

A Taxonomy of Roles

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1 Introduction

How many kinds of roles are out there? Although social and relational roles exist as dominant categories, we can see a lot of other kinds of roles which need closer attention. Although researchers on roles have been involved in defining roles that should nicely cover all kinds of roles, it is not clear how many kinds of roles there are[Masolo 2004][Mizoguchi 2007].

We have been investigating roles by observing typical examples that we believe they are roles. For example, a *runner* is definitely a role, but how about a *breather*? Both are roles as special type of *doer* role. For a runner, while he/she needs not to be so and he/she can start and/or stop being a runner, he/she must be a breather throughout his/her life. Being a breather is essential to being an animal which contradicts being a role. How about *murderer* role who has finished a killing event? If it means a person who has just committed a killing action, then what role is he playing after that? How about *victim* role? It has been killed by a murderer and hence there is no chance to be played because the player has been dead. These suggest that roles are still mysterious to us.

The goal of this extended abstract is not to present a complete and rigid theory of roles but rather to stimulate the research on roles by presenting a few unaddressed issues. So, it is written aimed at being comprehensive and conceptual rather than narrow and rigid. We first build a taxonomy of roles and explore a temporal model of roles like *murderer* and *victim* which are dependent on occurrents as context. We have realized that although most of the roles are *ongoing* like *walker* and *president*, some are *historical* like *murderer* in the sense that roles are dependent on a past event. We discuss such a temporal issue of roles with a comprehensive taxonomy of roles.

2 Enumeration of role kinds

Although researchers have discussed roles to date using typical examples such as *teacher*, *president*, *wife/husband* in depth, how many kinds of roles there are in the world is still left unclear[Masolo 2004][Mizoguchi 2007]. We believe it is beneficial for us to investigate how many kinds of roles or role candidates exist out there for further refinement of existing theories of roles. Note, however, we should not aim at exhaustive

enumeration of kinds of roles, which is essentially hard and problematic, since we do not have a convincing definition of roles yet.

Here we present a taxonomy of roles designed intended to reveal possible kinds of roles to help us come up with better understanding of roles. Note that the classification is done in terms of the contexts on which each role kind is dependent. A role usually has multiple dependencies. So, we have to carefully select the essential one among them. The key issue here is to concentrate on dependency on which the role is determined and to which the existence of the role instance is limited in the sense that it needs the individual context for its existence. Note also that our goal is not in the structure of the taxonomy itself but in enumeration of kinds of roles. The taxonomic structure should be understood as just a means of presentation of role kinds. Nevertheless, the current taxonomy suggests us interesting insights as we see in the following.

2.1 Overview

Fig. 1 shows a taxonomy of roles including a few pseudo-roles. We intentionally include such pseudo-roles to stimulate our understanding on what is a role. It is designed according to a similar way to that of organizing upper ontologies. “Particular”, roles at the object level, includes what we usually see in the real world such as *teacher*, *president*, *wife/husband*, etc. The issue here is the fact that there are so many kinds of roles other than *teacher*, *president*, *wife/husband*. Roles are divided into two according to the context they depend on: those dependent on occurrent and those on continuant. Many of the well-known roles belong to the latter. Examples belonging to the latter include relational roles, social roles, spatial roles, attributive roles, drama roles. On the other hand, there are quite a few roles depending on processes and events. They are actor roles such as *driver* and *runner*, task roles such as *symptoms* and *fault hypothesis* in the context of diagnostic tasks, functional roles such as *level-control valve* and *steering wheel*, artifact role such as *table role* which a box plays, etc. All the roles mentioned thus far are **ongoing**, by which we mean the context the role depends on is active when the role is being played. Surprisingly, there are quite a few roles whose contexts are inactive when they are played. Typical examples include *murderer*, *culprit*, *witness*, *victim*, *product*, *residue*, etc. Their contexts are past events.

