The Acquisition of Passive with Instrumental Prepositional Phrases in English

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WITH INSTRUMENTAL PREPOSITIONAL PHRASES IN ENGLISH

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I. Introduction

The goal of this paper is to find out when and how children understand a passive sentence with an instrumental prepositional phrase (IPP) like the following:

(1) The fish was eaten with a fork.

(2) The thief was shot with a gun.

Studies of how the passive in English is acquired have been carried out widely and fruitfully for quite some time. However, our knowledge of how the passive with IPP is acquired is still zero. This study is intended to be a beginning research work in this respect, and it may have a wider application for some related structures for future research.

Another important issue this study bears on is that by studying the acquisition of the passive with IPP, we have a test of previous claims about the

studies that are particularly of interest here. One is the Maturation Theory proposed by Borer and Wexler (Borer & Wexler (1987)), which is given to account for the fact that children are found to comprehend and produce short passives (e.g., without by phrase) and passives involving action verbs earlier than long passives and passives involving non-action verbs. The reason they give is that at a certain stage, children can comprehend and produce only adjectival passives, for the machinery of forming an "A-Chain" in order to complete the derivation of a passive construction has not matured. In this paper, we are going to show that

theory is that no passives with IPP can be acquired if children do not show their understanding of the verbal

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passive. The passive with IPP will be acquired
automatically only after they have verbal passives.

The other theory of interest here is the
Affectedness Theory which is proposed by M. Anderson
(1979) and followed by D. Lebeaux (1985), T. Roeper
(1984) and others. Lebeaux claims that the Affected
Argument Constraint (AAC) is universal and that
Children at first use the AAC to produce passives with
actional verbs, which means that they only recognize
those "affected objects". Naturally, passives that
involve non-actional verbs will not be learned until
they know the property of case-absorption of -ed.

What I will argue in this paper is that IPP always
connects an agent involved in an action, therefore,
even if a passive is ambiguous between an adjectival
passive and a verbal passive, there will be only the
verbal reading left if IPP is added to it. I will show
later that IPP is actually a syntactic trigger of the
agent in a passive sentence. Furthermore, IPP can only
go with action verbs and verbs with affected objects if
the verbs are transitive. Thus, when children are
confronted with a passive sentence with IPP, on the one
hand, they use the "Affectedness Argument Constraint"
to detect a trace; and on the other hand they use IPP
to find out the agent either explicit or implicit in a
passive sentence with IPP. The central idea is that
the agentivity and the semantic notion of
"affectedness" are the keys to the understanding of the
passive structure for the children, which implies that
when a verbal passive does not have a syntactic trigger
like IPP they will get the passive if the verb can help
the child get the affected object, consequently, the
agent.

In section 2, we are going to talk about the
properties of IPP and some interesting facts about IPP
in detail. Section 3 will examine different accounts
for how the passive is acquired. In section 4, we will
present motivations and the reasoning behind the
present experiment and different predictions about the
acquisition of the passive with IPP. In Section 5 we
will describe the experiment in detail with the
procedures and methods etc. as well as the results.
We will conclude this paper with a discussion of the
experiment in section 6.

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II. Instrumental Prepositional Phrase

What is an instrumental prepositional phrase (IPP)? How does it behave in adult grammar? How do IPPs behave with respect to passives? These are the main issues we are going to address in this section.

1. Properties of IPPs

The functions of the <u>with</u>-phrase in English are various as illustrated by the following examples (3a--c)(all of which are VP complements) and (4)(where the <u>with</u>-phrase is an NP complement[1]). The <u>with</u>-phrase we are interested in is (3 a) in which <u>with</u> introduces an instrument by assigning instrumental case or by assigning an instrumental θ-role to the NP. Hence, IPP specifies that in (3a) <u>with a knife</u> is an instrument used in an action (the cutting) by an Agent (by John in this sentence).

(3) a. John cut the salami <u>with a knife</u>. (Instrument)
　　 b. John cut the salami <u>with difficulty</u>. (manner)
　　 c. John left <u>with a knife/his wife</u>.
　　 (accompaniment)

(4) The man <u>with a yellow hat</u> took George to the fire station. (accompaniment)

There are various interesting properties of IPP[2].

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[1]. The examples in (3 a--c) and (4) do not list all the functions of <u>with</u>-phrase in English. I have no intention of giving a uniform treatment of the <u>with</u>-phrase in this paper. I assume that, structurally speaking, examples in (3) are in the VP domain (VP complements), and (4) is in the NP domain (an NP complement). Later, in my experiment I will be concerned only with the intrumentals and the accompaniment of NPs.

[2]. Defining the status of IPP as an argument or adjunct has remained a controversial question in the literature. For example, some say it is an argument just like agents and themes which are arguments of the verbs (see Bresnan (1982)); some say it is only an adjunct that is linked to the verb (see Carlson and Tanenhaus (1987), Grimshaw (1986) among others). As a thorough discussion of this topic is beyond the scope of this paper, I don't intend to join the argument. But I believe that my study to be shown later somehow gives support for the former view. Besides, there is a distinction between sentential

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Since an instrument is something that is used by
somebody or some animal that can take part in an
action, the basic property of IPP is that it requires
an Agent to appear either explicitly or implicitly in a
sentence. In the examples below we can see IPPs go
well with sentences that have Agents regardless of
whether or not the verbs are transitive, although
intransitive verbs with IPPs are much more limited than
transitive verbs with IPPs.

(5)   John killed the man with a gun/a knife/a pillow
                                                    etc.

(6)   a. John was walking with a stick.
      b. John was swimming with a flipper.[3]

      Further evidence for the connection between the
IPPs and Agents can be found in the sentences that
involve experiencer verbs. The subject of a sentence
with an experiencer verb can be an Agent or a Theme.
As predicted, sentences are always good with IPPs when
the Agents are the subjects, but IPPs are not so
comfortable in those sentences in which the Themes are
the subjects.

(7)   a. He amused me.
      b. His performance amused me.

(8)   a. He amused me with his performance.
      b.*His performance amused me with a funny
                                            somersault.

(9)   a. He annoyed me.
      b. He annoyed me with his picture.

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        adverbials and VP adverbials. Although I assume IPP is a
        VP adverbial, I leave this as an open question since this
        is not the main concern of this paper.

            [3].   I owe example (6b) to Edwin Williams.

            There are differences between the _with_-phrases in
        (5) and (6) though. Like instrumentals in a transitive
        sentence, the _with_-phrases in (6) also indicate concrete
        tools that are used in the actions. But somehow we can
        also interpret them as accompaniment while this reading is
        almost impossible in sentences in (5). We can say _John_
        swims with a funny swimming suit, in which the
        instrumental reading disappears.

(10) a. His picture annoyed me.
　　 b.?His picture annoyed me with a scratch.

　　　 We could accept (8b) and (10b) only if we assume
that the <u>with</u>-phrases are NP complements that have been
extraposed to the end of the sentences, and not
intrumentals.　More evidence for the Agent-IPP
connection can be found from sentences with unaccusa-
tive verbs, as pointed out by Joan Bresnan (according
to Hale and Keyser (1987), instrumentals do not go well
with unaccusatives.　Thus the following sentences are
ungrammatical unless they are interpreted as middles.

(11) a.*The ship sank with a torpedo.
　　 b.*The door opened with a skeleton key.

　　　 From here we can further predict that IPPs can
occur with sentences with Agents even though the Agents
may not be overtly present.

(12) a. John$_i$ promised Bill$_j$ PRO$_i$ to cut the salami with
　　　　　　　　　　　　　　　　　　　　　　　 the knife.
　　 b. The salami was cut (by John) with a knife.
　　 c. The ship$_i$ was sunk __$_i$ (by the crew$_j$) PRO$_j$ to
　　　　　　　 arrest the captain with the handcuffs.

　　　 The IPP goes well in the control sentence in (12a)
because the Agent role is assigned by the verb of the
lower clause and it is controlled by <u>John</u> in the higher
clause.　(12b) and (12c) show that the optionality of
the Agent role doesn't affect the presence of the
instrumentals. It can still occur in the passive
sentence (12b), and in the passive with a purpose
clause (12c). I will talk about the interaction between
the passive and the IPP in detail later.

　　　 So far we have given convincingly strong evidence
to show that the Agent role licenses the existence of
an IPP because wherever an IPP occurs there is always
an Agent-IPP connection.　However, the middle
construction apparently seems to be a problem for our
claim.　Nevertheless, we will show below that it is
not.

　　　 The middle construction is found to involve agency
(Keyser and Roeper (1984)) because the verbs of the
middle construction are actually of transitive origin.
The peculiar thing about the middle construction is
that the subject, like the passive, is the externalized
theme; while the Agent, unlike the passive, cannot be
present overtly.　However, this Agent is <u>felt</u> and is

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<u>understood</u> somehow. It cannot be expressed overtly in a
<u>by</u>-phrase as shown in (13a), and it cannot control an
infinitival purpose clause as shown in (13b)--a
striking contrast with (12b) and (12c) above: (Examples
below are cited from Hale and Keyser (1987)[4]

(13) a.*Limestone crushes easily by children.
     b.*This corn grinds easily to feed the chicken.

     Furthermore, a similar contrast is shown by
Jaeggli (1986) with adverbs which Jackendoff (1972)
calls agent-oriented adverbs:

(14) a. The price was decreased willingly.
     b.*The price decreased willingly.

     Hale and Keyser (1987) argues that the absence of
the syntatically-realized Agent Role in the middle
construction is due to the fact that there is no Agent
θ-role in the middle verb[5]. Nevertheless, it is
possible that IPP can occur in the middle construction:

(15) a. Limestone crushes easily with a sledgehammer.
     b. This bread cuts easily with a hacksaw.

     Thus, instead of the Agent-IPP connection we have
argued for above, we see a Theme-IPP connection in the
middle construction. But remember we say there is an
<u>understood</u> agency involved in the construction. In
fact, this Agency exists without the presence of the
IPP. It exists even without the presence of the common
adverbs (like <u>easily</u>), although under condition. Hale
and Keyser (1987) give the following examples to show
that it is not necessary to have an adverb in the
middle:

(16) a. This bread won't cut.
     b. <u>This</u> bread cut. (contrastive)

     Therefore, we can say that although it may be true
that the middle verb does not assign an Agent θ-role

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[4].   Most of the examples of the middle construction
are drawn from their work unless otherwise specified.

