This paper analyzes the diachronic semantic shift of the Japanese V-*e*-*ba* construction. In Old Japanese (OJ), V-*e*-*ba* appears to mark a causal adjunct clause as can be seen in the use of causal connectives *node* in Modern Japanese (ModJ) and *because* in English translations (1). On the other hand, the V-*e*-*ba* form in ModJ appears to mark a conditional adjunct (antecedent) (2b). Furthermore, in Middle Japanese (MidJ), the use of V-*e*-*ba* as logical/symmetric conjunction has emerged as in (3).

GOAL: The goal of this paper is to account for how the interpretation of V-*e*-*ba* shifted from causal to conditional (via logical/symmetric conjunction). The core semantics of the V-*e*-*ba* construction is a sequential conjunction in the sense of update semantics, i.e., $c[\varphi\text{-e-ba } \psi] = c[\varphi][\psi]$. The causal meaning in OJ is obtained by an I-implicature (conjunction buttressing), while the conditional meaning in ModJ is obtained by a Q-implicature. The proposed diachronic development is in accordance with Deo's (2015) Evolutionary Game Theory model that underpins the grammaticalization paths from the semantic-pragmatic perspective.

PUZZLE: In the traditional Japanese grammar (e.g., Sakakura 1958), two verbal morphemes adjacent to *-ba* in OJ are said to mark whether the event expressed by the verb is settled or not: *-a* and *-e* are called *mizen* 'unsettled/irrealis' and *izen* 'settled/realis', respectively. Together with the assumption that *-ba* unambiguously marks conditional, the traditional grammarians conclude that the causal interpretation of V-*e*-*ba* in OJ comes from the combination of the settledness of *-e* and the conditionality of *-ba*, and the function of the construction shifted from causative to conditional as a result of losing the settledness feature of *-e*. This explanation is puzzling in view of Traugott & Dasher's (2002) generalizations of language change: meanings tend to become increasingly subjective, i.e., grounded in the speaker subjectivity, and increasingly procedural, i.e., indicate constraints on the interpretation of the utterance rather than its actual content. A causal statement like (1) is more subjective and procedural in that it involves the speaker's judgment that there is a causal dependency between two facts, while a conditional statement like (2) is less subjective and less procedural in that it merely expresses quantification over event predicates. Thus, the claim that V-*e*-*ba* shifted from causative to conditional does not fit the general rule of semantic change.

***Ba* AS CONJUNCTION:** Fukuda (2006) presents convincing evidence against the traditional view (discussion and examples omitted for space reasons) and claims that *ba* in V-*e*-*ba* is not a marker of conditional but a marker of conjunction. Furthermore, the verbal morphemes *-a* and *-e* are not markers of (un)settledness/(ir)realis but markers of syntactic positions. I translate Fukuda's claim in generative terms as follows: *-a* is a marker of infinite ([−FINITE]) Aspect Phrase (AspP), while *-e* is a marker of finite ([+FINITE]) CP. Thus, (2a) with V-*a*-*ba* is a genuine conditional which expresses quantification over event predicates (Kratzer 1991), while (1a) with V-*e*-*ba* is not a conditional but a conjunction of two saturated propositions.

ANALYSIS: I propose that the default semantics of φ-*e*-*ba*-ψ is sequential conjunction in update semantics (Stalnaker 1968, Heim 1982), $c[\varphi\text{-e-ba } \psi] = c[\varphi][\psi]$. Thus, the *semantic* interpretation of (1a) is: 'only harsh events increased AND she was very much depressed'. The causal interpretation of φ-*e*-*ba*-ψ in (1a) arises from pragmatic/Gricean reasoning (Levinson's (2000) I-implicature/conjunction buttressing). Indeed, (4) shows that OJ φ-*e*-*ba*-ψ expresses a sequential conjunction of events in chronological order rather than a causal relation. If c, the input context to be updated by φ-*e*-*ba*-ψ, is a suppositional context rather than the utterance context, we obtain the ModJ-style conditional interpretation, $\varphi \rightarrow \psi$ (Roberts 1989, Kaufmann 2000). To recapitulate, in OJ, there was only a single construction V-*e*-*ba* to mark all three interpretations in question: sequential conjunction, logical/symmetric conjunction and causal. The OJ hearer had to use contex-

