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Measuring individual differences of Self-as-We:

Reliability and validity of revised version of the Self-as-We scale

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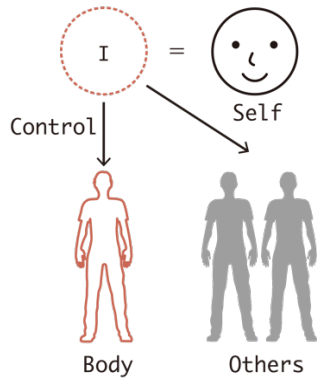
Abstract

We previously created an original scale to evaluate individual differences in Self-as-We, a holistic view of the self, based on the East Asian philosophy of self, which is distinct from the mainstream idea of self in Western philosophy (Watanabe, Murata, Takayama, Nakatani & Deguchi, 2020, in Japanese). One component of this scale, the Collective Action scale, has shown adequate reliability as well as usefulness in terms of its association with mental health (Murata, Watanabe & Deguchi, 2020, in Japanese). However, the response rate of “Neither agree nor disagree” was quite high, suggesting that it may have been difficult for survey participants to answer. Therefore, we developed a revised version of the Collective Action scale with modified wording to make it easier to answer and then tested its reliability and validity based on the responses of 1,082 volunteers.

1. Introduction

Self-as-We is a holistic view of the self that assumes a multi-agent system consisting of a wide variety of agents that support and afford an individual’s somatic actions. It considers the individual “I” to be included among the various agents that make up the system while also considering the totality of these agents as the self. In the conventional idea of self, when performing an action, “I” is an agent that controls the movements of a person’s body and relationships with others through free will, and “I” is the self (Figure 1(a)). In contrast, Self-as-We views “I” as an agent that cannot perform any action alone but lives within “We,” and “We” is the self (Figure 1(b)). The conventional idea of self considers “I” as an individual self, and “We” is constituted only when multiple selves come together from time to time. In contrast, in Self-as-We, “I” as an individual always exists only as an agent that constitutes “We,” a multi-agent system. As a result, for “I,” “We” is an entity from which it is impossible to escape, that is, *an inescapable entity*.

a) Conventional idea of self



b) Self-as-We

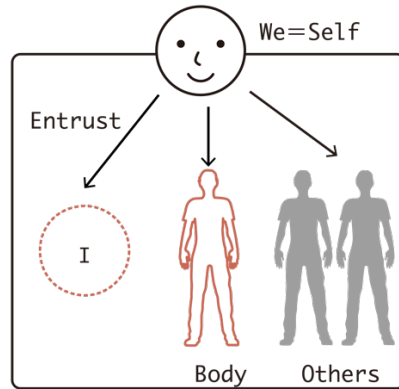


Figure 1. (a) Conventional idea of self. (b) Self-as-We.

As a member of “We,” each agent plays a certain role as a co-entruster to whom the Self-as-We entrusts actions, and a fellowship relationship based on cooperation and equality in a wider sense is to be established between them. For example, a sense of unity is created from the fact that the individual members are inseparably linked to “We,” and since “We” cannot be reduced to individual agents, neither its achievements nor its faults depend solely on a particular member. “We” is both a single system and a collection of many diverse agents, and even though there is no leader who oversees the entire system, each agent fulfills the role entrusted to it by “We,” thus creating a de-centered, spontaneous order and accord.

“I” is an agent that acts autonomously and actively, but at the same time, it also has a passive and heteronomous aspect in a way that it acts in the form of being entrusted by “We” (i.e., auto-heteronomy). Furthermore, “We” is not limited to a specific group of people but can extend to a wider range of relationships, such as society in general (i.e., openness). When people have this idea of self, they are likelier to have an attitude of respect for others as active agents and as beings entrusted with a certain and indispensable role to play in their joint actions with others (see Deguchi, 2022 for a detailed explanation of Self-as-We as philosophical concept).

