Reconciling Causal and Modal Representations for Two Salish Out of Control Forms

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1. Introduction

St'át'imcets (also known as "Lillooet") and Sḵwẉú7mesh (also known as "Squamish") are Salish languages spoken in present-day southwestern British Columbia, Canada. The St'át'imcets (St') circumfix *ka...a* and the Sḵwẉú7mesh (Sḵ) particle *txw* have both been called "out of control" markers (Demirdache 1997, Matthewson et al. 2005, Davis et al. 2007, 2009, Jacobs 2007, 2011). They share a number of similar readings, for instance, in (1a,b), a "no choice" or "had to" reading:

(1) a. **ka**-wat'k'=kán-**a** i=ts'aqw-ann'-an ti=qvl̓-wíl̓'c=a
OOC-vomit-1SG.SUBJ-**OOC** when.PAST=eat-DIR-1SG.ERG DET-bad-become=EXIS
ts'úqwaz' St'át'imcets
fish Davis et al. 2007: (61)
'I had to throw up after eating that rotten fish.'

b. na men **txw** x̱ay-m ta stá7uxwlh Sḵwẉú7mesh
RL just **OOC** laugh-INTR DET children Jacobs 2007: (16)
'The children had to laugh' (even though they were trying not to).'

The notion of "control" (Thompson 1979) refers to morphology, pervasive in Salish languages, that seems to have to do with the amount of control that the agent has over the event.[1] Different Salish langauges have different morphological systems for control. Broadly speaking, St' *ka…a* has "no choice" readings as well as abilitative readings (Davis et al. 2007, 2009), while Sḵ *txw* contributes only "no choice" meaning, with abilitative readings contributed by "limited control" transitivizers and intransitivizers (Jacobs 2007, 2011).

Both causal (Demirdache 1997, Davis & Demirdache 2000, Jacobs 2007) and modal (Matthewson et al. 2005, Davis et al. 2007, 2009, Jacobs 2011) analyses have been given for St' *ka…a* and Sḵ *txw*. Despite much insightful analysis, it is still not clear whether a causal or a modal framework carves this domain of meanings more cleanly at its joints; nor is it clear why St'át'imcets *ka...a* and Sḵ *txw* share some but not all readings.

Here I propose that these forms can be understood in a hybrid framework that places the modal notions among the nodes of a causal model Pearl (2000). In effect, desires (or for inanimate entities, dispositions[2]) and abilities are represented as states that causally influence eventualities. Thus, as in the causal approaches, we can consider causal relations explicitly; and as in the modal approaches, causal influences can be represented without entailing the actuality of the eventuality. An additional key component of this approach is the notion of *efficacy* (Copley 2005, Copley & Harley 2015): the idea that one particular influence gets to determine what happens.[3] When these formal components are assembled,

* Bridget Copley, Structures Formelles du Langage (CNRS/Université Paris 8). Thanks to Henry Davis, Hamida Demirdache, and Peter Jacobs. Errors are my own. Abbreviations in glosses are from the original papers, with the possible exception of **OOC** 'out of control' which I have used throughout.

[1] It has been pointed out, however (Demirdache 1997, Davis et al. 2007, 2009), that agenthood is not always involved.

[2] Desires and dispositions often travel together grammatically and I propose they do here. See Copley (2018) for discussion of this phenomenon.

[3] Matthewson et al. (2005) were the first to make the link between the O'odham data in Copley (2005) and Salish control phenomena.

ka...a and *txw* end up sharing the meaning that the influence associated with the subject is not efficacious. This strongly echos the causal analyses cited above. The subject's influence itself can be either a desire/disposition, which leads to "no choice" readings, or an ability, which leads to abilitative readings; this is reminiscent of the modal analyses. Using these causal and modal elements, the proposal yields a paradigm of anti-efficacious causal structures to be further investigated.

