

Refocusing on Jigsaw – Cooperative Interdependence to Enhance Learning, Civility, Well- ness, Connection and Belonging

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As U.S. schools were being newly racially integrated in an atmosphere of much urgency, skepticism, and yet with great need, Professor Elliot Aronson developed the jigsaw interdependent learning strategy in Austin, Texas. In the cooperative jigsaw method, students learn material in groups and teach it to one another (Aronson, 1978). Although the need for jigsaw was obvious to many, for some parents and school board members it was suspect; born within an atmosphere of stigma, unknowns, misrepresentations, and fear in society.

With integrating classrooms as the rationale for the design and implementation of jigsaw, revisiting jigsaw today presents another opportunity to foster civility, inclusion, connection, and belonging as we seek to address conflicts arising over migration in the education context. For those people seeking refuge in new lands as climate change, conflict, and poverty make their homes unlivable, jigsaw is one tool among many that can benefit our present-day classrooms and societies at large. With this urgency, we revisit cooperative learning's origins, methodology, and benefits.

ORIGINS OF THE JIGSAW LEARNING PROCESS

Over the years, various versions of jigsaw learning have been put forth with slightly differing methods of implementation, while in general, the concept has remained relatively consistent with the original intent. Rarely has there been a learning process with such relative simplicity and yet elegance of concept as jigsaw.

Aronson showed great wisdom in proposing that students, depending on grade level, should be introduced to the concept of working with and learning from each other before implementing the jigsaw process. They proposed team building exercises that emphasized listening skills, co-learning and teaching, the process of sharing pertinent information via turn taking, collaboration and other strategies learned through group games, discussions, and question and answer sessions.

The teacher introduces and discusses the new learning concept several weeks before beginning the jigsaw process and after a series of group sharing experiences.

The primary jigsaw method includes instructors beginning with assigning approximately six students to each »home group«. In the »home group«, each student has a different segment of related material that they will teach each other. After introductions to each other in the »home group«, the students are assigned to into »expert groups«, in which each student has the same material, to better learn their subject matter before returning to their »home group« to present it. In the »expert group«, students share perspectives and give examples – they are motivated to learn and work within their »expert groups« so they better understand how to teach the material and concepts they are responsible for sharing with others when they return to their »home group«. Once back in their original »home group«, each student teaches the others, who are not familiar with the concepts that they now know.

I suggest that teachers occasionally encourage students to spend time (at lunch or recess) with members of their »expert group« or »home group« to build on their interactions and social connections outside of the jigsaw activity. This can lead to an understanding that we can be different, look different, learn differently, and hold differing views, and still allow space for these differences to be accorded respect. As a Ph.D. candidate, I collaborated on jigsaw research with its innovator, Professor Aronson, and since then edited a book, articles, and gave presentations on related topics. Currently, I give talks and write articles related to wellness and resilience, while maintaining a clinical psychology practice. Through these experiences and continued attention to the ongoing unfolding of jigsaw cooperative interdependent learning research, I find abundant evidence for its educational benefits, as well as for its key societal gains.

Fundamentally, Jigsaw relies on our human capacity for empathy through respect for exchange of thoughts and fee-

lings. Developing »natural altruism« through prosocial behavior can begin as early as age one (Bridgeman, 1983). Students and adults at all levels can develop this social and cognitive reciprocity through various means – jigsaw being one of them. The evolutionary biology theory of »reciprocal altruism« may help contextualize why jigsaw is effective and worthy of our attention (Trivers, 1983).

As a university project coordinator under Aronson, and lecturer to undergraduate classes during those pioneering years, I provided academic and experiential opportunities for university students to learn about the theory behind cooperative learning, developmental psychology, and how to prepare students and develop group materials for use in the classroom. Professor Aronson and I regularly gave workshops to teachers, administrators, and parent associations, which supported the coordination and implementation of jigsaw. Many academics also provided formative perspectives and research on jigsaw, developed curricular materials, and coordinated associations, newsletters and conferences on the topic (e.g. Johnson, D.W. & Johnson, R.T., 1981 & Slavin, 1983).

My research shows that jigsaw enhances perspective-taking in comparison to traditional teacher-led lectures, and even more so than with traditional group learning methods, (Bridgeman, 1981). I implemented jigsaw cooperative learning at a fifth-grade level within a research study, and with a university class in an informal assessment (Bridgeman B., Bridgeman, D., 1978). Students at both levels reported an appreciation for the camaraderie that developed, the positive regard for each other, and the overall cooperative experience that prompts diversity of thought with its vital non-hierarchical nature. I witnessed the process of »collective resilience« and what I refer to as providing »trusted reciprocity« due to its turn taking and mutual support. The students' »home group« can often be experienced as a »supportive safe place« and especially for those who, for varied reasons, do not feel they »fit in« or belong. It can develop familiarity, emotional regulation, and predictability (Bridgeman, D. & Aronson, E., 1980).