Watanabe et al. (2020) proposed two scales to assess this holistic self: “Collective Action” and “Transcendent Factor.” Both scales include items on the horizontal relationship of “I” and “Others” in “We” (e.g., fellowship, sense of unity, openness) and the vertical relationship of trust between “We” and “I” and between “We” and “Others” (e.g., auto-heteronomy, sense of trust). The Collective Action scale evaluates the tendency of Self-as-We from the perspective of what kind of attitude one

is likely to adopt in the context of team activities with joint goals. The Transcendent Factor scale assesses broader and more general cognitive tendencies related to the characteristics of Self-as-We not limited to the joint action of the team. Although the Collective Action scale has shown adequate reliability as well as usefulness in terms of its association with mental health during the spread of COVID-19 (Murata et al., 2020), the response rate of “Neither agree nor disagree” was quite high (48.3% of the total responses), suggesting that the scale may have been difficult for survey participants to answer. Therefore, we developed a revised version of the Collective Action scale with modified wording to make it easier to answer and then examined its validity and reliability through a web-based survey of 1,082 respondents. Specifically, we conducted an exploratory factor analysis of the scale to test its reliability and then analyzed the relationship between the scale scores and daily team activities to test its validity.

2. Methods

2.1 Participants

The study protocol was approved by the NTT Communication Science Laboratories Research Ethics Committee and was performed in accordance with the ethical standards set forth in the 2013 Declaration of Helsinki. Informed consent was obtained from all participants using a web form before the survey began. A total of 1,082 Japanese individuals (540 women and 542 men) aged 20s to 60s participated. The number of participants by gender and age is shown in Table 1.

Table 1. Demographic information for the sample.

	Men	Women
20s	103	104
30s	106	107
40s	110	108
50s	111	112
Over 60s	112	109
Total	542	540

2.2 Revision of Collective Action scale

We developed a revised version of the Collective Action scale with modified wording to make it

easier to answer. Specifically, the wording of each of the items in the Collective Action scale was revised to make it easier for respondents to imagine and answer, and we added an item related to fellowship between team members, “I should respect my fellow team members even if I find them difficult to get along with”, and an item related to the individuality of members’ behavior, “It is not a problem for team members to have motives that are different from those of the team” (see Table 2).

2.3 Procedures

For each of the questions on the Collective Action scale (revised version) and Transcendent Factor scale, the order of presentation was shuffled (see the order of responses in Tables 2 and 3). Participants responded to the survey form on the web using a PC, smartphone, or tablet. They were required to answer each question in order to proceed to the next one, so there are no missing values. In addition to the scales, we asked questions about whether they work with others in their daily lives toward a goal, how often they work with others, and how they perceive their relationship with their team over the course of these activities. For the perception of relationship within the team, we used a scale asking about the degree of unity between the team and oneself, which was created with reference to “Inclusion of Other in the Self Scale (Aron, Aron, & Smollan, 1992),” and a scale asking about the strength of cohesion within the team (see Watanabe et al., 2020).

Table 2. Self-as-We items in the Collective Action scale.

	The Collective Action scale (Watanabe et al., 2020, Japanese)	The Collective Action scale (revised version, Japanese)	The Collective Action scale (revised version, English)	Order of responses
	<p>これまでの経験に基づき、あなたが5人から10人くらいのチームで一つの目標に向かって意思決定や活動をする場面を想像してください。そのような場面で、「あなた自身がどのように感じたり考えたりしやすいか」についてお尋ねします。あなた自身について当てはまると思うものを選択してください。</p>		<p>Based on your past experience, imagine a situation where you make decisions or take actions toward a goal in teams of about five to ten people. You will be asked how you would feel or think in such a situation. Choose the option from the response scale that most applies to how you feel about each statement.</p>	
1	自分の属するチームが失敗したときには、自分のことのようにショックを受けるほうだ。	自分の属するチームが失敗したときには、自分のことのようにショックを受けるほうだ。	When the team I belong to fails to achieve its goals, I tend to feel devastated as if it were my personal failure.	8
2	自分の属するチームが成功したときには、自分のこととして喜びを感じるほうだ。	自分の属するチームが成功したときには、自分のこととして喜びを感じるほうだ。	When my team succeeds in its goals, I tend to personally feel happy.	10
3	チームの取り組みで起きた失敗はチームの過失であって、誰か個人の過失だとは言えないと思う。	チームの取り組みで起きた失敗はチームの過失であって、特定の誰かのせいにはできないと思う。	The team should bear collective responsibility for any mistakes made during the project, and we cannot blame a specific member.	4
4	チームの取り組みで得られた成果はチームの成果であって、誰か個人の貢献に還元できないところがあると思う。	チームの取り組みで得られた成果はチームの成果であって、特定の誰かの手柄であるとは言えないと思う。	Any results that are achieved by the team belong to the team and cannot be attributed to a specific member.	11