Here I give the broadest possible overview of readings that *ka…a* and *txw* sentences have, without going into their numerous interactions with eventuality type and morphology. For comprehensive exposition and analysis of *ka…a*, see Demirdache (1997), Davis (2000), Matthewson et al. (2005), and Davis et al. (2007, 2009); and for *txw*, Jacobs (2007, 2011). I follow Davis et al. (2007, 2009) in highlighting a distinction between "no choice" and what I will call "abilitative" readings; this distinction will be crucial to the proposal.

As we saw above in (1), the "no choice" category are readings where actions are construed as involuntary or uncontrollable. These also include sentences with nuances that include suddenness, unexpectedness, and unwillingness:

(2) a. nilh láti7 **ka**-t'ál=s-**a** ta=káoh-s-a St'át'imcets
FOC there **OOC**-stop=3POSS-**OOC** DET=car-3POSS=EXIS Davis et al. 2007: (53)
'His car suddenly stopped.'

b. **ka**-lhéxw-**a** ta=snéqwem=a St'át'imcets
OOC-come.up-**OOC** DET=sun=EXIS Davis et al. 2009: (9b)
'The sun came out.'

(3) a. chen men **txw** uys Sk̲ww̲ú7mesh
1SG.SUBJ just **OOC** go.(inside) Jacobs 2007: (8)
'I fell inside all of a sudden.'

b. na men **txw** k̲w'iyísh ta John Sk̲ww̲ú7mesh
RL just **OOC** dance DET John Jacobs 2007: (10)
'John just up and danced.'
(Context: it wasn't time to dance at the event, but John got up unexpectedly and started dancing.)

c. na men **txw** tá7-st-as ta sitn Sk̲ww̲ú7mesh
RL just **OOC** make-CAUS-3ERG det basket Jacobs 2007: (23)
'She decided to make a berry basket.' (Context: she didn't want to, but she either decided to because of circumstances, or was made to because she was expected to.)

Davis et al. (2007, 2009) also include accidental readings, as in (4a), in the no choice category. I propose here to instead include them in the abilitative category, based in part on the fact that Sk̲ *txw* excludes them along with (other) abilitative readings, and in part on a consideration to be discussed below. The *manage-to* and *ability* readings are also contributed by ooc marking in St', with ability being the most prominent reading for *ka…a* (H. Davis, p.c.). Note that unaccusatives do not occur with the ability meaning, as shown in (4a), and unergatives do not occur with the accidental meaning, as shown in (4c). In Sk̲ , as mentioned above, abilitative readings are contributed by limited control morphemes rather than ooc *txw* (Jacobs 2007, 2011).[4]

(4) a. **ka**-sek-s-às-**a** ti sq'úm'ts-a ti twéw'w'et-a. St'át'imcets
OOC-hit-CAUS-ERG-**OOC** DET ball-DET DET boy-DET Demirdache 1997: (10e)
'The boy hit the ball (accidentally).'/*The boy is able to hit the ball.'

b. **ka**-gwél-s=kan-**a** St'át'imcets
OOC-burn-CAUS=1SG.SUBJ-**OOC** Davis et al. 2007: (6a)
'I managed to get it lit.'

c. **ka**-álkst-kan-**a** St'át'imcets
OOC-work-1SG.SUB-**OOC** Demirdache 1997: (8a)
'I am able to work.'/*'I accidentally worked.'

Both causal and modal analyses have been given for *ka…a* and *txw*. On the causal side, Demirdache

[4] Jacobs (2007) reports, however, that limited control is sometimes compatible with *txw*.

(1997) and Davis & Demirdache (2000) argue that St' *ka…a* "supresses either the initial subevent in the event structure of a predicate, or the name … that is associated with this subevent" (Demirdache 1997: 98). Crucial to this analysis is the insight that even unaccusative predicates in St' have a causative lexical representation (Davis 2000). As for Sk̲ *txw*, a causal analysis is given by Jacobs (2007), who proposes that *txw* is a marker of "the causer of the event" [being] "different than the grammatical subject of the sentence"; and tellingly, that "[t]his separates volitionality from causation" Jacobs (2007: 281). These proposals crucially identify a key component of the meanings studied: namely, that the causal influence associated with the subject is removed or set aside in some sense. However, what is lacking is a clear explication of how to represent abilitative flavor in *ka…a* sentences such as in (4), as well as how volition is to be represented in such a way as to interact with causal relations in sentences such as (3c) above. In addition, as Davis et al. (2007) point out, certain St' examples with *ka…a* lack actuality entailments for what would be the result. Thus, a causal relation CAUSE such that e_1 CAUSE e_2 entails the actuality of e_2, as in e.g. Lewis (1973), is *a priori* excluded.