[5].   Another alternative would be to assume that
middles still assign Agent θ-role, but it is [-argument],
which means this θ-role has to remain implicit (see Cinque
(1980); Roeper (1987)). On either view the Agency is
there. Thus IPPs are allowed to appear in middles.

syntactically, (which means we will not see a surface
Agent-IPP connection) semantically, from the lexicon of
the verb there is still an agentive interpretation that
makes the appearance of IPP possible. Actually, this
is what Hale and Keyser (1987:3) have claimed that
"'Agency' is semantically present in the English
middle", and that the fact that the middle does not
"stand alone" very well--requiring, as it does, an
adverb (like easily), or some other "additional mater-
ial" (like IPP) suggests that once the adverbial is
present the association of this semantic Agency becomes
stronger and more obvious. Thus, the apparent Theme-
IPP connection in the middles doesn't pose any counter
argument to our claim. Instead, it helps us to reach
the following conclusion --the existence of the IPP
implies Agency either overtly present or not or either
semantically or syntactically interpreted, and the
existence of this Agency definitely licenses the
presence of the IPP.

   Another interesting property of IPPs has something
to do with the so-called semantic notion of affect-
edness. This term was first used by Anderson (1979) in
her study of the passive in noun phrases. She proposed
that a passive nominal such as the city's destruction
(by the enemy) cannot be formed unless the derived
subject, i.e., original object, is affected by the
action expressed by the (deverbal) nominal. According
to Hale and Keyser (1987), this constraint has been
found by many others (Jaeggli, (1986); Rizzi, (1986);
and Roberts, (1985)) to hold for the formation of
middles as well. Thus, we find *physic's knows easily
as bad as *physics' knowledge (by the student).
Therefore, in the middles and in the nominalization the
reason that the objects can be externalized or preposed
is that in both structures the object has to be
affected by the verb. Before, we talk about the occur-
rence of IPPs in the middles. It is interesting to
note that IPPs go equally well with passive nominals
which have affected objects; but not well with passives
that involve nonactional (or stative) verbs, which,
like other passsives with actional verbs, can also take
by-phrases in the construction.

(17) a. The city's destruction (by the enemy) with the
            fatal bomb was shocking to everybody.
     b. The patient's examination (by the doctor) with
            the new equipment took only two hours.

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(18) a. John cut the salami (with a knife).
     b. The salami was cut (by John).
     c. The salami was cut (by John) with a knife.

(19) a. John loved Mary (*with a hug).
     b. Mary was loved (by John).
     c.*Mary was loved (by John) with a hug.[6]

     I assume the reason why both structures in (17)
can take IPPs and the asymmetry shown in (18) and (19)
also lies in this Affectedness Constraint. In fact,
given this, we find we can account for the asymmetry
between nonactional passives and the middles as well.
Below, we show a summary of how passives (actional or
nonactional), middles, and nominalizations behave with
respect to IPPs, by-phrases, and to the notion of
"affectedness":

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     [6]. Charles Clifton (personal communication) pointed
out to me that sentences with nonactional verbs like love
can still take a with-phrase as shown in the following:

          (i) a.   John loved Mary with passion.
               b.   Mary was loved with passion.

     I believe he was right about suggesting that this
with-phrase is not instrumental. We find it doesn't mean
that with passion can only appear in sentences with
nonactional verbs, which indicates that the appearance of
this kind of with-phrase is not restricted by the
Affectedness Constraint.

          (ii) a.   John kissed Mary with passion.
               b.   Mary was kissed with passion.

We also find that with passion can be paraphrased by the
corresponding adverb passionately:

          (iii)a.   Mary was loved passionately.
               b.   Mary was kissed passionately.

Therefore, we can conclude that the with-phrase that can
go with nonactional verbs can only be the adverbial of
manner, and not an IPP. This is because IPPs are concrete
objects that can be used in an action while manner can
never be something actual or concrete that you can really
grasp with your hands or other equipment.

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Structure	by-phrase	IPP	Affectedness
Nominalization	(+)	(+)	+
Actional passive	(+)	(+)	+
Nonactional passive	(+)	-	-
Middles	-	(+)	+

Note: Parentheses indicate the optional occurrence of the elements.

   From this table we find that in the middles the superficial Theme-IPP connection allows the existence of the IPP while the superficial by-phrase in non-actional passives cannot have the Agent-IPP connection. While we have taken pains to explain the Agency-IPP connection in the middles, however, we find we are in trouble again--the superficial by-phrase in nonactional passive cannot take IPP. Why can we not have Agent-IPP connection this time? Why is it that the Agent doesn't license the presence of IPP? This is not a problem, as can be seen, if we look at the third column of the table. Any structure that can take Affected object can take IPP. Therefore, it is the Affectedness that is directly related to the presence of the IPP. This, in turn, implies that IPP is in the domain of the VP. If a verb is transitive, then only when the connection between the affected object and the IPP is formed can the VP connect the Agent. Otherwise, the Agent cannot connect the IPP if the object is not affected. Just as this theory predicts no Agent-IPP connection can be formed in nonactional passive since within the VP, no Affected-object--IPP connection can be formed in the first place.

   On the other hand, with the Affectedness, we find the apparent mystery shown by the middles solved so easily and so readily without the need of any further explanation. Thus so long as there is an affected object in a sentence IPPs can occur. The reason why Agent cannot occur in the middle is that syntactically there is no room for it since the affected object has taken its subject's place. Consequently, this semantically affected object suggests semantic Agency in the middles. Recall we argue that even though in some structures Agent is not overtly present, IPPs can still occur in passives and in control sentences. However, never in those sentences can we find the affected Theme being absent except in those sentences

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that involve intransitive verbs (e.g., (6a) and (6b)[7].
This, in fact, also fits the observation made by
Grimshaw (1986) that in English the internal argument
(e.g., the object) should obligatorily be present
either in VP or in noun phrases, but the Agent is only
optional in noun phrases. Therefore, I believe this
Affected-Theme-IPP connection is the second property of
IPPs.[8]

    Up to now, I think the nature of IPP is clearly
laid out. I contend that the two properties of IPP are
related and depend on each other.   The Affectedness
property licenses the occurrence of IPPs if the verbs
are transitive. The Agency property licenses the
occurrence of IPPs if the verbs are intransitive. The
two properties would collapse into one if we only had
transitive verbs taking IPPs (because Agency always
occurs if there are Affected objects). Therefore, we
find that transitive verbs with IPPs are unmarked and
it is not so common for intransitive verbs to take IPPs
because they only fit the Agency condition.

2. The Interaction between IPPs and Passives

    Given the two properties of IPPs, how they should
behave with respect to passives is easily predicted.
Below, I will give a brief analysis of the passive
construction and then discuss the interaction between
passives and IPPs.

    The passive structure is a construction that
involves a movement from object position to subject
position. This movement is motivated by two properties
of the structure stated by Chomsky (1981) such as (a)
[NP,S] does not receive a θ-role and (b) [NP,VP] does
not receive Case within VP. The argument in [NP, VP]
thus has to move with the θ-role that is assigned by
the verb to the subject position to receive case. As a
result of the application of the movement, the moved
object postulates a trace after the verb, thus, forming
a so-called "A-chain" (argument chain). Following

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        [7]. We will talk more about the intransitive
sentences later.

        [8]. The second property shown by IPPs in a sense gives
a convincing argument for its status as VP complement.
Furthermore, it somehow suggests that verbs with Affected
objects are qualified to have agents either syntactically
or semantically.

Williams (1981), the whole movement is to externalize
the internal argument of the VP. The whole procedure
can be represented below:

(21) a. [_____]$_{NP}$ was killed the thief.
      b. [the thief]$_i$ was killed [t$_i$]
          |___ A-Chain ___|

Obviously, <u>the thief was killed</u> does not have the
same meaning as <u>the thief was dead</u>. For the former,
everybody is aware there is an Agent performing the
action of killing; for the latter, no Agent is
involved. The thief could die of any disease or
whatever the cause. The crucial point here is that
verbs like <u>kill, hit, kick</u> etc. always take an Agent to
do the action in spite of the fact that sometimes the
Agent will not surface once passivized. That is to
say, passive like this is only agentless in form, but
not agentless in nature. There is an implicit argument
hidden in the short passive.

(22) The thief was killed. = The thief was killed by one.

That such verbal short passive has an implicit
Agent has been pointed out by many linguists (e.g.,
Roeper (1984), Jaeggli (1986) among others). The most
convincing evidence is that such kind of passive can
take agent-oriented adverbs (we showed this in (14a)
and the implicit Agent can function as a syntactic
controller (12c) while in a sentence without an
implicit Agent, control is impossible. This contrast
is shown again in the following examples drawn from
Roeper (1987):

(23) a. *The boat sank to collect the insurance.
      b.   The boat was sunk to collect the insurance.

However, there are short passives that <u>do</u> have an
agentless reading. Taking sentence (24a) as an example:

(24) a. The glass was broken.
      b. The glass was in pieces.
      c. The glass was broken by someone.

(24a) has two interpretations--one being (24b) which
involves no Agent; the other (24c) has an Agent in
contrast.

It has become a well-known fact ever since Wasow
(1977) made the distinction that there are two kinds of
passives, one that exhibits adjectival properties--the

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adjectival passive--and one that exhibits verbal
properties--the verbal passive. Therefore, if (24a) is
interpreted as (24b), the whole predicate is taken to
designate a property of the subject, which is an
adjectival passive. On the other hand, if (24a) is
interpreted as (24c), that is, the subject functions as
the object of the activity and an implicit argument is
present, then it is a verbal passive.

     As we can see, the difference between the two
passives lies in whether or not there is an implicit
agent. But since morphologically adjectival passives
and verbal passives share the same affix---ed and
whether the implicit Agent reading is involved or not
depends on the context sometimes, it is not an easy
thing to do to distinguish the two. Nevertheless,
three diagnostic environments for adjectival passive
are advanced by Levin & Rappaport (1986) among others.
First, the prefix un- always attaches to passive
participles. But it never attaches to verbs, there-
fore, there is reason to believe that the past
participles it attaches to are also adjectives.
Secondly, only adjectives but not verbs can follow
verbs such as seem, remain, sound, look, and appear,
which select only adjectival compliments. A passive
participle appearing as the complement to such verbs is
therefore taken to be adjectival, not verbal.

(25) a. The dog seemed hungry.
     b. The dog seemed combed.
     c.*The dog seemed kicked.

     Thirdly, only adjectives and not verbs may occur
as pre-nominal modifiers of nouns.

(26)   a. a broken glass
       b.*a dropped glass

     Needless to say, these diagnostic environments are
helpful for distinguishing verbal passives from
adjectival passives. But as for an ambiguous short
passive sentence, it seems we need information from the
context as well as the three diagnostic environments.