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5	チームが活動できるのは、チームの外の人々が支えてくれるお陰だと思う。	チームが活動できるのは、チームの外の人々が支えてくれるお陰でもあると思う。	The team can conduct its activities partly thanks to the support from people outside the team.	1
6	自分のチームの利益を超えて、他のチームや社会の役に立つような成果を出したいと思う。	自分のチームの利益に加えて、他のチームや社会の役に立つような成果も出したいと思う。	I would like to achieve results that are beneficial not only for my team, but also for other teams and society as a whole.	13
7	メンバーが協調するためには、必ずしも初めから役割を明確に決めておく必要はないと思う。	それぞれのチームメンバーの役割は最初から固定するより、臨機応変に変えて行った方が良い場合もあると思う。	In some situations, the role of each member should be flexible, rather than fixed from the beginning.	3
8	リーダーが存在しなくても、チームはうまくまとまることもあると思う。	リーダーが存在しなくても、チームメイト同士でうまく活動を進められることもあると思う。	Even in the absence of a leader, team members can sometimes conduct their activities well.	9
9	チームの活動に参加するときには、自ら主体的に行動している感覚と、やらされている感覚の両方を同時に感じるほうだ。	チームの活動に参加するときには、自ら行動している能動的な感覚と、チームの要請に従う受動的な感覚の両方を同時に感じるほうだ。	When I participate in the team's activities, I feel that I am able to take initiative for my actions proactively in addition to passively following the team's requests.	5
10	チームで意思決定をするときには、自らの意思に基づいて決める感覚と、チームの意思に従わせられている感覚の両方を同時に感じるほうだ。	チームで意思決定をするときには、自らの意思に基づく能動的な感覚と、チームの意思に従う受動的な感覚の両方を同時に感じるほうだ。	When making decisions as a team, I am a kind of person who feels to act proactively according to one's own will as well as act passively following the team's will.	7
11		メンバーの中に苦手な人がいても、その人をチームメイトとして尊重すべきだと思う。	I should respect my fellow team members even if I find them difficult to get along with.	16
12	他のメンバーと意見が対立しても、チームの意見として尊重すべきだと思う。	自分の考えと異なる意見も、チームの意見として尊重すべきだと思う。	I should respect other members' opinions as the team's opinions even if I disagree with them.	14
13	チームの一員は、一定の範囲の意思決定を任せられるべきだと思う。	チームの一員は誰であれ、一定の範囲の意思決定を任せられるべきだと思う。	Any member of the team should be trusted to make decisions on their own to a certain extent.	12
14	チームの目標に対してどのように振舞うかは、チームの一員に委ねられるべきだと思う。	チームの目標に対してどのように振舞うかは、チームの一員それぞれに委ねられるべきだと思う。	How to try to accomplish the team's goals should be left to the decision of individual members.	2
15	チームメンバーには、積極的に活動に参加しない人がいてもよいと思う。	チームメンバーの中には積極的に活動する人もしない人も両方いてよいと思う。	It is not a problem when there are team members who are proactive and those who are not.	6
16		チームメンバーの中にはチーム全体の目標とは異なる動機によって参加する人がいてもよいと思う。	It is not a problem for team members to have motives that are different from those of the team.	15

The English version was prepared by double back-translation (commissioned by Crimson Interactive Japan Co., Ltd.), where one translator prepared the English version and another back-translated and revised it.

Table 3. Self-as-We items in the Transcendent Factor scale.