These considerations, among others, motivated modal approaches to these meanings, as in Matthewson et al. (2005) and Davis et al. (2007, 2009) and Jacobs (2011). Davis et al. (2007, 2009) propose that St' *ka…a* is a circumstantial modal with variable quantificational force, i.e. either universal or existential force. The idea in a nutshell is that the no choice readings have universal force, and the abilitative readings have existential force. Thus causal information is used (in the choice of modal base and ordering source) but without entailing the result; careful attention is paid to the presence or absence of actuality entailments. Jacobs (2011: 412) follows Davis et al. in suggesting that a modal analysis is plausible for Sk̲ *txw*. However, in this approach to these ooc forms, as Jacobs comments, there remains more to say about how eventuality types and valence interact with the core modal meaning. Indeed, it is not terribly clear why formally modal meanings would interact so pervasively with eventuality types and valence, as ooc morphology does (though this is a longstanding problem for modal denotations in general, not limited to ooc phenomena). Most seriously, there are well-known problems with treating ability as a circumstantial possibility modal (Nadathur 2021).

How can these approaches be reconciled in a way that sheds light on the meanings of *ka…a* and *txw*? First we must note that it is possible to represent explicit causal relations even when the effect does not occur (Copley & Wolff 2014). In this paper I will do just this, using a novel class of causal models (Pearl 2000) based on the notion of *efficacy* (Copley 2005, Copley & Harley 2015). From there, we will follow the existing causal analyses in explicitly representing causal relations. Explicit representation of causation will more closely align with action-based treatments of ability, and should eventually allow for more grounded explanations of the interactions with eventuality types and valence, through general constraints on what kind of event can be caused by which agent (or by no agent at all). Finally, we will follow the existing modal analyses in underlining the importance in the first place of the modal notions, namely desires/dispositions, and abilities.

2. Formal framework

2.1. Causal model basics

For our purposes, a causal model (Pearl 2000) is a formal representation of the structure that causal relations give to a conceptual model of the world.[5] Causal models are formally represented by means of a directed acyclic graph. There is a set of variables that are the vertices (or nodes) of the graph. These variables are allowed to have various values. These are connected by a set of edges (or arrows). The causal model conveys that the values of some variables influence the values of other variables, according to both the arrows of the graph (which show the *direction* of causation) and the functions associated with one or more of these arrows (which give more information about which values go together). For instance, $A \rightarrow B$ represents that the value of B is dependent in some way on the value of A, without specifying which values go together.

Information about which values go together is something that comes from world knowledge. Consider, for instance, a scenario where either lightning or arson may cause a forest fire. We can model this

[5] For a gentle introduction to causal models, see Chapter 1 of Pearl & Mackenzie (2018).

scenario with the causal structure $L \rightarrow F \leftarrow M$, where $L = 1$ iff there is lightning, $F = 1$ iff there is fire, and $M = 1$ iff the match is lit. The possible values of each node are thus the truth values of the associated proposition. The entire structure is a "collider" structure, since two influences in a sense "collide". We can represent the values of F given the values of L and M: so, $F = F_F(L, M)$. In this case, F_F happens to be the *OR* function. In principle, we could set F_F to be any function we like that takes the values of the other variables and returns the value of X, but it should faithfully reflect world knowledge.

Causal models are useful for us in that they allow us to represent the directionality of causation (given by the variables and the arrows) without a particular variable necessarily being given a particular value. Specifically, we will be interested in cases of "anti-efficacy", where $X \rightarrow Y$ is in the model, but Y does not have the value that X's influence would have been expected to make it have.

