

EVENT STRUCTURE ANALYSIS

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Ethno, the event structure analysis (ESA) program, was written in the Java programming language by [David Heise](#). Your World Wide Web (WWW) browser downloads the program from Indiana University. Then your computer runs the program.

About Java

The great benefit of Java is that a Java program runs on any computer - Wintel, Unix, Macintosh, etc. All that's needed is a WWW browser that implements Java. However, Java has some limitations.

Java has stringent security restrictions to keep viruses off your computer. Therefore a Java Internet program cannot write files to your computer. This means that saving your work involves a special procedure, which is described in the Help message on *Import-Export*. Another aspect of Java security is a message on some windows, indicating that the window comes from a Java program.

About ESA

Event structure analysis is a qualitative methodology for understanding sequential events. *Prerequisite* analysis focuses on how the events are connected logically. The program draws a chart showing the prerequisite structure. *Composition* analysis focuses on how the events link people and things. The program creates tables showing how a narrative associates people with each other and with non-human entities.

Event structure analysis is a substantial topic with its own literature. Check the [ESA Reference page](#), which contains links to some on-line versions of papers.

The following table outlines procedures for conducting analyses with *Ethno*. Each column displays steps involved in a particular kind of analysis. "Careful" and "Thorough" analyses involve more work. However, these kinds of analyses also provide you with more information as you perform analytic tasks, enhancing the quality of interpretations and judgments.

Prerequisite Analyses			Composition Analyses	
Quick	Careful	Thorough	Careful	Thorough
	Copy a narrative text into ESA to save quotes with events.	Copy a narrative text into ESA to save quotes with events.		Copy a narrative text into ESA to save quotes with events.

Enter sequence of short names.	Enter sequence of short names.	Enter sequence of short names.	Enter sequence of short names.	Enter sequence of short names.
		Define relevant entities, people and actions, and specify each event's agent, action, object, instrument, alignment, setting, product, and beneficiary.	Define relevant entities, people and actions, and specify each event's agent, action, object, instrument, alignment, setting, product, and beneficiary.	Define relevant entities, people and actions, and specify each event's agent, action, object, instrument, alignment, setting, product, and beneficiary.
			Compute associations of key people and entities.	Compute associations of key people and entities.
				Define abstract types and compute their associations.
	Enter full sentence descriptions of each event.	Enter full sentence descriptions of each event.		
Link the events	Link the events	Link the events		
	Eliminate unneeded detail with summary events.	Eliminate unneeded detail with summary events.		
Test the model to refine it.	Test the model to refine it.	Test the model to refine it.		
		Specify and test a generalized model.		

Help Messages

A separate help display is available for each of the different kinds of tasks involved in event structure analysis. Each help display is a separate WWW page.

The table below outlines the help system. Titles in the table are hyperlinked so that you can visit all the displays from here.

Help Title	Topics Covered
Introduction	What you are viewing now.

Sequence	How to define new events by typing short names. How to use a narrative text in analyses. How to edit the sequential record of events.
Events	How to edit short names. How to enter full event descriptions and comments. How to code an event's Agent, Action, Object, Instrument, Alignment, Setting, Product, and Beneficiary. How to define entities, people, and actions. How to change some event parameters in a process model.
Associations	How to define entities, people, and actions, and generalizations of these. How to analyze associations among entities, people, and actions that are created by co-occurrences in events.
Linking	How to specify prerequisites for events. How to change the questioning that helps you specify an event's prerequisites.
Chart	How to modify an ESA model, working directly on the chart. How to refine a model's ability to account for sequential process. How to find blocks of events that can be summarized as a single event. How to develop a model of generalized events that interprets a narrative at a higher level of abstraction. How to print the chart.
Import-Export	How to import a sequence of events that you prepared in a text processor. How to save data generated in the program. How to re-use saved data at a later time. How to save and recall a generalized model.



URL: www.indiana.edu/~socpsy/ESA/Introduction.html last updated March 26, 2005.
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Ethno's Opening Display

Popup menus for moving around in the program appear in the darkened area at the top of the display.

- The leftmost menu is the ***Help*** menu.
- The middle ***Operations*** popup menu invokes different program functions. Selecting *Define sequence* takes you to the opening display of the program, being described here. *Link events* takes you to a page where you specify event prerequisites. *Chart* shows you a picture of the linked events, and allows you to develop a process model and abstracted events. *Import-Export* allows you to save and recall your analyses.
- The rightmost popup menu, ***Events***, allows you to examine events that you have defined. The events are listed in alphabetic order. While examining an event, you are able to define and examine entities, people, and actions.

Narrative Box

The box in the lower-right part of the opening display is where you put the text of a narrative you are analyzing.

Sequence

The box on the left lists the sequence of events that you have defined. The buttons and popup menu at the bottom are for searching and for editing the sequence.

If you define *generalized events* during your work with *Ethno*, the generalized events will be added automatically to the sequence, immediately following each instantiation.

Short Name Field

The field labeled **Next event** is where you type a short name for an event. Press Enter when you have the short name as you want it.

Creating Events

For an alternative way to enter events, see the [help message on importing-exporting](#).

Optional. Including Narrative Text

- In your word processor, display the narrative text describing the episode.
- Select all of the narrative text, and copy the text to the clipboard.
- In *Ethno*, click inside the **Narrative** box, and clear whatever was there.
- Paste the narrative text from the clipboard into the **Narrative** box.

Now you can scroll through the narrative, using it as a reference while you define events. The narrative will be saved with the study when you export your work to a file.

Event Name

- *Optional.* As you begin naming the next event, drag the mouse over the relevant text in the **Narrative** box in order to select it. Selected narrative text will be saved with the event for later reference. The selection must be made just prior to the next steps.
- Compose a short name for the next event in the abbreviated-name field.

Names should be short, so that they fit on the event structure chart. This is especially important with narratives involving 50 or more distinct events because charts of big structures get quite crowded. Short names that work well as reminders of the full event usually include a verb. Individuals often can be abbreviated to a single letter. For example, the short name *P welcomes Q* probably will remind you of the full event.