	The Transcendent Factor scale (Watanabe et al., 2020, Japanese)	The Transcendent Factor scale (English)	Order of responses
	あなたは普段どのようなことを感じたり考えたりしていますか。あなた自身について当てはまると思うものを選択してください。	What do you usually feel or think? Choose the option that applies to you.	
1	身の回りの自然も、自分も同じ世界の一部であると感じる。	I feel that both myself and the natural environment around me are part of the same world.	2
2	人類全体の幸福のために、自分も何かをすべきであると感じる。	I feel I should do something that contributes to the happiness of all humankind.	4
3	見ず知らずの他人でも、自分や身近な人と同じくらい大事に思う気持ちを持っている。	I value strangers the same way I value myself and those who are close to me.	1

4	自分と直接かかわりが無い人でも、どこかでつながりを感じる。	I feel some connection with people even if they have no direct involvement with me.	7
5	アイデアを思いつきたときには、自分の意思を超えた何かが降りてきたと感じる。	When I come up with an idea, I feel something beyond what my will has descended upon me.	8
6	何かを書いたり作ったりしているときに、自分の意思を超えた何かにかきされている(作られている)という感覚がある。	When I write or make something, I feel that I am driven to do so by something that is beyond my will.	5
7	自分は自身で生きているという感覚と同時に、自分以外の誰かや何かに生かされていると感じることがある。	I sometimes feel that my life is sustained not only by myself but also by someone or something else.	3
8	自分の生き方は、自分自身だけでなく、過去や未来の人々とのつながりの中にある。	My way of life is connected not only to myself but also to the people in the past and future.	6

The English version was prepared by double back-translation (commissioned by Crimson Interactive Japan Co., Ltd.), where one translator prepared the English version and another back-translated and revised it.

3. Results and discussion

3.1 Factor analysis of the Collective Action scale

The response rate of “Neither agree nor disagree” was lower (30.90%) than in the previous study (Murata et al., 2020), suggesting that the revised scale was easier for the participants to answer. An exploratory factor analysis (maximum likelihood and promax rotation) was performed on the responses to the Collective Action scale items. The relationship between the number of factors and eigenvalues is shown in Fig. 2. We can see that the slope (change in eigenvalues) from component 1 to component 2 is large, and the slope from component 2 to component 3 is also inclined to some extent, while the slope after component 3 is constant and gentle, suggesting a two-factor structure.

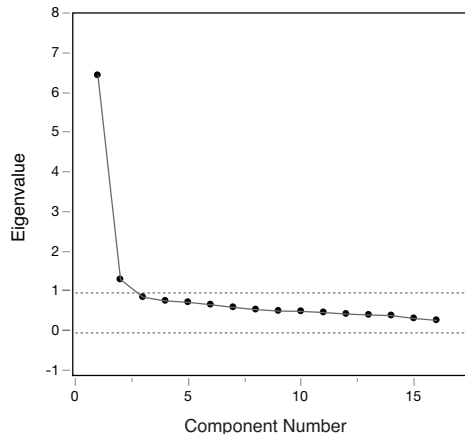


Figure 2. Scree plot of factor analysis for the Collective Action scale.

Table 4 lists the factor loadings of each item. We treat 13 items as the first factor because the factor loadings for Factor 2 are low while those for Factor 1 are all above 0.5. The Cronbach's alpha coefficient for the scale based on the first factor was 0.90, indicating sufficiently high reliability, while the coefficient for the three items of the scale based on the second factor was 0.59, indicating low reliability. These three items are "How to try to accomplish the team's goals should be left to the decision of individual members," "It is not a problem when there are team members who are proactive and those who are not," and "It is not a problem for team members to have motives that are different from those of the team," all of which relate to the tolerance for differences in attitudes among team members. This tolerance for diversity in individual attitudes is an important aspect of a relatively large community or organization but might not be appropriate for a scale such as the Collective Action scale, which is designed to assess perceptions about the relationships of a particular "team" sharing a single goal. Therefore, we decided to adopt 13 of these items, excluding the three items related to tolerance for differences, as items for the Collective Action scale. The average or total score of the 13 items can be used to assess the degree of Self-as-We in the team's collective action.

Table 4. Factor loadings of each item.

	Items	Factor1	Factor2	Cronbach's alpha coefficient
1	When the team I belong to fails to achieve its goals, I tend to feel devastated as if it were my personal failure.	0.67	0.14	0.90
2	When my team succeeds in its goals, I tend to personally feel happy.	0.77	0.22	
3	The team should bear collective responsibility for any mistakes made during the project, and we cannot blame a specific member.	0.61	0.42	
4	Any results that are achieved by the team belong to the team and cannot be attributed to a specific member.	0.56	0.46	
5	The team can conduct its activities partly thanks to the support from people outside the team.	0.68	0.47	
6	I would like to achieve results that are beneficial not only for my team, but also for other teams and society as a whole.	0.66	0.40	
7	In some situations, the role of each member should be flexible, rather than fixed from the beginning.	0.58	0.53	
8	Even in the absence of a leader, team members can sometimes conduct their activities well.	0.53	0.46	
9	When I participate in the team's activities, I feel that I am able to take initiative for my actions proactively in addition to passively following the team's requests.	0.64	0.40	