tual information to disambiguate the OJ speaker's meaning for a successful communication. Along the diachronic development, morphemes marked specifically for causal *kara/node* 'because' and symmetric conjunction *to* 'and' have emerged (*kara* and *to* in 17th C: *node* in 19th C (Kobayashi (1996)). These interpretations are semantically stronger than the default sequential conjunction ($\because$ CAUSE(φ, ψ) entails $\varphi \rightarrow \psi$, and $\varphi \& \psi$ entails $\varphi \rightarrow \psi$, but not vice versa); thus, the use of φ-*e-ba*-ψ Q-implicates $\neg$CAUSE(φ, ψ) and $\neg(\varphi \& \psi)$.

Put another way, as summarized in (5) and (6), OJ was at the stages of zero-CAUS and zero-LCON (logical/symmetric conjunction), where hearers had to use contextual information to disambiguate the meaning of *e-ba*. When the MidJ speakers started to use *node* 'because' and *to* '(logical/symmetric) and', Japanese entered the emergent-CAUS/LCON stages. In ModJ, these morphemes are grammaticalized, thus ModJ is situated in the categorical-CAUS/LCON. Furthermore, as for the conjunction/conditional dichotomy, ModJ seems to be entering the generalized-LCON stage since φ-*to*-ψ has an interpretation similar to so-called "conditional conjunctions" (Culicover 1970, Kaufmann 2018) in (Modern) English as illustrated in (7).

EGT MODELLING: The diachrnoic trajectory sketched above naturally fits into the framework of Evolutionary Game Theory (van Rooij 2004, Deo 2015). In particular, Deo's (2015) analysis of the diacrhonic progressive-to-imperfective path is straightforwardly carried over to the current analyses of the causal-to-conditional and conjunction-to-conditional paths. In the following, we take the causal-to-conditional path for illustration. Deo (2015) hypothesizes that "[a] semantic grammaticalization path in the functional domain must be structurally underpinned by some privative contrast between a specific and a general meaning" (p. 47). As for the causal-to-conditional path, we can indeed identify such a privative contrast: A causal statement describes a *phenomenal* relation between specific events (1), while a conditional statement describes a *structural* relation between general event types (2).

SPEAKER AND HEARER STRATEGIES: Deo (2015) adopts van Rooij's (2004) model of signalling games enriched with contextual factors. A context is a probability distribution over the state/meaning space {**caus**(al),**cond**(itional)}. Two contexts (phenomenal and structural) are considered ($C_{phen} : P(\textbf{caus}) = 0.9 \& P(\textbf{cond}) = 0.1$; $C_{struc} : P(\textbf{caus}) = 0.1 \& P(\textbf{cond}) = 0.9$). A speaker strategy is a mapping from pairs of a state and a context to forms $\{$*node*, *e-ba*$\}$ and a hearer strategy is a mapping from pairs of a form and a context to states. Deo's speaker and hearer strategies considered for the progressive-to-imperfective path are directly applied to the causal-to-conditional path as done in (8) and (9). S_{cd} is a "context dependent" strategy where the speaker employs the *e-ba* form invariably. S_{pcd} is a "partially context dependent" strategy where the speaker uses *node* to convey the **caus** state only in C_{struc}, where the **cond** state is more probable. S_{em} is an "explicit marking" strategy, where the speaker employs *node* to mean **caus** and *e-ba* to mean **cond** independently of contexts. $S_{cd'}$ is the same as S_{cd} except that the speaker invariably uses *node* instead of *e-ba*. Similarly, in H_{cd}, the hearer interprets the speaker's intention solely from the context.

CATEGORIZATION: Let us take the "replicator-mutator" equation (10) and the mutation probabilities (11), and apply it to the causal-to-conditional path. In the zero-CAUS stage, $\langle S_{cd}, H_{cd} \rangle$ is most common and easy to learn, although some learners may move to $\langle S_{pcd}, H_{pcd} \rangle$ to avoid miscommunication. $\langle S_{pcd}, H_{pcd} \rangle$ prevalent in emergent-CAUS is a demanding strategy since the speaker needs to be attentive to the context, thus offsprings tend to go for $\langle S_{em}, H_{em} \rangle$ since the parent strategy contains *node*, an indication toward the grammaticalization of CAUS. $\langle S_{em}, H_{em} \rangle$ common in categorical-CAUS is a reliable strategy but a high frequency of *node* may direct some offsprings to $\langle S_{cd'}, H_{cd} \rangle$, which is economic form-wise, reaching the generalized-CAUS stage.

