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The Persistence of L1 Patterns in SLA: the Boundary Crossing Constraint and Incidental Learning

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Abstract

Based on the theoretical framework of Talmy (1985 et passim) and Slobin (1987 et passim) the present study analyses the influence of L1 patterns on the description of motion events with boundary crossings. Arab speakers avoid the use of manner of motion verbs in the description of these events and use simple path verbs (e.g. enter, go etc.), whereas speakers of English mostly use manner verbs (run, crawl etc.). These deeply engrained differences between L1 and L2 are a learning challenge in SLA. We analyse the use of manner verbs by an intermediate and an advanced group of Arab EFL learners, who live in the UK. Most learners either avoid the description or use path verbs as in Arabic. As the learners do not produce ungrammatical sentences, they will not receive negative feedback (e.g. from a teacher) and rely entirely on incidental learning from the input. However, despite the high frequency of these manner verbs in the daily input of the learners, they do not acquire the patterns of the target language even at a high proficiency level. Implicit learning in this context is hardly possible and explicit teaching and learning is needed to overcome the influence of the first language.

Keywords: motion events, boundary-crossing, implicit statistical learning, linguistic typology, Arabic speakers of English

Resumen

Basado en el marco teórico de Talmy (1985 et passim) y Slobin (1987 et passim), el presente estudio analiza la influencia de los patrones de la L1 en las descripciones de eventos de movimiento con fronteras. Los hablantes de árabe evitan el uso de la forma de verbos de movimiento en la descripción de estos eventos y usan verbos más simples (por ejemplo, entrar, ir, etc.), mientras que los anglófonos usan principalmente verbos de movimiento (ejecutar, arrastrarse, etc.). Estas diferencias profundamente arraigadas entre la L1 y la L2 son un desafío de aprendizaje en la ASL. Analizamos el uso de verbos modales entre un grupo de árabe ILE (Inglesa como Lengua Extranjera) intermedio y avanzado, que viven en el Reino Unido. La mayoría de los estudiantes evitan la descripción o usan verbos de camino como en árabe. Como los estudiantes no producen oraciones agramaticales, no recibirán comentarios negativos (por ejemplo, de un profesor) y dependerán totalmente del aprendizaje incidental de entradas cotidianas. Sin embargo, a pesar de la alta frecuencia de estos verbos de movimiento en el aporte diario de los alumnos, no adquieren los patrones del idioma de destino, incluso en un nivel alto de competencia. El aprendizaje implícito en este contexto es casi imposible y se necesita enseñanza y aprendizaje explícitos para superar la influencia del primer idioma.

Palabras clave: eventos de movimiento, cruce de fronteras, aprendizaje estadístico implícito, tipología lingüística, hablantes árabes de inglés

1. Introduction

Speakers of different languages vary in their lexicalization of motion events. The study of these language-specific preferences led Talmy (1985, 1991, 2000a and 2000b) to propose his typology which depends on the ways the semantic components of motion are verbalized across the world's languages. In Talmy's original framework, languages are classified into two groups: Satellite-framed languages (S-languages) and Verb-framed languages (V-languages). According to Slobin (2004), S-languages can easily encode the use of *Manner* with motion verbs at boundary crossings, scenes where a figure crosses a spatial boundary, (he ran into the room) since they can encode the direction of the movement in the satellite (into), whereas this use is not licenced in V-languages (the boundary crossing constraint), such as French, Spanish and many others, where constructions such as "he entered the room running" or simply "he entered the room" are used. As a consequence, speakers of V-languages avoid the use of manner of motion verbs with boundary crossings in English because it is in conflict with their L1 patterns. Although Slobin's classification is useful to describe and predict these aspects of second language acquisition, it has been shown that the classification

is not a clear-cut dichotomy and that languages only have a general tendency for one category but also show structures that are more in line with the other category (Beavers, Levin, & Tham 2010, Slobin 2004). Arabic has typically been classified into a V-language (Saidi 2008), but how Arab learners describe *Manner* at boundary crossing motion events is under-researched. To this end, the present study attempts to compare the use of manner of motion verbs in boundary crossings of 64 Arab EFL learners with two proficiency levels (intermediate and advanced) who live in the UK with two monolingual groups: Arabic and English. First, we need to establish that English and Arabic natives follow different patterns. Then, we investigate the patterns produced by the learner groups. We assume that native groups will show different typological patterns and that both learner groups will face difficulty when using the manner verb in boundary crossing due to the effect of the cognitive constraint from L1.

As the learners do not produce ungrammatical structures with a path rather than a manner verb as the main verb (e.g. he entered the house), it is expected that they will not receive negative feedback. The teaching of motion event patterns has received little attention (exceptions are Attwood & Treffers-Daller (under review), and Cadierno & Robinson 2009). With the lack of negative feedback and deliberate teaching, the only possible way available for the learners is through incidental learning from the frequency in the input. Frequency of input has long been established in the literature as a factor which often leads to the acquisition of second language (L2) features. For example, lexical items which are frequently used tend to be learned relatively easier than the less frequent ones (Milton 2009). However, there are areas of Second Language Acquisition (SLA) that seem to be resistant to frequency effects and incidental learning (for a discussion see Ellis 2002, Gass and Mackey 2002). The boundary-crossing motion event domain could be one of these. To explore whether input frequency can play a role in learning manner verbs in boundary crossings, the frequency with which the learner groups use the target structures were compared with the frequency data of the same structures from the British National Corpus (BNC) and from the monolingual groups. We assume that, in our case, there are limitations for learning from frequency in the input and that the deeply ingrained cognitive constraint of L1 can only be overcome through explicit instruction. This paper is structured as follows: first we briefly discuss Talmy's typology and Slobin's thinking-for-speaking hypothesis with reference to the typological difference between Arabic and English. Second, the boundary crossing constraint is presented followed by a summary on the role of input frequency on incidental statistical learning. After that, the research questions and hypotheses are formulated, followed by a description of the study methods. Then, we present the results. Finally, the article is concluded by a discussion of the results.