10	When making decisions as a team, I am a kind of person who feels to act proactively according to one's own will as well as act passively following the team's will.	0.66	0.47	
11	I should respect my fellow team members even if I find them difficult to get along with.	0.62	0.43	
12	I should respect other members' opinions as the team's opinions even if I disagree with them.	0.68	0.47	
13	Any member of the team should be trusted to make decisions on their own to a certain extent.	0.59	0.53	
14	How to try to accomplish the team's goals should be left to the decision of individual members.	0.47	0.50	0.59
15	It is not a problem when there are team members who are proactive and those who are not.	0.16	0.50	
16	It is not a problem for team members to have motives that are different from those of the team.	0.30	0.58	

Next, to test the validity of the revised Collective Action scale, we examined the relationship between responses to questions about actual daily team activities and mean scores on the 13 items.

3.2 Relationship between the scores of the Collective Action scale and daily team activities

Our analysis of the relationship between daily participation in team activities and the scores of the Collective Action scale showed that scores were higher for those who participated in team activities ($N = 710$) than for those who did not ($N = 372$) ($t_{614.9} = 7.65, p < .0001$, Fig. 3). Furthermore, a one-way analysis of variance (ANOVA) on the relationship between the frequency of team activities and the scores of the Collective Action scale for those who work in teams in their daily lives showed that the higher the frequency of team activities, the higher the scores on the Collective Action scale ($F_{5, 709} = 4.50, p = .0005$, Fig. 4).

In addition, we examined the relationship between how one perceives the team activities in which they participate and the score of the Collective Action scale. A one-way ANOVA revealed that the greater the sense of unity they felt with the team, the higher the Collective Action scale score ($F_{4, 709} = 7.14, p < .0001$, Fig. 5). It was also shown that the Collective Action scale scores were higher for those who felt stronger ties within the team ($F_{4, 709} = 5.37, p = .0003$, Fig. 6).

To summarize, the Collective Action scale score was higher for those who participated in team activities, especially those who participated more frequently, and also for those who felt a stronger sense of team unity and cohesion within the team. These findings suggest that the Collective Action scale can capture an important sense of self as it relates to daily team activity.

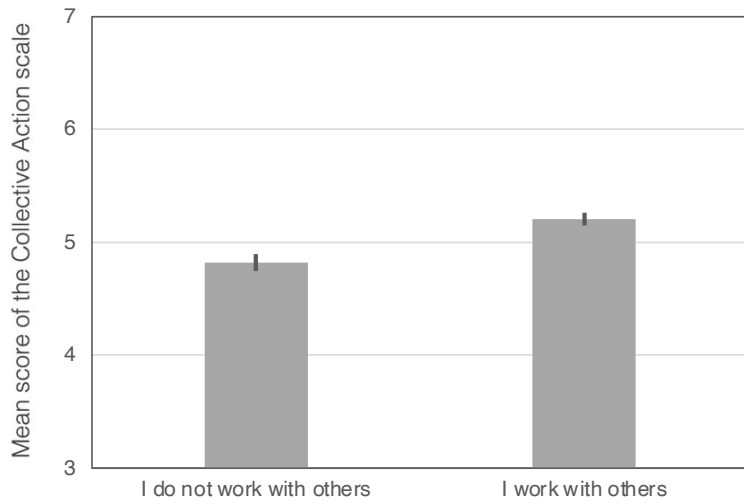


Figure 3. Mean score of the Collective Action scale by daily participation in team activities.
Error bar represents 95% confidence interval.