(1) a. kurushiki koto nomi masar-**e-ba**, ... (OJ)
harsh things only increase-E-BA
b. tsurai koto bakari fueteiku **node**, ...(ModJ)
harsh things only increase because
"Because only harsh events increased, (she was very much depressed)." (Genji, 11th C)

(2) a. uramu bekaram fushi-o-mo, nikukarazu kasumenas-**a-ba**, ... (OJ)
hate should thing-ACC-ADD sweetly mention-A-BA
b. uramu no-ga mottomona ten-mo kawairashiku bokashite i-**e-ba**, ... (ModJ)
hate NML-NOM reasonable point-ADD sweetly vaguely say-E-BA
"Even the things you definitely hate, if you just mention them sweetly,
(men will love you more)." (Genji, 11th C)

(3) narimono-ni obie-nu mo ar-**e-ba**, obieru ko mo ar-oosi. (MidJ)
loud.noise-DAT scare-NEG ADD exist-E-BA scare child ADD exist-probably
'Probably, some are not scared by a loud noise and some kids are scared.' (Ukiyoburo, 19th C)

(4) sore-o mir-**e-ba**, sansun bakari naru hito, ito utsukushiute witar-i. (OJ)
it-ACC see-E-BA 3.inches only COP person very lovely exist-PERF
'He looked at it and there was a person, who was only three inches tall, sitting very lovely.'
(Taketori, 9-10th C)

(5) a. zero-CAUS: *e-ba* (OJ)
b. emergent-CAUS: (*node*), *e-ba* (MidJ)
c. categorical-CAUS: *node*, *e-ba* (ModJ)
d. generalized-CAUS: *node*

(6) a. zero-LCON: *e-ba* (OJ)
b. emergent-LCON: (*to*), *e-ba* (MidJ)
c. categorical-LCON: *to*, *e-ba*, (ModJ)
d. generalized-LCON: *to* (ModJ?)

(7) nonbiri siteru **to** okureru yo. (ModJ)
take.time PROG and late PRT
'You take time and you'll be late.'≈ 'If you take (too much) time, you'll be late.'

(8) Speaker strategies

	C_{phen}		C_{struc}	
	caus	**cond**	**caus**	**cond**
S_{cd}	*e-ba*	*e-ba*	*e-ba*	*e-ba*
S_{pcd}	*e-ba*	*e-ba*	*node*	*e-ba*
S_{em}	*node*	*e-ba*	*node*	*e-ba*
$S_{cd'}$	*node*	*node*	*node*	*node*

(9) Hearer Strategies

	C_{phen}		C_{struc}	
	node	*e-ba*	*node*	*e-ba*
H_{cd}	**caus**	**caus**	**cond**	**cond**
H_{pcd}	**caus**	**caus**	**caus**	**cond**
H_{em}	**caus**	**cond**	**caus**	**cond**

(10) x_i': the frequency of strategy i after a time-step; Q_{ji}: the probability that strategy j mutates into i; x_j: the frequency of j, f_j: the average payoff of j; ϕ: the average fitness of the population:

$$x_i' = \sum_{j=1}^{n} Q_{ji} \frac{x_j f_j}{\phi}$$

(Taken from Deo (2015, p. 37))

(11) Stipulated mutation probabilities for transitions from one strategy pair to another; each row/column represents a parent/offspring strategy. (Taken from Deo (2015, p. 41))

$Q =$	$\langle S_{cd}, H_{cd}\rangle$	$\langle S_{pcd}, H_{pcd}\rangle$	$\langle S_{em}, H_{em}\rangle$	$\langle S_{cd'}, H_{cd}\rangle$
$\langle S_{cd}, H_{cd}\rangle$	0.94	0.06	0	0
$\langle S_{pcd}, H_{pcd}\rangle$	0.02	0.91	0.07	0
$\langle S_{em}, H_{em}\rangle$	0	0	0.97	0.03
$\langle S_{cd'}, H_{cd}\rangle$	0	0	0	1

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