     So far, we have shown that the formation of the
passive construction is complicated by different verbs.
Putting passives with nonactional verbs aside at the
present, there are verbs that can only be verbal
passives once passivized. There are also verbs that
are ambiguous between adjectival passives and verbal

passives. Given the properties of IPPs, the
predictions are clear if IPPs are added to passives.

Recall that the two properties of IPPs are (a)
IPPs entail Agents; and (b) IPPs appear only with
"Affected" objects, consequently, two predictions are
made. First, the distinction of the two kinds of verbs
(verbs like hit, and verbs like break) with respect to
nonactional passives disappears. Since both kinds take
affected objects, IPPs are qualified to appear in both
but cannot appear in nonactional passives as shown in
(19c) before. (For the sake of convenience, it is
repeated below in (27c).)

(27)   a. The horse was hit with a bat.
       b. The glass was broken with a bat.
       c.*Mary was loved with a hug.

Secondly, the adjectival-verbal ambiguity
disappears in (27b) as well, for only the verbal
reading is forced. In other words, the Agent-IPP
connection is being formed, even though the Agent may
be implicit.

Just because IPP can disambiguate an ambiguous
passive sentence, it seems we have found a better test
to see whether a passive is adjectival or verbal, as
pointed out to me by Roeper. Borer and Wexler (1987)
use by-phrase to do this test. They say that
constructions which are unambiguously adjectival and
not verbal do not admit by-phrases easily. The
following examples are drawn from their work:

(28) a. the fact was unknown (*by Peter)
     b. the uninhabited island (*by the British)
     c. the closed door (*by Peter)
     d. the torn doll (*by Peter)

But there are too many counter examples to this
test. In their footnote 3 they cite examples from
Roeper (1983) (as (29a-b) below). Pinker et al (1987)
also cited such examples from Wasow (1977) who pointed
out explicitly that adjectival passives can take by-
phrase (as (29c-d) below).

(29) a. the code was unbroken by the Russian
     b. the island was uninhabited by Mankind
     c. the child was unwanted by his parents
     d. John remained feared by all

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Borer & Wexler (1987) claimed that these kinds of
examples "represent an exception rather than a norm",
for they noticed that the "generic" Agents seem better
than specific ones. But we find IPP such a handy and
powerful tool for the test that no further explanation
is necessary to exclude certain examples:

(30) a. the code was unbroken (by the Russian) (* with
                                the translation)
     b. the island was uninhabited (by Mankind) (*with
                                shelters)
     c. the child was unwanted (by his parents)
                                (*with the cradle)
     e. John remained feared (by all) (*with the guns)

To sum up, in this section we have discussed how
IPP behaves in adult grammar. The two properties of
IPPs help us make two clear predictions concerning the
interaction of IPPs with passives. The affectedness
property of IPP successfully explains why nonactional
passives cannot take IPPs while the other property of
IPP--Agency entailment convincingly shows why the
adjectival-verbal ambiguity disappears without the need
of any other diagnostic tests.

Then we are faced with the following questions:
if a passive with IPP is unambiguously verbal, when
will it be possible for children to understand such a
structure? How can children know that the IPP is
disjoint in reference with the subject in a passive
sentence with IPP? (e.g., how can they know the
surface subject is not the user of the instrument?)
What helps them to connect the IPP with the agent that
is implicit?   Hence, these become the central concern
of this paper.

III. Previous Accounts

It is clear that two things are involved in a
passive sentence with IPP, that is, the sentence should
be a passive and the sentence should have an
instrument. If we want to see how children acquire
passives with IPP, two natural questions arise: how
do children acquire IPP in active sentence? How do
children acquire a passive without IPP? In this
section we are going to present some previous accounts
for the two acquisition processes. Below we will show
that the study by Randall (1982) gives us very helpful
implications for the acquisition of IPP in active sen-
tences. Then we will present two different accounts of
the acquisition of passives. One is called the

Maturation Theory proposed by Borer and Wexler (1987).
The other is the Affectedness Theory (Anderson (1979);
Lebeaux (1985); Roeper (1985); Pinker et al (1987))

1. The Acquisition of IPP in Active Sentences

Previous studies that were cited by Randall (1982)
showed that "by 3 years of age, children control both
accompaniment phrase in NPs (which begin occurring in
production data by about 2.5 years, see Bellugi (1967))
as well as verbs with IPPs (which emerge at about 3
years of age (J. de Villiers, personal communication))"
(Randall 1982,p.140). In order to show this point more
clearly, we will briefly present Randall's study
below.

Randall's study focuses on questions such as "What
are the structures and constraints of complex
morphology? How are they learned?" She conducted two
pretests and three experiments in order to determine
the place of the Morphological Inheritance Hypothesis
she proposed in a theory of the acquisition of
morphology. What is relevant to our study here is that
she tested her theory with the help of with-phrase
complements in her experiments.

According to the adult grammar, morphological
complements are different in complement structures of
verbs and deverbal form. In general, derived forms are
more limited than their bases in the complements they
follow. This group, following Randall, will be called
non-inheritance morphologically complex form, for they
do not automatically inherit the subcategorizations of
their underlying forms. The agentive suffix -er
belongs to this group. A nominal in -er can only
inherit the direct object of its underlying verb, if
there is one. (e.g., the painter of the picture), which
is the unmarked form, following Carlson and Roeper
(1980). Other than that, no additional verbal
modifiers may appear, unless they can be given a
nominal-modifier interpretation. Therefore, a writer
with a candybar cannot be interpreted as a man who
writes with a candybar, in which the with-phrase is
interpreted as a verbal complement--the instrument of
the activity. The only possible reading for this phrase
is that the with-phrase should be interpreted as an
accompaniment of the agentive noun "a writer".

There are also derived forms, however, that allow
multiple verbal complements to appear after the noun,
including all of the strictly subcategorized

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complements. This group, therefore, is classified as
"inheritance" in Randall's term. -ing nominal inherits
all the verbal complements beyond the direct objects.
The function of the with-phrase in A lady eating with
chopsticks is identical with the function of with-
phrase in A lady is eating with chopsticks.

The Morphological Inheritance Principle says
(Randall, 1982: 220) "A derived item inherits the full
subcategorization of its base if it maintains either
the category and/or the meaning of the base form. If
both of these are changed, the derived form inherits
only the unmarked portion of the base form's subcate-
gorization." What this principle predicts would be
that children will initially overgeneralize inheritance
to all forms which they identify as deverbal. A series
of experiments were conducted with a picture
identification task on 21 children, ranging from 3.0 to
7.4 years old. A group of 12 adults also participated
in the study.

In one of Randall's pretests, she used phrases
like a boy without shoes and a lady eating with
chopsticks in order to see if the subjects had
previously mastered the interpretations of
prepositional phrases in simple NPs and VPs. The
results provided convincing evidence for her theory.
Children's responses were exactly the same with adults-
-100% correct. This is to say, there is no question
that children understand the instrumental reading and
the accompaniment reading of with-phrase equally well.

More interestingly, just as the Morphological
Inheritance Principle predicted, Randall's other
experiments showed strong evidence for
overgeneralization of instrumental reading of with-
phrase in -er forms. For example, when the children
were asked to point out the picture(s) for phrases like
a diver without a mask, in addition to the correct
choice (the accompaniment reading), children also
selected 82% of the time the picture that corresponds
to the instrumental and not to the accompaniment
reading for the PP. None of the adults, in contrast,
selected this picture.

What Randall's studies have told us is that
children at really very young ages do not only show
their understanding of the with-phrase, but also
overgeneralize the usage of the instrumental reading of
the with-phrase. The reason why they do so is that
they innately know that a with-phrase is a property of

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a verb. They may think that IPP is an internal
argument of the VP, or at least in the domain of a
verb. The implication we get is that it is possible
that children will show their knowledge of IPP in
passive sentences, too. More importantly, if this is
really the case then IPP may help the child understand
verbal passives better due to the properties that IPP
has.

2. Previous Accounts for the Acquisition of Passives

It is commonly believed that children seem to have
more difficulty in comprehending and producing passives
that involve nonactional verbs than passives with
actional verbs. Various reasons are offered depending
on different theories. In the following, we will
examine Borer and Wexler's Maturation theory (1987)
first, and then the theory of the Affectedness school
(David Lebeaux (1985), Roeper (1984), Pinker et al
(1987) to list a few here).

A. The Maturation Theory

The Maturation Hypothesis is a theory of the
development of certain aspects of linguistic
competence. The rationale of this theory is that
assuming that some linguistic principles are innately
situated in the brain as innate biological charact-
eristics of human beings, which are not learned but are
mature only at a later stage, the same should be true
for linguistic principles. They are not constant
through development. Rather, they mature and become
available only as the child grows older. This will
take time because "The biological program underlying
the formal principles guides their development over
time." (Borer & Wexler, 1987:124). What they claimed
certainly sounds like a reasonable theory.

As far as the acquisition of passive is concerned,
they presented three facts. The first one is based on
Maratsos et al. (1983) that children at a certain stage
perform better on passive constructions which involve
actional verbs before passives which involve verbs
which are not actional. The second observation is that
long passives (with by-phrase) seem to be acquired
later than short passives (Maratsos (1983)). The third
observation concerning the acquisition of short
passives is that children seem to perform better on
short passives that don't have implicit agent
(adjectival passives) than the short passives that
involve implicit argument (verbal passives). According

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to Borer & Wexler, this is because the maturation of
the "A-chain" plays a crucial role in the development
of the acquisition of passives.

     The so-called "A-chain" refers to any structure
that involves movement from an argument position to
another argument position. As for the verbal passive,
the moved object forms a chain with the trace that is
left behind after the movement due to the Projection
Principle. On the other hand, adjectival passives only
show lexically a category change, and they do not
involve syntactic movement, therefore no chain will be
formed. Borer & Wexler claimed that there is a [±SR]
semantic restriction that forms part of Universal
Grammar[9]. Therefore, the child somehow knows this
restriction innately, and is able to tell that only
actional verbs can form adjectival passives, and that
nonactional verbs and those actional verbs that are not
open to adjectival analysis cannot do so. Assuming
this to be the case, they predict that what the child
can comprehend and produce first are only lexical or
adjectival passives. He will not be able to comprehend
verbal passives, for the formation of the "A-chain" is
not available to the child yet. Consequently, passives
with non-actional verbs and long passives, which are
definitely passives that involve "A-chain", will be
acquired by the child only when the machinery of the
"A-chain" matures.

     Given their explanation, it seems all the facts of
the acquisition of passive fall out naturally and
automatically. Nevertheless, as we examine more
carefully their theoretical claims and the evidence
they supply, we will see that many things will be
called into question.

