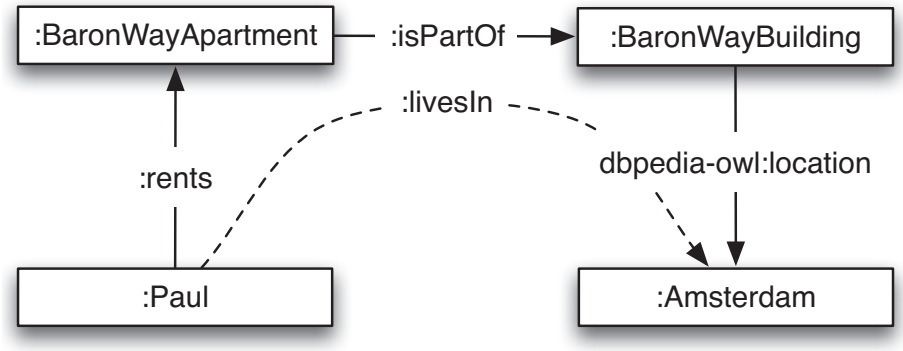

Figure 4.2: Property chains (dotted lines are inferred by the reasoner)

```
:livesIn rdf:type                owl:ObjectProperty ;
        owl:propertyChainAxiom ( :rents :isPartOf :location ) .
```

Figure 4.2 shows how the existence of the :livesIn relation can be inferred from the apartment example. Note that the property chain axiom does *not* make the named property (:livesIn) equivalent to the chain of properties; it is rather a *subproperty* of the chain. In OWL2 DL, property chains may only involve object properties, though most reasoners can handle chains that have a datatype property as last step.

Because of their expressiveness, property chains are subject to a number of restrictions. First of all, just like transitive properties, the superproperty of property chains is *composite*. This means that they cannot be used in a number of axioms (see table 4.1). Secondly, the property chain may not be recursive: the superproperty of the chain, its inverse, or one of its *sub*properties (or their inverse) may not occur in the property chain axiom. For instance, OWL2 DL does *not* allow us to extend the :livesIn property in the following way:

```
:livesIn rdf:type                owl:ObjectProperty ;
        owl:propertyChainAxiom ( :rents :isPartOf dbpedia-owl:location ) ;
        owl:propertyChainAxiom ( :livesIn dbpedia-owl:country ) .
```