2. Literature Review

2.1. Language Typology and Differences between L1 and L2

The typological frameworks of the present study are based on Talmy (1985, 1991, 2000a, 2000b) and Slobin's "thinking-for-speaking" (1987 et passim). Talmy's typology is based on different ways the semantic components of motion are used to describe motion events across the worlds' language. Generally, a motion event consists of a *Figure*, a *Path*, a *Ground or Landmark* and the *Motion* itself, e.g. the man (*Figure*) went (*Motion*) into (*Path*) the house (*Ground*). In addition, a co-event, such as *Manner of Motion* and *Cause of Motion*, can be expressed, e.g. the man ran (*Manner*) into the bank, the man threw (*Cause*) the ball. Talmy's typology makes a fundamental distinction between S-languages and V-languages. In S-languages such as English motion events can be described in a main verb and a satellite that indicates the *Path* (e.g. "into"). It is easy in these languages to express the *Manner* in the main verb (e.g. "ran into"). Most European languages, apart from the Romance languages belong to this type. Romance languages are V-languages where *Path* is typically expressed in the main verb and therefore *Manner* needs to be expressed in a different way, i.e. in a subordinate construction, for example, in Spanish "entrar corriendo a/en" (enters running) (Larrañaga, Treffers-Daller, Tidball and Ortega, 2012: 124). Slobin (1996) uses this typology to provide evidence for his thinking-for-speaking hypothesis in which he claims that people direct their attention while speaking to the components of motion events that are codable in their language, that is, the speakers' perspectives on motion events are defined by the options available in their language. This is also evident from studies on translations between typological different languages (Alonso 2018). The fact that V-language speakers express *Manner* outside the main verb when describing boundary crossings requires a heavier syntactic construction which could explain why speakers of V-languages tend to express *Manner* less frequently in these contexts (Slobin 2004). Özçalışkan and Slobin (2003: 259) point out that there are no absolute rules but that it is about how "habitually" speakers of different languages describe motion events. In a similar vein, Slobin argues that languages can be ranked on a "cline of manner salience" and that "a number of factors contribute to the degree of salience of manner in languages" (2004:2). The picture is even more complex as satellite-framed patterns can be found in languages that are characterized as verb-framed, e.g. "Pierre s'est enfui de l'école" (Pierre ran away/ escaped from school), a satellite-framed structures that can be found in French, a typical V-language (Kopecka 2006: 83). Some languages, such as Mandarin, do not seem to fit into Talmy's simple dichotomy and therefore a third category has been suggested, serial-verb languages where one verb expresses *Manner* and another verb *Path*, e.g. Mandarin: *feil chul* "fly exit" (Slobin 2004: 8). Many studies have English as one part of a language pair in their methodology and it

is generally accepted that English is seen as an S-language (Özçalı⊡kan & Slobin 2003, Slobin 2004, Alonso 2011, Gennari, Sloman, Malt & Fitch 2002). In Arabic, there are fewer studies. According to Talmy (1985) and Slobin (2006: 62), Arabic is classified as a V-language. This also holds for Arabic varieties other than Modern Standard Arabic (MSA). However, there seems to be a more complex situation. "Indeed, although Tunisian Arabic appears, as expected, to be strongly verb-framed, there are many other strategies which were not taken into account by Talmy's typology" (Saidi 2008: 202). Detailed studies of these alternative strategies in MSA are not available. However, bearing the complexity of the typological distinctions in mind, we assume as working hypothesis in the present study that the two languages involved here, English and Arabic, can be classified as either satellite-framed or verb-framed.

2.2. The boundary crossing constraint

This notion goes back to Slobin and Hoiting (1994) but the concept was first mentioned under a different name by Aske (1989). Aske compares the use of manner of motion verbs in Spanish and English and comes to the conclusion that the distribution of *Path* phrases is different in English and Spanish and that some constructions that are typical for English are not allowed in Spanish, e.g. "*ran into the house*". He suggests that this is the case because these telic phrases predict an end-state and in this context no manner of motion verbs are allowed in Spanish, instead a construction such as "entered the house running" is possible. Slobin and Hoiting coined the term boundary crossing constraint for V-languages. A more general version of this constraint is the notion "change of state generally" (Slobin 1997: 441), where not only movements but general changes of state, i.e. "*he kicked the door shut*" are not licensed in V-languages. Instead, constructions, such as "*he shut the door by kicking*", are used (see also Talmy 1991). In the context of the present study, we use the term "boundary crossing constraint" because our data consist of movement descriptions only. To our knowledge, there is only one study that includes boundary crossing events with Arabic speakers (von Stutterheim, Bouhaouos and Carroll, 2017). They found that "manner verbs do not combine with forms expressing a boundary crossing" (2017: 245) for MSA and for Tunisian Arabic. The literature also shows that there seems to be exceptions to the boundary crossing constraint for a variety of languages. Slobin (1997: 456) observes that manner of motion verbs are allowed in some V-languages in certain contexts, e.g. "he jumped from the branches" is possible in Portuguese. Slobin (2004: 7) argues that "verbs that encode particular forces that are more like punctual acts than activities, such as equivalents of 'throw oneself' and 'plunge'" might be an exception from the general constraint. In a similar vein, Naigles, Eisenberg, Kako, Highter and McGraw (1998) found that speakers of Spanish can use "jump" or "slide" when a figure jumps or slides into a pool. They conclude that "perhaps a boundary

crossing that is only the by-product of one's exertion, and not the original goal, is not viewed as a true boundary crossing" (1998: 453). In other words, the actor initiated the movement but after that the boundary crossing as such was out of his/her control and merely as result of gravity. Another possible explanation is that these events consist of a horizontal rather than a vertical motion (Naigles et al. 1998). These are of course speculative explanations, but it shows that the boundary crossing constraint is a complex issue and not just a simple dichotomy. It is beyond the scope of the present study, however, to investigate the exceptional character of these specific boundary crossings in detail but we include a picture with a figure that plunges into a pool and a figure that tumbles into a net in our data collection (see Appendix).

2.3. Incidental learning and input frequency

The question whether "it is possible for adults to learn linguistic regularities implicitly through exposure" has been raised by Kachinske, Osthus, Solovyeva and Long (2015: 391). Incidental language learning refers to "the acquisition of a word or expression without the conscious intention to commit the element to memory" (Hulstijn 2012: 1). It has been discussed for about 30 years (see Rebuschat 2015), mainly in first language acquisition research but increasingly also in SLA. In recent years, also the term "implicit statistical learning" has been used (Walk & Conway 2015: 191) to refer to the learners' ability to induce statistical regularities of language from the input automatically, unintentionally and without conscious awareness. We use this term in the present study because it combines both the notion of incidental learning and input frequency. According to Ellis (2002), frequency effects can be found in all aspects of second language learning, e.g. in the acquisition of phonology, syntax and lexis. Ellis (2002: 144) points out that "'rules'... are structural regularities that emerge from learner's lifetime analysis of the distributional characteristics of language input". The main argument here is not that language-specific innate structures are necessary to acquire language but rather frequency distribution in the input can provide us with cues to learn language structures. It is important to note that frequency is not the only factor and "moderating effects" (Ellis 2002: 147) also play a role in language acquisition. The question is what these moderating effects are and, for example, what the role of language transfer from L1 with regard to learning from frequency in the input is. Gass and Mackey (2002) respond to Ellis (2002) and state that although frequency in the input certainly has an influence on language learning, there are other important factors, such as saliency, the perception of patterns (2002: 253) and transfer from L1 (2002: 256). Arabic, for example, does not have copula and as a consequence Arabic learners of English find it difficult to learn and use this form in a consistent way. Another well-known example is the difficulties encountered in acquiring indefinite and definite articles by L2 learners whose L1s

do not have them (e.g. Chinese). Even Chinese learners at a high proficiency level in English seem to struggle with the use of articles because they are lacking in Chinese and this cannot be overcome in many cases despite the high frequency of articles in the input (see for example Robertson 2000).