     First of all, although it seems reasonable,
actually, it is very revolutionary to claim that
linguistic competence should be an instance of
biological characteristics that cannot be learned but
have to await their maturation at certain stage, if not
available at early stage. Nevertheless, it is not

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     [9]. This [SR], to the best of my understanding, refers
to a constraint that can pick out those actional verbs
that have the potential to derive adjectival passives.
This group of verbs are [+SR] because they can stand all
the adjectival criteria we talked about before.
Therefore, nonactional verbs and those verbs that can not
form adjectival passives are excluded.

quite clear "what matures when", as Williams phrased it
(Roeper & Williams, 1987). Certainly, man's ability to
speak is undoubtedly a biological one, which makes man
different from other animals. This ability does not
show right at birth, but develops and matures at a
later stage. To say this ability undergoes biological
maturation is as convincing as to say that human sexual
characteristics, which do not develop until adoles-
cence, are instances of biological characteristics. We
know what matures when more or less for these ins-
tances[10]. But to say that linguistic ability matures
and develops by itself in the process of acquisition
needs more research to support it. I don't think Borer
& Wexler will have much objection to this point as they
also admitted (1987:130) that "maturation of explicit
pieces of grammatical competence has not been suggested
or studied." Although they did supply evidence to
study one of the linguistic principles---A-Chain
formation, still there is much to be desired, as we
will show later.

Secondly, as far as the acquisition facts go,
whether acquisition of short passive should necessarily
precede long passive is also questionable. Some
investigators have supplied evidence to show that
passives with by phrase do occur as early as although
not earlier than and not as frequent as the occurrence
of the short passives. Amy Weinberg (1987, Roeper And
Williams:176) cited from the studies conducted by
Maratsos and Aabramovitch (1975) who showed "that long
and short passives are acquired at the same time in the
course of development". In some toy-moving tasks
conducted by Roeper and other researchers (1981), the
preschoolers (though the exact age is not revealed)
gave 87 percent correct responses to agentless passives
like the rock was thrown, and 95 percent correct
responses to agentive passives like the pig was chased
by the horse. This percentage can be taken as direct
counter evidence to Borer & Wexler's account. The
results showed that children not only do better on long
passives than short passives but also can comprehend
unambiguous verbal passives as well, for the research-

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[10]. In fact, Charles Clifton pointed out to me that
the notion of maturation is not so clear even in cases
other than language. eg., environmental factors (espe-
cially hormonal factors) are very important in allowing
the maturation of sexual characteristics, just as
experience is very important in allowing language
development.

ers took special care in choosing verbs that cannot be
analyzed adjectivally. More convincing, was Horgan's
experiment cited by Borer & Wexler, which showed in an
elicited production task that children did use by-
phrase occasionally. The boys in the experiment
produced the passives with by-phrase 6.45% of the time;
girls 19.20% of the time. The children tested were of
the ages between 24ms--48ms. Of course there are
individual differences across the children, and it did
show that children didn't use by-phrase overwhelmingly
all the time. Still the above data should not be
neglected. Notice that this is a production task. Of
course, children tend to speak short sentences instead
of long sentences owing to their cognitive or other
related limitations. It is common knowledge that
people, generally speaking, understand more than what
they can speak. Once they speak a sentence, it is rare
that they don't know what the sentence means,
especially, if a certain structure is used
productively.   The same should be and is true for
children. What's more, just by saying that children
only speak short passives doesn't prove or disprove
that children only have adjectival but not verbal
passives. More convincing evidence needs to be found
to prove this point.

     Thirdly, it seems that the claim that [±SR] is
innate to the child leaves much to be desired. Borer &
Wexler used this so-called universal principle to
explain why the acquisition of passives with action
verbs precedes that of passives with nonaction verbs.
Under this view, the child is supposed to know which
verb can be used adjectivally and which verb cannot.
Only action verbs can be used prenominally and as
complements for verbs like seem, look, appear, and
sound. Nonactional verbs cannot. Therefore, the child
should know that actional verbs are [+SR] whereas
nonactional verbs are [-SR]. Assuming this is true,
only adjectival passives are what children can
comprehend and produce. However, this is such a loose
restriction that you can find exceptions too easily.

     In the first place, as we have said before, not
all the action verbs can be used adjectivally. There
are quite a lot of cases that can show that the
adjectival uses of some actional verbs are no good,
besides sentences (24). Nevertheless, this group of
verbs, like those verbs that can be adjectival, are
also "a subset of actional verbs" (B & W, 1987: 143).
The reason they give for why this group is [-SR] is
that they cannot form adjectives. Remember nonactional

verbs are also [-SR]. Then this generalization is not
formed by the nature of verbs (actional verbs are so
different from nonactional verbs) but by the facts they
show. Hence, if those verbs are not open to the
analysis of adjectival passives they are [-SR]
regardless of whether they are actional or not; then if
they are [-SR], no adjectival passives can be derived.
With this constraint, this group of verbs and
nonactional verbs are grouped together as if there were
no differences between the two groups. Otherwise, a
further distinction besides [± SR] should be made.
This is a position that is hard to take.

        In the second place, there are cases to show that
some nonactional verbs may be [+SR] because adjectival
uses of some nonactional verbs are not always bad.
Michiko Terada (crurrent volume) presented cases where
native speakers of English feel the following are just
fine.

(31) a. hated cat
     b. reported news
     c. preferred reading

Weinberg (1987:178) also listed examples which show
that context helps to improve the acceptability of the
adjectival use of nonactional verbs.

(32) After seeing so many orphans, a loved child is a
                                    pleasure to see.

(33) The child seems loved, but then she shows up with
                                    all those bruises.

        They themselves also say that there are exceptions
like unseen, unknown, unlike. But this time the
explanation is that the prefix un is being [+SR].
However, no explanation can be found to account for
(31-33). Even if there can, it will be nothing but
another principle to take care of another group of
exceptions.

        These cases show that it is not true that
adjectives are formed only by actional verbs and that
nonactional verbs cannot be used adjectivally. If this
is the case, then how can a child tell that some of the
action verbs cannot be used adjectivally, and that some
of the nonaction verbs can be. Naturally, it is
questionable to claim that this restriction is innate
to the child. Besides, this principle cannot explain
why passives with nonactional verbs should come later

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than passives that have concrete actional verbs. As
Roeper pointed out (personal communication) their
argument only makes sense if one argues that it is true
for adults as well as for children. But as we have
shown this is not the case. Certainly, a more
convincing theory is needed.

B.   The Affectedness Account

Following Anderson's (1979) observation that there
is Affectedness involved concerning the formation of
nominalizations in English, David Lebeaux (1985, cited
in Roeper, 1987 and in Terada, 1987) proposes that
there is an Affected Argument Constraint (AAC) as being
universal, which holds both in the child's grammar and
the adult grammar. It says that Affected Objects are
internal arguments of a verb, which must occur within a
verb phrase. If an NP is [+affected] in a VP in the
deep structure, that object can be moved, and it always
leaves a trace next to the verb. Thus, this so called
AAC successfully accounts for the fact that nominals
and middles and compounds as well as actional passives
are all subject to this constraint but not nonactional
passives. Thus, the representation of passive is the
following:

(34)   the boy$_i$ was chased __t_i__ .

Current linguistic theory says that verbs assign
case. An affected object, being an internal argument
of the verb, should always get case from the verb.
This is taken care of by the Case theory with respect
to the Government.   However, Lebeaux suggests that a
verb requires a syntactic object as well as a semantic
one, while a nominalization may only require an object
semantically. Hence, while the syntactic analysis
allows passive to occur without a semantic trigger, the
nominalization requires the semantic trigger of an
affected object.   Therefore, passives can escape the
AAC constraint if the syntactic object is not affected
while other structures have to observe the constraint
strictly.

With this constraint, Lebeaux also accounted for
the fact that children's first passives are only
passives that involve affected objects.   In turn, this
implies that their first passives should involve
actional verbs rather than nonactional verbs, for
children utilize only the semantic feature but not
syntactic feature, as children do not initially assign
case. Because of this constraint there will be a stage

at which children cannot comprehend a passive where the subject is the non-affected object like <u>John</u> in <u>John was liked</u>.

As we can see, this constraint plays a very important role in adult grammar. It also illustrates the deterministic character of language acquisition. Although it lacks a clear linguistic definition, as pointed out by Roeper (1985)[11], it serves as one instance of some non-linguistic trigger for linguistic knowledge. It doesn't matter if it has a syntactic character or not. The point is that it is crucial for the syntactic analysis. Lebeaux and Roeper convincingly showed that this is an early constraint on passives hypothesized by children. Pinker et al (1987) also argued that Affectedness is one of the major defining properties of the core passives rule.

In spite of the powerfulness of this notion, it should be carefully remembered, following Roeper, that passive structure involves a mechanical interaction between three modules of grammar: case-assignment, morphology, and syntactic movement. Lebeaux assumes five steps of acquisition of the passive construction as cited below:

(35) 1. Passive form is recorded from surface structure
     2. In the passive where a +affected element
                  moves, a trace is posited with AAC.
     3. A chain is formed. Since a chain is always
        Case-marked, a child finds out that the
                  object position is not Case-marked.
     4. A child notices that passive morphology absorbs
        Case since verbs usually Case-mark the objects.
     5. Passive is grammaticalized.

Following this model, Terada (1987) showed that the 3-year-old children successfully posited a trace after the verb in small clause construction. With this theory, Pinker et al (1987) also showed children have a

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[11] Roeper's study is on the acquisition of implicit arguments. However, on the one hand, passive is a construction that bears implicit argument; on the other hand, in another study of his (1981), he showed that of all the structures (except control structure) that bear implicit arguments, passive is the first to appear in child language. Therefore, we think at this stage, the acquisition of implicit arguments is on the same line with the acquisition of passive.

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tendency to passivize nonactional verbs less
productively than actional verbs.

    Although this model correctly points out that at
one step a child notices that passive morphology
absorbs Case, it is not quite clear how this becomes
possible and how important a role this case-absorption
plays. Besides, we are not quite clear when and how the
child realizes the existence of the Agent role in the
passive. Roeper, following the Affectedness Argument
Constraint, in his study of the acquisition of implicit
arguments, advances the idea that there are two
different ways of identifying trace in the object
position of the verb: a) semantic recognition of an
internal argument, or b) recognition that -ed absorbs
case. Following Chomsky's syntactic Projection Prin-
ciple which prevents deletion of thematic roles through
syntactic movements, Roeper proposes that this
principle operates in the lexicon as well. In other
words, it is the affixation that helps to preserve
thematic roles. Verbal affixes are considered to be
able to maintain thematic roles. Thus the acquisition
of passives or say the acquisition of implicit
arguments boils down to the acquisition of affixation.
The reason that the child can learn the thematic
properties of affixes is that the principles of
preservation of the thematic roles by affixation is
innate. Therefore the child should simply have to
recognize affixes and the preservation of thematic
roles is automatic. It follows that as soon as a child
can divide between a verb and an affix, she will know
that the thematic roles are present. The way to find
out if this is so is to seek a correlation between the
productivity of affixation and the preservation of
thematic roles. Therefore, the Affectedness theory
becomes more convincing and more refined.