2.2. Efficacy models

An influence is *efficacious* (Copley 2005, Copley & Harley 2015), when it alone determines what happens. The idea that this notion should be represented in our model drives the constraints to causal models that I will propose here. I assume that an efficacious influence can be identified.

Let's call a causal model with the following local (i.e., *ceteris paribus*, defeasible) and global licensing conditions an *efficacy model*. *Local listening* says that an arrow from A to B is only licensed if the value of B "listens" to the value of B when all other arrows into B are erased. We consider two ways to for this to occur: the arrow is associated either with a "stimulatory"/"positive slope" function, where the value of A positively correlates with the value of B, marked with a "+"; or it is associated with an "inhibitory"/"negative slope" function, where the value of A negatively correlates with the value of B, marked with a "-" (and see Lewis 1973, Croft 2012). Since we are using truth values as the values, there are only two possible functions that arrows can correspond to, as in (5):

(5) a. Stimulatory function (positive slope): f^+ b. Inhibitory function (negative slope): f^-

X	Y
1	1
0	0

X	Y
1	0
0	1

Local determinacy says that each arrow $X \rightarrow Y$ in the model is associated with a function f_{XY} which is one of the two functions given in (5); and *local* (or *defeasible*) *efficacy* says that if all other arrows into Y are erased, $Y = f_{XY}(X)$. That is, the value of Y is set to what X says it is.

Zooming out, we assume a limited version of the *causal principle*, namely that certain events need to have causes (though some can occur spontaneously; see Haspelmath 1993). And finally, we need to answer the question of what valuations are possible if we have a collider structure. Colliders in an efficacy model are globally indeterminate even though each arrow is locally determinate; for example, in the model $X \rightarrow Y \leftarrow Z$, both X and Z "propose" a value for Y. The "winning" influence is simply the one that we pick out as winning. That is, when $X \rightarrow Y$ is part of the model: then X is (globally) efficacious for Y iff for all nodes Z in the model: the value of $F_Y(X, Z)$—that is to say, the value of Y in this model—is set to the value of $f_{XY}(X)$.

2.3. Modal notions in a causal model

We will need to model both desires/dispositions and abilities of the subject. (I will write simply "desire" from here on out, with the understanding that dispositions are included.) I propose here that desire and ability be seen, for our current purposes, purely as states that influence eventualities. In this way they can be represented in the causal model as nodes that influence other nodes. The backstory of what these notions really are can certainly still be modeled using quantification over sets of possible worlds, but we will not do so here. These modal states will be represented by "subject-related influence" variables that can have the value 0 or 1. We will also need, of course, a node for whether the eventuality occurs or not (eliding the telic/atelic distinction); call it E.

We can identify two kinds of subject-related influence nodes. *Desire* nodes ("D") represent a desire that an eventuality of the kind described by the verb occurs; so, a desire for $E = 1$. The way desires are understood here is as dispositional properties of the subject: in the absence of other, interfering influences, they influence the event to occur. *Ability* nodes ("A") represent properties that require certain conditions, and if such conditions are present, and if interfering influences are absent, $E = 1$.

Let's note that the subject can be in a state that is neither desiring for the eventuality to happen nor desiring for the eventuality not to happen; likewise, the subject can be in a state where they neither have the ability to make the eventuality happen, nor the ability to ensure that the eventuality does not happen. In other words, each of the desire domain and the ability domain allow not two, but three possible states that the subject can be in (represented below in Figure 1). We will also find it useful to represent two additional kinds of nodes: $\widetilde{D}$, for "dislike", and $\widetilde{A}$ for the ability to avoid the eventuality's happening, which I will term "avoid-ability" (= the ability to avoid). These nodes carve up the space of subject's states as follows:

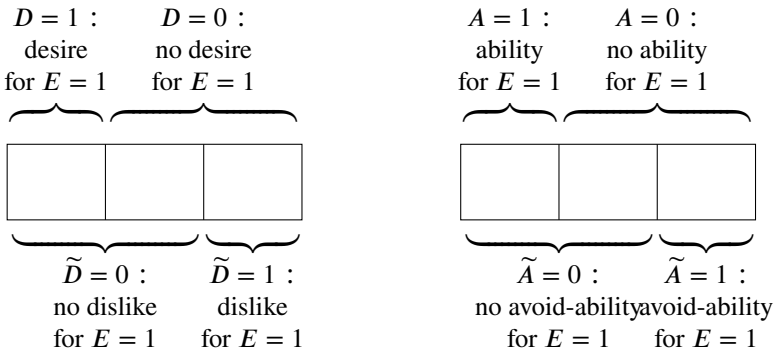

Figure 1: Desire, dislike, ability, and avoid-ability

The desire and dislike nodes will be the influencing nodes for the "no-choice" readings, while the ability and avoid-ability nodes are the influencing nodes for the abilitative readings. This makes sense, because if we think about the two kinds of nodes, they recapitulate the universal (necessity) and existential (possibility) modal analyses (Davis et al. 2007, 2009), but in a causal system. With the desire/dislike nodes, the eventuality happens if nothing inteferes; while with the ability/avoid-ability nodes, even if nothing interferes, the eventuality only happens sometimes, in the presence of certain other conditions.

Using $\widetilde{D}$ and $\widetilde{A}$ is especially interesting for the *unwillingly* and *accidentally* readings. In the case of the *unwillingly* readings (e.g. (3c) above), speakers describe the subject as not wanting the event to occur, i.e., having a desire that it not occur. But wanting and not wanting, in this sense, do not pick out complementary sets of states, because there is a middle option of indifference. Thus, unwillingness should not be represented as the negation of wanting; instead we give it its own kind of variable. As for *accidentally* readings: In principle, such a reading could be a case of unwillingness ($\widetilde{D} = 1$). But if it is, why is the accidental reading sensitive to, e.g., whether a predicate is unaccusative (felicitous, as in (4a)) or unergative (infelicitous, as in (4c))? It's perfectly possible to have desires about unergative events. On the other hand, if these readings are really about avoid-ability, there is a plausible reason for this pattern; events satisfying unergative predicates are comparatively easier to avoid ($\widetilde{A} = 1$) and events satisfying unaccusative predicates are more spontaneous, so perhaps sometimes unavoidable ($\widetilde{A} = 0$, and see Haspelmath 1993). This is why I propose to represent accidentally readings as cases where $\widetilde{A} = 0$.

Finally, as a reminder, inanimate subjects can also occur with ooc marking. Particular attention has been paid to these in St' especially (e.g. Demirdache 1997, Davis et al. 2007, 2009) where unaccusatives (as in (2)) and ability readings (as in (6)) need not have animate subjects.

(6) u, kéla7=t'u7 **ka**-kwís-**a** lts7a — St'át'imcets
oh first=ADD **OOC**-rain-**OOC** here — Davis et al. 2007: (51a)
'Oh, it can really rain here.'

So how are inanimate subjects to be treated in this analysis if we are talking about "desire" and "dislike"? The idea already mentioned above is that "desire" should be understood as something like a disposition toward a kind of eventuality occurring. Additionally, the subject-related influencing nodes can, as far as *the grammar* is concerned, generally occur with inanimate subjects. However, grammar is not the only consideration here. Combinations of certain influencing properties with certain subjects and certain kinds of eventualities are expected to be impossible because of world knowledge as to which entities can influence which eventualities and how they do so. So, for instance, perhaps it is not possible for inanimate entities to have the ability to avoid the occurrence of an eventuality. All this could be investigated in conjunction with a deeper dive into the compositional semantics of ooc marked-sentences.