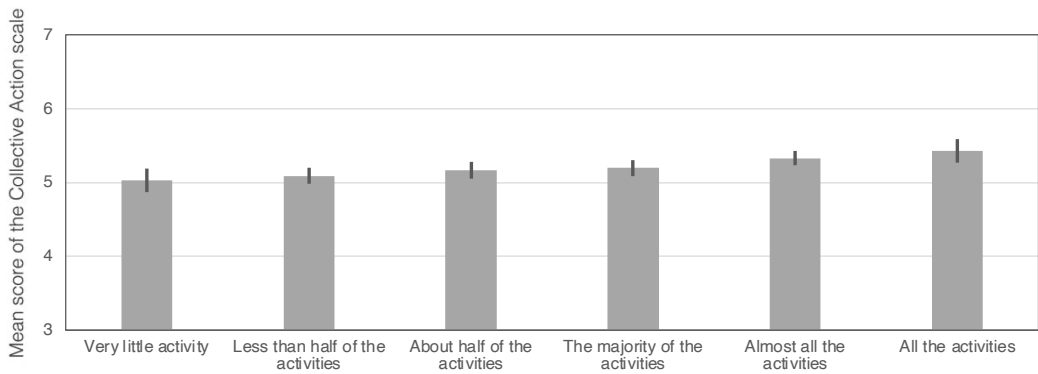


Figure 4. Mean score of the Collective Action scale by frequency of participation in team activities.
Error bar represents 95% confidence interval.

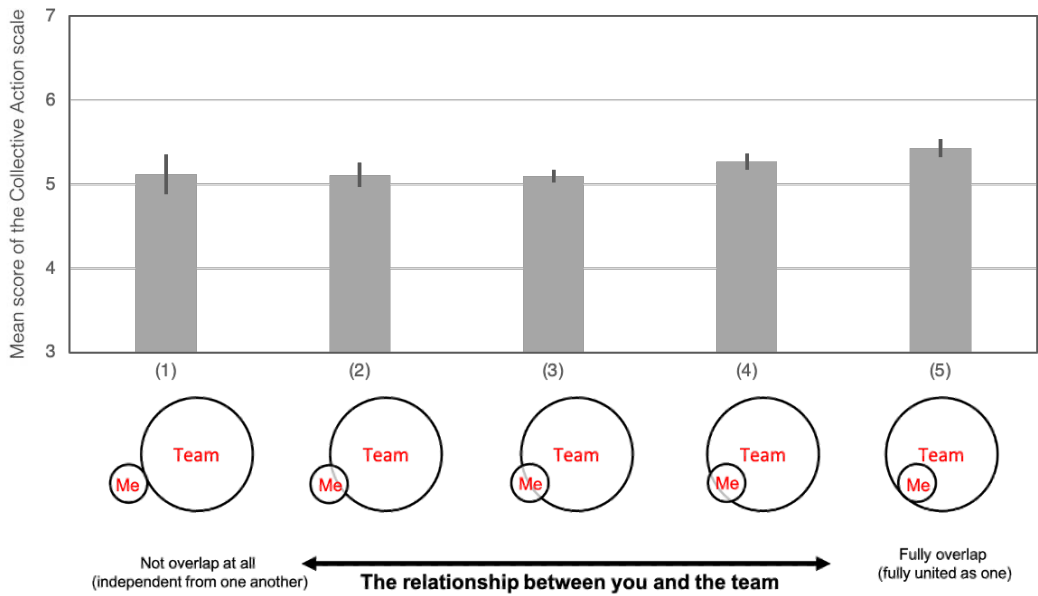


Figure 5. Mean score of the Collective Action scale as a function of sense of team unity.
 Error bar represents 95% confidence interval.