- Press **Enter** on the keyboard. The short name of the event will appear at the end of the sequence list. It also will be added to the *Events* popup menu, allowing you to visit a display for that event.

At any time you may visit the event's display in order to add a longer description for the event. The long description appears at the bottom of *Ethno*'s opening display when you click on the event's short name in the sequence list, and if available the long description is the text presented when linking events. Visiting the event's display also allows you to edit any text that you entered previously.

Repeating an event:

Select the event in the popup menu below the sequence list. Another instance of the event will appear at the end of the sequence. The pair of radio buttons below the popup menu must be set to **Repeat** for this to work.

Searching the Sequence

When **Find**

is selected in the pair of radio buttons below the popup menu, the popup menu allows you to find all instances of an event in the event sequence.

Selecting an event in the popup menu causes all instances of that event in the sequence to be highlighted in the event sequence box.. You may have to scroll through the sequence to see all instances.

Editing the Sequence

New events may be added at any time by entering another short name, as described in the section on Creating Events. The new event will be placed at the end of the sequence, but may be repositioned as described next.

Moving an event:

First click on the event that you want to move in order to select it. Second, click the **Move** button. The button will turn red to signal that the selected event will be moved. Third, click the event that should follow the selected event after it is moved. The selected event will be taken from its old position and inserted just ahead of the event where you release.

Keep in mind that an event that instantiates a generalized event should immediately precede the generalized event.

Cutting an event:

When **Repeat** is selected in the pair of radio buttons next to the popup menu:

Click on an event in the sequence list to select it. Then click on the **Cut** button. The selected instance will be removed from the sequence.

If that is the last instance of the event in the list, then a **Confirm** dialog will appear asking if you truly want to remove the event from your study. You may cancel the deletion.

If you confirm that you want the event deleted, the event will be purged from the analysis. Consequences of the purged event will be transferred to events that are prerequisites of the purged event.

When **Find** is selected in the pair of radio buttons below the popup menu:

Select an event in the popup menu in order to select all instances of that event in the event sequence. Click on the **Cut** button. All but the first instance of the event will be deleted from the event sequence.

A **Confirm**

dialog will appear to ascertain whether you want the remaining instance deleted from the sequence and the event deleted from your study.

URL: www.indiana.edu/~socpsy/ESA/Sequence.html

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Events, the rightmost popup menu in the darkened area at the top of *Ethno*, lists events that you have defined. Select one to examine and modify information on that event. While you are examining an event, three popup menus appear as a second line of menus in the darkened area. The second line of menus allows you to go to entities, people, and actions that you have defined. **Entities** are inanimate objects or places. **People** are individuals, groups, and animals that instigate actions. **Actions** are verbs in descriptions of events. Each of the menus has three functions:

- Choosing the top line that says *New ...* lets you define a new entity, person, or action.
- After you have defined an element, you can choose its name in a popup menu in order to visit a screen relating to that element. The names are listed in alphabetic order.
- Clicking on a radio button at the right of the screen, then choosing an element from a popup menu, adds the element to one of the lists at the right, as described below in the section on *Event Frame Coding*.

Editable Texts

The four boxes on the left of the screen are editable text fields. Click in a box to get a cursor. Then you may type or edit the contents of the box.

The text field labeled **Short name of the event** and the text box labeled **Event description** present the short and long descriptions of the event. The short name has a maximum of 25 characters.

The description of an event has important effects on event structure analyses because the description cues judgments about logical interrelations of events. Usually a more specific description makes it easier to identify logical relations while using the program's linking routine. You can make an event description more specific by identifying more of the elements involved in the event - instrument, alignment of instrument, setting, etc. On the other hand, an event that is described too concretely may never repeat, even though essentially the same thing happens again. Thus, events described too concretely will make an event structure seem more complex than necessary. So you should try to describe an event with considerable specificity, while avoiding details that hold for just one occurrence.

The text box labeled **Source text** shows the portion of narrative that you selected when defining the event.

The text box labeled **Comments**

is a place where you may type notes regarding the event. The notes are saved and retrieved as part of the model with the *Import-Export* option on the **Operations** menu.

Modeling Information

The middle portion of the Event form presents information accumulated while linking events, testing a process model, and developing a generalized model. (These procedures are described in the Help messages

on linking and on the chart.)

The box labeled **Prerequisites** shows the events that must occur before the event being examined can occur.

The box labeled **Consequences**

shows the events that can occur only after the event being examined has occurred.

Double-clicking an event in the **Prerequisites** box or in the **Consequences** box brings the clicked event up in the Event form. The new event replaces the event currently being viewed in the Event form.

The box labeled **Summarizes**

shows concrete events that have been summarized by the event being examined.

The box labeled **Generalizations** shows abstract events that are instantiated by the event being examined.

Clicking on the two checkboxes below the boxes changes parameters of the focal event.

- All prerequisites must occur before the focal event can occur if *Disjunctive prerequisites* is unchecked. If this item is checked, then occurrence of any one prerequisite enables the focal event.
- The focal event cannot repeat until at least one of its consequences has occurred if *Repeats without depletion* is unchecked. Activity among consequences is irrelevant for occurrence of the focal event if this item is checked.

The line beginning with the word "linked" shows whether questions have been answered regarding the prerequisites of the event being examined.

Event Frame Coding

Radio buttons and scrollable lists appear at the right side of the screen. The eight categories - Agents, Acts, Objects, Instruments, Alignments, Settings, Products, and Beneficiaries - are for defining the composition of the event.

Agent is the person or group engaging in the action. **Act** is a verb describing what is happening. **Objects** are entities or people that change as a result of the action. **Instrument** is an entity or person or organization which the agent uses to process the object. **Alignment** is the part of the object or setting where the action is focused, typically the object of a preposition in the event description. **Setting** is an encompassing entity within which the action is done. **Product** is the entity or state change produced by the action. **Beneficiary** is the person to whom the product is transferred for use in a subsequent event; beneficiaries include *Experiencers*, who are perceivers for whom the event is performed.