3. Proposal

My proposal is that ooc marking in St' and S$\underline{\text{k}}$ both have an *anti-efficacy* meaning. In other words, the original influencing node and arrow provided by the sentence does not get to determine what happens. Anti-efficacy, taken together with the assumption that certain events need causes, invokes the existence of a second influence on E that is efficacious for E, making a collider structure. St' by *ka…a* contributes desire, dislike, ability, and avoid-ability readings, while S$\underline{\text{k}}$ *txw* contributes desire and dislike readings only.

While there is not space here to do justice to the compositionality of the aspectual-verbal systems in St' or S$\underline{\text{k}}$, nor to make precise the differences between at-issue and not-at-issue meaning, we can at least sketch out the beginnings of an analysis by showing how anti-efficacy works, and by presenting the space of possible anti-efficacy readings. In the efficacy model diagrams that follow, the node, value, arrow, and function of the second, entailed influence are marked with parentheses. The exclamation point marks the value of E, because it is surprising given the value of the original influencing node and the original arrow's function. The checkmark (✓) marks the function (the arrow) that is efficacious and therefore gets to determine the value of E; the × marks the arrow that is not efficacious. The function corresponding to each arrow, either f^+ or f^- as defined in (5) above, is notated above the arrow.

So, for instance, we can identify *unexpectedly* readings (such as in (3b) above) as those where the subject *lacks* a certain desire that would, in the absence of other influences, lead to the eventuality occurring; but despite this lack, the eventuality turns out to occur anyway. This state of affairs is shown in (7a). We can follow Davis et al. (2007, 2009) in linking the *unexpectedly* reading to the *suddenly* reading: If the causal route from desire to the E-eventuality usually takes time, and if the causal route from the additional entailed influence X does not, the onset of the E-eventuality might well be comparatively sudden.

In (7b), the influencing node is a dislike, so normally, in the absence of interfering influences, the eventuality would not be expected to occur. Yet nonetheless the eventuality occurs, despite the subject's unwillingness. There does seem to be a difference here between attested examples in St' and those attested in S$\underline{\text{k}}$; both permit "uncontrollable" eventualities (as in (2a) above), but only S$\underline{\text{k}}$ seems to permit "controllable" eventualities (as in (3c) above). This apparent contrast should be further investigated in light of the present proposal.

(7) a. *Unexpectedly* reading

D	$\xrightarrow[\times]{f^+}$	E	$(\xleftarrow[\checkmark]{f^+}$	$X)$
0		1!		(1)

b. *Unwillingly* reading

$\widetilde{D}$	$\xrightarrow[\times]{f^-}$	E	$(\xleftarrow[\checkmark]{f^+}$	$X)$
1		1!		(1)

We turn now to the abilitative readings of St' *ka…a*. Where the influencing node is an ability and $E = 1$, we expect *manage-to* readings, as in (4b) above, where the subject lacks a property (or lacks the totality of the properties) that would ensure that E gets the value 1; but lo and behold, $E = 1$ anyway, and we therefore must accommodate the second influence X. And as we have seen, accidental readings, such as in (4a) above, can be represented with an avoid-ability influencing node. What this conveys is that the subject would normally, in the absence of other influences, have the ability to avoid the occurrence of the eventuality, but because of the anti-efficacy contributed by *ka…a*, the eventuality in fact occurs.

(8) a. *Manage-to* reading

A	$\xrightarrow[\times]{f^+}$	E	$(\xleftarrow[\checkmark]{f^+}$	$X)$
0		1!		(1)

b. *Accidentally* reading

$\widetilde{A}$	$\xrightarrow[\times]{f^+}$	E	$(\xleftarrow[\checkmark]{f^+}$	$X)$
1		1!		(1)

Note, however, that although the examples above all have $E = 1$, this does not strictly speaking seem to be a requirement for *ka…a* (Davis et al. 2007, 2009), including for no choice readings. As Davis et al. point out, cancellations of no choice readings are difficult to elicit. I accept their reasoning that things that circumstantially must happen usually do happen; when they do not, in the current framework it's because the model being used was not faithful to reality.