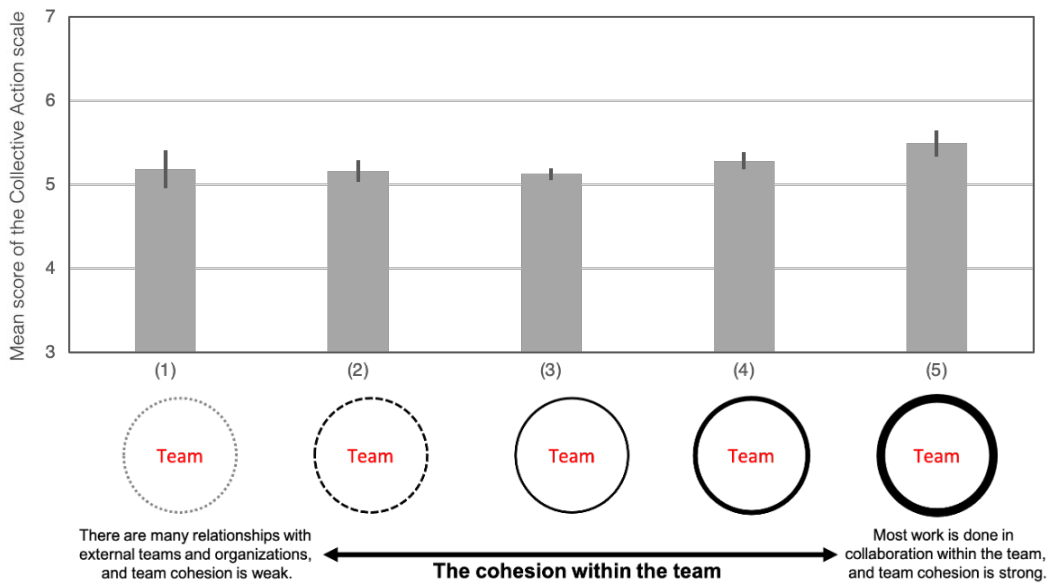


Figure 6. Mean score of the Collective Action scale as a function of sense of team ties.
 Error bar represents 95% confidence interval.

3.3 Factor analysis of the Transcendent Factor scale

Next, we performed an exploratory factor analysis (maximum likelihood and promax rotation) on the responses to the Transcendent Factor scale items. The relationship between the number of factors and eigenvalues is shown in Fig. 7. We can see that the slope (change in eigenvalues) from component 1 to component 2 is large, while the slope after component 2 is constant and gentle, suggesting a one-factor structure. As in Watanabe et al. (2020), the factor loadings were all above 0.5 and the Cronbach's alpha coefficient of the scale was sufficiently high (0.87), suggesting that all items contributed to the high reliability of the scale.

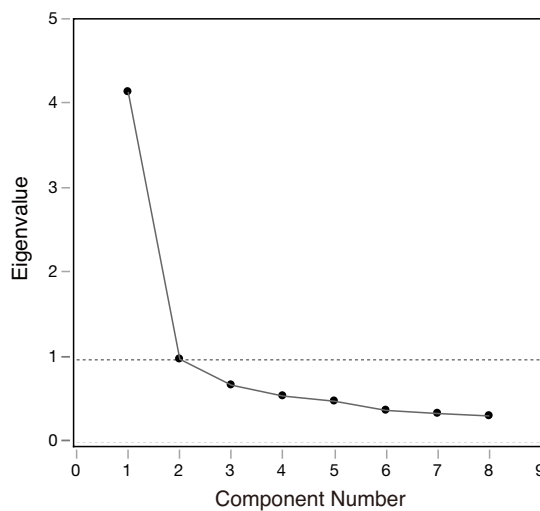


Figure 7. Scree plot of factor analysis for the Transcendent Factor scale.

General discussion

In this study, we developed a revised version of the Collective Action scale and tested its reliability and validity through a web survey. Compared to the previous study, the response rate of “Neither agree nor disagree” was lower, suggesting that the scale has been improved to be more easily answered. In addition, the results suggested that the three items concerning tolerance for differences in attitudes of team members were inappropriate when combined into the same factor as other items, so we decided to use only the remaining 13 items as a new Collective Action scale. Each person's involvement in an organization or community is diverse, and some members may share the same motivations and intentions while others do only the bare minimum in their assigned roles.

Acceptance of these diverse attitudes is deeply related to the idea of “Self-as-We” in the sense that others are entrusted from “We” as “I” and that they have their own behavior. This may be an important factor when evaluating Self-as-We in medium-to-large organizations, rather than the degree of Self-as-We in a small team sharing a single goal, which the Collective Action scale measures.

Our findings showed that the Collective Action scale score was higher for those who participated in team activities, especially those who participated more frequently. In addition, the higher the sense of unity between the team and oneself, the stronger the sense of connection within the team, and thus the higher the score of the Collective Action scale, suggesting that this scale can measure an important idea of self in the collective action of a team. Like Watanabe et al. (2020), the results of an exploratory factor analysis of the Transcendent Factor scale demonstrated the high reliability of the scale. As such, the means or sum of all items on the Transcendent Factor scale allow for evaluation of broader and more general cognitive tendencies related to the characteristics of Self-as-We not limited to the collective action of the team.

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