I later introduced a related process referred to as »meta jigsaw«. Among the various versions of meta jigsaw were components that included a rotating and pairing of two students in the expert group who worked collaboratively to coordinate note taking and co-teaching. I referred to the process as co-mentoring, or mutual coaching, where they reviewed concepts captured, sometimes recording or taping illustrations of relevant points. They then discussed with all in the expert group various points to emphasize and consider in teaching those in their home group. This social and cognitive reciprocity process strengthened the learning and sharing while facilitating a better understanding of the concepts mastered.

JIGSAW'S GIFTS AND ESSENCE OF BELONGING

Jigsaw is a gift for students, grounded in developing relationships that show mutual caring. As Professor Aronson perceptively stated, this process allows for there to be many knowledgeable students, not just the one the teacher selects to answer an inquiry in a traditional lecture style classroom (Aronson, 1978). As a result, Aronson noted that students take away several primary points, »none of them could do well without

the aid of every other person in that group, and each member had a unique and essential contribution to make«.

Research over the past several decades further proves jigsaw's many benefits. It enhances academic performance (Baneng, 2020; Mbacho, 2013; Jones & Jones, 2008; De Vega, 2020). It dement (Willis, 2021; Kumar, et al., 2017). As a form of prosocial development, jigsaw promotes empathy across differences, including for refugees (Taylor & Glen, 2020). Jigsaw enhances motivation (Nurnindyah, 2023; Facing History, 2020). It can also promote belonging, which as Walton and Cohen report, can be key to academic progress (Walton & Cohen, 2007). Even in the workplace, a variant of jigsaw can bring people together and support societal benefits (Torrance, 1982).

Cooperative learning as a broader concept has been connected with the development of cognitive, metacognitive, and motivational skills that can promote self-regulated learning in students (Efklides, 2008; Järvelä, et al., 2008; Facing History, 2020). As a tool for social and emotional learning, jigsaw can teach the seldom-taught skill of building rapport through turn-taking for both listening and sharing, and learning from and with each other through reflective thinking and learning. It has been shown to have a significant effect on the mutual respect students have for each other (Nadya & Santoso, 2021). I suggest that students write in a journal how it feels to be shown empathy and compassion and ways to offer it to one another to integrate these feelings.

Perhaps the most important societal benefit of jigsaw is its role in fostering belonging, a critical element of a society (Walton & Cohen, 2007). There is a wide range of research showing broader benefits of belonging outside the classroom too (e.g. Japanese »quality circles« and their role in fostering workplace belonging (Torrance, 1982 & Walton & Cohen, 2007)). Many universities and workplaces now have belonging initiatives, including Georgetown, Google, MIT, UC Berkeley, Stanford, UC Santa Cruz, and others.

The longest psychological developmental study shows the benefits of social connections to belonging. A Harvard study, which began in 1938 and is ongoing under current research director Dr. Robert Waldinger, reports from interviews with boys from a very young age and into their later years that the primary variable consistent with the best physical and mental health was maintaining »social connections, not necessarily with the same social contacts, yet that they have ongoing connection with others« (Waldinger & Shultz, 2022). Waldinger's research and the ongoing study have been widely reported and are central to a U.S. report by the Office of the Surgeon General, Dr. Vivek Murthy, emphasizing the epidemic of »loneliness and isolation«. The report recommends that schools should be »implementing socially based educational techniques such as cooperative learning projects that can improve educational outcomes as well as peer relations« (OSG, 2023). This finding about the importance of belonging to wellbeing has deep roots in psychology. Within the early social psychology concept of hierarchy from 1943, Maslow brilliantly refers to our basic desires for psychological needs, safety needs, love and belonging, esteem and self-actualization (Maslow, 1943).

As jigsaw builds one's belonging backbone, it produces academic skill development, encouraging inquiry process

skills, such as the importance of asking why, evaluating relevance, and understanding and assessing whether there is support for or against one's point of view. Co-teaching jigsaw requires students to synthesize, seek common themes, reflect, and present. Consequently, it allows for a deeper integration and understanding of the material. In other words, this process contributes to learning the crucial »critical thinking skills« that have been politicized and intentionally discouraged in many classrooms over the past decades (Christiansen & Sullivan, 2010).

Further, jigsaw's interdependent method, with its integration of social and cognitive components, is highly conducive to an active participatory way of learning and teaching, what I refer to as »shared learning«. The interaction with varied concepts, and with each other, is a crucial learning experience that aids in the understanding of a subject and one's view on a topic, apart from a focus on grades. A teaching blog emphasizes the importance of emotional intelligence and jigsaw, and reports that »jigsaw contributes to better comprehension, analytical skills, and [is] overall an enjoyable experience for students« (Nusrath et al., 2019).