    Since the properties of IPP have something related
to this Affectedness, I will continue this study along
the lines of the Affectedness Theory.

IV.   The Acquisition of Passives with IPP

    Now we come to the main concern of our study. We
will see how the two theories (Maturational Theory and
the Affectedness Theory) we presented above predict the
acquisition of passive with IPP. I basically assume
the line of the latter one and offer my own ideas on
how this will be acquired, given the specialties that
IPP has.

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Given that the Maturational Theory says that all the passives at the earliest stage are no other than adjectival passives and that all other passives should be acquired instantaneously only once the ability of forming that "A-chain" is matured, then we are making the following predictions: at a certain stage 1) if a child is confronted with a simple ambiguous passive sentence like the glass was broken s/he will choose the stative reading even though it may be a verbal reading for the adult in the circumstances. If s/he is confronted with a verbal passive, like the horse was kicked, s/he will still treat it as an adjectival or s/he will not be able to give any interpretation at all. Because they cannot realize that there is a trace after the verb. Naturally, random responses are expected from the child.

Under the Affectedness Theory, the child is able to identify the affected object as an internal argument which is moved to the subject position. At the stage that the passive is not grammaticalized, the child will not necessarily get the Agent in the passive if the structure is open to a lexical analysis. However, the realization of the existence of the trace after the verb will be evoked if they are confronted with passives that can only be verbal passives. This process may not be stable since the role that morphology has played in the passive structure may be neglected. But a semantic Agent is possibly realized.

Let us consider in detail what the two theories would say about the acquisition of passive with IPP. Suppose a child is given two sentences like the following:

(36) The board was broken with an ax.

(37) Bert was pushed with one hand.

Notice the verb break in (36) could be ambiguous between adjectival or verbal interpretation. But the verb push in (37) is unambiguously verbal. Under the Maturational Theory, at a qcertain stage, no passive with IPP will be acquired by the children, since it is unambiguously verbal. Therefore, for (36) the child will either still give an adjectival reading of the sentence in spite of the existence of the IPP, thus giving an accompaniment reading of the with-phrase. Or, (s)he realizes there is an IPP in the sentence, which turns the passive into a verbal passive just like Bert was pushed, then (s)he will not be able to

interpret the sentence anymore. Consequently, (37)
will be as hard as or maybe harder than Bert was
pushed.

Under the Affectedness Theory, (37) will be
interpreted in the same way as Bert was pushed, since a
trace will be forced to be present anyway. Put it
another way, we know for sure that it is possible that
passive with IPP could be acquired by children whose
knowledge of passives is not at the last stage yet.
However, this theory will not tell us how children
interpret the IPP in connection with passive exactly.
For example, we will not know for sure how the child
gives up the adjectival reading of the verb break in
(36) and only interpret it verbally. How can the child
find out that the surface subject is not the agent for
the instrument?

Following Roeper (1984), I assume that there are
two general factors which play an important role in
acquisition:

(38) Children prefer sentences that include agents.

(39) Children prefer sentences that include affebǰedts.

These two factors can successfully explain that
sometimes children may fail to comprehend a passive
sentence because no Agent is present or because the
affected object is absent from the position after the
verb. However, on the other hand, they can also tell
us once the child can find something that can turn to
the two rules they are using, the comprehension of the
passive structure (and other structures as well) may
become easier. Thus, I find it helpful if we
manipulate the "triggering" idea discussed in Pinker
(1984) and in Roeper (1984). Since the properties of
IPP involve both Agent and Affected object, then I
assume that in a passive sentence with instrumentals,
IPP may in fact serve as a syntactic trigger for the
understanding of such a structure. Since the existence
of the IPP always implies the existence of the Agent
either explicitly or implicitly, the child is forced to
find the implicit Agent in such a structure, giving up
the adjectival passive interpretation for (36) and
strengthening the chain formed with the moved affected
object and the trace left after the verb in (37).
Therefore, for a passive with IPP, we can say the child
uses the Affected Argument Constraint to find out the
trace, and s/he uses the Agent-IPP connection to find
out the implicit agent. I believe this is true not

only in the process of acquisition but also in the adult grammar, as we have shown that for an adult a passive without IPP could be ambiguous, too. Thus, the proposal that IPP is a trigger for the implicit argument in passive helps us to solve the problems which cannot be dealt with directly by AAC. In fact, we also find support for this idea from other researchers. Pinker et al (1987) suggested that the extra auxiliary <u>being</u> as in <u>the dog is being chased by the bear</u> may have served as an additional surface cue to the passive. They also cited Stromswold et al. (1985)'s work, whose work shows that at certain ages children's comprehension of passive sentences improves with the number of passive surface cues included in a sentence.

However, since acquisition is affected by many factors (for example, the rare occurrence of passive with IPP, the burden it adds to the process of parsing as IPP makes the sentence longer), we really need to test out if this is true even though in theory we can say that passive with IPP is very possibly to be acquired by children at a fairly young age.

Thus, we have given the reasons and the motivations that are behind our experiments to be presented soon.

To sum up, in this section we have shown the two possibilities predicted by the Maturation Theory and the Affectedness Theory. We have proposed in line with the Affectedness theory, that IPP may be a syntactic trigger that helps the understanding of the structure of passive with IPP for the child. Our next step is to see if there is such an Agent-IPP connection for the child.

V. The Experiment

In this section we are going to put our hypotheses into practice and provide experimental evidence for the predictions that are made by the theories we have talked about. The experiments are designed to seek the answers for the following questions:

1. Is it the case that children's first passives are exclusively adjectival passives?
2. When can children understand passives with IPP? Do they understand Passives with IPP only after they know adjectival passives?

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3. How can children understand passives with
    IPP? Do they know that the subject is
    disjoint in reference with the instrument
    (IPP)?· What helps them to associate the
    implicit argument as the Agent to use the
    instrument?
    If children cannot understand passives with
    IPP, why not? What prevents them from
    understanding them?

General Introduction:

     A picture identification task was designed with
three kinds of sentences among 7 three-year-old
children and 10 four-year-old children in Sand Hill
Nursery School in Leverett, Massachusetts. The three
kinds of sentences are 1) IPPs in active voice; 2)
short passives; and 3) passives with IPP. (We will call
the testing of the three kinds of sentences three tests
later on although the three kinds were tested at the
same time to individual children.) For each sentence
there are three pictures as a set for the children to
choose the correct answers from. In order to let
children feel at ease with the experimenter so that
what we get should be the true responses from the
children, the experimenter visited the nursery school
several times before the experiment, taking part in
whatever the activities were going on at the time. The
experiment was done individually with each child, who
was asked to listen to a sentence uttered by the
experimenter and to identify the correct picture(s)
that represents what the experimenter said. Assuming
that the experiment should be conducted in such a way
that children would not feel bored but interested
instead, we asked the children to choose the correct
picture by putting a sticker on the pictures. (We
found this _is_ a good way to keep the child interested
in the task.) Before the child was tested individual-
ly, how the experiment should go was explained to all
the children jointly with the help of their teachers in
the day care center. When it was clear the child knew
what (s)he should do, the test sentences were presented
in the frame of a question: "Can you show me in which
picture ʻThe boy was digging a hole with a feather' ?"
Sentences were repeated if the child did not seem to
understand them since the experimenter spoke with a
foreign accent. The child was also told that (s)he
could choose more than one picture, and (s)he was also
assured that there was no right or wrong answers to
each sentence since (s)he was encouraged and praised
all the time during the experiment. Altogether there

were 17 testing sentences, for each individual the test
took about 10 minutes (at most 15 minutes).

<u>Test of IPP in Active Sentences</u>

Although Randall's experiment already showed that
children understand instrumental phrases at a very
early age, still IPP in active voice could serve as a
kind of pretest for IPPs in passives. As a pretest,
during the playing time, the experimenter tried to use
IPPs both in active and passive voices when talking
with some of the children. Sentences like "Pass me the
ball with the bat" "Was the ball hit with my hand?"
were used to communicate with the children. The
children did seem sensitive to the sentences because
sometimes they stopped to reflect the sentences or
asked "Why?" There was one girl who had just turned
three who did everything accordingly, which relieved
the worry we had (We were not quite sure if IPP was too
difficult for younger children or not). Nevertheless,
we still think it is necessary to include such a test
in our experiment. Because on the one hand, the
majority of the children were not spoken to with the
experimental sentences; on the other hand we wanted to
examine if children could show their knowledge of IPP
without strongly depending on the reference they could
see in the right context.

It is said that good testing sentences are those
antipragmatic ones, which can reveal the child's true
knowledge of grammar (Randall 1982), therefore, we
chose three antipragmatic IPP sentences and two normal
IPP sentences in the test. Sentences like <u>The boy was
digging a hole with a feather</u>, represent the
antipragmatic ones since nobody could use a feather to
dig a hole unless the feather was a magic one in a
fairy tale. Sentences like <u>The bear held a doll with a
basket</u> represent the normal case. The assumption was
that if the child could still interpret <u>with a feather</u>
instrumentally in spite of the impossibility, we know
for sure that the child understands the function of
IPP.

Three pictures for each sentence were presented to
the children which varied according to the various
functions that a <u>with</u>-phrase has (e.g., instrument,

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accompaniment of VP and accompaniment of NP)[12]. But
in each set of pictures, definitely there was one being
instrumental while the other two alternate with a
picture showing the accompaniment of the Theme (a
possible reading); accompaniment of the Agent (an
unlikely reading for adults, or a picture that showed
no connection between the instrument and the Agent
(again an impossible reading). Below is an example with
the descriptions of the pictures for the testing
sentence shown in (40). (The underlined letter shows
the correct picture.)

(40) dig: The boy was digging a hole with a feather.

Pictures:a. The boy with a feather was digging a hole
(with-phrase as an extraposed accompaniment of the boy)
          b. The boy was digging a hole with a feather
                                                  (IPP)
          c. The boy was digging a hole which had a
                     feather (Accompaniment of a hole)

        The prediction is that if the child can feel the
function of the IPP in such kind of sentences, (s)he
would choose picture (B) in spite of everything.   On
the other hand, if the with-phrase sounds like
something that described the object "the hole", or the
subject "the boy", the child would choose picture (c)
which showed the object accompaniment reading and
picture (a), which is the least possible reading for
the adult.