Here, for example, is an event and its categorizations.

In the emergency room (**setting**) the doctor (**agent**) injected (**action**) a sedative (**object**) into the raving man's (**object**) shoulder (**alignment**) with a hypodermic (**instrument**) so the nurse (**beneficiary**) would have a tranquil patient (**product**).

Coding Procedures

Codes for the Event-Frame categories are generated by making selections from the *Entity*, *Person*, and *Action* pop-up menus. Follow these steps.

1. Click the radio button for the category you are coding. The button will be highlighted.
2. If coding an action select the appropriate verb from the *Action* popup menu. Otherwise, select the appropriate inanimate object from the *Entity* pop-up menu, or the appropriate person from the *Person* pop-up menu.
3. Your selection will appear as a line in the box of the category you are coding.

Deleting Codes

You can delete an element from an event-frame list by double-clicking on the element.

Adding new entities, people, or actions

An entity or person that is not yet in the pop-up menus has to be added. Do this as follows.

1. Select the top line of the relevant popup menu which says *New* A window for defining an entity, person, or action will appear.
2. Name the element by typing in the **Name of ...** text field. Press Enter.
3. Click the *Return to event* button. This returns you to the Event window where you were working. At that point the element you just defined is available in the pop-up menus.

Additional uses of the Entity, Person, and Action screens are described in the *Associations* help message.

URL: www.indiana.edu/~socpsy/ESA/Events.html
last updated March 26, 2005.

When you are viewing an event, three popup menus in the darkened menu area allow you to go to entities, people, and actions that you have defined. All three kinds of element are displayed on the **Element Form**, which is described here. Clicking the *Return to event* button on the form takes you back to the event you were examining before dealing with entities, people, or actions.

Information on Entities, People, Actions

Creating An Element

Clicking in the **Name of ...** text field produces a blinking cursor, where you can enter, or edit, the name of an element. Your typing is saved when you press Enter or click some other element on the screen.

Deleting An Element

To remove a defined element from your study, present that element in the **Element Form**. Substitute the word *delete* for the name of the element, and press Enter. This removes the element, and leaves the form ready for defining a new element.

Generalizations of a deleted element are transferred to the deleted element's concrete manifestations.

Relevant Events

When you first arrive at the screen for an element, the **Events containing** box lists the events in which the element appears. An event is included in the list if the element was coded in any of the Event-Frame categories for that event.

After an association analysis, the **Events containing** box lists events which contributed to the reported results.

Generalizations

You can specify how an entity, person, or action is related to more general categories by using the popup menu titled *Choose a generalization*. An item selected from the popup menu will be listed in the **Generalizations** box below the popup menu.

Element X is a generalization of Y if you answer "yes" to the question: Is Y a kind of X? Or simply, Is Y an X? (Sometimes you may prefer the question: Is Y a part of X?) Here are some examples.

- A Ford is a kind of car. Car is a generalization of Ford.
- Heather is a woman. Woman is a generalization of Heather.
- Tutoring is a kind of helping. Helping is a generalization of tutoring.

An element has to be defined before it appears in the *Choose a generalization* popup menu. For example, you would have to define the entity "car", the person "woman", and the action "help" before the generalizations above could be specified. Generalized elements are defined in the usual way, by selecting *New entity* or *New person* or *New action*

in the popup menus within the darkened area at the top of the screen. You may define entities or people or actions that do not appear directly in any event, but which are generalized versions of elements that do appear.

Cascading Generalizations

Choosing a generalization may cause the addition of more than one element in the generalizations listing. The program lists the generalization that you chose, and all of its generalizations, and all of their generalizations, etc.

For example, suppose that you previously defined "car" as a kind of "machine". Then when you specify Ford as a kind of car, the program infers that a Ford is a kind of machine, and both "car" and "machine" are listed.

Removing Generalizations

Clicking on an item in an element's generalizations list to select it, then clicking the *Cut selected generalization* button, removes the item. However, this works only for items that are directly linked to the element.

For example, suppose you are working on the person "husband", with husband identified as a kind of "man", while man separately is identified as a kind of "male". Both "man" and "male" appear as generalizations of husband. "Male" reappears if you try to delete it, as long as "man" remains, because the program keeps inferring that a man is a kind of male. But cutting "man" removes both "man" and "male".

Concrete Forms

When you specify that X is a generalization of Y, you simultaneously are specifying that Y is a more concrete form of X. For example, a Ford is a concrete form of car, Heather is a concrete form of woman, tutoring is a concrete form of helping.

The box labeled **Concrete forms** lists the element's concrete forms, plus all of their concrete forms, etc.

Moving Between Elements

Double-clicking an event in the **Generalizations** box or in the **Concrete forms** box fetches the clicked element to the **Element Form**. The new element replaces the element currently being viewed in the **Element Form**.

Analyzing Associations

You can determine how events in a narrative associate entities and people and actions. The analyses are based on Event-Frame codings, which must be completed before beginning association analyses.

Procedure

The procedure for analyzing direct associations is as follows.

- Go to the window for a particular entity or person or action. Association analyses will show how this focal element is related to other elements.
- Click the *Constrain associations*

button at the bottom left of the window. This brings up a dialog, where you define the kinds of relationships that interest you. For example, you may limit analyses to events in which the focal person was agent in order to determine which entities or people served as objects of the person's actions. When done defining constraints, click the *Continue* button to return to the window for the focal element.

- Clicking the *Compute associations* button fills (or refills) the three lists at the bottom of the window.
- The results also are printed in the Java message console, viewable by selecting from one of the menus of your WWW browser. Printed results in the message console can be copied and pasted into a word-processor document.