Thus, jigsaw elicits involvement and encourages students to feel useful in their learning process, extending to *all* participants. In a recent study, Mbacho found that jigsaw minimizes the role of gender in achievement, particularly regarding math (Mbacho, 2022). Moreover, a 2020 study found that empathy can improve academic outcomes (Okonotua & Ruiz, 2020).

RESEARCH BRINGING JIGSAW'S BENEFITS FORWARD

Jigsaw's fostering of connection can support students amidst a landscape of increasing mental health concerns (Montero-Marin, et al., 2023; V. Hinze, et al., 2023). The ubiquitous use of social media, which did not exist when jigsaw was first developed, only renders these concerns and divisions more intense and increases the need for ways to provide in-person contact, discussion, friendship, and connection. Via my clinical psychology lens, I also value cooperative interdependence for the friendships it cultivates. As Bayer's research reports, »high quality friendships can protect kids from mental health issues, such as anxiety and depression that might otherwise result from social challenges, including being bullied« (Bayer, 2018).

Similarly, Walter and Cohen find that feelings of uncertainty about one's belonging may lead to disengagement, which in turn, leads to poor academic outcomes (Walton & Cohen, 2007). Newly immigrated students and those who are targets of oppression can feel marginalized, with the lack of a feeling of belonging impacting their mental health. As one example, a 2023 study reported that 4,000 Black adolescents reported a decrease in school belonging, which was associated with a 35 percent increase risk in suicidal thoughts and attempts (Boyd, 2023). Graham says »when you see other people in your classes (who look like you), you feel more like you belong«. Her research further illustrates that belonging is related to academic achievement and that increased school diversity can benefit all students (Abrams 2024, quoting Graham). She also reports that »higher diversity is linked to lower rates of bullying, due in part to shifts in power dynamics, and can improve adolescents'

attitudes toward people from other racial and ethnic groups« (Graham, 2023; see also Educational Psychologist, 2018).

Jigsaw's range of benefits include fostering respect-based collaboration and predictability to help students feel safe and supported, especially for those who are targets of racism, xenophobia, discrimination, or other forms of oppression. Jigsaw specifically supports the more shy, less confident, and the most challenged students and those who felt they were an »outsider« (Bridgeman, 1985). The overall political atmosphere, including the recent banning of racial equity curriculum in some districts, can make some groups of students – including refugees and migrants – feel like outsiders, threatening the fundamental validation of students' identity, causing students to require all the more support from prosocial curriculum (López, 2022).

Geoffrey L. Cohen's recent book skillfully amplifies and takes on a compatible view regarding our highly divisive U.S. political environment. Cohen makes the connection to education and the benefits of students working together cooperatively, and our needs for social connections and of a sense of place (Cohen 2022). Further, Cohen points to research by Aronson regarding the »jigsaw classroom« that »inspired so much of the cooperative learning movement in U.S. education« (Aronson, E., 1978; Cohen, 2022). Cohen and I also agree that jigsaw's support of cooperative learning may provide one small step in a supportive and corrective direction, particularly in these polarized times.

Jigsaw may play a role in peacebuilding as well. An objective of jigsaw is to understand how to hold each other's varying views, and appreciate how they can disagree, without demonizing, dismissing, or stereotyping. Others' perspectives become a consideration, not a threat, a setting where all belong (Cohen, 2022; see also Edutopia Video, 2023). A teaching study reports that prosocial behaviors and emotional intelligence (like with jigsaw learning) are positively associated with lifestyle habits that reduces school violence, substance abuse, and enhances life satisfaction (González Moreno, et al., 2024).

Taylor's research makes the point that »igniting the spark of allyship in young people could motivate new norms and help disrupt cycles of violence«, exactly why jigsaw interdependent learning was conceived (Taylor, 2020). Student encounters among those of »differing ethnic and religious groups in academic settings [has been] associated with favorable attitudes toward intergroup contact, even in the context of protracted ethnopolitical conflict« (Faibish, N., et al., 2023). Similarly, Glen, et al., recommend a model that induces empathy and prosocial behavior (like jigsaw) toward a member of a stigmatized group, as they propose that it may improve attitudes as a whole and in turn increase prosocial behavior toward refugees (Glen, et al., 2020).

The straight-forward yet compelling design of jigsaw demonstrates the genius and thoughtfulness that Aronson contributed to the field of psychology (via his many prize-winning publications, including the 13th edition of *The Social Animal*).

While jigsaw is not a panacea, it is a much-needed redirection of priorities for the benefit of our students and our world.

NOTE

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