Scoring

        Although the children were encouraged to choose
whichever picture they wanted, and some children chose
more than two pictures, only the first choice of IPP
was considered correct in scoring the test. This was
so because we believed the first choice would reveal
the true spontaneous interpretation of the child's
understanding of the sentences. Also this test was
only to make sure that children do know the function of
IPP in active voice so that IPP shouldn't be considered

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        [12]. Only these three kinds of with-phrase can take
concrete objects. The function of the with-phrase that
can take abstract object (e.g., with passion; with ease)
is excluded because we assume the acquisition of this kind
should come much later than that of the other three kinds.

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as a decisive factor if children failed to comprehend a
passive with IPP in Test 3.

Results and Discussion

        Results are shown in Table 1. As two types of
sentences are included we label them "antipragmatic"
and "non-antipragmatic respectively in the table. There
could be four interpretations according to the
arrangement of the pictures. Column (a) indicates the
IPP interpretation which certainly is the result we
want (also it is the adult's interpretation). Column
(b) is the accompaniment of the Theme reading, taking
with-phrase as an NP complement. Accompaniment of the
Agent (Acc of Ag) is column (c), which is a result of
extraposing the complement of the subject (very
unlikely in adult grammar in this respect). The least
possible reading is that the with-phrase is "doing"
something without any connection with an Agent, which
is represented in column (d).

TABLE 1
Distribution of responses to IPP in Active Sentences

Age	(a)	(b)	(c)	(d)
3.0--4.0	49%	28%	20%	3%
4.0--4.11	68%	18%	8%	6%
Total	58.5%	23%	14%	4.5%

        As we can see from the Table that the percentage
was not very high for the instrumental reading in
active sentences. However, we still have reasons to say
that instrumental reading is the preferred reading.
Notice when compared to other responses IPP reading is
the predominant response. If we take the ambiguity of
a with-phrase into consideration, that is, a with-
phrase is usually ambiguous between an instrument
reading, which is a modifier of a verb, and an
accompaniment reading, which is a modifier of a noun,
then the result could be taken as a further evidence
for Randall's conclusions--in spite of the ambiguity
children still favor the IPP reading over others. (Of
course, the ambiguity could also be taken as one factor
for the low readings.) Even in antipragmatic sentences
the IPP interpretation is still the dominant results.
This is shown in Table 2. The recorded results are
only the IPP reading.

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TABLE 2
Responses to Antipragmatic and Non-antipragmatic
sentences

Age	Antipragmatic	non-antipragmatic
3.0--3.11	52.3%	43%
4.0--4.11	73.3%	60%
Total	62.8%	51.5%

        If we say that children didn't understand the
function of IPP in active sentences and that they hit
upon the correct answer for <u>The boy held a doll with a
basket</u> only because of the help of the inference in the
possible context, (the 3-year-old group got 80% correct
response on this one) then it would be really hard to
explain why children gave a predominant instrumental
reading on sentences such as <u>Big Bird touched Grover
with Bert</u>, a highly unlikely situation in real life (3-
year-old group 57% and 4-year-old group 70%).

        Therefore, the results of this test suggest the
following conclusions. First, the predominant
responses to the IPP reading especially the results
drawn from the antipragmatic ones indicate that
children do know the function of IPP. Secondly, our
experiment did show that this ability grows with their
age, that is, IPP is a bit difficult for younger
children.

<u>Test of Short Passives</u>

        Two points were under consideration as the
experimental sentences were designed. First, as
different kind of verbs bear different properties with
respect to short passives, special care was taken to
choose the verbs used in the experiment. We tested 6
verbs, two pure verbal verbs, two adjectival verbs and
two ergative verbs. Again, for each sentence there
were three pictures, one being adjectival; one being
verbal; and one in active voice. We determined whether
it was really true that children's interpretations of
short passives are influenced by different verbs.
Secondly, we wanted to determine whether it was really
true that there is a stage at which children's passives
were only adjectival passives. In order to test this
point, we arranged the pictures in each set in such a
way that both adjectival and verbal readings were

available. (that is, we forced an adjectival reading
for verbs like <u>chase</u>, which are not open to adjectival
analysis). Thus, based on different theories as we
sketched previously, we would predict that if children
could only understand adjectival passives, they would
certainly choose the adjectival reading for those
ambiguous verbs (like <u>the bear was washed</u>) and may also
choose the forced adjectival reading for verbal
passives (creating a chased dog for <u>the dog was</u>
<u>chased</u>). Or they would simply be at a loss of what to
do and give random results for those verbs that are not
open to adjectival passives. Of course, on the other
hand, if the results were the opposite--children gave
verbal passive interpretations anyway regardless of
what type of the verbs are--we may find evidence to
argue for the "affectedness" theory. This is because
we didn't include nonactional verbs in the tests. No
matter what kind the verbs are (adjectival, verbal or
ergative), once they are interpreted as passives, they
all involve moved "affected" objects as the subjects.

<u>Results and discussion</u>

Again, we only take the first spontaneous response
as the children's interpretation of the tested
sentences. The responses are the following--verbal
passive, adjectival passive, and active sentence
readings. These are represented as (a), (b) and (c)
respectively in Table 3.

Generally speaking, as shown below, children
prefer verbal passives across the board. The 3-year-
old group was as good as and even slightly better than
the 4-year-old group. But this could not be evidence
for Borer & Wexler's theory because they did it better
not because they interpret all the sentences as
adjectival passives but rather as verbal passives:

TABLE 3
Distribution of Responses to Short Passives

Age	(a) verbal	(b) adjectival	(c)active
3.0--3.11	66.9%	12%	21.1%
4.0--4.11	61.6%	21.7%	16.7%
Total	64.5%	16.5%	19%

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        Since Borer & Wexler (1987) claimed that the
reason why at a certain stage children cannot
comprehend verbal passives is that the A-chain
formation is not matured, one would expect that not
only would there be differences between different
verbs, the ages of the children should also make
differences.   Therefore, we show Table 4 and Table 5
for 3-year olds and 4-year olds respectively.   Again,
(a), (b) and (c) represents the responses given by the
children as verbal passives, adjectival passives, and
active sentences with respect to different verbs.

TABLE 4
3-year olds responses to
short passives with respect to different verbs

Verb Type	(a)	(b)	(c)
"pure" action verbs	57.5%	17%	35.5%
Adjectival verbs	100%	0%	0%
Ergative verbs	43%	21%	36%
Total	66.9%	12%	21%

TABLE 5
4-year olds responses to
Short Passives with Respect to Different Verbs

Verb Type	(a)	(b)	(c)
"Pure" action verbs	75%	10%	15%
Adjectival verbs	55%	10%	35%
Ergative Verbs	35%	30%	35%
Total	61.5%	16.5%	19%

        Treating passives in general as verbal passives
was above chance for both age groups.   We find there
was no way to interpret the data as any evidence for
"adjectival only" hypotheses.   It is true that for the
younger group, children's performance was even much
better for the adjectival verbs than the older
children.   But this is not a supporting evidence for
Borer & Wexler's theory either.   First, adjectival
verbs are open to both verbal and adjectival analysis,

however, children especially the younger children, chose the verbal reading instead, suggesting that adjectival passive is not the only and the first available interpretation of short passives. Secondly, there is no way to say this is the result at the stage after the maturation of the A-chain formation either. How can we expect that this maturation process will first take place among the three-year olds rather than the four-year olds? Thirdly, given a closer look at the score we got for adjectival passive reading in general, at best, the three-year olds responded 12% of the time and the four-year olds 16% of the time. Such poor performance on adjectival passive across the board only suggests that once verbal reading is available, children will go to the verbal reading. They did not stick to the adjectival reading of the passive even though we assume that adjectival passives are the first to be acquired. Certainly it is the "Affectedness" theory that is at work.

The only complication of our findings is that children performed poorly on ergative verbs for both groups. The equally distributed responses were roughly those of chance, indicating the children didn't control this kind of passives. This is not surprising as the experiments made by Roeper showed similar results (see Roeper (1984)). For sentences like <u>"The cat is being hidden"</u> 3-4 year olds got 46.7% correct. This was because ergative verbs show a transitive and intransitive variation and within transitive variation there is also verbal and adjectival variation once passivized. Following Roeper, we would say that children were using largely cognitive inference in the analysis of the passive. In an ergative passive, they would find themselves an Agent (if it can be a possible Agent) even if such an Agent is not available in the surface, as ergative verbs can be interpreted intransitively. This view was held by Marantz (1982), according to Pinker et al (1987), that children use agent referents as their subjects. But for our test, there might be another possible explanation suggested by Jill de Villiers (personal communication) that is, the idea that children didn't get them right simply because of the irregular forms of the passive participles of these verbs we chose (<u>eaten, sunk,</u>) (but 100% on <u>cooked</u> as in <u>the Gingerbread boy was cooked</u>). Certainly a more thorough study is needed to prove this point.

To sum up the discussion on this test, although the 64.5% success rate suggests less than complete

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mastery, it certainly indicates that it is not the case
that children cannot comprehend verbal passives at all,
which means this is contrary to the predications made
by Borer & Wexler's theory. Even though we assume this
is the stage that "A-chain" formation is matured, or in
the process of maturing, the fact still needs an
explanation that 3-4 year olds did better than 4-5-year
olds on adjectival passives and that the adjectival
reading was not largely chosen even though that reading
was available. Therefore, the evidence we find only
strengthens the "affectedness" hypotheses. But
children's poor performance on ergatives indicates that
children may be reluctant to passivize those sentences
for which they can easily find possible Agents first.

Test of IPP in Passive Sentences:

     This group was our central concern because we
wanted to see if first of all children could understand
passives with IPP at all or not since they cannot be
analyzed as adjectival passives. We wanted to see if
IPP could serve as a syntactic trigger for the
understanding of the passives.

     Although no matter what kind of verb is used with
IPP, only the verbal reading is acceptable, we still
had two verbal, two ergative and two adjectival verbs
included in the six testing sentences. Again there
were three pictures in each set. Pictures were
arranged to see (1) if children ignore the passive
morpheme and the with-phrase completely so as to give
the with-phrase an object interpretation since it
appears at the end of each sentence, and (2) if they
interpret the with-phrase as the accompaniment reading
or not. Even though the accompaniment reading was not
preferred, we still let it alternate with the agent
accompaniment and the theme accompaniment as a
distracter in the pictures. The following example
shows how the pictures were arranged:

(41) lift: Ernie was lifted with a shovel.
Pictures: a. Ernie was lifting a shovel.
(Taking the instrument as the object of the verb)
           b. Ernie who was holding a shovel was lifted
           by Bert with two shovels.
           (Accompaniment with the theme)
           c. Ernie was lifted with a shovel by Bert.
           (instrument used by the implicit agent)

     Notice we alternate the number of the instruments
in the pictures because we wanted to make sure children

get the right responses due to their true linguistic competence and not merely because of the inferences they could find in the pictures. Also as we did the experiment we asked the children to identify the instruments in each picture first so as to make sure that children shouldn't fail the sentence just because they didn't see the instruments clearly.