The **Action associations**

box lists actions that occurred when the focal element served in ways specified in the constraints. The **Entity associations** box lists entities that appeared within the constrained Event-Frame categories. The **Person associations**

box lists people who appeared in the constrained categories. If a person is the focal element in an association analysis, then the results in the **Person associations** box show the person's social networks, as manifested in the narrative.

The listings show the numbers of events in which the focal element was associated with other Event-Frame elements. The counts include repetitions of events. The actual events contributing to the results are specified in the **Events containing** list.

Concrete Versus Generalized Events

If you have defined generalized events (as opposed to generalizations of event elements) then the radio button for *Generalized* containing events at the top middle of the form will be enabled. Select this and you will see all of the generalized events in which the focal element occurs. The lists at the bottom of the window will display association analyses using the generalized events.

Only concrete events are analyzed when the button for *Concrete* containing events is checked. Only generalized events are analyzed when the button for *Generalized* containing events is checked.

Analyses Using Generalizations of Elements

If the *Generalize* checkbox at the lower left of the form is unmarked, the program determines how events relate the focal element to other elements, working only with events in which the focal element directly appears, and reporting only entities and people that have been coded directly in those events. (The analysis uses concrete events or generalized events, depending on which radio button is selected at the top middle of the form.)

However, if the *Generalize* checkbox is marked, the program uses generalization specifications to expand the number of events considered, and to reduce the variety of entities, people, and actions reported. The analysis includes any event that involves the focal element, and also any event that involves a concrete form of the focal element. The analysis reports only the most generalized forms of entities, people, and actions that arise in the included events. (Again, the analysis is conducted over either concrete events or generalized events, depending on the selected radio button at the top middle of the form.)

Suppose, for example, that the definitions of "Mary" and "Jane" specify that each is a "wife," and the definitions of

"Bob" and "Joe" specify that each is a "husband." When analyzing "wife" as agent with the *Generalize* checkbox marked, the program considers any event in which the agent was "wife," or "Mary," or "Jane." On finding events involving "Bob" or "Joe," the report gives information about "husband."

URL: www.indiana.edu/~socpsy/ESA/Associations.html
last updated March 26, 2005.

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Events require other events to establish necessary conditions for their occurrence. The *Link Events* form asks questions that help you identify which events in a narrative are prerequisites for other events. The elicitation procedure taps your understanding of the process in order to build a formal model.

Events must be defined and time ordered before beginning the task of specifying event linkages.

Components of the Linking Display

Controls

A popup menu titled *Type of question* allows you to use different elicitation questions.

Radio buttons under the label **Begin questioning with:** allow you to change the order in which questions are asked.

A *Redo* button restarts questions regarding the event shown just above the button.

Done

button terminates questions regarding the event shown just above the button, leaving the links established in prior questions.

The button labeled *Start over from the beginning* allows you to clear all linking information.

Elicitation Question

The elicitation question presents two events within a question frame. *Yes* and *No* buttons allow you to answer the question. A *Next question* button records your answer and displays the next question.

Chart

A thumbnail chart showing linkages among events is displayed at the middle of the screen. (Select *Chart* in the *Operations* menu to see the full-size chart with event names.)

Notes

Record of answers and comments

indexes all questions that have been asked, and indicates whether the answer to each question generated a link or not. You can type comments in this box.

Information is appended in this box when you change linkages by editing the chart, or while testing a model.

The entire linking history is included in the saved data when you export a model.

Specifying Linkages

The basic procedure is as follows.

1. An event name is printed in the topmost box at the right of the screen, and another event name is printed in the box below it. The two event descriptions are embraced within a question asking you if the events relate. Answer the question by clicking either the *Yes* or *No* button below the boxes.

The texts appearing in the boxes are full descriptions of events if you have entered such descriptions. Otherwise the boxes show the short names of the events.

The *Yes* and *No*

buttons disappear after you click one of them. This is a time when you can enter comments. The buttons reappear as usual when the next question is presented.

Initially the next-question button says either *No. Next question* or *Yes. Next question*. Clicking this button instead of *Yes* or *No* records that a linkage is lacking, and you move directly on to the next question. Absence of linkage is common and often uninteresting, so you may be willing to bypass the *Yes* and *No* buttons and the opportunity to type comments.

You may click the *Done*

button at the point where you have specified all of the linkages of the event printed above the button. This saves you from having to click the *No. Next question* button repeatedly in answer to additional linkage questions for that event.

2. Your answer is recorded in the **Record of answers and comments** box at the bottom of the screen. You may click in the box to type remarks of your own, in particular about why events are linked.

The record of answers is structured as follows. The short name of the focal event is printed on a separate line as a heading. The answer to each question about the focal event is printed on an indented line. Each indented line identifies the other event in the question by the other event's short name. The line then specifies whether or not the other event was linked as a prerequisite to the focal event. The kind of question and the direction of questioning are specified in parentheses.

3. Click on the *Next question* button. Once again, two event descriptions will be presented, embraced within a question. Continue answering the questions until the program announces that you have reached the end.

Forms of the Elicitation Question

The question that you are asked can be varied by selecting from the *Type of question* pop-up menu. The four options are:

- Prerequisite: Does ___ require ___ or a similar event?
- Implication: Does occurrence of ___ imply ___ or a similar event?
- Historical Causation: Is ___ or a similar event a cause of ___ in the circumstances that existed?
- Counterfactual: Suppose an event like ___ does not occur. Can ___ occur anyway?

The last two questions reverse the placement of the events in the boxes, as compared to the first two questions.

The questions are equivalent logically. Answering *Yes* to the first three questions, or *No* to the counterfactual question, indicates that the two events are linked. Answering *No* to the first three questions, or *Yes* to the counterfactual question, indicates that the two events are not linked.

Switch among these questions as desired when you are linking two events. One form of question may seem more lucid than the other forms.

Order of Questions

Under the title **Begin questioning with:** are two radio buttons at the left of the screen, *End events* and *Initial events*. These control the order in which questions are asked.