When producing atypical but otherwise grammatical structures, negative feedback is likely not to be given. Thus, the learner relies solely on incidental learning from input frequency. One can assume that the mere fact that the correct structures are frequent in the input does not generally lead to the unlearning of ungrammatical or atypical L2 structures (see Gass and Mackey 2002: 255). The lack of direct negative evidence (e.g. correction by teachers) plays a crucial part in the discussion on implicit statistical learning. Some researchers argue that, in the absence of explicit feedback, it is possible that frequency distributions can provide learners with indirect evidence that certain structures are ungrammatical or atypical. Stefanowitsch (2008: 513) argues that "negative evidence can be inferred from the positive evidence in the linguistic input". According to Stefanowitsch, learners compare the expected frequency of a verb with the actual frequency, and if, for example, this verb is never encountered in a transitive construction, the learner will assume that it is intransitive. Likewise, Boyd, Ackerman and Kutaz argue that "learners are able to infer constraints specifying how a word cannot be used by considering how it is used" (2012: 1). Again, input frequency plays a crucial role in this context. For example, the verbs *disappear* and *vanish* are both intransitive, but *disappear* is more frequent and therefore learners are much more sure that it cannot take an object. As a consequence, overgeneralisations in a learner's language where these intransitive verbs take an object are much more frequent for *vanish* than for *disappear* (Boyd and Goldberg, 2011: 56). Thus, the frequency of correct input has an influence on the learners' grammatical judgements without any negative evidence. The frequency of *disappear* as intransitive verb in the input "blocks" (Boyd and Goldberg, 2011: 61) its use as a transitive verb. This *blocking* is less effective with less frequent verbs, such as *vanish*. Boyd and Goldberg (2011) argue that statistical pre-emption explains this type of learning. When children hear new words (e.g. the non-existing verb *cham*) in certain constructions, e.g. "The cow is chaming (intransitive) and Ernie's making the cow cham (periphrastic causative)", they are unlikely to use this verb in a transitive construction (Boyd and Goldberg 2011: 60). Thus, certain positive input is computed in an unconscious way to replace negative input and pre-empt the use of ungrammatical structures. One has to bear in mind that these examples are from children's first language acquisition. However, there are also studies that confirm that pre-emption also plays a role in adults (Boyd et al. 2012). In the domain of motion events, it can be assumed that if the learners are sensitive to the frequency in the input, they are likely to produce the type of motion verb which is highly frequent in the input available to them, be it a manner verb in the case of S-languages or a path verb in

V-languages. However, the case is more complicated with boundary crossing motion events (see Treffers-Daller & Calude, 2015).

One study which includes the notion of statistical learning with regard to the boundary crossing constraint is Treffers-Daller and Calude (2015). They found that adult learners of French with English as L1 are sensitive towards the frequency of motion verbs in the input and that their use of target like structures increases with higher proficiency, but that the learners at all levels fail to acquire the boundary crossing constraint in French because of lack of negative evidence. The English sentence "John runs into the house" is not the equivalent of the French sentence "Jean court dans la maison". The latter sentence means that John/Jean runs around inside the house because French does not licence manner of motion verbs with boundary crossings (Treffers-Daller and Calude 2015: 607). The learners in Treffers-Daller and Calude's study fail to acquire the boundary crossing constraint in French even though it is frequent in the input. Another study with English learners of Spanish (Larrañaga et al, 2012) shows a similar picture where the learners do not acquire the boundary crossing constraint in Spanish even at a higher proficiency level. This is in contrast to the findings of Cadierno and Ruiz (2006) who found that L1 plays only a limited role in advanced second language acquisition. The studies mentioned above are quite the reverse situation to our study as these learners of French or Spanish fail to acquire a constraint of the target language because they do not have this constraint in their L1, whereas our learners need to unlearn a constraint from L1 if they use the target language. One can assume that this is an even more challenging learning task since the learners in the present study produce grammatically correct sentences in the target language and are therefore very unlikely to receive negative feedback, whereas feedback in the case of English learners of Spanish or French is more likely as they produce sentences that have a different meaning than intended. Arab learners of English do not only need to notice the frequency of the motion verbs but to retreat from overgeneralizations that are transferred from their L1. They should notice that patterns like "run into" when describing boundary crossing scenes are frequent, but L1 patterns "enter running" are not expected in English. Hence, the frequency of manner verb with boundary crossing should block overgeneralization form L1. The fact that these L1 patterns are deeply entrenched makes us assume that frequency in the input is insufficient to overcome this difficulty. The present study seeks to investigate whether the boundary crossing constraint transferred from L1 can be overcome through input frequency and whether implicit statistical learning takes place with increasing proficiency.

3. Research questions

The following research questions are based on the discussion in the literature about the differences between Arabic and English in the expression of *Manner* in boundary crossing events. Research questions 1 and 2 refer to the differences between L1 and L2 and need to be answered to identify the potential learning burden. Research questions 3 and 4 ask whether and how this learning challenge can be overcome.

3.1. Research questions

1. Are there significant differences in the use of manner verbs in the description of boundary crossings between native speakers of Arabic and English?

2. Are there exceptions from the boundary constraint in Arabic that are similar to that in other languages, e.g. uncontrolled movement that are seen as "punctual acts" such as jumping?

3. To what extent does L2 proficiency influence the learnability of manner verbs with boundary by Arabic-speaking learners of English?

4. What role does input frequency and "implicit statistical learning" play in the acquisition of manner verbs expressing a boundary crossing?

4. Methodology

4.1. Participants

The participants in the present study are two groups of Arabic-speaking EFL learners and two control groups of native speakers of English and Arabic. The mean age of the English native speakers (n = 20) is 19.5 (4 males, 16 females), and that of the Arabic native speakers (n = 20) is 31.6 (1 male, 19 females). The first group of EFL learners consists of 34 participants in a pre-sessional course at a British university (mean age = 28.38; 19 males, 15 females). They are on an intermediate to upper intermediate level with IELTS scores ranging from 4.5 to 6.0. The second EFL learner group are 30 postgraduates at an advanced level with IELTS scores ranging from 6.5 to 8.5. Their mean age is 31.6 (9 males, 21 females). The imbalance in the gender distribution is partly due to the fact that monolingual Arabic speakers with limited contact to English are mainly found in the female Arabic population in the UK. As for their regular use of English, the learner groups report using the language between

'sometimes' and 'very frequently'. It is expected that since both learner groups live in the UK, they will have encountered the use of manner verbs in boundary crossing in the input in their daily contact. However, this is not explicitly taught and a contrastive analysis between the two languages is not part of their curriculum. Teachers normally give no negative feedback when the learners use correct structures, e.g. "he went into the house", where native speakers would say "he ran into the house" when a running figure is shown on a picture. Any learning of these structures seems to have taken place implicitly.

