are not in contact with one another (M = 4.93) than if they are (M = 3.80), t(113) = 3.59, p < .0005. Similarly, at is sensitive to support, being rated as more appropriate if the Ground is not supporting the Figure (M = 5.10) than if it is (M = 3.53), t(45) = 6.48, p < .0001. Finally, use of at reflects an influence of canonicality: at is rated as more appropriate if the Figure and Ground are in a canonical configuration (M = 4.0) than if they are not (M = 2.53), t(22) = 4.54, p < .0002.

Experiment 2
Experiment 2 was designed to determine where speakers expect a Figure to be if it is described as at a Ground.

Participants were given pictures of the Figures and Grounds from Experiment 1 and asked in each case to place the Figure at the Ground. The resultant scenes were coded for coincidence of the Figure and Ground (as points) (Herskovits, 1986, inter alia), contact between the Figure and Ground, support of the Figure by the Ground, and functional interaction of the Figure and the Ground (Coventry & Garrod, 2004; Vandeloise, 2003).

The results suggest that coincidence of the Figure and Ground (as points) is not a major expectation for scenes described with at, appearing in only 30% of the responses. Likewise, it appears that speakers do not expect the Ground to support the Figure against gravity (support appears in only 48% of responses). In contrast, contact does appear to be expected, occurring in 76% of the responses. In addition, there is an expectation of a functional interaction between the Figure and Ground, as evidenced by the role of functional interaction in 64% of responses.

Discussion
Taken as a whole, these results suggest that at, like other English prepositions, is sensitive to geometric and extra-geometric aspects of spatial scenes. However, the roles of the various factors appear to be dependent on the task of the participant, as evidenced in particular by the differing direction of influence of support and contact on the results of the two experiments. When describing an existent scene, as in E1, at is most acceptable if the Figure and Ground are proximal, yet it is dispreferred if there is a contact or support relation. This can be explained by the existence of a competing preposition, on, which is often used in such instances (Coventry & Garrod, 2004; Herskovits, 1986). On the other hand, when attempting to comprehend another’s usage of at, competing prepositions are less relevant, resulting in a heightened influence of contact and support (E2). These results highlight the importance of examining both production and comprehension in order to probe the meanings of spatial prepositions.

References