If you select *End events*

the program develops questions about a focal event by starting with events that have the longest strings of prerequisites. This eliminates many questions if the focal event is linked to an event at the end of a prerequisite string. Answering that the focal event requires the event means that the focal event also requires all of the event's prerequisites, so questions about the prerequisites are skipped.

If you select *Initial events*

the program develops questions about a focal event by starting with events without specified prerequisites. This avoids many questions if the new event is not dependent on any of the events in a long prerequisite string. Answering that the focal event does not require another event means that the focal event is not dependent on any of the other event's consequences, so questions about the consequent events are skipped.

In general, it is easier to answer questions involving end events, and the chances of answering wrong are less.

Changing Answers

If you give a wrong answer and you catch your error while the program still is asking questions about the same focal event, you may start over and re-answer the questions for that focal event.

Click the *Redo*

button. The program forgets answers you gave regarding the focal event, and re-starts the series of questions regarding the focal event. Your answers about prior focal events are retained.

Otherwise an erroneous answer is best corrected by selecting *Chart* from the *Operations* menu. You can add or delete links graphically.

You can jettison all answers given in a linking elicitation, and start over, by clicking the button named *Start over from the beginning*.

Using the Thumbnail Chart

The thumbnail chart showing linkages among events indicates events by dots rather than by names. You can determine the name and description of a dot's event by pressing the *Control* key and clicking on the dot. The information about the event is presented in a dialog window, which can be removed by clicking *Okay*.

The chart is updated each time you complete elicitation questions for a focal event.

The chart also tracks your progress in answering elicitation questions about a focal event by using different colors for dots.

- *Black* dots are events whose relation to the focal event is yet to be determined.
- A *green* dot shows the structural position of the event currently being considered in regard to its linkage to the focal

event.

- *Yellow*

dots show events whose linkage to the focal event is known. The linkage information may be a direct result of your answer to a linkage question, or the information may have been deduced from the logical structure of events.

URL: www.indiana.edu/~socpsy/ESA/Linking.html
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The chart is a kind of graph showing relations among events.

Many charts fit within the standard window. Very large charts cause scrollbars to be added to the window so that you can examine all parts of the chart.

A *Function*

menu appears in the dark area above the chart. The different functions that are available in the Function menu are discussed below.

Reading the Chart

Events are represented on the chart by their short names.

The program may truncate short names to prevent overlapping in a crowded chart. *Clicking* the mid-point of a truncated name while holding down the **Control** key shows the untruncated name in a dialog, plus the full event description if a description has been provided for the event.

A name may be dragged to a different position. Repositioning lasts until the program redraws the entire chart.

Font styles used to print event names convey information. A plain style is used for *concrete* events with *conjunctive*

prerequisites - that is, all prerequisites have to happen before the focal event can happen. Italic shows events with *disjunctive*

prerequisites - that is, only one prerequisite has to happen before the focal event can happen. Bold is used for *generalized* events.

Lines represent relations between events.

Black lines represent implications. Occurrence of the bottom event implies occurrence of the top event. In other words, the event at the top of a black line is a prerequisite for the event at the bottom, and the bottom event cannot occur until after an occurrence of the top event.

Magenta lines stand for a commutation relation, in which the bottom event becomes a prerequisite for the top event, after an initial occurrence of the top event.

An example of commutation is entering and leaving a room. Entering is required before leaving can occur. But having entered, one must leave before entering again. The two events commute. An event-structure-analysis chart would represent this relation by a black line going down from `enters room` to represent the requirement of entering before leaving. The chart also would show a magenta line going up from `leaves room` to `enters room` to represent the requirement of leaving before entering again.

Yellow lines stand for a relation in which a concrete event instantiates a general event. When the concrete event occurs, we can say that the general event has occurred as well.

An example of instantiation is a corporate executive parking in the company garage. When this occurs, we can say the executive has gone to work. Parking in the company garage instantiates going to work.

Several procedures impose a dialog window over the chart. You may drag the dialog window to a different position to reveal the chart underneath.

Inspecting Mode

Tracing upward along black lines from a focal event reveals the set of events that have to happen before the focal event can happen. Tracing downward is going "deeper": e.g., someone who engages in an event lower on the diagram is "deeply" involved in the incident.

The chart initially appears in *Inspecting* mode, and in this mode you may click an event to highlight its linkages. Events linked to the clicked event - upward and downward, directly or indirectly - are displayed white-on-black. Click in any blank area to remove highlighting from all events.

Editing Mode

Having selected *Editing* from the *Function* menu, you can operate directly on the chart to add, delete, or modify an implication. Click on an event and it will be highlighted. Click on a second event, and it, too, will be highlighted. The relation of interest is between these two events.

A dialog window appears over the chart.

- A button named *Delete link* is on the dialog window if the two events already have a black line connecting them. Click this button to remove the link between the events. When you click the *Delete link* button, the dialog vanishes, and the chart is redrawn without the link.
- A button named *Add link* is on the dialog window if a black line does not connect the two events. Click this button to create a direct link between the events. The first clicked event will become a prerequisite for the other event, unless the chart implies that the second event must precede the first. After clicking the *Add link* button, the dialog vanishes, and the chart is redrawn with the new link.
- Radio buttons labeled *Upper event enables lower event* and *Lower event enables upper event* appear on the dialog. Marking the first of these makes the upper event into a normal prerequisite. Marking the second radio button makes the lower event into a conditional prerequisite for the upper event, as in a commutation relation.
- A checkbox labeled *Lower event depletes upper event* is on the dialog. An event depletes a prerequisite if it uses up conditions produced by the prerequisite, so the prerequisite must occur a second time in order for the event to occur again. This aspect of the relation between the two events can be changed by marking or unmarking the checkbox before clicking the *Add link* button, or before clicking the *Keep link* button that is on the dialog when two events already have a line between them.

Hold down the **Shift**

key while clicking the events if you want to create, or eliminate, commutation between events. The dialog window will ask if you want to toggle commutation. Answering okay adds commutation when the events do not have commutation initially; answering okay removes commutation when they do have a commutative relation currently.