4.2. Measures

The material used was a free description task where participants were supposed to describe 12 pictures with boundary-crossing events. The task was designed and used by Özçalışkan (2015) and used by Cadierno (2010). The boundary-crossing events were of three types: 4 pictures depict a movement INTO a bounded space (e.g. *running into the house*), 4 pictures show a movement OUT OF a bounded space (e.g. *flying out of the cylinder*), and in the last 4 pictures the displacement is OVER a line or plane (e.g. *crawling over a carpet*). This particular material has been used because both *Manner* and *Path* components are salient in the pictures. A list of the figures with the different motion events is given in Table 1 below (see also Appendix).

Table 1. List of boundary-crossing motion events

	Type of Motion Event	Event Description
1	INTO a bounded space	Run into a house
2	OUT OF a bounded space	Fly out of a cylinder
3	OVER a plane or line	Crawl over a carpet
4	INTO a bounded space	Dive into a pool
5	OUT OF a bounded space	Dash out of a house
6	OVER a plane or line	Flip over a beam
7	INTO a bounded space	Tumble into a net
8	OUT OF a bounded space	Creep out of a house
9	OVER a plane or line	Leap over a hurdle
10	INTO a bounded space	Crawl into a house
11	OUT OF a bounded space	Sneak out of a pot
12	OVER a plane or line	Jump over a cliff

4.3. Procedure

The pictures were presented to the participants in the order found in Table 1 above. The participants were first introduced to the cartoon character Adam and then were asked to write a few sentences to describe what Adam is doing. The words for the landmarks in the pictures such as *house*, *pot* and *carpet* were provided and the learners were advised to use these words. The advanced Arab EFL learners and Arabic native speakers were met individually. The intermediate Arab EFL learners and English native speakers completed the task in a class setting. It took the participants 10 to 20 minutes to finish the task. The participants also filled in a background questionnaire prior to the task to obtain background information about the participants such as their age, how much they use English in their daily life and how long they live in the UK.

5. Data Analysis

In a first step, we analysed the 12 motion event construals according to an adaptation of the classification of Cadierno (2010) and Özçalıkan (2015) and put them into 6 different categories. An overview is given in Table 2.

Table 2. Event construal patterns

Category	Example
Manner verb + satellite	Ran into
Neutral verb + satellite	Go out
Neutral verb + manner adjunct Manner verb + neutral verb	Go into the class running Run and go into
Path verbs	Enter/ exit
Path verbs + manner adjunct or manner verb + path verb	Enter xxx running Run and enter
No boundary crossing or implicit boundary crossing	Go away from the carpet

After coding the data according to the categories in Table 2, two types of analysis were conducted: one where the verb type for each boundary crossing event (12 events) was computed for the native speakers in order to examine the effect of the boundary crossing event type on the use of manner verbs. In the other type of analysis, the number of the boundary-crossing events that fell in the classification above was computed for the learners in order to investigate the preferred event construal pattern.

A third analysis was also performed in order to explore the effect of input frequency on the descriptions of the investigated boundary crossing scenes. The frequency of all the manner verbs with boundary crossing (Manner verb + satellite) by the learner groups was compared to the frequency of the same patterns by Arab and English native groups and the frequency of these patterns in the input available to the learners which was obtained from the British National Corpus.

6. Results

In presenting the results, first, how native speakers of Arabic and English encoded the boundary crossing scenes is explored. Next, how learners encode the boundary-crossing situations is examined in comparison with the native groups. A comparison between the learner groups is also included. Finally, the role of input frequency is investigated.

6.1 The lexicalization patterns by the native groups

In order to find out whether native speakers of Arabic and English have different preferences for the 12 events, a comparison between these two groups was made on the basis of the 6 categories listed in Table 1. Because some of the categories have low frequencies, an analysis with a Chi^2 test would not have been appropriate. We therefore opted for the Fisher exact test. The test ("exact command" in SPSS with Monte Carlo option) produces for tables larger than 2x2 p-values based on the tests statistics of the Fisher-Freeman-Halton test, which is an extension of the original Fisher-exact test for larger tables. The results are given in Table 3.

Table 3. A comparison between the event construal by Arabic (n = 20) and English (n = 20) native speakers

Event	Value test statistics	p-value	Effect size (Cramers's V)
Event 1	36.998	< .001	.915
Event 2	30.857	< .001	.860
Event 3	29.260	< .001	.810
Event 4	Ns		
Event 5	44.252	< .001	.975
Event 6	Ns		
Event 7	Ns		
Event 8	39.065	< .001	.916
Event 9	Ns		
Event 10	36.108	< .001	.903
Event 11	29.957	< .001	.853
Event 12	10.035	< .01	.503

For four events, there is no significant difference between the two native speaker groups. For event 4 and 9, both groups use mainly manner verbs (event 4: NE: 20; NA: 18 manner verbs; event 9: NE: 18, NA: 16 manner verbs), for event 6 both groups avoid the boundary crossing (NE: 13; NA: 10 instances of avoidance) and for event 7 both groups mainly use simple Path constructions (NE: 10; NA: 12 path verbs). Event 4 describes a figure that dives into a pool, and event 9 describes a figure that jumps over a hurdle, both of which will be discussed later. One event (number 6) was probably difficult to interpret. Some participants said the figure was dancing and they probably did not see a boundary crossing there. For event 7, both native groups preferred the path verb (fall) over the manner verb (tumble), probably because the *Path* component is more salient than the *Manner* component in this event. For all other events, the differences between the two native speaker groups are significant with a large effect size (Cramer's V > .5; see Cohen 1988). For further analysis, the events with non-significant differences are excluded because they either are not a clear prompt for a boundary crossing (e.g. event 6) or pose no learning burden for Arab EFL learners as there is no difference in the event construal between L1 and L2 (e.g. event 4 and 9) . For the other events, a detailed overview of the preferred event construal by the native speaker groups is given in Table 4.