The ability cases, however, do not have this difficult quality. I propose that ability readings of *ka…a* are cases where the influencing node is an ability A, and $A = 1$, and since A is not efficacious, $E = 0$. This idea awaits confirmation, but it finds support in the observation (Matthewson et al. 2005) that in St', the evidential *k'a*, instead of ooc *ka…a*, is generally used when it's possible that $E = 1$:

(9) a. wa7 **ka**-ríp-**a** ku káwkew kents7á St'át'imcets
IMPERF **OOC**-grow-**OOC** DET sagebrush DEICTIC Matthewson et al. 2005: (16a)
'Sagebrush can grow around here.'
(Okay if speaker knows no sagebrush actually grows here.)
Consultant's comment: "If somebody brought some seeds it would grow here—it's just a possibility it would grow here."

b. wa7 k'a kents7á sxek ku káwkew St'át'imcets
be EVID DEICTIC maybe DET sagebrush Matthewson et al. 2005: note 7
'Sagebrush might be growing around here.'
Context: Not only are the climate and soil right, but you have reason to believe that it's actually possible there is some sagebrush.

The possibility that $E = 0$ opens up a range of other, in principle possible, anti-efficacious meanings, which are detailed in the second row of the table in Figure 2. The "actuality" readings from (7) and (8) are in the first row of the table. Throughout, the entailed second influence X is not represented. The labels on the cells correspond to readings, but there may be more readings that might correspond to any one cell.

Anti-efficacy readings	Subject-related influencing node			
	D desire	$\widetilde{D}$ dislike	A ability	$\widetilde{A}$ avoid-ability
actuality readings ($E = 1$)	$D \xrightarrow[\times]{f^+} E$ 0 1! unexpectedly	$\widetilde{D} \xrightarrow[\times]{f^-} E$ 1 1! unwillingly	$A \xrightarrow[\times]{f^+} E$ 0 1! *manage-to*	$\widetilde{A} \xrightarrow[\times]{f^-} E$ 1 1! accidentally
non-actuality readings ($E = 0$)	$D \xrightarrow[\times]{f^+} E$ 1 0! ?frustrative	$\widetilde{D} \xrightarrow[\times]{f^-} E$ 0 0! ?declined offer	$A \xrightarrow[\times]{f^+} E$ 1 0! ability	$\widetilde{A} \xrightarrow[\times]{f^-} E$ 0 0! ?near miss

Figure 2: The space of possible anti-efficacy readings on this proposal

The gray cells are those readings where I do not know the status of the judgments in St'. Matthewson et al. (2005) implies a connection between *ka…a* and frustrative meanings.[6] I suspect that the "declined offer" and "near miss" cells might be ruled out on the grounds that both nodes have a zero value, which would not satisfy even the weakest (disjunctive) condition that the verb might impose on those values.

Interestingly, however, Sk̲ limited control marking, when it gets an ability reading, apparently does not entail the non-occurrence of the eventuality, as shown in (10):

[6] Matthewson et al.'s (2005) discussion of the morpheme *ka* in St' is also relevant here; *ka* on its own seems to enforce the non-actuality of the eventuality.

(10) chen wa kw'ach-n-umi — St'át'imcets
1S.SUB IMPF look-LCTR-2S.OBJ — Jacobs 2011: (77b)
'I can see you.'
Context: An adult is playing peek-a-boo with a child.

This point should be further explored, but it may suggest that the cell marked "ability" in Figure 2 is not appropriate for S̲k̲ limited control. Instead perhaps an *efficacious* ability analysis, where $A = 1$ and $E = 1$, could be considered as a possible analysis for S̲k̲ limited control ability readings.

4. Conclusion

I hope to have demonstrated the usefulness of a certain class of causal models which I termed "efficacy models", in conjunction with modal notions such as desire and ability, for understanding out of control forms in these languages. The resulting representations suggest that both *ka…a* in St'át'imcets and *txw* in S̲k̲wẇú7mesh may share an "anti-efficacy" meaning, and may differ in whether their meanings can have an abilitative influencing node. This proposal also provides a paradigm of anti-efficacious meanings for further investigation.

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