Testing Mode

The diagram looks different than usual after you select *Testing* from the **Function** menu. The name of the first event in the sequence will be printed on a red field. Names of other events that are possible at that point will be printed on yellow fields. In general:

Red field

This event is occurring currently.

Yellow field

This event could be occurring; its prerequisites are fulfilled.

Aqua field

This event has been accomplished and is not yet depleted by a consequence.

The diagram changes after you click anywhere on the chart, causing the first event to be "done". The red event now is event 2 in the sequence. The first event is printed on an aqua field, indicating that it has happened and no other event has yet made use of its effects. As you continue clicking, you will see yellow fields appearing as new events are enabled, and aqua fields disappearing as occurrence of later events uses up the effects of earlier events.

Keep clicking until the program informs you that you have reached the end of the event sequence.

To make events in the sequence occur automatically, hold down the **Shift** key when you click on the chart.

Inconsistencies

You probably will be interrupted before you reach the end because some event violates assumptions of the process model. When the program comes to such a case, it superimposes an **Amelioration dialog** on the chart and tells you what's wrong. There are two basic possibilities.

Unprimed

Occurrence of the next event may be impossible because all of its prerequisites are not fulfilled. The program suggests ways of fixing this, which may or may not include all of the following.

Let's call the next event "event X" and the problematic prerequisite "event P". Then P may have been used up recently by some other event Y, and thus P's consequences no longer are available to enable X, or prime it. In this case the problem could be solved by changing the logical structure so that P isn't a prerequisite for Y. Then Y's occurrence wouldn't use up P, and P still would be available for X after the occurrence of Y. The program will suggest such possibilities if there was an event that used P since the last occurrence of X. The program also will suggest that the problem could be solved just by eliminating P as a prerequisite of X.

Another solution is possible by allowing that P is a prerequisite for Y, but Y does not use up P: then P's effects still would be available to enable X.

Instead of focusing on the model, we might suppose that the record of events is inaccurate. Maybe there was an occurrence of P after Y, but it didn't get recorded. The program will suggest this possibility if an unfulfilled prerequisite is enabled and possible right before the occurrence of X.

It's possible that the logical structure has to be interpreted in a special way. Maybe P is one of the prerequisites of X but not necessary for P, because X can be enabled by any one of its prerequisites. That is, X is enabled by one of its prerequisites OR another, rather than by the combination of all of them. The program will suggest the possibility of disjunctive prerequisites if X has multiple prerequisites and at least one of them has occurred and not been used up. If X already has been made into an event with disjunctive prerequisites, then the program will list events that happened recently and suggest that one of these might be another disjunctive prerequisite of X that enables X at the moment.

Possibly an event that depends on X also enables it. For example, suppose someone entered a room (X), then left the room (Q), then entered again. Q depends on X, but Q also enables the second occurrence of X - the two are connected in a commutation loop. When possible, *Ethno* will offer this solution to the problem of X being unprimed. Adopting the solution makes X into an event with disjunctive prerequisites and adds a relation from Q to X which is displayed in magenta.

Unused

Alternatively, the next event (X) may be impossible because it has gone unused since its last occurrence. The program has a number of ways of dealing with this problem, too.

Perhaps X is a prerequisite for one of the events that occurred since the last occurrence of X. Then X would have been depleted, and it would make sense to do X again. The program will suggest this possibility for any events that occurred just once since the last occurrence of X.

The program will ask if X can be repeated without regard to whether X was depleted by some consequence.

You might want to deplete X by adding an overlooked event as a consequence of X. The program will offer the opportunity to define a new event by entering its short name.

On the other hand, maybe the event record is wrong, and some event that uses X did occur but didn't get recorded. The program will list any possibilities - events that require X and that are ready to occur just before X is to occur again.

Implementing a Solution

The **Problem dialog**

tells you which event is problematic and which kind of problem has occurred. All solutions are listed in a scroll box so you can consider the different options before making a choice. One particular solution is presented below the scroll box, and this is the one that will be implemented if you click the ***Adopt this solution*** button. However, you can change the implementable solution by clicking the ***Go to next solution*** button.

A popup menu appears in some of the proposed solutions. It lists all the different events that can be used with the given solution, and you must select the one you want before clicking the ***Adopt this solution*** button. (Sometimes there is only one item in the popup menu.)

A text field for entering a short name appears when the program offers the opportunity to add a new event. Type the name of a new event before clicking ***Adopt this solution***. The Problem dialog will be replaced by the Relation dialog (described in the section above on Editing Mode), so you can define the relation between the problem event and the new event.

After you adopt a solution, click the ***Done*** button. The program reruns the analysis from the beginning of the event sequence to make sure the change doesn't create inconsistencies earlier in the sequence. It stops and waits for you to continue when it reaches the event you fixed.

You may forego all proposed solutions by clicking the ***Done*** button on the dialog window without clicking the ***Adopt this solution*** button. This allows you to look at the sequence or the definitions of some events before making a decision about how to fix the problematic event.

Episode Statistics

A **Completion Dialog**

appears when every event in the sequence has been tested successfully. The dialog announces that all events have been

tested, and tells you that event statistics are available on the Java console. Clicking the *Cancel* button makes the dialog disappear, leaving the chart as it was at the beginning of testing.

If you look at the Java console, you will see a table

The topmost numerical entry in the table, *Number of defined events*, reports how many entries currently are in *Ethno*'s **Events** menu. The next numerical entry, *Number of event occurrences*, reports how many lines currently are in the **Sequence** listing.

A three-column table with a row for each defined event appears below the first two numerical entries. The columns are labeled *FREQUENCY*, *PRIORITY*, and *EVENT*.

EVENT

is the short name of the event considered on that row. The rows are sorted alphabetically by the events' short names. Names of generalized events are tagged with an underline as the first character.

FREQUENCY is the number of times the event appears in the **Sequence** listing.