Table 4. Preferred event construal by native speakers (number in bracket = mode based on the categorisation in Table 2)

Event	Preferred construal Native Speaker of English	Preferred construal Native Speaker of Arabic
1	Manner verb + satellite (18)	Avoidance or implicit boundary crossing (9)
2	Manner verb + satellite (20)	Path verbs + manner verb or manner adjunct (9)
3	Manner verb + satellite (14)	Avoidance or implicit boundary crossing (11)
5	Manner verb + satellite (19)	Path verbs + manner verb or manner adjunct (13)
8	Manner verb + satellite (18)	Path verbs + manner verb or manner adjunct (18)
10	Manner verb + satellite (19)	Path verbs + manner verb or manner adjunct (11)
11	Manner verb + satellite (17)	Simple path verb (13)
12	Manner verb + satellite (19)	Manner verbs (11)

This means that the native speakers of English consistently use manner verbs + satellite (e.g. run into), whereas the native speakers of Arabic either avoid the description of the boundary crossing or use path verbs with or without adjunct (run and enter, enter running), for the exception of event (12) which will be discussed later, e.g:

daXala   Adam i:la l-bait   raki:Dan

entered   Adam to the house   running

Adam entered the house running

### 6.2 Lexicalization patterns among the Arab EFL learner groups

The further analysis focuses on the Arab EFL learners and we conflate the 6 categories used so far into a simple dichotomy: manner verb with satellite versus other event construal. Table 5 gives an overview over the number of event contruals with a

manner of motion verb plus a satellite or other alternative construals (which include categories 2 to 6 found in Table 2) for the four groups of participants. We excluded events from this computation where there was no significant difference between the event construals by native speakers, i.e. event 4, 6, 7, and 9.

Table 5. Event construal with manner of motion verbs + satellite and alternative construals

Event	Native speakers of English (n = 20)		Advanced Arab Learners (n = 30)		Intermediate Arab Learners (n = 34)		Native speakers of Arabic (n = 20)	
	Manner verb + satellite	other	Manner verb + satellite	Other	Manner verb + satellite	Other	Manner verb + satellite	Other
1	18	2	5	25	3	31	0	20
2	20	0	13	17	14	20	3	17
3	14	6	10	20	3	31	0	20
5	19	1	13	17	9	25	0	20
8	18	2	20	10	11	23	1	19
10	19	1	14	16	7	27	1	19
11	17	3	7	23	7	27	2	18
12	19	1	22	8	22	12	11	9

As mentioned before, there is a clear pattern where the use of manner verbs is preferred by native speakers of English and the use of other event construals is preferred by native speakers of Arabic. The patterns used by the learners lie between the preferred patterns of the native groups. Figure 1 visualises the preferred patterns of the four groups.

Figure 1. Preferred event construals by the four groups (percentages)
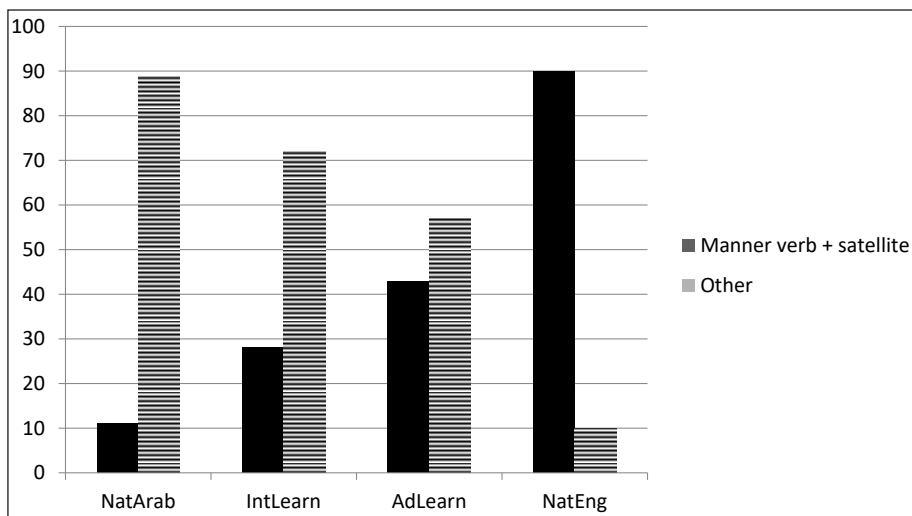
Overall, the differences between the four groups are significant (Fisher exact = 2156.976, p < .001, Cramer's V = 1.0). Again we used the "exact" command (Monte Carlo option) in SPSS, which produces the value for the Fisher-Freeman-Halton test for tables larger than 2x2. All differences between the individual groups are also highly significant at the .001 level (Native speakers of English and Advanced Learners: Fisher exact = 519.466; Advanced Learner and Intermediate Learners: Fisher exact = 686.824; Intermediate Leaners and Native speakers of Arabic: Fisher exact = 550.523). Figure 1 indicates a learning process, where learners at a lower level start with event construals that are closer to the Arabic native patterns, and where with increasing L2 proficiency more constructions are used that come closer to the English native-like pattern without reaching the native-like level totally.

6.3 The role of input frequency

As explicit teaching of these structures does not take place, only the learning difficulty of the patterns and the possible frequency of these structures in the input can explain the learning process or the lack of it. The differences between the two native speaker groups can explain in part the magnitude of the learning difficulty. This is an indication on how deeply entrenched these structures are in the L1. As an indication of the possible frequency of the target structures in the input (manner verb + satellite) such as 'run into', we use frequency data from the British National Corpus (BNC). We used three predictor variables: native Arabic use, native English use as found in the data, and the data from the BNC in two multiple regressions. The

dependent variable was the actual use by the intermediate and by the advanced learner groups. The results are given in Table 6.

Table 6. Predicting the use of manner verbs with boundary crossings (multiple regressions, method "enter")

Dependent variable	Anova	Explained Variance (R^2)	Predictor variables	Standardized Beta	Sig
Use of manner verbs with boundary crossing by					
Intermediate Learners	F (3, 16) = 72.571	.919	NatEng	.403	t = 5.312, p < .001
	p < .001		NatArab	.738	t = 10.072, p < .001
			BNC	-.063	t = -.880, p = .392
Advanced Learners	F (3, 16) = 37.831	.853	NatEng	.759	t = 7.442, p < .001
	p < .001		NatArab	.357	t = 3.625, p < .01
			BNC	-.152	t = -1.592, p = .131

Multicollinearity is not a problem as in both cases the value for Tolerance is greater than .2 and the Variance Inflation Factor is smaller than 10 (see Field, 2005: 175). Only the native Arabic and the native English patterns are significant in both models and the frequency based on the BNC does not predict the patterns used by the learners.