Results and discussion

        Children responded in 3 ways as the pictures were arranged. Table 6 gives the gross results on this test. Table 7 shows the results of the three-year olds and Table 8 the results of the four-year olds. (a) represents the IPP reading, (b) the accompaniment reading of the theme (the surface subject); (c) the object reading. In this test, we see that the verbal reading is preferred regardless of the differences between the verbs.

TABLE 6
Distribution of responses to IPP in Passive

Age	(a)	(b)	(c)
3.0--3.11	59.7%	26%	14.3%
4.0--4.11	73.5%	18.3%	8.2%
Total	66.6%	22.15%	11.25%

        Although the results suggests a less than complete mastery of the structure, still it supplies very important implications. First, we are assured of the fact that IPP is not a factor that will block the understanding of the passive structures. Second, not only that, we see once again that verbal (thus, instrumental) were favored more than accompaniment readings and the surface object reading. Put it another way, children do have passives in their mind. Third, the better performance by the four-year olds seems to suggest that IPP could be serving as a syntactic trigger for the verbal passives (61.6% in short passives, 73.5% in this test). Three-year olds showed a slightly worse performance. However, as we compare the performances on the ergative verbs we noticed that not only the four-year olds did better than they did for the short passives, the three-year olds showed the same tendency.

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TABLE 7
Distribution of responses of 3-year olds to
Passive with IPP with respect to different verbs

Verb Type	(a)	(b)	(c)
adjectival verbs	78%	14.5%	7%
Ergative verbs	71.5%	21%	7.5%
"pure" action verbs	36%	42.5%	21.5%

TABLE 8
4-year olds' responses to passives with IPP
with respect with different verbs

Verb Type	(a)	(b)	(c)
adjectival verbs	80%	15%	5%
Ergative verbs	80%	15%	5%
"pure"action verbs	50%	30%	20%

        As a matter of fact, we wouldn't expect any
differences across the verbs in passives with IPP, for
any passives with IPP will be unquestionably verbal.
What is striking is when you do compare the different
performances on the ergative verbs with and without the
IPP. Without IPP, the performance was too poor to be
considered as any valuable information to prove that
children have verbal passives. With IPP, the
performances are all above chance level. Therefore, I
consider this as a suggestive conclusion that IPP could
be serving as a syntactic trigger.

        It seems that the results we got suggest the
following explanation. It may be the case that the
child could not feel the trace of a short passive
sentence if the child could interpret the subject in a
sentence which consists of a verb that could be
transitive and intransitive. Therefore, he could not
feel that the real Agent is not the subject. However,
when an instrument appears in the sentence it acts like
a syntactic trigger to activate the affectedness of the
verb and to figure out that a trace is left behind the
verb, and therefore it is the affected argument that is
moved to the subject position of the passive.
Furthermore, since an instrument requires an Agent

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(although not vice versa) and if they cannot find an explicit Agent in the surface they will infer an implicit agent in the deep structure. Therefore, the association of the instrument and the Agent is complete.

Unfortunately, this theory runs into problems in explaining the fact that children do better with "pure" actional verbs in short passives, but poorly with that kind of verbs with IPP. If there is such a thing that IPP is a trigger for verbal passives, why is it that it didn't seem to at work this time? (Three-year olds got verbal passives reading 57.7% in short passives and 36% in verbal passives with IPP).

We should take some factors into consideration. It is true that passives with IPPs are much longer than short passives. Children tend to comprehend short sentences better. Besides, passive in general is rare in the adult grammar. But passives with IPPs are even rarer. Although in the first test we showed that children do understand the function of IPP, yet they do appear that they still have difficulty understanding the structure well, especially the younger children. In this respect, we should say more research should be done to study this[13]. However, as we said before there shouldn't be any differences across the verbs once IPP is added. The performance of passives with IPP in general is not too bad. Table 9 gives a

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[13]. Other factors may concern the validity of the tests. In one instance, IPP is represented by such instrument as involving one part of the body (Bert was pushed with one hand). One question we can raise is whether it should be considered as the same kind of instrument, as with a knife. Maybe this kind of instrument should have been avoided in designing the test in the first place.

Some researchers in an informal meeting of language acquisition held in Amherst suggested that from their experience, children are found to be fond of a particular picture if they think it is funny or for whatever reasons. I also found some children brightened up at some pictures and pointed at the pictures before I finished the sentences. Even though I repeated myself several times they would still insist on the same pictures.

But all these do not mean that they are exactly the factors that prevent the child from understanding the structure in general. These only suggest more careful study should be done.

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comparison between responses for the short passives and
for the passives with IPP.

TABLE 9[14]
Comparison with the Results
Shown in Test 2 and Test 3

Age	Short passives	Passive with IPP
3.0--3.11	66.9%	59.7%
4.0--4.11	61.6%	73.5%
Total	64.5%	66.5%

     I assume the differences were not significant
enough to make the claim that children understand
passives with IPP better. But our experiment still
favored the Affectedness Hypotheses and the
"triggering" idea in that we notice that among the 3-4-
year-old group, 57% of the children do passives with
IPP better or as good as they do on short passives.
This tendency is even greater when comparing the
performances of the 4-5-year old group. 90% of them do
passives with IPP better than they do on short
passives. Although there is one exception (a four-
year-old whose performance on short passive with IPP
was not as good as his performance on short passive),
the 90% indicates that the results from the 4-year olds
are consistent and is good enough for us to say that
something is playing a role in helping the children
understand verbal passives and to detect the implicit
arguments in the passive.

     One thing is certain from the table that at least
children's knowledge of verbal passives is consistent.
Children are more willing to choose the verbal reading
when such a reading is available. They are forced to
choose the verbal reading anyway once there is only the
verbal reading available. With this, we conclude the
discussion of the three tests in this Section.

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     [14].   In order to see if the results are significant
enough we need to do statistical analyses. All the
results shown here are only suggestive. Because, without
the statistical analyses, we only interpret them in an
intuitive way.

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VI. Conclusions and implications

Let's return to the initial predictions made by
the two theories.

1. We have found that it is not really true that
children's passives at a certain stage are exclusively
adjectival. These findings actually follow the
conclusion made by Pinker et al (1987:263) that "there
is no reason to believe that young children's passives
are exclusively adjectival."

2. We do find sufficient evidence to say that
children do have verbal passives. If children did not
have verbal passives, then they should always take a
stative interpretation in short passives and in
passives with IPP (choosing the accompaniment reading
for the with-phrase). Although the results do not show
that children interpret passives all as verbal passives
(because they are not all verbal) at least the score of
more than 50% of the responses indicate that they do
have the verbal reading.

3. We have found that passives with IPP are not
only possibly acquired by the children but also we have
shown that IPP might be a syntactic trigger for the
implicit argument of the passive structure, although a
more thorough study is still needed[15]. Again, if IPP
cannot trigger the implicit agent then no difference
should be expected for the responses of ergative verbs
with or without IPP, for there is no reason cognitively
to assume that the subject is the object with a

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[15]. Besides IPP, there are other adverbials that can
enforce the verbal reading of a passive sentence.

    (a) The table was broken with difficulty.
    (b) The plastic sheet was torn easily.

Adjectival as the verbs are, the adjectival reading
disappears completely with the help of the underlined
adjuncts. The success of IPP helping the child get the
verbal reading of passive suggests that these adjuncts
could serve as some syntactic triggers, too. Of course,
this also indicates that more work should be done in order
to establish this theory on a solid ground.

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transitive verb because ergatives allow this kind of a
reading anyway for subjects.[16]

    Of course, our experiment does not say that Borer
& Wexler's theory is totally unacceptable. Although
the data we have does not favor this analysis, we do
not have enough evidence to say the theory is not right
either. As Charles Clifton put it, "The children we
tested may be too old." That is, the children we
tested are past the stage if there is one that requires
the maturation of the "A-chain" formation. However,
this proposal fits only a portion of the data. It
fails to account for the fact that 4-5 year olds do
better on passives with IPP than on short passives. It
fails to account for the unavailability of adjectival
passives to children in short passives, especially when
their mastery of verbal passive is not complete.

    It is still the case that we don't know when this
"A-chain" matures. We don't know how young the child
are considered as not past the stage. I tested a 2.8-
year old, who is said to be one of the brightest and
one of the most verbal children in the Sand Hill
Nursery School. The results were too poor to be taken
as valuable information to prove she really knew any
passives. However, there was also a 2.9-year-old boy
whom I tested in his home, who showed at least a
partial control over the passive. He got 60% of the
time on the instrumental reading of the first test (IPP
in active sentence); 83% on the verbal reading of the
short passives, and 50% correct answer on passives with
IPP. Of course, there are differences across
individual children, but the first child we tested was
by no means not clever and the second was by no means a
child prodigy. (Of course other pragmatic matters
should be taken into consideration. For example, the
first child may not feel as comfortable with the
experimenter as the second child. The first child met
the experimenter only once while the second many times;
the first one took the test alone with the experimenter
at school but the second one took the test at home with
the experimenter when he knew that his mother was in
another room.) Even though there is a time difference
(the first child is one month younger than the second
one) and if we assume there is such a stage, we would
expect that this process would be really short.

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        [16].   This point was made to me by Roeper through
    personal communication.

Certainly, a more thorough experiment is needed with the youngest children. Otherwise, the data we have is not really sufficient enough to prove or disprove completely one theory or another.

To sum up, we did an experiment to find out how children comprehend passives with IPP. Our study somehow proves that the Affectedness is a core principle for language acquisition, while at the same time partially challenges the Maturation Hypothesis. It also has raised an important question as to whether there is such a syntactic trigger for the implicit argument in the passive (and other structures). It certainly has suggested that a wider application of this proposal is possible if more research could be done in this area.