2.2 Occurrent role and Object role

According to the kinds of players, there are two role kinds: *continuant role* and *occurrent role* in Occurrent-dependent role. Although players of many of the popular roles are continuants, it is interesting to see there are a few roles whose players are occurrents. Examples include *preparation* and *post-processing*. The issue here is what a context of such an occurrent role is. A *preparation* role is done before the main process, so that the main process does not happen yet. A *post-processing* role is done after the main process, so that the main process has been terminated already. If we follow this line of reasoning

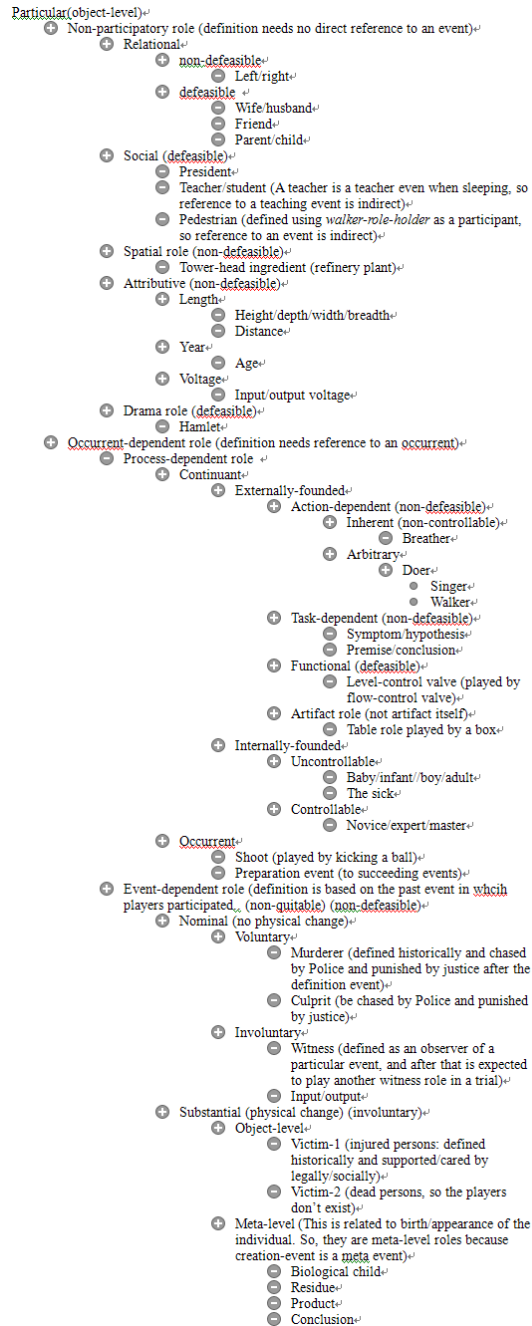


Fig. 2. Informal diagram of occurrent-dependent roles.

and if we understand the context of these roles is the main process, we have to conclude these occurrent roles are not ongoing. However, it is rather counterintuitive. Both roles should be ongoing because when such roles are being played they are really preparing and post-processing. This difficulty is resolved by carefully choosing the context. In fact, the context for these roles is not the main process but the series of processes/events which is alive when these roles are being played [Galton 2009].

2.3 Process-dependent role and event-dependent role

Now we discuss the main topic. Occurrent-dependent roles are divided into two kinds: one is ongoing and the other is not. As we have discussed it in the waterfall paper [Galton 2009], any process is progressive (ongoing) and any event is non-ongoing (historical). This suggests that ongoing occurrent-dependent roles should be termed **process-dependent** and non-ongoing occurrent-dependent roles should be termed **event-dependent**.

2.3.1 Process-dependent roles

Let us examine process-dependent roles first. Typical example of this kind is *actor role* which includes *singer role*, *walker role*, etc. The singing process should be alive when a singer is singing and the walking process should be alive when a walker is walking. It is trivial. On the other hand, an event has a property of completion and must be dealt with as a whole at any time. A killing event becomes a complete event only when it has been finished. Before termination, it is not a killing event. A *murderer role* cannot have a killing process as its context because it is not yet completed. Only killing event can be the context of *murderer role* because of its completion property. Process-dependent role is divided into the following four roles:

- (1) Action-dependent role
- (2) Task-dependent role
- (3) Functional role
- (4) Artifact role

2.3.2 Event-dependent role

Salient features of roles of this type except those dependent on future events include the following two:

- (1) A role-holder instance is created at the very end of the event, and hence it is not ongoing.
- (2) The player cannot stop to play the role once it has begun to play it.