7. Discussion

Research question 1 about the differences between Arabic and English in the construal of motion events with boundary crossings can be answered on the basis of our findings. The results of the present study show a clear difference between native

speakers of English and Arabic. In line with expectations, Arabic native speakers use significantly fewer manner verbs with boundary crossing in their L1. Our findings lend support to Slobin's (2004) conclusion on thinking-for-speaking patterns found in depicting boundary-crossing motion events across S-languages and V-languages. Research question 2 which asks about exceptions from this categorical dichotomy can also be answered. In line with the literature, the avoidance of manner verbs by Arab native speakers does not hold for all events in the present study. This supports the revised typology of Beavers, Levin and Tham (2010), who show that in many languages both V-framed and S-framed patterns occur, but that languages differ in the extent to which these patterns can be found. In the present study, speakers of Arabic and English show clear tendencies but no exceptionless rules. A more fine-grained picture of these tendencies can be drawn through the analysis of event 4 which depicts a figure diving into a pool and event 9 which describes a figure jumping over a hurdle. In both cases, both native groups use mainly manner verbs. This is in line with similar event construals for Portuguese (Slobin 1997, 2004) and Spanish (Naigles et al. 1998). There seems to be a universal rule for speakers of different V-languages that manner verbs are licensed in these contexts. Naigles et al. (1998) argue that this is the case because the actor only initiates the act and that the actual boundary crossing is out of his/her control. However, in our case (event 4 and 9), the figure clearly plunges into the pool and leaps over the hurdle on purpose and the boundary crossing is clearly intended. We are therefore inclined to follow Slobin's (2004) explanation that a boundary crossing in a punctual act might be the reason for this exception. One might wonder why this is not applied to event 12, which depicts a punctual act (a figure jumps over a gap), where a significant difference between the native speakers of Arabic and English is found. A closer examination of the Arabic native speakers' description of this event, however, shows that the Arabic speakers produce more manner verbs than path verbs (11 manner verbs as opposed to 9 *Path* constructions), a result which shows that the use of manner verb is licensed in this type of boundary-crossing event. This is also in line with Slobin's (2004) interpretation. Further research is needed here with similar punctual acts in horizontal and vertical directions in order to get further insights into this pattern of exceptions across languages.

Research questions 3 and 4 ask about the factors that might influence the learnability of the English target structures. Two factors are investigated, the proficiency of the learners and the frequency of the relevant structures in the input. After excluding the events with punctual acts where the native groups show no significant difference, we are left with the events that seem to pose a learnability issue for the learners. For these events, our findings show that Arab EFL learners use significantly fewer manner verbs with boundary crossings than English native speakers. Instead, they tend to use simple path or neutral verbs or avoid the description of the boundary-crossing at all.

It seems that in the motion events where native speakers of English and Arabic show different tendencies, the production of manner verbs with boundary crossings by Arabic-speaking learners of English seems challenging. This can provide evidence for the influence of the learners' L1 in describing motion events with boundary crossings which goes in line with the results of Cadierno (2010), Alonso (2011), Larrañaga et al (2012), and Treffers-Daller and Tidball (2015). Moreover, this holds for different proficiency levels as both learner groups, the intermediate and the advanced, use fewer manner verbs in this context than English native speakers. There are, however, some indications that learning took place as the advanced learners use more manner verbs than the intermediate learners but both groups are significantly different from the native speakers. Therefore, it can be assumed that the difficulty in encoding manner verbs with boundary crossing motion events is not limited to the intermediate Arab learners but remains persistent with the advanced learners. This result is similar to the results of Larrañaga et al. (2012) in which they show that describing boundary crossing scenes is problematic for English learners of Spanish even in a later stage due to L1 influence. One has to bear in mind that in the current study the advanced learners are at a highly proficient level with IELTS scores above 6.5 and both learner groups live in the UK which increases the probability of exposure to the target structure in the input. This is an indication that the L1 patterns in the description of boundary crossings cannot be overcome simply by exposure to input frequency in L2. Even though the use of manner verb in depicting motion events with boundary crossing is assumed to be frequent in the L2 input, learners seem to fail to notice that patterns such as "run into" occur but not "enter running". Hence, input frequency could not help the learners to pre-empt L1 patterns and use manner verbs with boundary crossing in a native-like way. Through examining the role of frequency in the input, the two multiple regressions support this conclusion. The only significant variables that predict the use or the lack of use of manner verbs in boundary crossings are the preferences of the two languages involved. Frequency of the potential input as measured with data from the BNC is not significant in these regression models. The high explained variance (R^2) in the dependent variable solely on the basis of native Arabic and native English patterns shows how deeply ingrained these patterns are, which supports earlier findings for other language pairs (Treffers-Daller and Calude, 2015). Therefore, we can assume that implicit statistical learning based on frequencies is not possible for the patterns under discussion. Teacher feedback would be necessary to acquire these structures. Such negative feedback is, however, normally not given as the learners produce grammatically correct structures albeit different from the preferences of the target language. The findings of the present study are not only relevant from a linguistic viewpoint but also have clear pedagogical implications. Although foreign language teaching programmes cannot take every difference between L1 and L2 into account, it would be possible to include

the use of manner of motion verbs in boundary crossings in these programmes as this is a universal phenomenon and applies to many learners.

8. Conclusion

The analysis of the descriptions of motion events with boundary crossings reveals that English and Arabic native speakers behave differently where Arabic shows a preference to encode the traversal of boundary with path verbs normally without expressing *Manner* information and English systematically uses manner verbs with *Path* encoded in a satellite. Consequently, the boundary crossing constraint in L1 seems to affect the use of manner verbs by Arabic-speaking learners of English. The study shows that even Arabic-speaking learners with high proficiency in English tend to have difficulties in the use of manner verbs with boundary crossings which suggests that proficiency in general is not enough to overcome L1 preferences and to adopt target-like patterns. Through the analysis of the role of the input frequency as measured by the BNC, the study also shows that input frequency is not a significant factor in the learnability of manner verbs. Hence, implicit statistical learning from exposure to the input seems to be hardly possible. Future research is needed to investigate whether it is possible to overcome deeply ingrained cognitive constraints through explicit instruction in a classroom setting.

References

Alonso, R. A. (2011). The translation of motion events from Spanish into English: A cross-linguistic perspective. *Perspectives*, *19*(4), 353-366.

Alonso, R. A. (2018). Translating motion events into typologically distinct languages. *Perspectives*, *26*(3), 357-376.

Aske, J. (1989). Path predicates in English and Spanish: A closer look. *Proceedings of the Berkeley Linguistics Society*, *15*, 1-14.

Attwood, T. & Treffers-Daller, J. (under review). Unlearning the boundary crossing-constraint.

Beavers, J., Levin, B., & Tham, S. W. (2010). The typology of motion expressions revisited. *Journal of linguistics*, *46*(02), 331-377.