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Appendices[17]

I. Sentences used in <u>Test of IPP in Active Voice.</u>

1. <u>Grover dropped the doll with a bag.</u>

3-4; 4-5 Pictures:
50%		<u>(a)</u> Grover dropped the doll with a bag.(IPP)
14%	20%	(b) Grover with a bag dropped a doll.(accompaniment of the Agent)==(Acc of Agent)
86%	30%	(c) Grover dropped a doll that is together with a bag. (accompaniment of the theme)== (Acc of Th)

2. <u>The bear held the doll with a basket.</u>

Pictures:
14%	20%	(a) The bear was holding his own arms and didn't hold the basket that had a doll in it. (IPP has no connection with Agent)
	10%	(b) The bear was holding a doll together with a basket.(Acc of Th)
86%	70%	<u>(c)</u> The bear was holding the doll with a basket. (IPP)

3. <u>Big Bird touched Grover with Bert.</u>

Pictures:
	20%	(a) Big Bird touched grover who was with Bert. (accompaniment of the theme)
57%	70%	<u>(b)</u> Big Bird used Bert to touch Grover.(IPP)
43%	10%	(c) Big Bird who was together with Bert touched Grover.(Acc of Agent)

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[17]. For the sake of convenience, the children's responses to each picture were given in the two left columns. The numbers represent the percentage. The example pictures of each set are attatched at the end.

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3-4; 4-5   4.   <u>Ernie opened the door with a</u>
                      <u>piece of thread.</u>

                Pictures:
57%   80%   <u>(a)</u> Ernie used a piece of thread to open
                      the door (IPP)
43%   10%   (b) Ernie was opening the door which has
                      a piece of thread on the door handle.
                      (acc of Th)
      10%   (c) The thread opened the door while
                      Ernie was near the door. (IPP has no
                      connection with the Agent)

                5.   <u>The boy dug a hole with a piece of</u>
                      <u>feather.</u>

                Pictures:
14%   20%   (a) The boy with a feather was digging a
                      hole.(Acc of Agent)
43%   70%   <u>(b)</u> The boy used a piece of
                      feather to dig a hole.
                      (IPP)
43%   10%   (c) The boy dug a hole
                      which has a piece of
                      feather. (Acc of Th)

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II Sentences in the _Test of Short Passive_

3-4; 4-5;   1.   <u>chase</u> (verbal): <u>The dog was chased.</u>

                  Pictures:
29% 70%   <u>(a)</u> The dog was chased (by a cat)
                                      (verbal passive)
57% 20%   (b) The dog was chasing a cat.(active
                                          sentence)
14% 10%   (c) The dog was chased. (running)
                            (forced adjectival passive)

                  2.   <u>wash</u> (adjectival): <u>The bear was</u>
                      <u>washed</u>

                  Pictures:
     20%   (a) The bear was washing a towel (active)
100% 70%   <u>(b)</u> The bear was washed.(by Bert) (verbal)
     10%   (c) The bear was washed.(no agent)
                                        (adjectival)

3-4; 4-5   3.   <u>cook</u> (adjectival)   <u>The gingerbread</u>
                      <u>boy was cooked.</u>

                  Pictures:
     30%   (a) The ginger bread boy was cooking
                                  a fish.(active)
     30%   (b) The ginger bread boy was
                      cooked (no agent) (adjectival)
100% 40%   <u>(c)</u>   The ginger bread boy was cooked.
                             (by a cook) (verbal)

                  4.   <u>sink</u> (ergative): <u>The boat was sunk.</u>

                  Pictures:
43% 30%   <u>(a)</u> The boat was sunk. (by a man)
                      (verbal)
14% 30%   (b) The boat was sinking. (active)
43% 40%   (c) The boat was sunk.(no agent)
                               (adjectival)

                  5.   <u>eat</u> (ergative): <u>The fish was eaten.</u>

                  Pictures:
29% 30%   (a) The fish was eating (water-
                            weeds).(active)
43% 40%   <u>(b)</u> The fish was eaten. (by a cat)
                              (verbal)
29% 30%   (c) The fish was eaten.(no agent)
                              (adjectival)

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               6.   kick (verbal): The horse was kicked.

               Pictures:
        20%   (a) The horse was kicked. (no agent)
                              (forced adjectival)
86%   80%   (b) The horse was kicked (by a
                                          dog).(verbal)
14%   (c) The horse was kicking a dog.
                                            (active)

PASSIVE WITH INSTRUMENTAL PREPOSITIONAL PHRASE 361

III. Sentences used in the Test of Passives with IPP

1. roll (ergative): The cat was rolled with one stick.

3-4; 4-5; 10%		Pictures: (a) The cat with a stick was rolled (-IPP)
14%		(b) The cat was rolling a stick. (with as object)
86% 90%		(c) The cat was rolled with a stick. (by a rabbit) (+IPP)

2. push (verbal): Bert was pushed with one hand

Pictures:

43% 60%   (a) Bert was pushed with a hand. (by Ernie) (+IPP)

43% 20%   (b) Bert was pushing a hand. (with as object)

14% 20%   (c) Bert with one hand was pushed . (by Ernie) (Acc of Th)

3. lift (adjectival): Ernie was lifted with one shovel.

Pictures:

14% 10%   (a) Ernie was lifting a shovel. (with-phrase as object)

29% 10%   (b) Ernie with a shovel was lifted.(by Bert)(Acc of the Th)

57% 80%   (c) Ernie was lifted with a shovel(by Bert). (+IPP)

4. tickle (verbal): Grover was tickled with one doll.

Pictures:

29% 40%   (a) Grover was tickled with a doll. (by Bert)(+IPP)

71% 40%   (b) Grover with a doll was tickled. (by Bert)

     20%   (c) Grover was tickling a doll. (with-phrase as object)

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3-4; 4-5   5.   <u>Wave</u> (ergative): <u>The flag was waved</u>
                     <u>with two hands.</u>

                Pictures:
29%   30%   (a) The flag with 2 hands on it was
                          waved.(Acc of Th)
57%   70%   <u>(b)</u> The flag was waved with 2 hands.
                          (by Bert)(IPP)
14%   (c) The flag was waving 2 hands.
                          (w<u>i</u>th-phrase as object)

                6.   <u>break</u> (adjectival) <u>The board was</u>
                     <u>broken with an ax.</u>

                Pictures:
100% 80%   <u>(a)</u> The board was broken with an ax.
                          (IPP)
      20%   (b) The board with an ax was broken (with
                     a hammer). (Acc of Th)
                (c) The board was breaking an ax.(w<u>i</u>th-
                     phrase as object)

PASSIVE WITH INSTRUMENTAL PREPOSITIONAL PHRASE 363

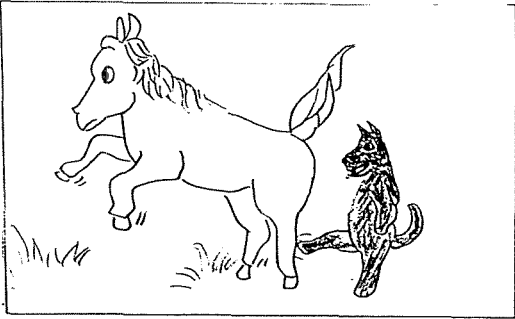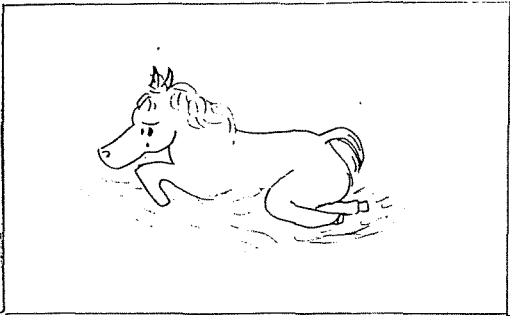I.   Example pictures used in the Test of IPP in Active
Voice.

The boy dug a hole with a piece of feather.

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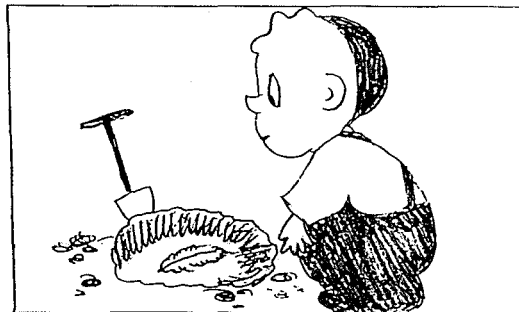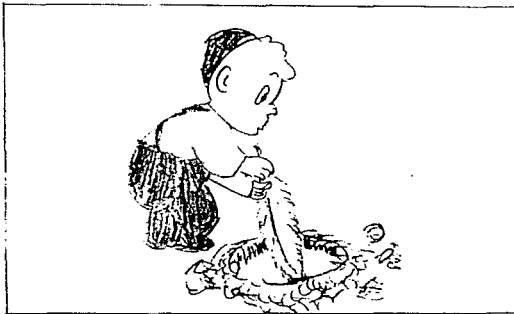
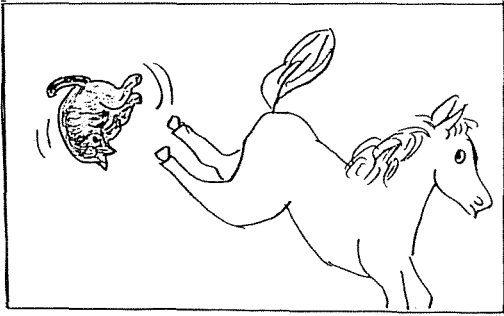## II.   Example pictures used in the Test of Short Passive
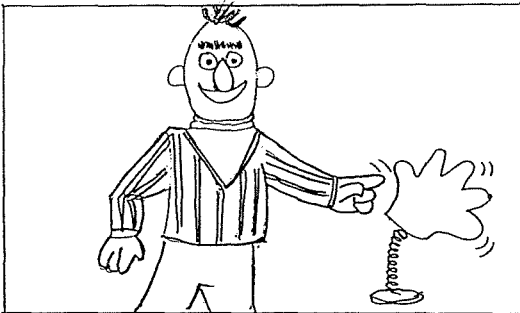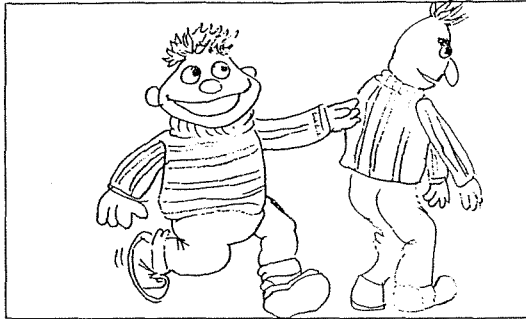
The horse was kicked.

-1-

-2-

-3-

PASSIVE WITH INSTRUMENTAL PREPOSITIONAL PHRASE 365

III. Example pictures used in the Test of Passives with IPP

Bert was pushed with one hand.