PRIORITY

is an indicator of an event's salience, of how soon individuals implemented an event once it was feasible. The priority indicator roughly corresponds to the percentage of times the event occurred out of all the times the event was primed and ready to occur. Precisely, the value is the number of times the event occurred (f_e), divided by one plus the number of times the event occurred, plus the number of times the event was possible but its occurrence was preempted by some other event (f_o), with the overall quotient multiplied by 100 to produce a percentage-like value. In algebraic terms, the priority indicator is the following: $100 f_e / (1 + f_e + f_o)$.

One is added to the denominator to mute values based on small numbers. For example, suppose an event occurred immediately the one time it was possible. In this case, the event occurred 100% of the time that it was possible, but the priority indicator is 50 to reflect the fact that the computation is based on a single instance. On the other hand, suppose an event occurred immediately all nine times that it was possible. Again the event occurred 100% of the time it was possible, but the priority indicator is 90 in this case, reflecting the fact that the computation is based on more instances and therefore is a more dependable indicator of high priority.

The table may be selected by dragging through it, copied with a keystroke command (e.g., Control-C on Windows computers), and pasted into a text file. Then the text file can be imported into a spreadsheet to sort the rows of the table on frequency or on priority. Column entries are separated by tabs to facilitate importing into a spreadsheet.

Experimenting Mode

Selecting *Experimenting* from the **Function** menu produces a change similar to selection of *Testing* mode: events that are feasible appear on a yellow field. However, no event is shown as occurring (on a red field) because *Ethno* ignores the stored sequence of events while operating in *Testing* mode. Instead, you define a sequence of events by clicking on one event after another.

Clicking on an event causes the event to be displayed on an aqua field, indicating that the event now has been accomplished, and its accomplishments are yet to be depleted by other events. Clicking also causes events that are enabled by the accomplished event to be shown on a yellow field, indicating that they could happen now.

Clicking only on yellow entries produces a string of events that conforms to the rules defined in the model. Thus *Experimenting* mode allows you to see how the model defines a variety of episodes, each consisting of a "grammatical" string of events.

If a model includes generalizations, then the generalized events occur when their instantiations are clicked. Clicking generalized events causes occurrence of the generalized event without causing any instantiation to occur.

Clicking in a blank area resets the chart to its initial state in *Testing* mode.

Clicking on an event alternatively may cause the **Amelioration dialog** to appear. This means that there is something doubtful about occurrence of the event at that point. The dialog indicates why there is a problem and suggests ways that the problem could be fixed, as discussed above under *Testing* mode.

CAUTION: Adopting a solution presented in the **Amelioration dialog** permanently changes the model, the same as in *Testing* mode.

Summarizing Mode

After you select *Summarize* in the **Function**

menu, the program finds every network of events that can be traced back to a single prerequisite, and that flows down to a single consequence, with at least one intervening event. A network of events of this kind can be interpreted as a single event, and in principle such a network might be summarized by a single event name.

Computations take a noticeable amount of time if a large number of events are in the model. They culminate in a dialog appearing above the chart.

A scrolling list titled **Summarizable sequences**

records each of the networks, using the name of an event or two. Clicking on a line highlights the whole network on the chart.

You can use these results to simplify a model. Select the network that you want to summarize, type a name in the dialog field called **Short name for summary event**, then click the button labeled *Summarize sequence permanently*. The events in the network are suppressed from view and a single event with the new name takes their place.

CAUTION: save your data with the *Import-Export* option in the **Operations** menu before summarizing, in case you want to see the detailed events again.

The dialog window also contains a **Done** button. Click this button to leave the dialog without changing data.

Generalizing Mode

Generalized events refer to more abstract kinds of people and actions than concrete events. A concrete event instantiates a generalized event if occurrence of the concrete event is reason to say that the generalized event occurred as well.

For example, the concrete event, "John spans Tommy," might correspond to the generalized event, "parent disciplines child." An occurrence of "John spans Tommy" is an instantiation of "parent disciplines child."

The program allows you to formulate a model of generalized events in parallel with a model of concrete events.

Select the *Generalizing* option in the **Function** menu. This causes a dialog to appear above the chart.

Entering a name in the field titled **Short name for new generalized event** and clicking the *Incorporate new event* button adds a generalized event to the data. The generalized event will be listed in the **Events** menu when you leave the dialog.

Each generalized event that you define appears in a popup menu on the right of the dialog window. The popup menu on the left lists all concrete events in the system.

Below each popup menu is a text box that presents the full description for the event selected in the popup menu above the box. In the case of generalized events, you can type in the box, allowing you to create or edit descriptions for the generalized event selected in the popup menu above the box.

Instantiations are established by selecting a concrete event in the left popup menu, selecting a generalized event in the right popup menu, and clicking the *Instantiates* button. The button then changes to *Delete link*.

The *Instantiates*

button appears when you align a concrete event and a generalized event that are unconnected. The *Delete link*

button appears when you align a concrete event and a generalized event that are connected by an instantiation relation.

Enter all generalized events and establish their instantiations. Click the *Done* button to leave the dialog.

The program sets the time ordering of the generalized events to the time ordering of their instantiations. But the program does not presume that the logical relations among generalized events can be computed from the logical relations of the instantiations. Instead, you must link the generalized events one by one. Define instantiations so that the program knows the time ordering of the generalized events. Then select the *Link events* option in the *Operations* menu. The program will present questions about the generalized events, allowing you to establish which are prerequisites for which.

The chart will show yellow instantiation lines connecting concrete and generalized events, after the generalized events have been linked. Generalized events are displayed in boldface, and the names are printed somewhat lower than concrete events to reveal instantiating lines.

You can refine the generalized model by selecting *Testing* in the *Function* menu, and clicking through the events in the standard way. Generalized events will happen along with their concrete instantiations.

Print

Select *Print* in the *Function* menu to print the chart on paper. A **Page Setup** dialog will appear, followed by a **Print** dialog. Specifications of paper size, margins, and portrait-versus-landscape must be made on the **Page Setup** dialog rather than on the **Print** dialog. (The **Print** dialog can be used to cancel the print job, and to adjust the printer.)