Boyd, J. K., Ackerman, F., & Kutas, M. (2012). Adult learners use both entrenchment and preemption to infer grammatical constraints. In *2012 IEEE International Conference on Development and Learning and Epigenetic Robotics (ICDL)* (pp. 1-2). IEEE.

Boyd, J.K. & Goldberg, A. E. (2011). Learning what not to say: The role of statistical preemption and categorization in a-adjective production. *Language*, 87(1), 55 – 83.

Cadierno, T. (2010). Motion events in L2 acquisition: The boundary-crossing constraint in English and Spanish. In Z. Han & T. Cadierno (eds.) *Linguistic relativity in SLA: Thinking for speaking* (pp. 1-33). Bristol: Multilingual Matters.

Cadierno, T., & Ruiz, L. (2006). Motion events in Spanish L2 acquisition. *Annual Review of Cognitive Linguistics*, 4(1), 183-216.

Cadierno, T., & Robinson, P. (2009). Language typology, task complexity and the development of L2 lexicalization patterns for describing motion events. *Annual Review of Cognitive Linguistics*, 7(1), 245-276.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences*. Hilsdale: NJ Erlbaum.

Ellis, N. C. (2002). Frequency effects in language processing. *Studies in Second Language Acquisition*, 24(2), 143-188.

Field, A. (2005). *Discovering statistics with SPSS*. London: Sage.

Gass, S. & Mackey, A. (2002). Frequency effects and second language acquisition. *Studies in Second Language Acquisition*, 24(2), 249-260.

Gennari, S. P., Sloman, S. A., Malt, B. C., & Fitch, W. T. (2002). Motion events in language and cognition. *Cognition*, 83(1), 49-79.

Hulstijn, J. H. (2012). Incidental learning in second language acquisition. In C. A. Chapelle (ed.), *The Encyclopaedia of Applied Linguistics*. Blackwell Publishing Ltd.

Kachinske, I., Osthus, P., Solovyeva, K., & Long, M. (2015). Implicit learning of a L2 morphosyntactic rule, and its relevance for language teaching In P. Rebuschat (ed.), *Implicit and Explicit Learning of Languages*, (pp. 388 – 415). Amsterdam/ Philadelphia: John Benjamins.

Kopecka, A. (2006). Typological perspectives. In. M. Hickman & S. Robert (eds.), *Space in languages: Linguistic systems and cognitive categories* (pp. 83-102). Amsterdam/ Philadelphia: John Benjamins.

Larrañaga, P., Treffers-Daller, J., Tidball, F., & Ortega, M. C. G. (2012). L1 transfer in the acquisition of manner and path in Spanish by native speakers of English. *International Journal of Bilingualism*, 16(1), 117-138.

Milton, J. (2009). Measuring Second Language Vocabulary Acquisition. Bristol: Multilingual Matters.

Naigles, L. R., Eisenberg, A. R., Kako, E. T., Highter, M., & McGraw, N. (1998). Speaking of motion: Verb use in English and Spanish. *Language and Cognitive Processes*, *13*(5), 521-549.

Özçalışkan, S. (2015). Ways of crossing a spatial boundary in typologically distinct languages. *Applied Psycholinguistics, 36*(2), 485-508.

Özçalışkan, Ş., & Slobin, D. I. (2003). Codability effects on the expression of manner of motion in Turkish and English. In A. S. Özsoy, D. Akar, E. Nakipoğku-Demiralp, E. Erguvanlı-Taylan & A. Aksu-Koç (eds.). *Studies in Turkish Linguistics,* (pp.259 – 270). Istanbul: Boğaziçi University.

Rebuschat, P. (2015) (ed). *Implicit and Explicit Learning of Languages*. Amsterdam/ Philadelphia: John Benjamins.

Robertson, D. (2000). Variability in the use of the English article system by Chinese learners of English. *Second Language Research*, *16*(2), 135-172.

Saidi, D. (2008). Typology of motion event in Tunisian Arabic. In M. Kokkonidis (ed.), *Proceedings of LingO 2007* (pp. 196-203).Oxford: Oxford University.

Slobin, D. I. (1987). Thinking for speaking. *Proceedings of the Thirteenth Annual Meeting of the Berkeley Linguistics Society*, 435-444.

Slobin, D. I. (1996). From "thought and language" to "thinking for speaking". In J. J. Gumperz & S. C. Lenvinson (Eds.), *Rethinking Linguistic Relativity* (pp. 70-95). Cambridge: Cambridge University.

Slobin, D. I. (1997). Mind, code, and text. In J. Bybee, J. Haiman, & S. A. Thompson (eds.), *Essays on Language Function and Language Type: Dedicated to T. Givón* (pp. 437-467). Amsterdam/Philadelphia: John Benjamins.

Slobin, D. I. (2004). The many ways to search for a frog: linguistic typology and the expression of motion events   In S. Strömqvist & L. Verhoeven (eds.), *Relating Events in Narrative: Typological and Contextual Perspectives* (Vol. 2, pp. 219-257). Mahwah, NJ: Lawrence Erlbaum Associates.

Slobin, D. I. (2006). What makes manner of motion salient? Explorations in linguistic typology, discourse, and cognition. In M. Hickmann & S. Robert (eds.), *Space in Languages: Linguistic Systems and Cognitive Categories* (pp. 59-81). Amsterdam/ Philadelphia: John Benjamins.

Slobin, D. I., & Hoiting, N. (1994). Reference to movement in spoken and signed languages: Typological considerations. *Proceedings of the Twentieth Annual Meeting of the Berkeley Linguistics Society*, 487-505.

Stefanowitsch, A. (2008). Negative entrenchment: A usage-based approach to negative evidence. *Cognitive Linguistics*, *19*(3), 513-531.

Talmy, L. (1985). Lexicalization patterns: semantic structure in lexical forms. In T. Shopen (ed.), *Language Typology and Syntactic Description* (Vol. 3, pp. 57-149). Cambridge: Cambridge University Press.

Talmy, L. (1991). Path realization: A typology if event conflation. *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistics Society*, 480-519.

Talmy, L. (2000a). *Toward a cognitive semantics*, Vol I, Cambridge, MA: MIT Press.

Talmy, L. (2000b). *Toward a cognitive semantics*, Vol II, Cambridge, MA: MIT Press.

Treffers-Daller, J., & Calude, A. (2015). The role of statistical learning in the acquisition of motion event construal in a second language. *International Journal of Bilingual Education and Bilingualism*, *18*(5), 602-623.