Although players of the roles of this type have freedom on when to begin to play, they cannot stop to play because of its dependence on events which had been terminated and hence there is no way to change any fact related to it. A very unique role is *witness* role whose player cannot control even when to start. Although *murderer*, *culprit*, *witness* roles, etc. are not physically influenced from the event, there are such roles that are

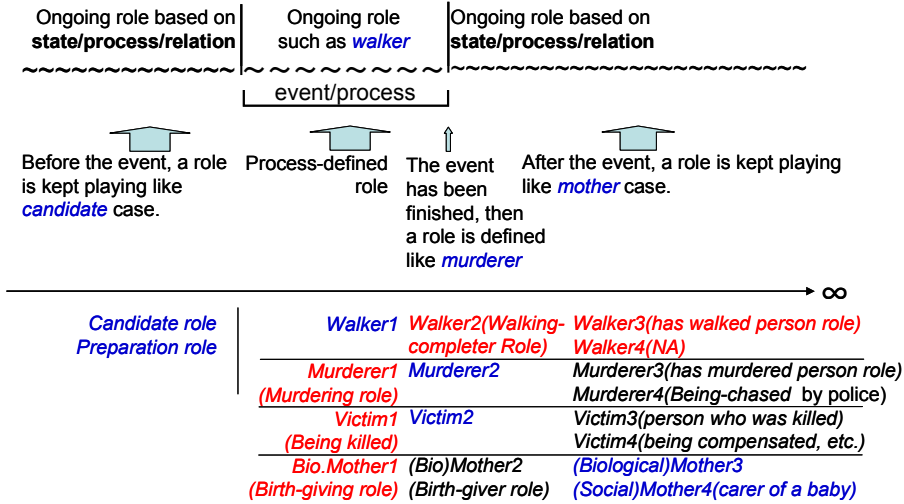


Fig. 2. Informal diagram of occurrent-dependent roles.

physically influenced by the event. Examples include *victim*, *residue*, *product*, etc. Even worse, *victim* who has been killed by a murderer cannot be played. These peculiar characteristics derive from the fact that players come into being or disappear as the result of the event. In summary, event-driven roles are so different from other roles and they need in-depth investigation.

3 Towards a temporal model of occurrent-dependent role

We built a temporal model of occurrent-dependent roles as shown in Fig. 2 to examine them in detail. In theory, we can define four kinds of roles associated with each of the roles of this type. For an occurrent-dependent role, we can define four associated roles from *role1* to *role4*. In the following discussion, we use actions as examples of occurs and their participant roles, especially actor roles, of actions as examples. *Role1* denotes process-dependent role and *role2* – *role4* event-dependent roles, so that *role1* is ongoing. In the case of *walker* role, in fact, *walker1* is equivalent to the original *walker* role. However, the rest three, *walker2* – *walker4* do not make sense well, though we can introduce them theoretically. *Role2* is a role defined at the very end of the event and corresponds to “action completer role” like *murderer* in the case of actor role. In the case of *walker* role, *walker2* denotes “walking (event) completer role”. *Role3* is a role defined as “one who had completed an action” to refer to him/her and we call it “**content-oriented reference**”. *Role4* denotes a new emergent role associated with *role2*. *Murderer4* is defined as “being chased by police”-role or “being punished by justice”-

role, etc. and is a derived role from the original one which is *murderer*₂. We could define *murderer*₁ which means “be murdering role”, but it does not make sense well in reality.

A *victim* has no player because he/she has been dead. Our theory of roles was based on a strong assumption that any role must be played by an existing player, in other words, role-playing must be done while the player exists. How can we explain this issue associated with *victim* role? There are two alternative solutions: one is we allow a kind of roles which have no player, and the other is we exclude such from the set of role candidates. We take the former alternative, though its discussion is omitted here.

4 Concluding remarks

We have discussed a taxonomy of roles and several new kinds of roles. Especially, we discussed a temporal model of event-dependent roles such as *murderer*, *victim*, etc. There could be a radical claim that event-dependent (historical) roles are not roles. But, as discussed in the introduction, our intention is to collect as many role kinds as possible for better understanding about what a role is and what is not and why. To reveal reasons why ABC is not a role, we would need more perspectives contributing to explaining why it is not. The taxonomy we have discussed in this paper is presented for very this purpose. Among others, we found event-dependent roles need special care to establish a convincing theory of roles.

References

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