Ethno

formats the chart automatically to fit the printed page. Changing paper size, margins, and portrait-versus-landscape usually changes the formatting of the chart.

Saving the Chart

Here is a kludge to save the chart as a graphic.

- Buy Adobe Acrobat and install it, including its virtual printer called Acrobat Distiller.
- In *Ethno*, with your study loaded, choose Chart, then Print.
- In the Printer pull-down menu, select Acrobat Distiller as your printer.
- Click ok to print; this produces a PDF file.
- Load the resulting PDF file and save it as a TIF graphics file.
- Load the TIF in your graphics program to modify it (e.g., to change yellow lines to greyscale).

URL: www.indiana.edu/~socpsy/ESA/Chart.html
last updated March 26, 2005.

You can create a sequence of events in a spreadsheet and then import the sequence into *Ethno* for analyses.

Once you have analyzed events, you can save the *Ethno* project by copying and pasting text. The saved text may be reloaded to continue analyses at another time.

To import a sequence of events for analysis:

You can import a list of events consisting of short names, plus optionally: a sentence-long event description, a quote from an archival source, your own comment, and entries in the eight event-frame categories (agent, act, object, instrument, alignment, setting, product, and beneficiary), in that order. The twelve fields must be separated by tabs. Event frame categories may contain multiple percepts, separated by ", ".

The easiest way to build a sequence for input is with a spreadsheet formatted as follows.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Short Name	Long Name	Source	Comment	Agent	Act	Object	Instru- ment	Align- ment	Setting	Product	Benefi- ciary
2	I came	Caesar traveled to a new territory.	VENI	This is from the tutorial example.	P: Caesar	A: transport	P: Caesar, E: Roman Army	E: chariots	E: dirt roads	E: Europe		P: Caesar
3	I saw	Caesar reconnoitered the military situation	VEDI		P: Caesar, P: lieutenant	A: reconnoiter	E: defensive structures			E: enemy territory		P: Caesar

- Each line must relate to just one event.
- The line must begin with the short name of the event. (Any short name longer than 25 characters will produce a warning when you import the sequence.)
- Optionally, the short name may be followed by texts for the other fields. However, any field other than the short name may be left blank.
- Repeated events must be entered by entering just the short name (optionally with a different source text than the first appearance of the event).
- Event-frame entries must be prefixed with tags to specify their type. "E: " is the tag for entities; "P: " is the tag for people; "A: " is the tag for acts.

To import the sequence into *Ethno*:

1. Select the spreadsheet cells containing your data, and copy the text to the computer clipboard. For example, to import the two events shown above, select cells A2 through L3, and press the keys for copying.
2. In the ESA program, choose *Import-Export* from the **Operations** pop-up menu.
3. Click the **Clear Text** button to clear the text box on the display.
4. Paste the clipboard text into the text box by pressing keys for pasting.

5. Click the **Import Sequence**

button. If the sequence of events was prepared correctly, it will be replaced by a message reporting that the data were imported successfully.

After importing a sequence in this way, you may select an event in the **Events** menu to go to the display for that event. The display will show the event's short name, plus its longer description, the source text, and the comment, if these were included. Entities, people and acts will be properly assigned in the event frame, and the elements will be incorporated into the menus for entities, people and acts.

The sequence may be edited by selecting *Define Sequence* on the **Operations** menu. The events may be linked by selecting *Link Events* on the **Operations** menu.

To export an *Ethno* project:

A Java applet cannot write a file on your computer for the sake of security. However, *Ethno* provides a procedure for saving your work. **Use it frequently!**

- Choose *Import-Export* from the **Operations** pop-up menu.
- The display comes up with the text box filled.
 - The text in the box is the program's record of your work - the source text describing the episode, your definitions of events, of linkages between events, of event compositions in terms of your defined entities, persons and actions, and a record of each of your decisions linking one event to another.
- Click the **Select Text** button to select everything in the text box.
- Press keys to copy the selected text to the computer clipboard.
- Paste the text into an open document in a text processor, and save the file for future use with an XML suffix - e.g., "myStudy.xml". A simple text processor (like NoteTab in Windows) is best in order to avoid embedded formatting codes for fonts, margins, etc.
- **Caution!** The program formats the text so that *Ethno* can read it. The export-import procedure will fail if the data get corrupted.

Most internet browsers will display an XML file with helpful formatting if you click the file's name or icon. The display provides a record of all information involved in your study. [Here](#) is an example of an XML file archiving an *Ethno* study.

To import an *Ethno* project:

- Use a text processor to load an XML file that you saved previously. (*Ethno* also can read data files produced by the program before the conversion to XML format.)
- Copy the text to the computer clipboard.
- In *Ethno*, choose *Import-Export* from the **Operations** pop-up menu.
- Click the **Clear Text** button to clear the text box on the display.
- Press keys to paste the clipboard text into the text box.
- Click the **Restore Study** button. If the exported record of the study was uncorrupted, it will be replaced by a message reporting that the data were imported successfully.

After restoring an analysis in this way, all screens look the same as when you exported the analysis.

Generalized models:

The first stage of a prerequisite analysis produces a model showing how concrete events are linked one to another

(see the Help messages on *Linking* and *Chart* for more details). After you have completed such a model, you can add a generalized model showing how the concrete events instantiate more general events (see the *Chart* help for details).

A new entry, *Export abstract*, appears on the **Operations** menu after you have specified generalized events and linked them. Select this option to export the generalized model alone.

Sometime later when you are working on a different concrete model, you can add the previously-defined generalized model. Import the generalized model as usual, except click the **Append Study** button as the last step. You then will be able to instantiate the generalized events with the different concrete events in your later study, as described in *Chart* help.

URL: www.indiana.edu/~socpsy/ESA/Import-Export.html
last updated February 8, 2007.