Treffers-Daller, J. & Tidball, F. (2015). Can L2 learners learn new ways to conceptualise events? Evidence from motion event construal among English-speaking learners of French. In P. Guijarro-Fuentes, K. Schmitz and N. Mullar (Eds.), *The acquisition of French in multi-lingual contexts* (pp. 145-184). Bristol: Multilingual Matters

von Stutterheim, C., Bouhaous, A., & Carroll, M. (2017). From time to space: The impact of aspectual categories on the construal of motion events: The case of Tunisian Arabic and Modern Standard Arabic. *Linguistics*, *55*(1), 207-249.
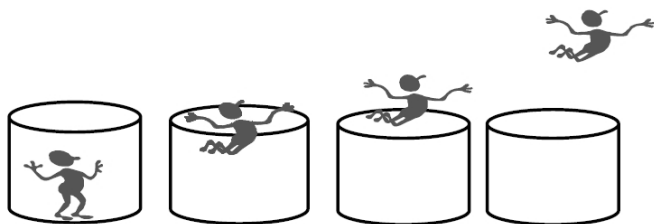
Walk, A. & Conway, Chr. (2015). Implicit statistical learning and language acquisition: Experience-dependent constraints on learning. In P. Rebuschat (ed.), *Implicit and Explicit Learning of Languages*, pp. 191 – 212. Amsterdam/ Philadelphia: John Benjamins.
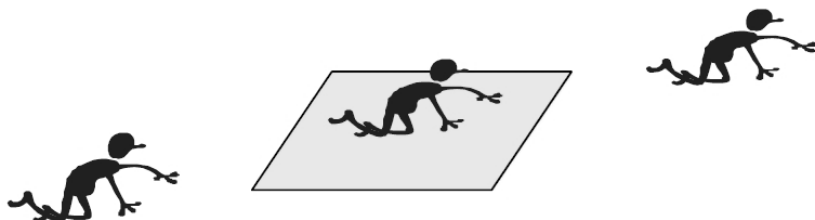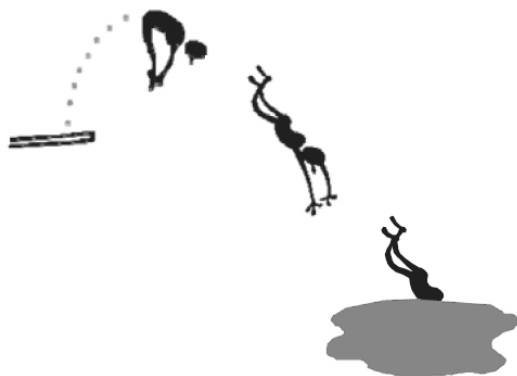
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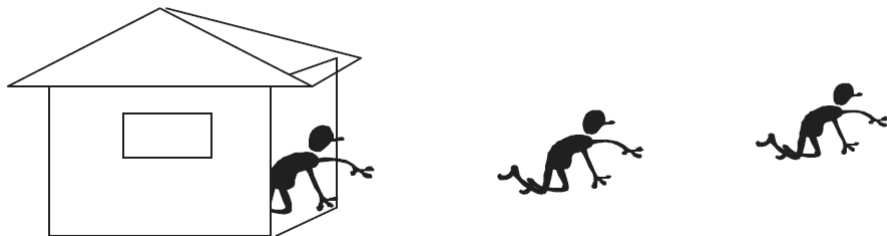
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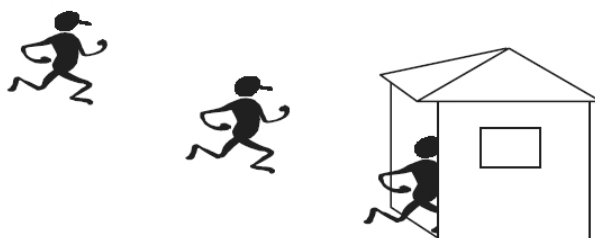
2. Fly out of a cylinder

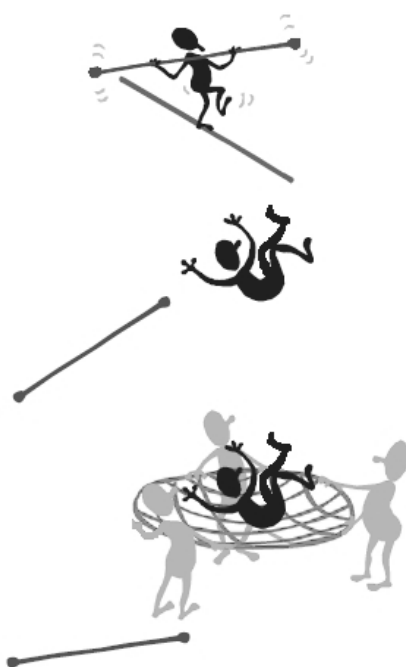## 3. Crawl over a carpet

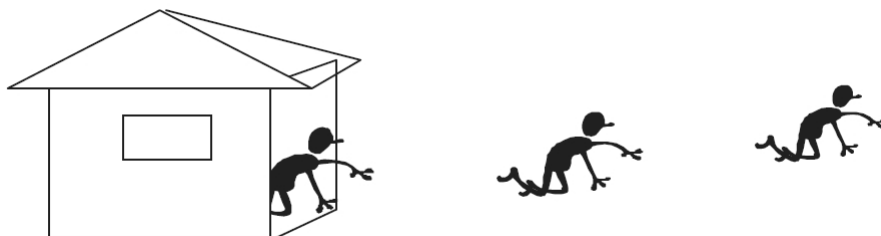## 4. Dive into a pool

5. Dash out of a house

6. Flip over a beam
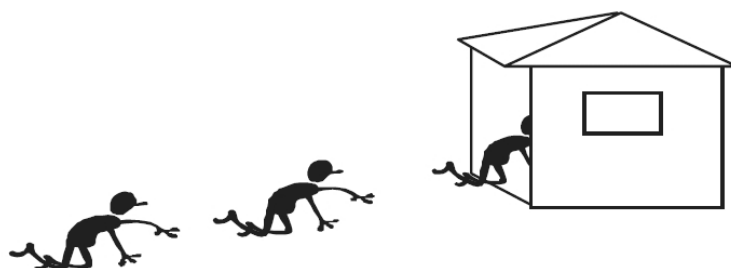
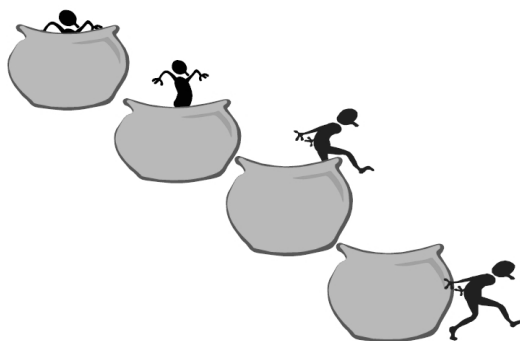### 7. Tumble into a net

8. Creep out of a house

9. Leap over a hurdle

10. Crawl into a house

11. Sneak out of a pot

12. Jump over a cliff